

Mitigation Monitoring Annual Report Year 10 (2021): Tualatin Valley Environmental Bank

1: **Tualatin Valley Environmental Bank**

Identifiers:

DSL Permit # APP46796 Corps Permit # NWP-2009-552 Permittee: Dave Heikes Farms Inc.
 County: Washington Report Date: Dec.9, 2020 Monitoring Year: 9
 Date Removal-Fill Activity Completed: October 2011
 Date mitigation was completed: Grading- October 2011, Planting- 2011-2015
 Date(s) of data collection: August 5,6,20 and September 3, 2021
 Report prepared by: C. Jonas Moiel

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**.
- Mitigation Bank** Report
- Other _____

3: **Results:**

	Performance standards (verbatim from permit)	Fully Met? (Y/N)	Comments/Reason for shortfall (mark NA if doesn't apply this year)
VEGETATION PERFORMANCE STANDARDS			
Herbaceous (PEM) Wetlands			
FACW or FAC Dominated Herbaceous Wetlands			
1.1	The combined cover of native species for Year 1 shall be 40%; Year 2 shall be 50%; and Year 3 and thereafter shall be 60%.	Y	Average cover of native species in 20 sample plots in this habitat class for Year 10 was 90%. At an 80% confidence level, the upper confidence interval (CI) was 94% and the lower CI was 86%. This meets the final standard (Year 3 & thereafter).
1.2	The cover of non-native invasive species during the 1st and 2nd years shall not exceed 30%. For year 3 and thereafter, the non-native invasive cover, excluding reed canarygrass (<i>Phalaris arundinacea</i>), shall not exceed 10%. The cover of reed canary grass shall not exceed 10% for year 3 and thereafter.	Y	Average cover of invasive species in this habitat class for Year 10 rounded to 1%. At an 80% confidence level, the upper confidence interval (CI) was 1% and the lower CI was 0%. No reed canarygrass was present in any sample plot. This meets the final standard (Year 3 & thereafter).

1.3	Bare substrate represents no more than 20% cover by the 3rd year after planting.	Y	There was a total rounded average of 2% bare substrate, which consisted of bare mineral soil or moss in this habitat. This year there was no cover of dead, sprayed non-native plants in this habitat. The upper CI was 4% and the lower CI was 1%. This meets the final standard (Year 3 & thereafter).
1.4	The standard for diversity in herbaceous wetlands is at least 6 native species, each with 5% or more average cover and occurring in at least 10% of the plots by the 3rd year after planting.	Y	This habitat is meeting the diversity standard with seven native species: <i>Hordeum brachyantherum</i> , <i>Leersia oryzoides</i> , <i>Lotus unifoliatus</i> , <i>Lycopus americanus</i> , <i>Madia glomerata</i> , <i>Eleocharis palustris</i> , <i>Carex obnupta</i> .
1.5	The hydrophytic vegetation standard is that the Prevalence Index is ≤ 3.0 and/or the vegetation passes the "50/20 rule" for dominance of hydrophytic vegetation.	Y	The average rounded Prevalence Index (PI) for the habitat class this year was 2 (FACW). This meets the final standard (Year 3 & thereafter).
OBL Dominated Herbaceous Wetlands			
2.1	The standard for native cover for Year 1 shall be 10%; Year 2 shall be 20%; and Year 3 and thereafter shall be 40%.	Y	Average cover of native species in 5 herbaceous plots in this habitat class for Year 10 was 82%, which exceeds the final (Year 3 and thereafter) standard. At an 80% confidence level, the upper confidence interval (CI) was 96% and the lower CI was 69%.
2.2	The cover of non-native invasive species during the 1st and 2nd years shall not exceed 30%. For year 3 and thereafter, the non-native invasive cover, excluding reed canarygrass, shall not exceed 10%. The cover of reed canary grass shall not exceed 10% for year 3 and thereafter.	Y	The average invasive species cover in this habitat class was 0%; no invasive species were present in any plots. Thus, at an 80% confidence level, the upper confidence interval (CI) and the lower CI were both 0%. This meets the final standard (Year 3 & thereafter).
Forested (PFO) Wetlands, Shrub dominated (PSS) Wetlands and Buffers			

3.1	The combined cover of native species for Year 1 shall be 40%; Year 2 shall be 50%; and Year 3 and thereafter shall be 60%.	PFO: Y PSS: Y Buffer: Y	<p>PFO: Average cover of native species in the 34 herbaceous plots for this habitat class for Year 9 was 75% (upper CI = 82%, lower CI = 69%). There was an average of 62% cover of native woody species in the 18 woody sample plots (upper CI = 70%, lower CI = 53%). Combining the herb & woody averages gives a total of 137% native cover, which meets the final standard (Year 3 & thereafter).</p> <p>PSS: Average cover of native species in the 41 herbaceous plots for this habitat class for Year 9 was 24% (upper CI = 31%, lower CI = 18%). There was an average of 93% cover of native woody species in the 20 woody sample plots (upper CI = 98%, lower CI = 88%). Combining the herb & woody averages gives a total of 117% native cover, which meets the final standard (Year 3 & thereafter).</p> <p>Buffer: Average cover of native species in the 28 herbaceous plots for this habitat class was 56% (upper CI = 64%, lower CI = 48%). There was an average of 36% cover of native woody species in the 14 woody sample plots (upper CI = 41, lower CI = 32). Combining the herb & woody averages gives a total of 92% native cover, which meets the Year 3 standard (this is Year 9 for the buffers).</p>
3.2	The combined cover of non-native invasive species will not exceed 30% by Year 3 and thereafter.	PFO:Y PSS:Y Buffer: Y	<p>PFO: The average cover of invasives in the herb plots for this class rounded to 1% (upper CI = 1%, lower CI = 0%); invasive cover in the woody plots was 0% (upper & lower CI = 0). This meets the final standard (Year 3 & thereafter).</p> <p>PSS: The average cover of invasives in the herb plots for this class was 8% (upper CI = 10%, lower CI = 6%); invasive cover in the woody plots rounded to 0% (upper & lower CI = 0%). This meets the final standard (Year 3 & thereafter).</p> <p>Buffer: The average cover of invasives in the herb plots rounded to 6% (upper CI = 9%, lower CI = 4%) and average invasive cover in the woody plots rounds to 0% (upper CI & lower CI = 0%).</p>
3.3	Bare substrate represents no more than 40% cover by the 3rd year.	PFO:Y PSS:Y Buffer: Y	<p>PFO: The average is 9% in the herbaceous plots (upper CI = 12%, lower CI = 5%).</p> <p>PSS: the average is 18% in the herbaceous plots (upper CI = 26%, lower CI = 9%).</p> <p>Buffer: The bare substrate averages 10% (upper CI = 14%, lower CI = 6%).</p> <p>Note: As of 2015 and thereafter, any herbaceous plot having $\geq 60\%$ shade from woody species is excluded from the bare substrate criteria.</p>

3.4	By Year 3 and thereafter, there are at least 6 different native species. To qualify, a species must have at least 5% average cover in the habitat class, and occur in at least 10% of the plots sampled.	PFO:Y PSS: Y Buffer: Y	PFO: 10 native species (<i>Deschampsia cespitosa</i> , <i>Leersia oryzoides</i> , <i>Eleocharis palustris</i> , <i>Hordeum brachyantherum</i> , <i>Lotus unifoliatum</i> , <i>Polygonum hydropiperoides</i> , <i>Sparganium emersum</i> [herbs] and <i>Fraxinus latifolia</i> , <i>Salix hookeriana</i> & <i>Salix lucida</i> var. <i>lasiandra</i> (<i>lasiandra</i>) [woody species]) met the criteria. PSS: 8 species (<i>Impatiens capensis</i> , <i>Scirpus microcarpus</i> [herbs], and <i>Cornus sericea</i> ssp. <i>sericea</i> , <i>Fraxinus latifolia</i> , <i>Populus balsalmifera</i> , <i>Salix hookeriana</i> , <i>Salix sitchensis</i> , <i>Salix lucida</i> var. <i>lasiandra</i> and [woody species]) met the criteria. Buffer: 6 native species, including 4 herb species (<i>Deschampsia cespitosa</i> , <i>Elymus glaucus</i> , <i>Hordeum brachyantherum</i> and <i>Festuca rubra</i>) and 2 woody species (<i>Fraxinus latifolium</i> , <i>Pseudotsuga menziesii</i>) met the criteria.
3.5	The density of woody vegetation is at least 1,000 native plants (shrubs) and/or stems (trees) per acre, including native volunteers. After the areal canopy cover (<i>including</i> shrub cover) is 50% or greater, there will be no minimum number of plants/stems. Woody vegetation standards should be met for two successive years without irrigation.	PFO: Y PSS: Y Buffer: Y	PFO: There was an average of 1,386 plants or stems/acre in 18 woody plots, which meets the standard. Average percent woody cover was 62% (upper CI=70% & lower CI= 53%). PSS: There was an average of 1,342 plants or stems/acre in 20 woody plots, which meets the standard. Average percent woody cover was 93% (upper CI= 98%, lower CI= 88%). Buffers: There was an average of 1,537 plants or stems/acre in 14 woody plots. Average percent woody cover was 36% (upper CI= 41%, lower CI = 32%).
3.6	The hydrophytic vegetation standard for PSS and PFO wetlands is that the Prevalence Index is ≤ 3.0 and/or the vegetation passes the "50/20 rule" for dominance of hydrophytic vegetation.	PFO: Y PSS: Y	PFO: The average rounded Prevalence Index (PI) from the herbaceous and woody plots were both 2 (FACW). PSS: The average rounded Prevalence Index (PI) from the herbaceous and woody plots were both 2 (FACW).
Notes: All the above cover percentages represent absolute areal cover. In all cases, the "Year" refers to the number of years after <i>that portion of the site</i> was first planted. All habitat classes <i>except</i> the buffers are Year 9; the buffers are Year 7. Bare substrate includes areas of bare soil and areas covered by moss, water, or dead herbaceous plants.			

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

June 10, 2022

TUALATIN VALLEY ENVIRONMENTAL BANK
MONITORING REPORT YEAR 10 (2021)

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TABLE OF CONTENTS

1.0 MITIGATION PLAN PURPOSE AND OVERVIEW:
1.1 LOCATION..... 1
1.2 MITIGATION GOALS AND OBJECTIVES..... 1
1.3 MAINTENANCE AND MANAGEMENT ACTIONS..... 1
1.4 MONITORING METHODS..... 2
1.5 MONITORING DATA LOCATIONS.....2
1.6 HYDROLOGY METHODS AND CONTEXT.....3

2.0 RESULTS:
2.1 VEGETATION STANDARDS.....3
2.2 HYDROLOGY STANDARDS.....5
2.3 DELINEATION OF WETLAND ACREAGE ACHEIVED.....6
2.4 WILDLIFE OBSERVATIONS.....6

3.0 CONCLUSIONS AND RECOMMENDATIONS:
3.1 PROJECT STATUS.....6
3.2 ANNUAL TRENDS..... 7
3.3 CONCLUSIONS.....7
3.4 RECOMMENDATIONS.....8
3.5 FINANCIAL SECURITY STATUS.....9

4.0 REFERENCES.....9

MAPS AND FIGURES:

- Figures 1a-1c: Monitoring Location Maps (Finalized 2017)
- Figure 3: Credit Determination Map 2017

Note: There is no Figure 2 this year and the maps included are from the Year 6 (2017) monitoring report.

APPENDICES:

- APPENDIX A: Vegetation Data
- APPENDIX B: Photographic Documentation
- APPENDIX C: Vegetation Monitoring Transect Location Table
- APPENDIX D: Credit Ledger (2019)
- APPENDIX E: Drone Photo Monitoring

1.0 MITIGATION PLAN PURPOSE AND OVERVIEW

1.1 LOCATION

The Tualatin Valley Environmental Bank (TVEB) is located on 105.95 acres at the confluence of the Tualatin River, Christensen Creek and several unnamed surface and sub-surface drainages. The TVEB is located near 9400 southwest Heikes Drive in Hillsboro, Oregon, 97123; Township 1 South, Range 2 West, Section 32, utilizing portions of tax lots 1200 and 691; and Township 1 South, Range 2 West, Section 29, tax lot 601.

1.2 MITIGATION GOALS AND OBJECTIVES

At the request of DSL, starting in 2015, we have removed some portions of text that are unchanged from year to year. To review the “Mitigation Goals and Objectives” please refer to the first three monitoring reports (Green Banks LLC 2012-2014) or the Mitigation Bank Instrument (Green Bank LLC 2010).

1.3 MAINTENANCE AND MANAGEMENT ACTIONS

Green Banks uses an integrated approach to vegetation management at the TVEB. For the first few years after Bank establishment (2012-2014), the maintenance efforts focused on non-native weed control. This included multiple herbicide applications per year, mowing, cutting, and prescribed burning. For the past seven years (2015-2021) there has been a substantial reduction in maintenance efforts as the native plant communities have become established.

In 2021, there was a low need for maintenance compared to previous years due to reduced non-native species cover and increased native species cover. Most of the common target weeds have been reduced to very low percent cover and small populations. This reduction in weed cover has allowed us to adjust how we manage the site, with a transition away from repeated herbicide applications and an increase in mowing and hand-pulling efforts. This trend of decreased non-native cover has been noted for the past seven years. Herbicide applications were made in a few select areas targeting perennial invasive grasses and broadleaf weeds in the spring and summer.

Most of the buffer areas, except those on steep slopes or with existing mature forest, were mowed twice per year for the first few years of establishment. In 2021 (as in 2019 and 2020), only patch mowing of certain areas of the buffers with higher levels of non-native plants was completed. Additionally, one herbicide application was made to the buffer areas targeting broadleaf weeds, as well as a targeted application in the wetland areas for reed canarygrass and other ODA noxious weeds. The herbaceous layer in most of the buffer areas is now dominated by native grasses and herbs, and the planted trees and shrubs are established enough to no longer require frequent maintenance mowing.

Beaver activity has increased over the last couple years and minor maintenance of the primary log-jam, including hand removal of sticks and debris, has been necessary to maintain the desired surface water elevations. Dave Heikes, the Bank Sponsor, installed a beaver “leveler” at the primary log-jam in the late summer of 2018. This included hand-installing a 12-inch corrugated pipe through the log-jam, and caging

the inlet of the pipe (to keep it from being plugged by beaver). It is anticipated that the leveler will reduce the amount of log-jam maintenance and help to maintain more consistent surface water levels.

1.4 MONITORING METHODS

At the request of DSL, we have removed some portions of text that are unchanged from year to year. To completely review the “Monitoring Methods”, including the criteria for designating plant species as “non-native” and/or “invasive”, please refer to any of the first three monitoring reports (Green Banks LLC 2012-2014) or the Mitigation Bank Instrument (Green Bank LLC 2010).

The 2021 vegetation monitoring was conducted between August 5th and 6th by Senior Scientist C. Jonas Moiel, and August 30th and September 3rd by Miles Eubanks.

For year 10 (2021) and beyond, we have proposed the use of drone photo-monitoring to monitor the native cover within the PSS and PFO wetlands due to the difficulty navigating through the dense areas. They have met the final performance standards (Year 3) for more than 7 years. These plant communities are very densely established with trees and shrubs and have high native cover. The PEM and Buffer communities were not monitored by drone and were using the standard monitoring methods described in the MBI.

An attempt at monitoring the buffer tree and shrub cover by drone was made, using new methods developed by Green Banks LLC as an experiment; this was suggested by DSL. Our goal in conducting this monitoring was to determine if we could accurately determine aerial cover estimates for various species through the use of drone photos. Our conclusion was that for plots with a high level of tree and shrub cover the method seemed to work with some level of accuracy; however, for low cover plots or plots with a high number of small shrubs such as snowberry or Oregon grape, there was a loss of accuracy. The size of the plot also matters in that if the plot is too large it needs to be photographed at a higher elevation and therefore it becomes more difficult to identify various species. We did not determine the “perfect” plot size for drone monitoring and are not interested in adjusting the plots that have been monitored for 10 years; this was more of an experiment than formal monitoring.

The agencies were provided with draft monitoring data and drone photos prior to the annual walk-through on August 10, 2021.

1.5 MONITORING DATA LOCATIONS

Please refer to Figures 1a-1c which display the planted habitat types (sample units), monitoring transect locations, monitoring data plots, photo monitoring locations, and hydrology monitoring pits and wells. The habitat types consist of PEM wetlands, PSS wetlands, PFO wetlands, and buffers. In the PEM wetlands, we divided the class into two sub-classes: OBL dominated and FACW/FAC dominated. This is the case because each of these sub-classes have different performance standards.

In the 2021 monitoring we had total of five herbaceous plots in the OBL PEM community, 19 herbaceous plots in the FACW/FAC PEM community, 34 herbaceous plots and 18 woody plots in the PFO community, 41 herbaceous plots and 20 woody plots in the PSS community, and 28 herbaceous and 14 woody plots in the upland buffer areas.

Over the first six years of monitoring there were some adjustments to the number and locations of the plots; several were skewed, moved or removed to avoid a dirt road, property lines, deep inundation, or habitat transitions. These adjustments were documented in the first six monitoring reports and are also summarized in the notes following the vegetation monitoring data tables in Appendix A.

Monitoring Transect and Plot Details

For an in-depth description of the monitoring transects and plot details please refer to the Year 5 (2016) Monitoring Report or the MBI (Green Banks LLC 2010).

The locations of the start and end points of each monitoring transect (Appendix C), the northwestern corner of each herbaceous plot, and all four corners of the woody vegetation plots were GPS surveyed when the monitoring locations were established in 2012. Any subsequent modifications have been GPS surveyed.

1.6 HYDROLOGY METHODS AND CONTEXT

Post-construction hydrology monitoring occurred between 2012-2016. The delineation lite was conducted in 2014 with additional data collected in 2016 per the request of DSL. On March 24 2017, Dana Field (DSL) met with C. Jonas Moiel and Jeff Handley to review the post-construction wetland delineation boundary; this site visit was made in the early growing season, primarily to evaluate wetland hydrology. Following the site visit, it was determined that wetland hydrology was achieved.

2.0 RESULTS

2.1 VEGETATION STANDARDS RESULTS

The raw vegetation monitoring data for the PEM and Buffer herbaceous and woody communities are presented in four tables included in Appendix A. In the first three years of reporting, the verbatim text of each vegetation standard and the results were presented in this section, essentially repeating all the information that is presented in the Cover Sheet. Starting in 2015, in the interest of brevity, please refer to the Cover Sheet, which provides the *exact wording* of all the Performance Standards, the current confidence interval (CI) ranges, and minor comments, as well as the Vegetation Performance Standards Summary Tables for each habitat unit (Tables 3a through 3e) and brief discussions below. Please note that for all wetland habitat types listed below, 2021 is considered to be Year 10. However, the upland buffers are considered to be at Year 8 as this is the eighth year of monitoring since the initial planting was completed.

Table 3a: FACW/FAC PEM Habitat (~ 8.3 acres, 19 Herb Plots, Year 10)										
Criteria	1.1: Percent Native Cover		1.2: Percent Invasive Cover		1.3: Bare Substrate		1.4: Diversity		1.5: Hydrophytic Community	
Performance Standard	1.1: ≥ 60% by Year 3 and thereafter		1.2: ≤ 10% reed canarygrass and ≤ 10% other invasive species by Year 3 and thereafter		1.3: ≤ 20% by Year 3 and thereafter		1.4: Six native species with ≥ 5% cover, occurring in ≥ 10% of the plots.		1.5: Prevalence Index is ≤ 3.0	
	Average	Pass? Y/N	Average	Pass? Y/N	Average	Pass? Y/N	Number of species	Pass? Y/N	Average	Pass? Y/N
Results	90%	Y	1%	Y	2%	Y	7	Y	2	Y

Herbaceous Palustrine Emergent (PEM) Wetlands- FACW/FAC Dominated Community

The FACW/FAC PEM community is meeting all the performance standards. It is densely populated with many native grasses, forbs, sedges and rushes with an average of 90% native cover, which is 30% above the standard of 60% by Year 3 (Standard 1.1). Invasive cover (Standard 1.2) rounds to 1%, *Convolvulus arvensis* was the only invasive species in the plots, same as in 2018, 2019 and 2020. Cover by other non-natives is also minimal. Seven native species (*Hordeum brachyantherum*, *Leersia oryzoides*, *Lotus unifoliolatus*, *Lycopus americanus*, *Madia glomerata*, *Eleocharis palustris* and *Carex obnupta*) met the diversity standard (Standard 1.4) of $\geq 5\%$ average cover and occurring in $\geq 10\%$ of the plots this year. Although the average rounded prevalence index (PI) was 2 (FACW) for this habitat class, several plots (< half) had a rounded PI of 1 (OBL).

Criteria	2.1: Percent Native Cover		2.2: Percent Invasive Cover	
Performance Standard	2.1: $\geq 60\%$ by Year 3 and thereafter		2.2: $\leq 10\%$ reed canarygrass and $\leq 10\%$ other invasive species by Year 3 and thereafter	
	Average	Pass? Y/N	Average	Pass? Y/N
Results	82%	Y	0%	Y

Herbaceous Palustrine Emergent (PEM) Wetlands- OBL Dominated Community

The OBL PEM community is meeting all performance standards (Standards 2.1 and 2.2). The average percent native cover (Standard 2.1) is 82%. Common native species included *Sparganium emersum*, *Polygonum hydropiperoides*, and *Lemna minor*. Cover by invasive species (Standard 2.2) averaged 0%; no invasive or other non-natives were recorded.

Palustrine Forested (PFO) Wetlands

The PFO community was monitored by drone in 2021 because it has met the final (Year 3) performance standard for more than 7 years. This approach to monitoring was proposed to the agencies in 2020 due to the difficulty of navigating through dense thickets of trees and shrubs; reduced monitoring after years of meeting final performance standards is also specified as an option in the MBI.

The purpose of drone monitoring is to display evidence of continued survival of tree and shrub communities. Non-native invasive species of concern are commonly not shade tolerant and the PFO areas have high cover (shade). The forests are too dense in most areas to even walk through with a backpack sprayer or conduct weed control if desired; they have also had low invasive cover for many years consecutively. Please refer to the Drone Photo Pages Appendix C for an aerial view of the PFO and PSS areas at Year 10.

In 2020, formal monitoring was conducted and the combined percent cover of native species (Standard 3.1) was 137% (75% herbs and 62% woody species), the invasive cover (Standard 3.2) in the herb layer was 1% due to a small population of *Convolvulus arvensis* and the woody layer invasive cover was 0%; and ten native species (seven herbs and three woody species) met the diversity standard (Standard 3.4).

Palustrine Scrub-Shrub (PSS) Wetlands

The PSS community was monitored by drone in 2021 because it has met the final (Year 3) performance standard for more than 7 years. This approach to monitoring was proposed to the agencies in 2020 due to the difficulty of navigating through dense thickets of trees and shrubs; reduced monitoring after years of meeting final performance standards is also specified as an option in the MBI.

The purpose of drone monitoring is to display evidence of continued survival of tree and shrub communities. Non-native invasive species of concern are commonly not shade tolerant and the PFO areas

have high cover (shade). The forests are too dense in most areas to even walk through with a backpack sprayer or conduct weed control if desired; they have also had low invasive cover for many years consecutively. Please refer to the Drone Photo Pages Appendix C for an aerial view of the PFO and PSS areas at Year 10.

In 2020, formal monitoring of the PSS community was conducted and the combined percent cover of native species (Standard 3.1) was 117% (24% herbs and 93% woody species), which was similar to the results from the previous three years; invasive cover (Standard 3.2) in the herb layer was 8%, and the woody layer invasive cover was at 0%; and eight (two herbaceous and six woody) native species met the diversity standard (Standard 3.4).

Table 3e: Buffer Habitat (~27.5 acres planted, 36.7 acres total; 14 Woody Plots & 28 Herb Plots, Year 8)

Criteria	3.1: Percent Combined Native Cover		3.2: Percent Invasive Cover		3.3: Bare Substrate		3.4: Diversity		3.5: Native Stem Count/ Cover	
Performance Standard	3.1: $\geq 60\%$ by Year 3 and thereafter		3.2: $\leq 30\%$ invasive species by Year 3 and thereafter		3.3: $\leq 40\%$ by Year 3 and thereafter		3.4: Six native species with $\geq 5\%$ cover, occurring in $\geq 10\%$ of the plots		3.5: Either $\geq 1,000$ plants per acre or 50% aerial cover of woody species	
	Average	Pass? Y/N	Average	Pass? Y/N	Average	Pass? Y/N	Number of species	Pass? Y/N	Average # woody plants /acre	Pass? Y/N
Results	100% (56% herbs & 44% woody)	Y	6% (6% herbs, 0% woody)	Y	10%	Y	6	Y?	1537	Y

Upland Buffers

This is Year 8 for the upland buffers and the community is meeting all of its performance standards. The combined percent cover of native species (Standard 3.1) is 100% (56% herbs and 44% woody). Invasive cover (Standard 3.2) in the herb layer was 6% and the woody layer invasive cover was 0%. The bare substrate (Standard 3.3) was met at 10%. The buffer areas met the diversity standard with 6 native species: *Deschampsia cespitosa*, *Elymus glaucus*, *Festuca rubra*, *Hordeum brachyantherum*, *Fraxinus latifolia*, *Pseudotsuga menziesii*. The habitat meets Standard 3.5 with 1,537 plants per acre.

NOTES: All the above cover percentages in the preceding tables and discussions represent absolute areal cover. Bare substrate includes areas of bare soil and areas covered by moss, water, and/or dead herbaceous plants.

2.2 HYDROLOGY STANDARDS RESULTS

Standard: "The criteria for achieving wetland hydrology at the mitigation site will be met if hydrologic conditions meet or exceed the basic standard of the 1987 *US Army Corps of Engineers Wetland Delineation Manual*, and refined in the *Corp's May 2010 Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys and Coast Region*."

Result: A wetland delineation lite was completed for the project area in 2014, with supplemental paired-plot data collected in several areas in 2016 per the request of DSL; these data can be reviewed in the 2014 and 2016 monitoring reports. Slight adjustments were made to the post-construction delineation boundary after the 2016 data were collected and are displayed in the 2016 report. After making a spring site visit to evaluate hydrology on March 24, 2017 DSL concurred with the delineated post-construction wetland

boundary except for a small area of approximately 1-acre where more information was requested. This information was provided in the 2017 monitoring report (Section 2.2) and the wetland delineation boundary was finalized.

Standard met? Yes. The post-construction wetland delineation boundary was concurred in spring of 2017, with the request for additional information for a small (approximate 1-acre) area. This additional information was provided in the 2017 monitoring report and the boundary was finalized.

2.3 DELINEATION OF WETLAND ACREAGE ACHEIVED

The post-construction wetland delineation lite was completed in 2014, with supplemental data collected in 2016, resulting in minor adjustments to the delineated boundary. The final (concurred) 2016 wetland delineation identified a total of 58.4527 acres of wetland within the project area; the 2014 delineation had a slightly larger wetland acreage of 58.533 acres prior to slight boundary adjustments in 2016.

The total wetland credits produced from this project are slightly higher than predicted in the MBI due to a slight increase in wetland creation acreage; see Figure 3. The following Table 4 summarizes the post-construction acreages by credit type.

Table 4: Post-Construction Credit Summary

Type	Ratio	Predicted Acreage (MBI)	Predicted Credit (MBI)	Achieved Acreage (post-construction)	Achieved Credit (post-construction)
Enhancement	3:1	33.2900	11.0966	33.2900	11.0966
Restoration	1:1	4.1100	4.1100	4.1100	4.1100
Creation	1.5:1	18.2800	12.1866	18.3156	12.2104
Buffers	10:1	36.7000	3.6700	37.1502	3.7150
No Credit	NA	13.5700	NA	13.0842	NA
TOTALS		105.9500	31.0632	105.9500	31.1320

2.4 WILDLIFE OBSERVATIONS

Since construction of the TVEB, the increased extent and duration of inundated areas have improved the habitat functions for amphibians, fish, insects, waterfowl and other avian species. Numerous species of ducks and Canada geese utilize the site. Great blue herons, egrets and belted kingfishers are often present, feeding in the water. A bald eagle's nest is present in the mature forest located in the southern portion of the site. A mating pair of eagles has been observed on-site since construction of the project in 2011. They have had two offspring per year in 2012, 2013, 2016 and 2018, and one offspring in 2014 and 2015. Besides the eagles, other raptors that utilize the site include osprey, northern harriers (marsh hawks), and other hawk species. Black tailed deer are often present in portions of the site and utilize the area for grazing and bedding. A coyote has been observed multiple times within the project area since 2011. Beaver activity has increased onsite since project construction.

3.0 CONCLUSIONS AND RECOMMENDATIONS

3.1 PROJECT STATUS

The mitigation wetlands are in compliance with all of the performance standards for Year 10. Reduced

monitoring of PFO and PSS areas was requested in 2020 and this monitoring was completed by drone in 2021.

The project is nearing the long-term management phase and the Bank Sponsor has been making efforts to finalize an agreement with a long-term land steward to take over management of the site in the future. Long-term management plan and conservation easement documents have been drafted and a potential Steward has been identified. It is anticipated that a long-term management agreement will be finalized in 2022.

3.2 ANNUAL TRENDS

In order to display the performance standard results between recent years we have included an Annual Monitoring Trends Table. With reduced monitoring of PFO and PSS areas, we wanted to provide a means to easily compare trends between years, rather than referring to the last six years of monitoring reports. Please see the Annual Trends (Table 5) below.

Table 5: Annual Trends from 2015-2021

Performance Standard	2015	2016	2017	2018	2019	2020	2021
FACW/FAC Herbaceous							
1.1 Percent Native cover	110%	95%	98%	92%	86%	96%	90%
1.2 Percent Invasive Cover	0%	1%	1%	1%	1%	1%	1%
1.3 Bare Substrate	3%	6%	6%	4%	4%	3%	2%
1.4 Diversity	6	6	6	6	4	6	7
1.5 Prevalence Index	2	2	2	2	2	2	2
OBL Herbaceous							
2.1 Percent Native Cover	83%	62%	91%	92%	83%	82%	85%
2.2 Percent Invasive Cover	0%	1%	0%	0%	0%	0%	0%
PFO, PSS, and Buffers							
3.1 PFO- % Combined Nat. Cover	100%	112%	108%	121%	130%	137%	NA (drone)
3.1 PSS- % Combined Nat. Cover	105%	117%	115%	114%	119%	117%	NA (drone)
3.1 BUFF- % Combined Nat. Cover	85%	84%	89%	85%	84%	92%	100%
3.2 PFO- % Invasive Cover	1%, 0%	2%, 0%	1%, 0%	0%, 0%	1%, 0%	1%, 0%	NA (drone)
3.2 PSS- % Invasive Cover	1%, 0%	3%, 0%	4%, 0%	6%, 0%	6%, 0%	8%, 0%	NA (drone)
3.2 BUFF- % Invasive Cover	1%, 0%	2%, 0%	1%, 0%	3%, 0%	8%, 0%	7%, 0%	6%, 0%
3.3 PFO- Bare Substrate	20%	12%	12%	9%	6%	9%	NA (drone)
3.3 PSS- Bare Substrate	15%	3%	15%	19%	22%	18%	NA (drone)
3.3 BUFF- Bare Substrate	1%	6%	14%	9%	6%	10%	10%
3.4 PFO- Diversity	5	8	7	8	8	10	NA (drone)

3.4 PSS- Diversity	5	8	7	7	8	8	NA (drone)
3.4 BUFF- Diversity	6	3	3	6	6	5	6
3.5 PFO- Native Stem Count	1171	1294	1409	1310	1346	1386	NA (drone)
3.5 PSS- Native Stem Count	1131	1244	1326	1318	1342	1342	NA (drone)
3.5 BUFF- Native Stem Count	807	1210	1385	1392	1387	1477	1537
3.6 PFO- Prevalence Index	2	2	2	2	2	2	NA (drone)
3.6 PSS- Prevalence Index	2	2	2	2	2	2	NA (drone)

3.3 CONCLUSIONS

In Year 10 (2021) the mitigation areas are continuing to be diverse native-dominated plant communities. The wetland areas had very low weed cover for Year 10 with an average range of 0-6% non-native invasive cover within the various wetland and upland community types. The non-native invasive cover across habitat types was similar to what was observed in 2020 and previous years. Very little reed canarygrass was present in any of the habitats.

The planting of native trees and shrubs in the form of bare root, plug and live cutting have been successful. Some mortality has been observed, but a majority of the woody plantings in all habitats have high vigor. As a result, there has been a continued increase in woody cover in these habitats.

The hydrological enhancements made through construction of the project in 2011 are performing as designed. Please review the MBI or As-Built report for more information about the hydrological enhancements. The primary log-jam was observed approximately once per month in 2020. Water flow through the log-jam was nearly perennial with very limited flows in the late summer.

The TVEB credit ledger for 2021 is included in Appendix D. The most recent credit release was on May 23rd 2019, for 0.819 credits; bringing the total number of credits released to 23.349 credits or 75% of the total anticipated for the Bank. No credits were withdrawn from the Bank in 2020 or 2021. There is a total of 0.0259 credit currently released and available for withdrawal.

3.3 RECOMMENDATIONS

The TVEB is meeting all of the performance standards for Year 10 and is on track to continue meeting the performance standards for future years. It is recommended that the current plan and strategy for vegetative community establishment continue. There has been a decrease in weed cover within the wetlands since 2012, and it is likely that this trend will continue. Non-native plant control efforts should occur when necessary.

In 2022, the project area should be observed approximately quarterly from March through October to direct maintenance efforts and ensure that the project goals are being met.

3.4 FINANCIAL SECURITY STATUS

A performance bond (Assignment of Deposit) in the amount of \$89,782 was established for the release of enhancement area credits on October 24th 2011. In the fall of 2011, \$44,891 (50%) was returned to the bank sponsor after completion of hydrological enhancements and initial planting of the enhancement area. It was reduced by \$26,935 (30%) in May of 2017 for meeting Year 5 Performance Standards; \$17,956 is currently in the account.

An irrevocable letter of credit was established for the release of restoration, creation and buffer credits in 2011 in the amount of \$196,075. In March of 2013, a partial reduction of this account was granted resulting in an account balance of to \$114,125. In May of 2017, the total amount in this account was reduced to \$39,215, or 20% of the initial account total, for meeting Year 5 Performance Standards.

The release of financial securities will generally follow the financial assurance release schedule as described in Exhibit J of the MBI.

4.0 REFERENCES

Green Banks LLC. *Tualatin Valley Environmental Bank Monitoring Report, Years 1- 8*. Submitted to the Inter-Agency Review Team, December 2011-2018.

Green Banks LLC. 2010. *Tualatin Valley Environmental Bank Mitigation Bank Instrument*. Submitted to the Inter-Agency Review Team, December 31st 2010.

Oregon Department of Agriculture (ODA) 2012. ODA Plant Division, Noxious Weed Control. Oregon Noxious Weed List. URL <http://www.oregon.gov/ODA/PLANT/WEEDS/statelist2.shtml>.

U.S. Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS). 2012-2016. The PLANTS Database. National Plant Data Center, Baton Rouge, LA 70874-4490 USA. URL: <http://plants.usda.gov>

U.S. Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS). 2002. WETS Table for Hillsboro, Oregon WETS Station OR3908. Start yr. - 1971 End yr. – 2000 Accessed on-line in October, 2013 at URL: <ftp://ftp.wcc.nrcs.usda.gov/support/climate/wetlands/or/>

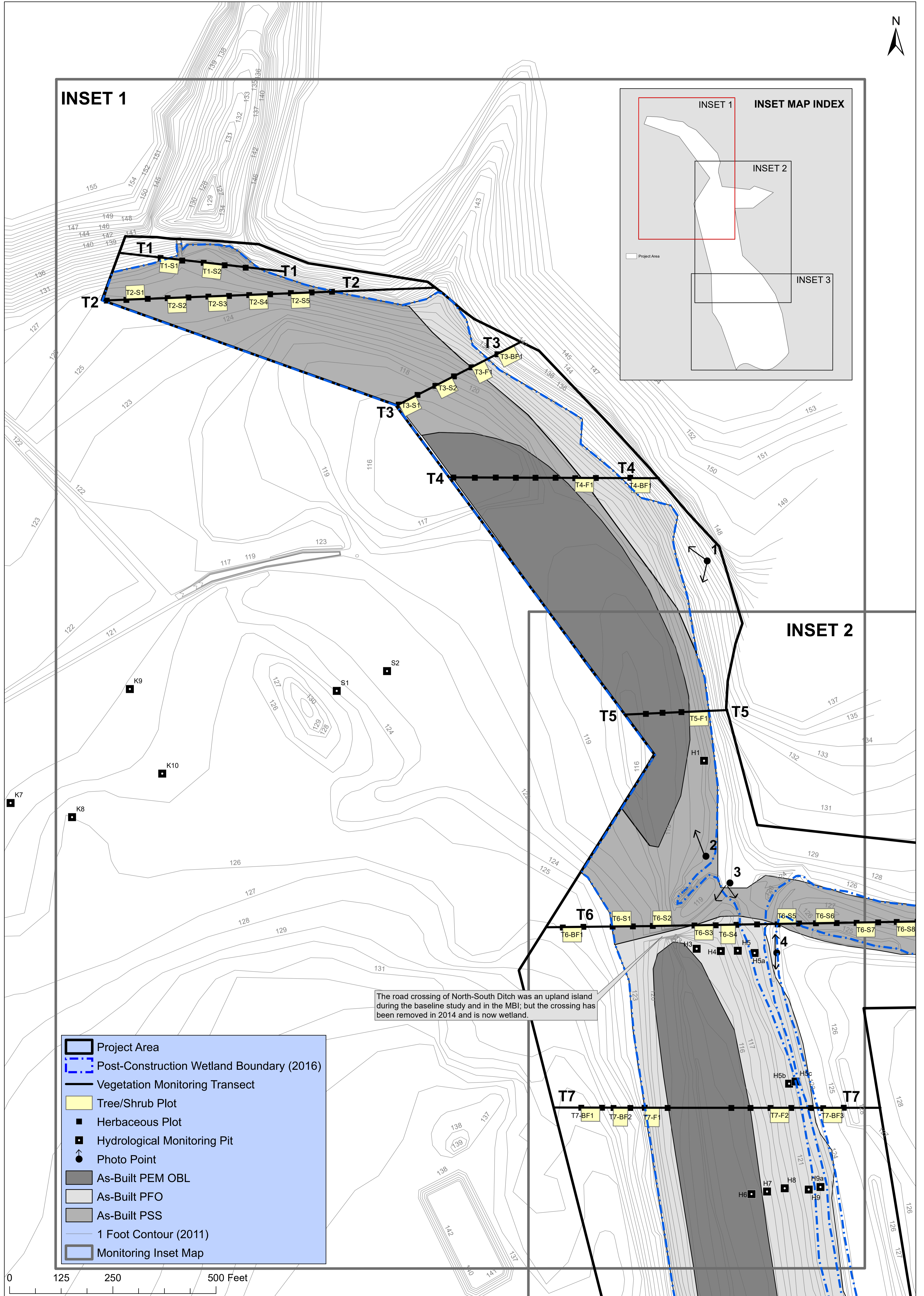
U.S. Army Corps of Engineers. 2014. *State of OREGON 2014 Wetland Plant List*; compiled from: Lichvar, R.W., M. Butterwick, N.C. Melvin, and W.N. Kirchner. 2014. The National Wetland Plant List: 2014 Update of Wetland Ratings. *Phytoneuron* 2014-41: 1-42. Accessed on-line in 2014 at URL http://www.oregon.gov/dsl/WETLAND/docs/OR_2014v1.pdf

MAPS AND FIGURES:

Figure 1a-1c: Monitoring Location Maps (Finalized 2017)

Figure 3: Credit Determination Map 2017

Note: The included maps are from the Year 6 (2017) monitoring report. The post-construction wetland delineation boundary was finalized in 2017 and the maps will no longer change.



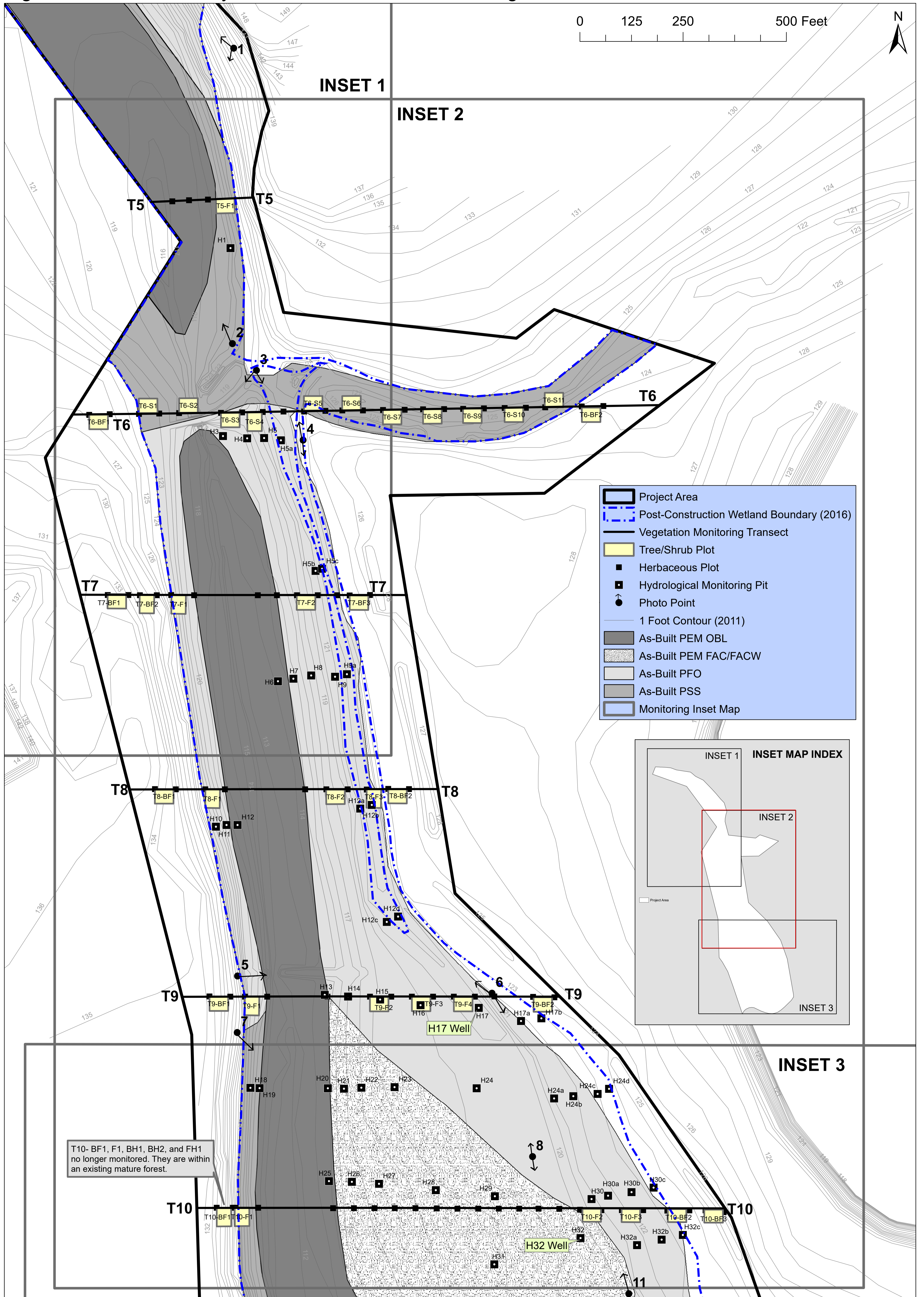
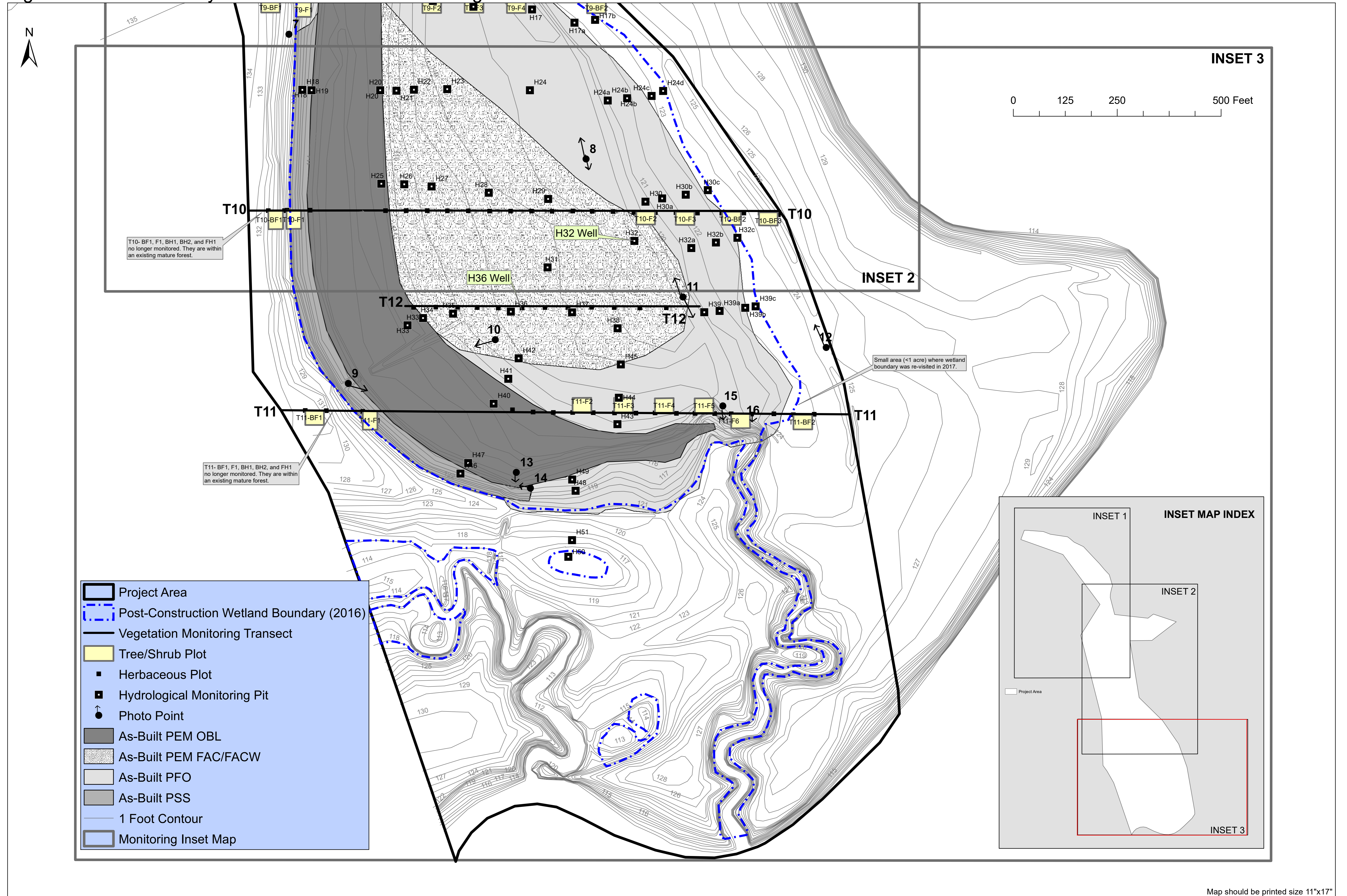
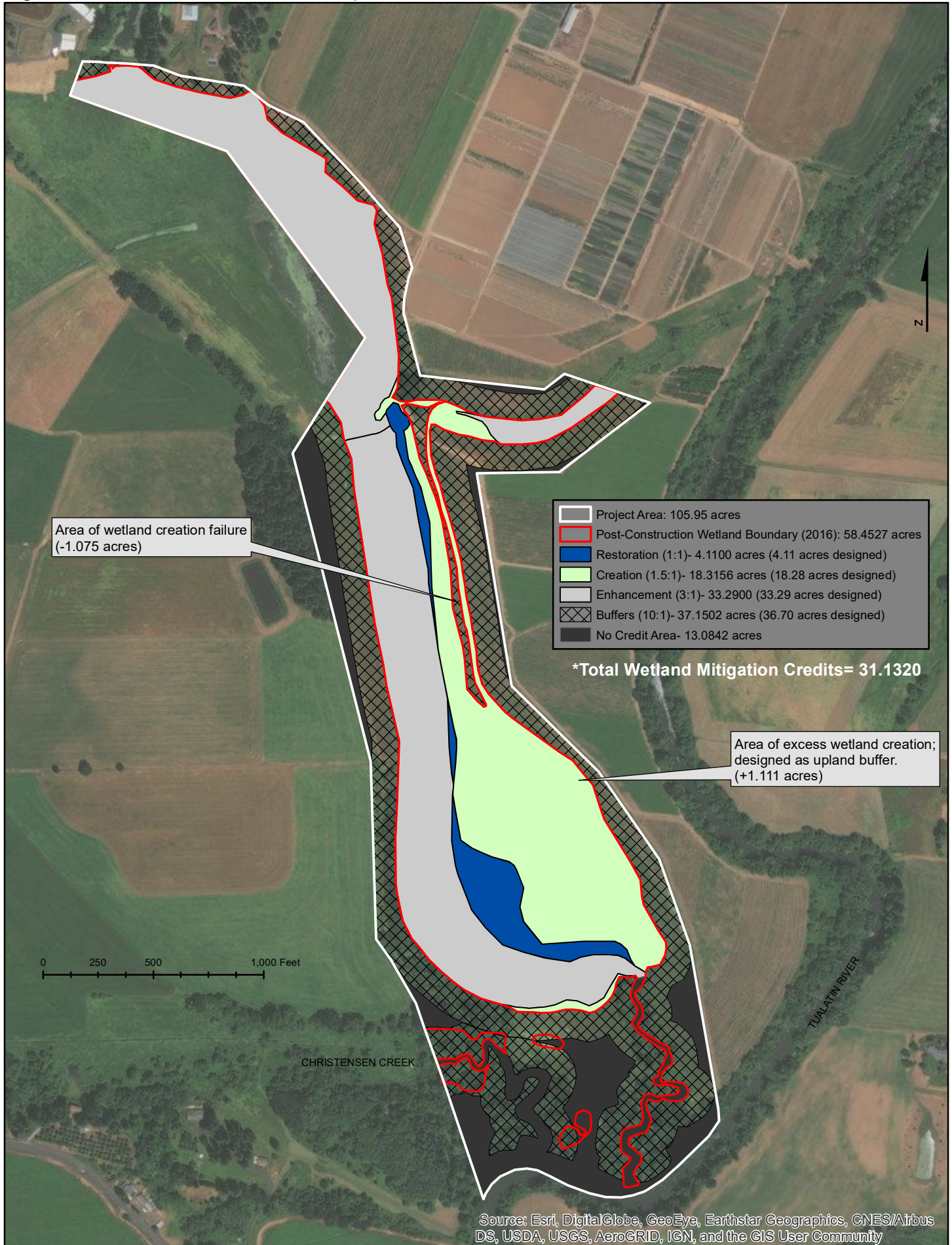


Figure 1c: Tualatin Valley Environmental Bank Monitoring Inset 3



Map should be printed size 11"x17"

Figure 3: Determination of Credits Map 2017



APPENDICES:

APPENDIX A:	Vegetation Data
APPENDIX B:	Photographic Documentation
APPENDIX C:	Vegetation Monitoring Transect Location Table
APPENDIX D:	Credit Ledger (2020)

APPENDIX A: VEGETATION DATA

Vegetation Data Tables should be printed at the size of 11"x17".

Vegetation monitoring notes are included after the tables in this appendix.

TUALATIN VALLEY ENVIRONMENTAL BANK

2021 Vegetation Monitoring		Sample Date(s):	Percent (%) Cover																															
Buffer Herbaceous Community		Origin (N, NN, I)	Wetland Status (1 - 5)	T3-BH1	T3-BH2	T4-BH1	T4-BH2	T6-BH1	T6-BH2	T6-BH3	T6-BH4	T7-BH1	T7-BH2	T7-BH3	T7-BH4	T7-BH5	T7-BH6	T8-BH1	T8-BH2	T8-BH3	T8-BH4	T9-BH1	T9-BH2	T9-BH3	T9-BH4	T10-BH3	T10-BH4	T10-BH5	T10-BH6	T11-BH3	T11-BH4	Average		
Native Herbaceous Species																																		
Achillea millefolium	N	4	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Deschampsia cespitosa	N	2	0	0	0	0	20	0	0	0	0	0	0	0	30	0	0	0	0	0	0	0	0	0	0	25	0	20	0	0	35	0	5	
Deschampsia elongata	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	0	0	0	0	
Elymus glaucus	N	4	40	25	10	15	0	0	0	2	5	5	5	0	0	0	3	0	0	10	5	20	0	0	0	0	0	0	0	0	0	0	5	
Epilobium ciliatum	N	2	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Epilobium brachycarpum	N		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	
Epilobium densiflorum	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	0	0	0	0	
Equisetum arvense	N	3	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	
Festuca idahoensis ssp. Roemerii	N	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	
Festuca rubra ssp. rubra	N	3	0	0	0	0	20	60	85	75	90	90	88	5	0	0	85	85	0	50	70	25	0	0	0	0	50	0	40	80	36			
Gnaphalium palustre	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	0	0	0	0	
Hordeum brachyantherum	N	2	0	0	0	0	0	0	0	0	0	0	0	0	35	0	0	0	0	5	0	0	90	45	30	15	2	0	10	10	9			
Lotus unifolius	N	4	0	0	0	0	30	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	1	
Madia glomerata	N	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	
Rosa nutkana seedling	N	3	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	
Invasive Herbaceous Species																																		
Cirsium arvense	I	3	0	0	0	0	0	0	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Convolvulus arvensis	I	5	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	20	5	0	0	1	0	0	0	2	0	0	0	0	0	0	1	
Phalaris arundinacea	I	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	
Holcus lanatus	I	3	10	20	10	15	0	0	10	15	0	0	0	40	3	15	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	5	
Hypericum perforatum	I	4	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	
Non-Native Herbaceous Species																																		
Agrostis capillaris	NN	3	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	
Alopecurus pratensis	NN	3	0	0	0	10	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	60	0	0	0	0	0	0	0	3	
Bromus hordeaceus	NN	4	0	15	0	12	0	0	0	0	0	0	0	0	55	0	0	60	20	0	10	0	12	0	2	20	50	5	3	9				
Crepis setosa	NN	5	0	0	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	
Daucus carota	NN	4	5	0	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	0	0	0	
Geranium dissectum	NN	4	0	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	
Hypochaeris radicata	NN	5	0	0	0	0	0	0	0	5	0	0	0	3	0	0	0	0	0	10	0	0	0	0	0	0	0	0	0	0	0	0	1	
Lactuca serriola	NN	4	5	0	0	0	0	0	0	0	0	0	0	0	0	1	6	0	0	3	0	1	0	0	0	3	0	0	0	0	0	1		
Leontodon taraxacoides ssp. taraxacoides	NN	5	0	0	0	25	0	3	0	0	0	0	40	5	0	1	0	0	10	0	0	0	12	0	8	0	0	7	1	4				
Lolium perenne	NN	3	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	
Raphanus sativus	NN	5	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	1	0	0	10	0	0	0	0	0	1		
Rumex crispus	NN	3	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	0	0	0	1		
Rumex obtusifolius	NN	3	0	0	0	0	0	0	0	0	0	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Sonchus asper	NN	4	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	
Vicia hirsuta	NN	5	0	15	0	0	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	1	
Vicia sativa	NN	5	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	0	0	0	0	0	
Vulpia brominoides	NN	4	0	0	0	5	10	0	0	0	0	0	0	0	20	25	0	0	10	0	0	15	5	0	0	15	0	0	0	5	4			
Bare Substrate																																		
Bare ground and/or moss			40	15	75	35	7	2	0	3	5	4	1	4	7	2	10	0	0	0	5	7	2	5	10	20	8	5	5	0	10			
Dead sprayed weeds			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	
Shade & Woody Stem Cover on Ground																																		
Shade from woody plants			100	20	100	25	0	0	0	0	25	30	35	10	0	0	5	30	0	30	15	0	0	0	0	0	0	0	0	10	0	16		
Stem (basal) cover on ground			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	
Aerial cover of native trees/shrubs rooted in plot (w/ species 4 letter code)			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	0	0	0	
Summary Information																																		
Cover of Native Herbaceous Species			40	25	15	15	40	90	85	77	95	95	93	8	65	0	88	94	0	65	75	53	90	73	30	35	52	0	85	90	56	6.4		

TUALATIN VALLEY ENVIRONMENTAL BANK

2021 Vegetation Monitoring		Sample Date(s):	Percent (%) Cover																				
FACW / FAC PEM Community			8/6/2021																				
Species	Origin (N, NN, I)	Wetland Status (1-5)	T10-PEM2	T10-PEM3	T10-PEM4	T10-PEM5	T10-PEM6	T10-PEM7	T10-PEM8	T10-PEM9	T10-PEM10	T12-PEM2	T12-PEM3	T12-PEM4	T12-PEM5	T12-PEM6	T12-PEM7	T12-PEM8	T12-PEM9	T12-PEM10	T12-PEM11	Average	
Native Herbaceous Species																							
<i>Agrostis exarata</i>	N	2	0	0	0	0	0	10	20	0	0	0	0	0	0	0	10	0	5	0	0	2	
<i>Beckmannia syzigachne</i>	N	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
<i>Bidens cernua</i>	N	1	0	0	0	1	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	
<i>Carex densa</i>	N	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
<i>Carex ovalis (leporina)</i>	N	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
<i>Carex scoparia</i>	N	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
<i>Carex obovata</i>	N	1	30	0	0	0	10	0	0	0	40	0	80	0	100	40	0	0	0	0	0	16	
<i>Cyperus erythrorhizos</i>	N	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
<i>Deschampsia cespitosa</i>	N	2	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	5	1	
<i>Eleocharis obtusa (ovata)</i>	N	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
<i>Eleocharis palustris</i>	N	1	50	0	0	0	0	0	0	0	0	70	15	0	0	0	1	0	0	0	0	7	
<i>Epilobium ciliatum</i>	N	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
<i>Epilobium densiflorum</i>	N	2	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	1	0	0	
<i>Galium trifidum</i>	N	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15	10	5	2	
<i>Grindelia integrifolia</i>	N	2	0	0	0	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
<i>Hordeum brachyantherum</i>	N	2	0	0	0	0	5	0	70	20	0	0	0	0	0	0	1	15	10	1	0	6	
<i>Leersia oryzoides</i>	N	1	0	30	75	2	0	0	0	0	0	0	95	0	0	0	0	0	0	0	0	11	
<i>Lemna minor</i>	N	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
<i>Lotus unifoliolatus</i>	N	4	0	0	0	80	93	20	12	10	25	0	0	0	0	5	40	40	30	10	35	21	
<i>Ludwigia palustris</i>	N	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
<i>Lycopus americanus</i>	N	1	0	0	0	10	10	5	0	0	0	0	0	0	30	35	0	0	0	0	0	5	
<i>Madia glomerata</i>	N	4	0	0	0	0	0	30	60	2	2	0	0	0	0	0	25	10	40	70	50	15	
<i>Plagiobothrys scouleri</i>	N	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
<i>Polygonum (Persicaria) hydropiperoides</i>	N	1	10	25	0	0	0	1	0	0	0	25	5	0	0	0	0	0	0	0	0	3	
<i>Potentilla gracilis</i>	N	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
<i>Prunella vulgaris</i>	N	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
<i>Sparganium emersum</i>	N	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Invasive Herbaceous Species																							
<i>Convolvulus arvensis</i>	I	5	0	0	0	2	0	0	3	3	2	0	0	0	0	0	0	1	0	0	0	1	
<i>Phalaris arundinacea</i>	I	2	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	
Non-Native Herbaceous Species																							
<i>Agrostis stolonifera</i>	NN	3	0	40	25	15	0	0	0	0	0	0	0	5	0	0	0	30	0	0	0	6	
<i>Agrostis capillaris</i>	NN	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
<i>Echinochloa crusgalli</i>	NN	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
<i>Lactuca serriola</i>	NN	4	0	0	0	0	0	3	0	0	1	0	0	0	0	0	0	0	0	7	0	1	
<i>Solanum dulcumara</i>	NN	3	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
<i>Trifolium species</i>	NN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
<i>Vicia tetrasperma</i>	NN	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	
Bare Substrate																							
Bare ground, unvegetated water, and/or moss			0	5	0	0	0	0	4	10	0	3	0	0	0	17	0	4	0	1	0	2	
Dead sprayed weeds			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Shade, Woody Stem Cover & Water Depth																							
Shade from woody plants			50	3	0	0	0	0	0	0	0	0	5	0	70	0	0	0	0	0	0	7	
Stem cover on ground			15	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	1	
Approx. water depth (feet)			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Summary Information																							
Cover of Native Herbaceous Species			90	55	75	93	113	79	92	87	93	95	100	95	100	77	112	65	100	92	95	90	3.3
Lower CI (80%)																						86	
Upper CI (80%)																						94	
Cover of Invasive Herbaceous Species			0	0	0	2	0	0	3	3	2	2	0	0	0	0	0	1	2	0	0	1	0.3
Lower CI (80%)																						0	
Upper CI (80%)																						1	
Bare Substrate			0	5	0	0	0	0	4	10	0	3	0	0	0	17	0	4	0	1	0	2	1.0
Lower CI (80%)																						1	
Upper CI (80%)																						4	
Native Diversity																						7 species met the criteria: HOBR, LEOR, LOUN, CAOB, LYAM, MAGL, ELPA	
Prevalence Index			1	2	2	4	3	2	1	2	2	1	1	1	1	1	2	3	2	1	2	2	N/A
Weighted Prevalence Index			90	175	150	388	392	132	103	205	202	95	100	110	100	92	218	285	186	64	185		
Sum of plant cover			100	95	100	110	113	82	95	90	96	97	100	100	100	77	112	96	102	99	100		

TUALATIN VALLEY ENVIRONMENTAL BANK									
2021 Vegetation Monitoring	Sample Date(s):	Percent (%) Cover							
OBL Herbaceous Community		8/6/2021							
Species	Origin (N, NN, I)	Wetland Status (1 - 5)	T4-PEMOB15	T4-PEMOB16	T8-PEMOB12	T9-PEMOB13	T11-PEMOB14	Row Average	
Native Herbaceous Species									
<i>Eleocharis obtusa (ovata)</i>	N	1	0	0	0	12	0	2	
<i>Eleocharis palustris</i>	N	1	0	0	0	20	0	4	
<i>Elodea canadensis</i>	N	1	0	0	0	0	0	0	
<i>Elodea nuttallii</i>	N	1	0	0	0	0	0	0	
<i>Elodea species</i>	N	1	0	0	30	0	5	7	
<i>Juncus oxymeris</i>	N	2	0	0	0	0	0	0	
<i>Leersia oryzoides</i>	N	1	0	0	0	45	0	9	
<i>Lemna minor</i>	N	1	50	2	0	0	0	10	
<i>Ludwigia palustris</i>	N	1	0	0	0	0	0	0	
<i>Polygonum amphibium</i> var. <i>emersum</i> (<i>Persicaria amphibia</i>)	N	1	0	0	0	0	0	0	
<i>Polygonum (Persicaria) hydropiperoides</i>	N	1	30	75	0	30	0	27	
<i>Potamogeton natens</i> and/or <i>P. nodosus</i>	N	1	0	0	20	0	50	14	
<i>Schoenoplectus tabernaemontmontani</i>	N	1	0	0	0	0	0	0	
<i>Sparganium emersum</i>	N	1	8	20	10	0	0	8	
<i>Stuckenia pectinata</i>	N	1	0	0	0	0	0	0	
<i>Typha latifolia</i>	N	1	0	5	0	0	0	1	
Invasive Herbaceous Species									
<i>Phalaris arundinacea</i>	I	2	0	0	0	0	0	0	
None this year									
Non-Native Herbaceous Species									
<i>Lythrum portula</i>	NN	1	0	0	0	0	0	0	
<i>Agrostis species (assmed NN, FAC or wetter)</i>	NN	3	0	0	0	0	0	0	
<i>Potamogeton crispus</i>	NN	1	0	0	0	0	0	0	
Bare Substrate									
Bare ground			12	0	40	3	45	20	
Unvegetated water (aprox.)			0	0	0	0	0	0	
Shade, Woody Stem Cover & Water Depth									
Shade from woody plants			0	0	0	25	0	5	
Stem cover on ground			0	0	0	3 (SALA)	0	0	
Approx. water depth (feet)			1	0.5	1.5	0	1	0.8	
Summary Information								Habitat Average	Standard Error
Cover of Native Herbaceous Species			88	102	60	107	55	82	11
Lower CI (80%)								69	
Upper CI (80%)								96	
Cover of Invasive Herbaceous Species			0	0	0	0	0	0	0
Lower CI (80%)								0	
Upper CI (80%)								0	
Bare Substrate			12	0	0	0	0	2	3
Lower CI (80%)								-1	
Upper CI (80%)								6	
Native Diversity								NA- there is no diversity standard for this community	
Prevalence Index			1	1	1	1	1	1	
Weighted Prevalence Index			88	102	60	107	55		
Sum of plant cover			88	102	60	107	55	89	

TUALATIN VALLEY ENVIRONMENTAL BANK

2021 Vegetation Monitoring		Sample Date(s):	Percent Cover %																
Buffer Tree and Shrub Data		8/6/2021	T3-BF1	T4-BF1	T6-BF1	T6-BF2	T7-BF1	T7-BF2	T7-BF3	T8-BF1	T8-BF2	T9-BF1	T9-BF2	T10-BF2	T10-BF3	T11-BF2	Row Average		
Native Tree and Shrub Species:		Origin (N, NN, I)	Wetland Status (1 - 5)																
<i>Abies grandis</i>	N	4	0	0	0	0	2	10	0	10	0	0	0	0	0	0	2		
<i>Acer circinatum</i>	N	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
<i>Acer macrophyllum</i>	N	4	5	20	0	2	0	0	0	0	0	0	6	1	2	2	3		
<i>Alnus rubra</i>	N	3	0	0	8	5	0	0	0	0	0	0	0	0	0	0	1		
<i>Amelanchier alnifolia</i>	N	4	2	5	0	1	0	0	0	1	1	2	0	0	0	0	1		
<i>Crataegus douglasii</i>	N	3	11	0	4	2	1	4	4	1	3	1	2	5	1	5	3		
<i>Frangula (Rhamnus) purshiana</i>	N	3	5	6	1	0	0	1	0	0	0	0	0	0	0	0	1		
<i>Fraxinus latifolia</i>	N	2	15	7	1	1	0	0	8	0	10	1	8	5	3	4	5		
<i>Holodiscus discolor</i>	N	4	0	5	0	0	0	0	0	0	0	2	0	0	0	0	1		
<i>Lonicera involucrata</i>	N	3	0	0	0	0	0	1	1	0	0	1	2	2	0	1	1		
<i>Mahonia aquifolium</i>	N	4	1	2	2	3	2	3	5	2	10	3	5	5	5	5	4		
<i>Malus fusca</i>	N	2	0	0	1	0	0	0	0	0	0	1	0	1	0	0	0		
<i>Oermleria cerasiformis</i>	N	4	0	0	0	0	1	1	0	0	0	1	0	0	0	0	0		
<i>Philadelphus lewisii</i>	N	5	0	0	0	1	0	0	0	0	0	0	1	0	1	0	0		
<i>Physocarpus capitatus</i>	N	2	0	0	0	0	1	1	1	0	0	0	0	1	0	1	0		
<i>Pinus ponderosa</i>	N	4	12	0	1	0	0	0	0	0	0	0	2	0	1	0	1		
<i>Populus balsamifera</i>	N	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
<i>Prunus emarginata</i>	N	4	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0		
<i>Prunus virginiana</i>	N	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
<i>Pseudotsuga menziesii</i>	N	4	16	20	1	0	45	25	0	34	1	28	0	0	0	0	12		
<i>Quercus garryana</i>	N	4	1	4	1	1	0	1	1	0	0	2	0	1	3	0	1		
<i>Ribes sanguinum</i>	N	4	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0		
<i>Rosa nutkana</i>	N	3	0	0	0	1	2	1	3	2	3	5	4	5	2	5	2		
<i>Rosa pisocarpa</i>	N	3	0	0	1	0	0	0	0	0	8	0	0	0	0	0	1		
<i>Rubus parviflorus</i>	N	4	0	0	0	0	5	0	1	0	0	0	2	0	0	0	1		
<i>Sambucus nigra ssp. cerulea</i>	N	4	8	0	0	0	0	0	0	0	0	0	0	0	1	0	1		
<i>Spiraea douglasii</i>	N	2	0	0	0	0	0	0	17	0	7	0	0	0	0	0	2		
<i>Symphoricarpos albus</i>	N	4	1	1	1	1	3	5	4	1	2	4	1	5	3	2	2		
<i>Thuja plicata</i>	N	3	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0		
<i>Tsuga heterophylla</i>	N	4	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0		
Non-Native Shrub and Tree Species																			
<i>Crataegus monogyna</i>	NN	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
None this year			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
<i>Prunus</i> species	NN		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
<i>Rosa rubiginosa</i>	NN	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Invasive Shrub and Tree Species																			
<i>Rubus armeniacus</i>	I	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
<i>Rubus cultivar</i>	I		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Native Shrub and Tree Count			Woody Stem Count (Trees and Shrubs)																
<i>Abies grandis</i>	N	4	0	0	0	0	2	5	0	3	0	0	0	0	0	0	1		
<i>Acer circinatum</i>	N	3	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0		
<i>Acer macrophyllum</i>	N	4	8	6	0	4	0	0	0	0	0	1	2	1	3	2	2		
<i>Alnus rubra</i>	N	3	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0		
<i>Amelanchier alnifolia</i>	N	4	0	2	0	0	0	0	0	2	1	1	0	0	0	0	0		
<i>Crataegus douglasii</i>	N	3	7	0	12	3	1	1	3	1	2	3	3	6	1	8	4		
<i>Frangula (Rhamnus) purshiana</i>	N	3	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0		
<i>Fraxinus latifolia</i>	N	2	8	3	3	3	0	1	8	0	13	4	8	7	8	8	5		
<i>Holodiscus discolor</i>	N	4	0	1	0	0	0	0	0	0	0	3	0	0	0	0	0		
<i>Lonicera involucrata</i>	N	3	0	0	0	0	0	1	1	0	0	1	3	1	0	2	1		
<i>Mahonia aquifolium</i>	N	4	2	3	11	7	13	10	16	5	19	7	11	9	10	21	10		
<i>Malus fusca</i>	N	2	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0		
<i>Oermleria cerasiformis</i>	N	4	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0		
<i>Philadelphus lewisii</i>	N	5	0	0	0	2	0	0	0	0	0	0	1	0	1	0	0		
<i>Physocarpus capitatus</i>	N	2	0	0	0	0	1	2	0	0	0	0	0	1	0	2	0		
<i>Pinus ponderosa</i>	N	4	10	0	0	0	0	0	0	0	0	1	0	1	0	1	1		
<i>Populus balsamifera</i>	N	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
<i>Prunus emarginata</i>	N	4	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0		
<i>Prunus virginiana</i>	N	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
<i>Pseudotsuga menziesii</i>	N	4	25	5	1	0	10	5	0	5	1	5	0	0	0	0	4		
<i>Quercus garryana</i>	N	4	1	3	2	1	0	3	1	0	0	1	0	3	7	1	2		
<i>Ribes sanguinum</i>	N	4	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0		
<i>Rosa pisocarpa</i>	N	3	0	0	1	0	0	0	0	0	13	0	0	0	0	0	1		
<i>Rosa nutkana</i>	N	3	0	0	0	0	6	2	7	9	6	6	10	15	3	14	6		
<i>Rubus parviflorus</i>	N	4	0	0	0	0	1	0	1	0	0	4	0	0	0	0	0		
<i>Sambucus nigra ssp. cerulea</i>	N	4	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
<i>Spiraea douglasii</i>	N	2	0	0	0	0	0	1	36	0	5	0	0	0	0	0	3		
<i>Symphoricarpos albus</i>	N	4	0	2	2	3	9	15	7	5	5	13	4	9	4	3	6		
<i>Thuja plicata</i>	N	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
<i>Tsuga heterophylla</i>	N	4	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0		
Summary Information																	Habitat Average	Standard Error	
Cover of Invasive Shrubs and Trees			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Lower CI (80%)																			
Upper CI (80%)																			
Density of Woody Vegetation			Average per acre	2226	871	1162	807	1452	1549	2581	903	2130	1452	1517	1710	1162	2001	1537	
Plot Area (shrub/tree plot)			1350																
Plot Area (shrub/tree plot) entered in B101 is in sq.meters or 43,560 for			43560																
Percent Cover of Native Shrubs and Trees			80	71	22	18	65	55	45	50	45	50	35	31	22	25	44	5	
Lower CI (80%)																		37	
Upper CI (80%)																		51	
Sum of native plants /plot			69	27	36	25	45	48	80	28	66	45	47	53	36	62	48		
Does Plot Pass Native Cover Standard based on ≥ 50% Native Cover Y or N?			Y	N	N	N	Y	N	N	N	Y	N	N	N	N	N			
Does Plot Pass Native Cover Standard based on ≥ 1000 plants or stems per acre Y or N?			Y	Y	N	N	Y	Y	Y	N	Y	Y	Y	Y	N	Y			
Sum of plant cover			80	71	22	18	65	55	45	50	45	50	35	31	22	25	44		

TUALATIN VALLEY ENVIRONMENTAL BANK																					
2021 Vegetation Monitoring																					
9/3/2021																					
PFO Tree and Shrub Data		Percent Cover %																			
Species	Origin (N, NN, I)	Wetland Status (1-5)	T3-F1	T4-F1	T5-F1	T7-F1	T7-F2	T8-F1	T8-F2	T8-F3	T9-F1	T9-F2	T9-F3	T9-F4	T10-F2	T10-F3	T11-F2	T11-F3	T11-F4	T11-F6	Row Average
Native Tree and Shrub Species:																					
<i>Alnus rubra</i>	N	3	0	0	0	10	7	15	0	0	2	0	0	5	0	0	0	0	0	0	2
<i>Amelanchier alnifolia</i>	N	4	0	0	0	0	0	0	0	0	20	0	0	0	0	0	0	0	0	0	1
<i>Cornus sericea ssp. sericea</i>	N	2	5	0	0	10	15	2	4	0	5	2	3	2	0	0	0	0	0	4	3
<i>Corylus cornuta</i>	N	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0
<i>Crataegus douglasii</i>	N	3	0	4	4	2	4	3	4	11	0	1	1	5	1	2	0	0	0	4	3
<i>Frangula purshiana</i>	N	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Fraxinus latifolia</i>	N	2	10	15	14	39	17	15	15	6	1	30	37	15	10	10	8	1	0	28	15
<i>Lonicera involucrata</i>	N	3	0	0	0	2	2	1	0	0	0	0	4	2	5	1	0	0	0	2	1
<i>Mahonia aquifolium</i>	N	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Malus fusca</i>	N	2	0	0	0	0	1	1	1	0	0	0	0	1	0	1	0	0	0	0	0
<i>Physocarpus capitatus</i>	N	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0
<i>Populus balsamifera</i>	N	2	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Rosa nutkana</i>	N	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13	1
<i>Rosa pisocarpa</i>	N	3	0	0	0	0	1	0	0	5	40	1	0	1	1	1	0	0	0	0	3
<i>Rubus spectabilis</i>	N	3	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
<i>Salix hookeriana</i>	N	2	15	55	60	0	20	4	11	0	0	6	4	8	0	0	0	14	8	0	11
<i>Salix lucida var. lasiandra</i>	N	2	55	30	30	5	10	2	22	0	0	12	0	5	0	0	35	30	29	0	15
<i>Salix scouleriana</i>	N	3	0	6	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
<i>Salix stichensis</i>	N	2	8	0	0	1	2	2	2	0	0	0	0	0	0	0	5	1	0	0	1
<i>Spiraea douglasii</i>	N	2	10	0	0	1	10	0	21	3	2	5	2	0	3	0	7	5	7	2	4
<i>Symphoricarpos albus</i>	N	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0
<i>Thuja plicata</i>	N	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Non-Native Shrub and Tree Species																					
<i>Crataegus monogyna</i>	NN	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Invasive Shrub and Tree Species																					
<i>Rubus armeniacus</i>	I	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Rubus species (cultivar)</i>	I		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Native Shrub and Tree Count																					
Woody Stem Count (Trees and Shrubs)																					
<i>Alnus rubra</i>	N	3	0	0	0	1	2	3	0	0	1	0	0	1	0	0	0	0	0	0	0
<i>Amelanchier alnifolia</i>	N	4	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
<i>Cornus sericea ssp. sericea (alba)</i>	N	2	3	2	0	14	7	2	1	0	0	0	4	4	3	0	0	0	0	5	3
<i>Corylus cornuta</i>	N	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0
<i>Crataegus douglasii</i>	N	3	0	0	1	4	2	3	5	9	0	0	2	3	1	4	0	0	0	2	2
<i>Frangula purshiana</i>	N	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Fraxinus latifolia</i>	N	2	1	6	3	22	14	10	19	1	1	15	30	18	15	20	1	2	0	5	10
<i>Lonicera involucrata</i>	N	3	0	0	0	3	1	1	0	0	0	0	5	6	8	2	0	0	0	4	2
<i>Mahonia aquifolium</i>	N	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Malus fusca</i>	N	2	0	0	0	0	1	1	2	0	0	0	0	1	0	2	0	0	0	0	0
<i>Physocarpus capitatus</i>	N	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0
<i>Populus balsamifera</i>	N	2	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Rosa nutkana</i>	N	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0
<i>Rosa pisocarpa</i>	N	3	0	0	0	0	3	0	0	1	22	1	0	1	1	1	0	0	0	0	2
<i>Rubus spectabilis</i>	N	3	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
<i>Salix hookeriana</i>	N	2	5	20	23	0	3	4	1	0	0	5	1	2	0	0	0	1	1	0	4
<i>Salix lucida var. lasiandra</i>	N	2	25	6	13	13	1	4	19	0	0	8	0	7	0	0	52	35	13	0	11
<i>Salix scouleriana</i>	N	3	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Salix stichensis</i>	N	2	3	5	0	2	1	4	1	0	0	0	0	0	0	0	4	2	0	0	1
<i>Spiraea douglasii</i>	N	2	6	0	0	3	8	0	19	3	2	2	1	0	6	0	4	4	5	1	4
<i>Symphoricarpos albus</i>	N	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12	1
<i>Thuja plicata</i>	N	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Summary Information																					
Cover of Invasive Shrubs and Trees																					
Lower CI (80%)																					
Upper CI (80%)																					
Density of Woody Vegetation		Average per acre	1387	1258	1420	2001	1420	1033	2162	452	871	1000	1387	1387	1097	968	1839	3259	678	1323	1386
Plot Area (shrub/tree plot)		1350																			
plot area entered in B62 is in		43560																			
Percent Cover of Native Shrubs and Trees		103	110	113	70	90	45	80	25	65	60	50	45	22	16	50	55	45	65	62	7
Lower CI (80%)																					
Upper CI (80%)																					
Sum of native plants /plot		43	39	44	62	44	32	67	14	27	31	43	43	34	30	57	46	21	41	40	
Does Plot Pass Native Cover Standard based on $\geq 50\%$ Native Cover Y or N?		Y	Y	Y	Y	Y	N	Y	N	N	N	N	N	N	N	N	N	N	N		
Does Plot Pass Native Cover Standard based on ≥ 1000 plants or stems per acre Y or N?		Y	Y	Y	Y	Y	N	Y	N	Y	Y	Y	Y	Y	Y	N	Y	Y	N	Y	
Prevalence Index--woody strata		2	2	2	2	2	2	2	3	3	2	2	2	2	2	2	2	2	2	3	2
Weighted Prevalence Index		206	230	235	154	194	109	164	66	212	122	105	103	51	37	100	110	90	167		
Sum of plant cover		103	110	113	70	90	45	80	25	65	60	50	45	22	16	50	55	45	65		

APPENDIX B: PHOTOGRAPHIC DOCUMENTATION



Photo Point 1 NW: Photo displays native dominated plant communities within the wetland area and native grass dominated upland buffer.



Photo Point 1 SW: Photo displays native dominated plant communities within the wetland area and native grass dominated upland buffer



Photo Point 2 NW: Photo displays native dominated plant communities within the wetland area and vigorously-growing woody plantings.



Photo Point 3 SW: Photo displays the un-improved access road near the “north-south” ditch.



Photo Point 3 SE: Photo displays the un-improved access road which crosses the constructed swale.



Photo Point 4 N: Photo displays the head of the constructed swale, at the un-improved access road crossing.



Photo Point 4 S: Photo displays head of constructed swale, at the un-improved access road crossing.



Photo Point 5 E: Photo displays northern woody-debris jam / ditch plug.



Photo Point 6 NW: Photo displays constructed swale and wetland creation area within the PFO vegetation community and upland buffer.



Photo Point 6 SE: Photo displays constructed swale and wetland creation area.



Photo Point 7 SE: Photo displays wetland enhancement, restoration and creation areas.



Photo Point 8 NW: Photo displays wetland creation area within the PEM FAC/FACW and PFO vegetation communities.



Photo Point 8 SE: Photo displays wetland creation and restoration areas within the PEM FAC/FACW and PFO vegetation communities.



Photo Point 9 SE: Photo displays southern woody-debris jam / ditch plug.



Photo Point 10 SW: Photo displays woody-debris jam / ditch plug, and an obligate dominated PEM community.



Photo Point 11 NW: Photo displays the mouth of the constructed swale and the wetland creation area.



Photo Point 11 SE: Photo displays the mouth of the constructed swale looking toward the log jams.



Photo Point 12 NW: Photo displays upland buffer area.



Photo Point 13 SW: Photo displays the re-contoured location of the 18” culvert, ditch outfall, and adjacent hill-slope trench.



Photo Point 14 NW: Photo displays the re-contoured location of the 18” culvert and ditch outfall.

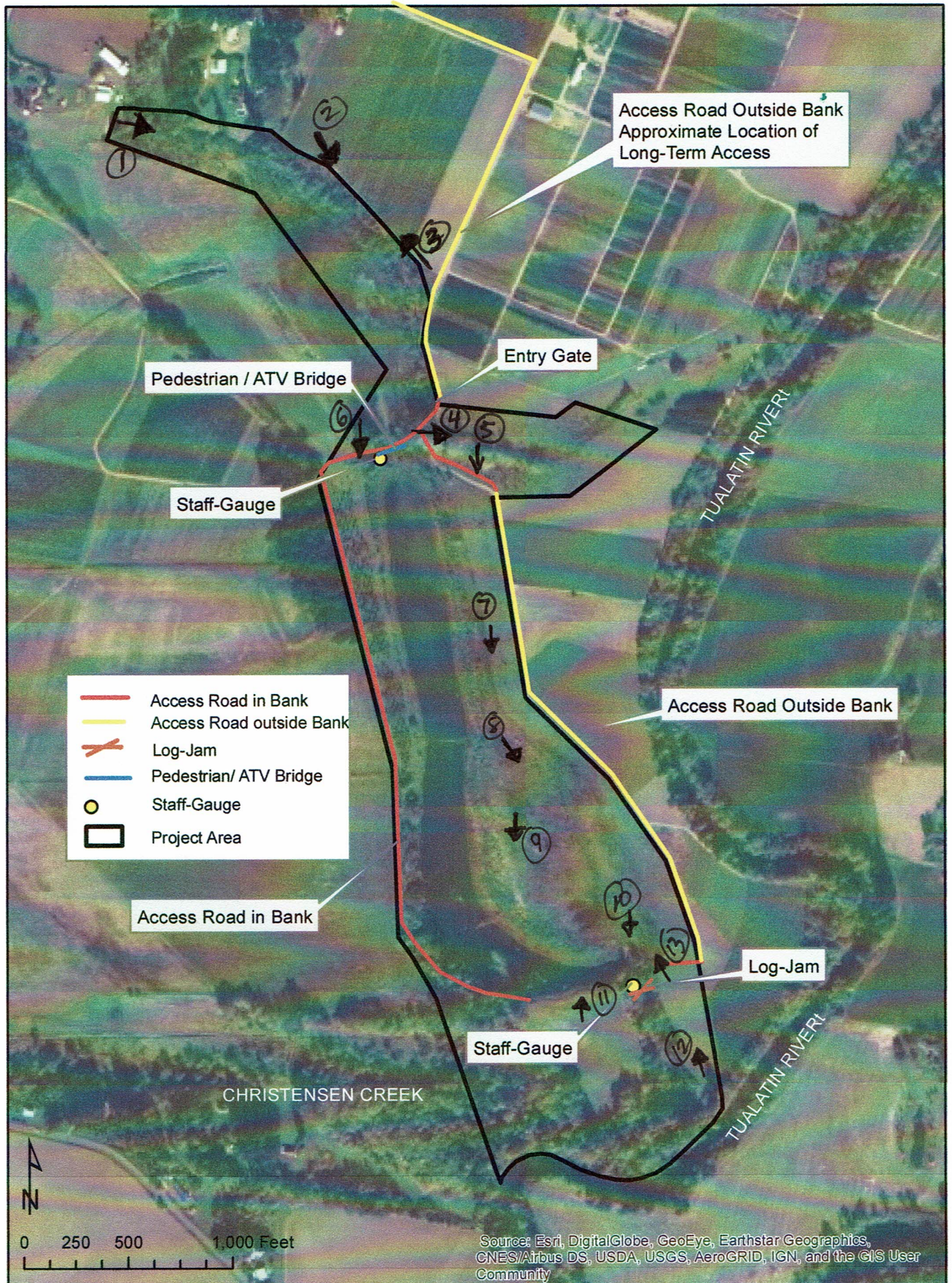


Photo Point 15 SW: Photo displays the secondary log jam.



Photo Point 16 SE: Photo displays primary log jam.

FIGURE 1: SITE PLAN MAP





DPP1: Photo displays willow dominated shrub wetland and upland buffer at northern end of the Bank, facing southeast.



DPP2: Photo displays forested, shrub, and emergent wetland, and upland buffer; facing southeast.



DPP3: Photo displays forested, shrub, and emergent wetland, and upland buffer; facing northwest.



DPP4: Photo displays forested wetland (East-West Swale) and upland buffers; facing east.



DPP5: Photo displays forested, shrub, and emergent wetland, and upland buffer; facing south.



DPP6: Photo displays forested, shrub, and emergent wetland, and upland buffer; facing south.



DPP7: Photo displays forested and emergent wetland, and upland buffer; facing south.



DPP8: Photo displays forested, shrub, and emergent wetland, and upland buffer; facing south.



DPP9: Photo displays emergent wetland “prairie” and adjacent shrub and forested wetland; facing south.



DPP10: Photo displays forested wetland and upland buffers, including constructed log-jam; facing south.



DPP11: Photo displays forested, shrub and emergent wetlands, and upland buffers; facing north.



DPP12: Photo displays upland buffers, and wetlands facing north.



DPP13: Photo displays emergent, shrub, and forested wetlands, and upland buffers; facing northwest.

APPENDIX C: VEGETATION MONITORING TRANSECT LOCATION TABLE

TUALATIN VALLEY ENVIRONMENTAL BANK

Vegetation Monitoring Transect Locations:

Transect	Start Latitude	Start Longitude	End Latitude	End Longitude
T1	45.448	-122.968	45.448	-122.967
T2	45.448	-122.968	45.448	-122.966
T3	45.447	-122.965	45.447	-122.964
T4	45.446	-122.965	45.446	-122.963
T5	45.445	-122.963	45.445	-122.962
T6	45.443	-122.963	45.443	-122.959
T7	45.442	-122.963	45.442	-122.961
T8	45.441	-122.963	45.441	-122.961
T9	45.439	-122.962	45.439	-122.960
T10	45.438	-122.962	45.438	-122.958
T11	45.437	-122.962	45.437	-122.958
T12	45.437	-122.961	45.437	-122.959

Please refer to Section E: Monitoring Data Locations for an in depth description of plot locations. Transects ran west to east. In general, the first plot on a transect was 5 feet east of the transect start point; herbaceous plots were spaced every 50 feet and tree/shrub plots were spaced every 100 feet. Some areas were not sampled due to deep inundation, upland, or impermeable surface. The locations of the start and end points of each monitoring transect, the northwestern corner of each herbaceous plot, and all four corners of the woody vegetation plots were GPS'ed; these data are available upon request.

APPENDIX D: CREDIT LEDGER (2021)

TUALATIN VALLEY ENVIRONMENTAL BANK CREDIT LEDGER: 1/1/2019 - 12/31/2021

Date	Transaction Type	Jurisdiction	Permitee	Permit Number (DSL/Corps)	Wetland Impact Type	Number of Credits (ac.)	Balance of Credits after Transaction (ac.)
1/14/2019	withdrawal	State/Federal	Brookman Development LLC	61502-FP, NWP-2018-00472	PEM; Slopes/Flats/Riverine	0.36	0.0009
5/23/2019	release	State/Federal				0.819	0.8199
6/28/2019	withdrawal	State/Federal	Washington County	62020-GP, NWP-2019-00243	PEM; Slopes/Flats	0.034	0.7859
7/16/2019	withdrawal	State/Federal	JT Smith Companies	61737-RF, NWP-2019-00035	PEM; Flats	0.34	0.4459
10/31/2019	withdrawal	State/Federal	Tualatin Hills Parks and Recreation District	61830-RF, NWP-2018-00365	PEM; Slope/Flats	0.28	0.1659
12/20/2019	withdrawal	State/Federal	Polygon Northwest	54853-FP, NWP-2013-00374	PEM; Flats	0.14	0.0259
Credits Released 2020 (ac.): 0		Credits Withdrawn 2020 (ac.): 0					
Total Credits Released (ac.): 23.349		Total Credits Withdrawn (ac.): 23.3231				Balance (ac.):	0.0259