# Mitigation Monitoring Annual Report Year 9 (2020): Tualatin Valley Environmental Bank

#### 1: <u>Tualatin Valley Environmental Bank</u> 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 18-24, 2020 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.
- X 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 P	ERFORM	IANCE STANDARDS
Herba	ceous (PEM) Wetlands		
FACW	/ or FAC Dominated Herbaceous	Wetlands	8
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 9 was 96%. At an 80% confidence level, the upper confidence interval (CI) was 100% and the lower CI was 93%. 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 9 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 3% 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 5% 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 six native species: <i>Hordeum brachyantherum, Leersia</i> <i>oryzoides, Lotus unifoliatus, Lycopus americanus,</i> <i>Madia glomerata, Carex obnupta.</i>			
1.5	The hydrophytic vegetation standard is that the Prevalence Index is $\leq$ 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 9 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	<ul> <li>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 &amp; woody averages gives a total of 137% native cover, which meets the final standard (Year 3 &amp; thereafter).</li> <li>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 &amp; woody averages gives a total of 117% native cover, which meets the final standard (Year 3 &amp; thereafter).</li> <li>Buffer: Average cover of native species in the 28 herbaceous plots for this habitat class was 51% (upper CI = 60%, lower CI = 42%). There was an average of 41% cover of native woody species in the 14 woody sample plots (upper CI = 46, lower CI =35). Combining the herb &amp; woody averages gives a total of 92% native cover, which meets the Year 3 standard (this is Year 5 for the buffers).</li> </ul>
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	<ul> <li>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 &amp; lower CI= 0). This meets the final standard (Year 3 &amp; thereafter).</li> <li>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 &amp; lower CI=0%). This meets the final standard (Year 3 &amp; thereafter).</li> <li>Buffer: The average cover of invasives in the herb plots rounded to 7% (upper CI= 9%. lower CI=5%) and average invasive cover in the woody plots rounds to 0% (upper CI &amp; lower CI=0%).</li> </ul>
3.3	Bare substrate represents no more than 40% cover by the 3rd year.	PFO:Y PSS:Y Buffer: Y	<b>PFO</b> : The average is 9% in the herbaceous plots (upper CI= 12%, lower CI =5%). <b>PSS</b> : the average is 18% in the herbaceous plots (upper CI=26%, lower CI =9%). <b>Buffer</b> : The bare substrate averages 10% (upper CI= 14%, lower CI= 6%). <b>Note:</b> As of 2015 and thereafter, any herbaceous plot having $\geq$ 60% shade from woody species is excluded from the bare substrate criteria.

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: N	<ul> <li>PFO: 10 native species (Deschampsia cespitosa, Leersia oryzoides, Eleocharis palustris, Hordeum brachyantherum, Lotus unifoliatus, Polgonum hydropiperoides, Sparganium emersum [herbs] and Fraxinus latifolia, Salix hookeriana &amp; Salix lucida var. lasiandra (lasiandra) [woody species]) met the criteria.</li> <li>PSS: 8 species (Impatiens capensis, Scirpus microcarpus [herbs], and Cornus sericea ssp. sericea, Fraxinus latifolia, Populus balsalmifera, Salix hookeriana, Salix sitchensis, Salix lucida var. lasiandra and [woody species]) met the criteria.</li> <li>Buffer: 5 native species, including 3 herb species (Elymus glaucus, Hordeum brachyantherum and Festuca rubra and 2 woody species (Mahonia aquifolium, Pseudotsuga menziesii) met the criteria.</li> </ul>			
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	<ul> <li>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 Cl=70% &amp; lower Cl= 53%).</li> <li>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 Cl= 98%, lower Cl= 88%).</li> <li>Buffers: There was an average of 1,477 plants or stems/acre in 14 woody plots. Average percent woody cover Was 41% (upper Cl= 46%, lower Cl= 35%).</li> </ul>			
3.6	The hydrophytic vegetation standard for PSS and PFO wetlands is that the Prevalence Index is $\leq$ 3.0 and/or the vegetation passes the "50/20 rule" for dominance of hydrophytic vegetation.	PFO: Y PSS: Y	<b>PFO:</b> The average rounded Prevalence Index (PI) from the herbaceous and woody plots were both 2 (FACW). <b>PSS:</b> The average rounded Prevalence Index (PI) from the herbaceous and woody plots were both 2 (FACW).			
<b>Notes:</b> 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
Deed Restriction or other protection instrument attached
Final Monitoring Report?
Requesting release or partial release of financial security?

Yes 🗌	No 🖂
Yes 🗌	No 🖂
Yes	

December 9, 2020

# TUALATIN VALLEY ENVIRONMENTAL BANK MONITORING REPORT YEAR 9 (2020)

Prepared by: C. Jonas Moiel, Senior Ecologist Green Banks LLC 14200 SE McLoughlin Blvd, Suite A Milwaukie, Oregon 97267 (503) 477-5391

Prepared For: Dave Heikes Farms Inc. 9400 SW Heikes Drive Hillsboro, Oregon 97123

green banks

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#### **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)

# 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 six years (2015-2020) there has been a substantial reduction in maintenance efforts as the native plant communities have become established.

In 2020, 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 six 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 2020 (and 2019), only patch mowing of certain areas of the buffers with higher levels of non-native plants was completed. 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 2020 vegetation monitoring was conducted between August 18<sup>th</sup> and 24<sup>th</sup> by Senior Scientist C. Jonas Moiel with assistance from Natural Resource Technicians Justin Crissman and Brandon Leveille.

Dana Field (DSL) was provided with draft monitoring data and visited the site for an annual walk-through on August 27, 2020.

# 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 2020 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 have been some adjustments to the number and layouts 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 all the herbaceous and woody plots are presented in eight 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, 2020 is considered to be Year 9. However, the upland buffers are considered to be at Year 7 as this is the seventh year of monitoring since the initial planting was completed.

Table 3a: FACW/FAC PEM Habitat (~ 8.3 acres, 19 Herb Plots, Year 9)										
Criteria	<b>1.1:</b> Percent Native Cover		<b>1.2:</b> Percent Invasive Cover		1.3: Bare Substrate		1.4: Diversity		<b>1.5:</b> Hydrophytic Community	
Performance Standard	<b>1.1:</b> $\geq$ 60% by Year 3 and thereafter		<b>1.2:</b> $\leq 10\%$ reed canarygrass and $\leq 10\%$ other invasive species by Year 3 and thereafter		<b>1.3:</b> $\leq 20\%$ by Year 3 and thereafter		<b>1.4:</b> Six native species with $\geq 5\%$ cover, occurring in $\geq 10\%$ of the plots.		<b>1.5:</b> Prevalence Index is $\leq 3.0$	
	Average Pass? Y/N		Average Pass? Y/N		Average	Pass? Y/N	Number of species	Pass? Y/N	Average	Pass? Y/N
Results	96%	Y	1%	Y	3%	Y	6	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 96% native cover, which is 36% 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 and 2019. Cover by other non-natives is also minimal. Six native species (*Hordeum brachyantherum, Leersia oryzoides, Lotus unifoliolatus, Lycopus americanus, Madia glomerata 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).

Table 3b: OB	L PEM Habitat (	~18.9 acres, 5 Herb	Plots, Year 9)			
Criteria	2.1: Percent Na	ative Cover	2.2: Percent In	2.2: Percent Invasive Cover		
Performance Standard	<b>2.1:</b> ≥60% by Y	<b>2.1</b> : $\geq 60\%$ by Year 3 and thereafter		<b>2.2:</b> $\leq 10\%$ reed canarygrass and $\leq 10\%$ other invasive ecies 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 the 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.

Table 3c: PF	) Habitat (	~23.8	acres, 18	Woody	Plots &	34 Her	b Plots, Y	(ear 9)				
Criteria	<b>3.1</b> : Percent Combined Native Cove	r	<b>3.2:</b> Percen Invasive Co	t over	3.3: Bare S	ubstrate	<b>3.4:</b> Divers	ity	<b>3.5:</b> Native S Count/ Cove	tem er	<b>3.6:</b> Hydro Commun	phytic ity
Performance Standard	<b>3.1:</b> $\geq 60\%$ by Year 3 and thereafter	у	<b>3.2:</b> $\leq$ 30% species by and thereaf	invasive Year 3 ter	3.3: ≤ 40% Year 3 and thereafter	by	<b>3.4:</b> Six nat species with cover, occured $\geq 10\%$ of t	tive h $\geq 5\%$ wring in he plots.	3.5: Either ≥ plants per act aerial cover o species	1,000 te or 50% of woody	<b>3.6:</b> Preva Index is <u>&lt;</u>	lence 3.0
	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	Average	Pass? Y/N
Results	<b>137%</b> (75% herbs 62% woody)	Y	<b>1%</b> (1% herbs, 0% woody)	Y	9%	Y	10	Y	1,386	Y	2 (in both herb & woody plots)	Y

Note: As of 2015, any herbaceous plot having  $\geq$  60% shade from woody species was excluded from the bare substrate criteria.

#### Palustrine Forested (PFO) Wetlands

The PFO community is meeting all of the performance standards. It is densely populated with native trees, shrubs and herbs. The combined percent cover of native species (Standard 3.1) is 137% (75% herbs and 62% woody species). 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%. Average bare substrate (Standard 3.3) was 9%. This year, ten native species (seven herbs and three woody species) met the diversity standard (Standard 3.4). These species were *Deschampsia cespitosa, Eleocharis paulstris, Hordeum brachyantherum, Leersia oryzoides, Lotus unifoliatus, Polgonum hydropiperoides, Sparganium emersum, Fraxinus latifolia, Salix hookeriana* and Salix lucida var. lasiandra. The average density of native woody species (Standard 3.5) was 1,386 plants per acre. The average prevalence index (Standard 3.6) in both the herb and woody plots is 2 (FACW).

Table 3d: PS	SS Habitat (	~11.6	Acres, 20	) Wood	ly Plots a	& 41 He	rb Plots,	Year 9	)			
Criteria	<b>3.1</b> : Percent Combined N Cover	ative	<b>3.2:</b> Percen Invasive Co	t over	<b>3.3:</b> Bare	Substrate	<b>3.4:</b> Divers	sity	<b>3.5:</b> Native S Count/ Cove	Stem er	<b>3.6:</b> Hydro Communit	phytic y
Performance Standard	<b>3.1:</b> ≥60% b Year 3 and thereafter	ру	<b>3.2:</b> <u>&lt;</u> 30% species by <sup>3</sup> and thereaf	invasive Year 3 ter	<b>3.3:</b> ≤ 409 Year 3 and thereafter	% by d	<b>3.4:</b> Six na species wit cover, occu in ≥ 10% o plots	tive th $\geq 5\%$ urring of the	3.5: Either ≥ plants per ac 50% aerial c woody speci	1,000 cre or over of es	<b>3.6:</b> Preval Index is <u>&lt;</u> (	ence 3.0
	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	Average	Pass? Y/N
Results	<b>117%</b> (24% herbs 93% woody)	Y	<b>8%</b> (8% herbs. 0% woody)	Y	18%	Y	8	Y	1,342	Y	2 (in both herb & woody plots)	Y

Note: As of 2015, any herbaceous plot having  $\geq 60\%$  shade from woody species was excluded from the bare substrate criteria.

# Palustrine Scrub-Shrub (PSS) Wetlands

The PSS community is meeting all of the performance standards (Standards 3.1-3.6). It is densely populated with native trees, shrubs and herbs. The combined percent cover of native species (Standard 3.1) is 117% (24% herbs and 93% woody species), which is similar to the results from the previous three years. The woody cover has continued to increase while the herbaceous cover continues to decrease, presumably from increased shade. Invasive cover (Standard 3.2) in the herb layer was 8%, and the woody layer invasive cover was at 0%. Cover by other non-natives is also generally quite minimal. Bare substrate (Standard 3.3) was 18% this year, which is a 4% decrease from previous year. This year, eight (two herbaceous and six woody) native species (*Impatiens capensis, Scirpus mircrocarpus, Fraxinus latifolia, Cornus sericea ssp. sericea, Salix hookeriana, Salix sitchensis, Salix lucida* var. *lasiandra* and *Populus balsamifera*) met the diversity standard (Standard 3.4). The habitat meets Standard 3.5 with 1,342 plants per acre. The average prevalence index (Standard 3.6) in both the herb and woody plots is 2 (FACW).

Criteria	<b>3.1:</b> Percent Combined Nativ Cover	e	<b>3.2:</b> Percent Cover	Invasive	<b>3.3:</b> Bare S	ubstrate	3.4: Diversit	ty	<b>3.5:</b> Native Ste Count/ Cover	em
Performance Standard	3.1: ≥60% by Y and thereafter	ear 3	<b>3.2:</b> <u>&lt;</u> 30% i species by Y thereafter	nvasive ear 3 and	<b>3.3:</b> ≤ 40% and thereaf	by Year 3 ter	<b>3.4:</b> Six nati with $\geq 5\%$ c occurring in the plots	ve species over, ≥ 10% of	<b>3.5:</b> Either $\geq 1$ per acre or 50 cover of wood	,000 plants % aerial y 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	<b>92%</b> (51% herbs & 41% woody)	Y	<b>7%</b> (7% herbs, 0% woody)	Y	10%	Y	5	Y?	1,477	Y

Note: As of 2015, any herbaceous plot having  $\geq 60\%$  shade from woody species was excluded from the bare substrate criteria.

## **Upland Buffers**

This is Year 7 for the upland buffers and the community is meeting nearly all of its performance standards; see discussion about diversity standard 3.4 below. The combined percent cover of native species (Standard 3.1) is 92% (51% herbs and 41% woody). Invasive cover (Standard 3.2) in the herb layer was 7% 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 in 2019 (Standard 3.4) with four herb species and two woody species, but in 2020 it had 3 herb species and two woody species which met the standard. The buffer diversity standard was not achieved in 2020; however, there are many species of trees and shrubs that will meet the diversity standard in future years as some are currently at 3-4% average cover. The habitat meets Standard 3.5 with 1,477 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 pairedplot 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 summarizes the post-construction acreages by credit type.

Type	Patio	Predicted Acreage	Predicted Credit	Achieved Acreage	Achieved Credit
Турс	Katio	(MDI)	(MIDI)	(post-construction)	(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

## Post-Construction Credit Summary Table:

## 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 nearly all of the performance standards for Year 9. The only standard that was not met was the diversity Standard 3.4 within the upland buffer habitat; this habitat met the diversity standard in 2019 and has many tree and shrub species that are anticipated to meet the standard in future years; no action is recommended to improve the diversity in the upland buffer areas.

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 2021.

## **3.2 CONCLUSIONS**

In Year 9 (2020) the mitigation areas are continuing to be diverse native-dominated plant communities. The wetland areas had very low weed cover for Year 9 with an average range of 0-8% 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 2019 and previous years. Very little reed canarygrass was present in any of the habitats; it averaged 0% cover in all habitat types except in the PSS where it averaged 6% cover.

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 2020 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. There is a total of 0.0259 credit currently released and available for withdrawal.

## **3.3 RECOMMENDATIONS**

The TVEB is meeting nearly all of the performance standards for Year 9 and is on track to 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 2021, 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.

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U.S. Army Corps of Engineers. 2014. *State of OREGON 2014 Wetland Plant List;* compiled from: Lichvar, R.W.,
M. Butterw ick, 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
<u>http://www.oregon.gov/dsl/WETLAND/docs/OR\_2014v1.pdf</u>

# **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 1a: Tualatin Valley Environmental Bank Monitoring Inset 1

Map should be printed size 11"x17"





Map should be printed size 11"x17"

![](_page_16_Picture_2.jpeg)

![](_page_17_Figure_0.jpeg)

# 2017

Map should be printed size 11"x17"

![](_page_17_Picture_3.jpeg)

# Figure 3: Determination of Credits Map 2017

![](_page_18_Picture_1.jpeg)

Aerial photo compliments of Bing.

# **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 ENVIRONM	ENTAL E	BANK																				
2020 Vegetation Monitoring	Sample Date(s):	8/18/2020- 8/24/20								F	Percen	t (%) C	Cover									
FACW / FAC PEM Community		Wotland	T10-P	T10-P	Т10-Р	T10-P	T10-P	T10-P	T10-P	Т10-Р	T10-PE	T12-P	T12-P	T12-P	T12-P	T12-P	T12-P	T12-P	T12-P	T12-PE	T12-PE	
Species	Origin (N, NN, I)	Status (1 - 5)	EM2	EM3	EM4	EM5	EM6	EM7	EM8	EM9	EM10	EM2	EM3	EM4	EM5	EM6	EM7	EM8	EM9	EM10	EM11	Average
Native Herbaceous Species																						
Agrostis exarata	N	2	0	0	0	0	5	0	15	0	0	0	0	0	0	0	15	5	5	0	0	2
Beckmannia syzigachne	N	1	0	0	0	15	0	4	5	0	0	0	0	0	0	0	0	0	0	0	0	1
Bidens cernua	N	1	0	0	/	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0
Carex ovalis (Jeporina)	N N	1	0	0	0	25	0	0	0	0	0	0	0	0	0	0	30	0	0	0	0	3 0
Carex scoparia	N	2	0	0	0	0	0	0	0	0	0	0	0	0	0	5	3	12	0	0	0	1
Carex obnupta	N	1	65	0	0	0	30	0	0	0	25	0	73	0	93	35	0	30	0	0	0	18
Cyperus erythrorhizos	N	1	0	0	3	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	0	0	10	15	30	0	0	0	0	0	0	0	4	0	2	3
Eleocharis obtusa (ovata)	N	1	0	30	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
Eleocharis palustris	N	1	35	0	0	0	0	0	0	0	0	40	0	0	0	0	0	0	0	0	0	4
Epilobium ciliatum Epilobium donsiflorum	N	2	0	0	0	0	0	0	0	1	0	0	0	0	0	20	0	0	0	0	6	1
Grindelia integrifolia	N	2	0	0	0	0	0	25	15	0	0	0	0	0	0	0	0	0	0	0	0	2
Hordeum brachyantherum	N	2	0	0	0	0	0	10	8	50	25	0	0	0	0	0	0	10	30	2	0	7
Leersia oryzoides	Ν	1	0	20	55	35	0	0	0	0	0	5	0	95	7	20	0	0	0	0	0	12
Lemna minor	N	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
Lotus unifoliolatus (Acmispon americanus)	N	4	0	0	0	5	10	35	8	30	40	0	0	0	0	0	35	30	5	50	51	16
Ludwigia palustris	N	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lycopus americanus Madia glomorata	N	1	0	0	0	15	35	5	20	0	0	0	0	0	0	8	20	8	0	0 50	0	6
Plagiobothrys scouleri	N	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	45	0	30	2
Polygonum (Persicaria) hydropiperoides	N	1	0	50	0	0	0	1	0	0	0	20	6	0	0	0	0	0	0	0	0	4
Potentilla gracillis	N	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0	0	0	0
Prunella vulgaris	N	4	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0
Sparganium emersum	N	1	0	0	0	0	0	0	0	0	0	25	0	0	0	0	0	0	0	0	0	1
Invasive Herbaceous Species			0	0	0	4	0	0	0	0	0	0	0	0	0	0	4	0			0	
Convolvulus arvensis		5	0	0	0	1	0	3	0	0	0	0	0	0	0	0	1	0	4	4	0	1
Non-Native Herbaceous Species	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	
Agrostis stolonifera	NN	3	0	5	7	8	15	20	5	0	0	0	0	5	0	3	5	0	0	0	0	4
Agrostis capillaris	NN	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Echinochloa crusgalli	NN	3	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lactuca serriola	NN	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0
Trifolium species	NN		0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Bare Substrate			0	0	0	2	10	0	4	2	0	10	20	0	0	0	0	0	1	0	0	2
Dead spraved weeds			0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0
Shade, Woody Stem Cover & Water Depth				Ū						<u> </u>		•		<u> </u>	Ŭ			Ű			Ŭ	
Shade from woody plants			25	3	0	0	0	0	0	0	0	0	0	5	0	5	0	0	0	0	0	2
Stem cover on ground			15	0	0	0	0	0	0	0	0	0	0	0	0	2	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
			T10-PEM	T10-PEM	T12-PEM	T12-PEM	T12-PEM	T12-PEM	T12-PEM	T12-PEM	T12-PEM	T12-PEM	T12-PEM	T12-PEM	Habitat Standard							
Summary Information			N	ω	4	U1	6	7	œ	9	0	N	3	4	U1	6	7	œ	9	ō	Ξ	Average Error
Cover of Native Herbaceous Species			100	100	95	95	81	80	91	97	127	90	80	95	100	90	103	112	92	104	99	<b>96</b> 2.6
Lower CI (80%)																						93
Upper CI (80%)			0	0	0	-	0	0	0		0	0	0	0	0	0		0	0		0	100
Cover of Invasive Herbaceous Species			0	0	0	1	0	3	0	0	0	0	0	0	0	0	1	0	6	4	0	1 0.4
Upper CI (80%)																						1
Bare Substrate			0	0	0	2	10	0	4	3	0	10	20	0	0	8	0	0	1	0	0	<b>3</b> 1.2
Lower CI (80%)																						1
Upper CI (80%)																						5
Native Diversity																						6 species met the criteria: HOBR, LEOR, LOUN,
Prevalence Index			1	1	1	1	2	3	2	3	2	1	1	1	1	1	2	2	1	2	3	CAUB, LYAM, MAGL
Weighted Prevalence Index		+ +	100	115	119	139	164	295	168	254	309	90	80	110	100	124	246	233	130	228	308	
Sum of plant cover			100	105	103	104	96	103	96	97	127	90	80	100	100	94	109	112	99	108	100	
																						· · · · ·

TVEB 2020 Vegetation Monitoring

Appendix A

TUALATIN VALLEY ENVIRONMI	ENTAL B	ANK							
2020 Vegetation Monitoring	Sample Date(s):	8/18/2020- 8/24/20		Percer	nt (%)	Cover			
OBL Herbaceous Community	Origin	Wetland Status (1	T4-PEMOBL5	T4-PEMOBL6	T8-PEMOBL2	T9-PEMOBL3	T11-PEMOBL4	Row	
Species	(N, NN, I)	- 5)						Average	
Native Herbaceous Species									
Eleocharis obtusa (ovata)	N	1	0	0	0	12	0	2	
Eleocharis palustris	N	1	0	0	0	20	0	4	
Elodea canadensis	N	1	0	0	0	0	0	0	
Elodea nuttallii	N	1	0	0	0	0	0	0	
Elodea species	N	1	0	0	30	0	5	7	
Juncus oxymeris	N	2	0	0	0	0	0	0	
Leersia oryzoides	N	1	0	0	0	45	0	9	
Lemna minor	N	1	50	2	0	0	0	10	
Ludwigia palustris	N	1	0	0	0	0	0	0	
Polygonum amphibium var. emersum	N	1							
(Persicaria ampribia)			0	0	0	0	0	0	
Polygonum (Persicaria) nydropiperoides	N	1	30	/5	0	30	0	27	
Potamogeton natens and/or P. nodosus	N	1	0	0	20	0	50	14	
Schoenoplectus tabernaemontmontani	N	1	0	0	0	0	0	0	
Sparganium emersum	N	1	8	20	10	0	0	8	
Stuckenia pectinata	N	1	0	0	0	0	0	0	
Typha latifolia	N	1	0	5	0	0	0	1	
Invasive Herbaceous Species		0	0	0	0	0	0		
Phalaris arundinacea	I	2	0	0	0	0	0	U	
None this year									
Non-Native Herbaceous Species									
Lythrum portula	NN	1	0	0	0	0	0	0	
Agrostis species (assmed NN, FAC or wetter)	NN	3	0	0	0	0	0	0	
Potomogeton crispus	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	β (SALA)	0	0	
Approx. water depth (leet)			1	0.5	1.5	0	l	U.ð	Standard
Cummeny Information									Standard
Cover of Netive Herbassous Species			00	100	60	107	EE	Average	11
Cover of Native Herbaceous Species			00	102	60	107	55	60 60	
LUWEL OI (00%)								09	
Cover of Invasive Herbaceous Species			0	0	0	0	0	90	Λ
Lower CL (80%)			0	0	0	0	0	0	0
Lipper CI (80%)								0	
Bare Substrate			12	0	0	0	0	2	.3
Lower CI (80%)			•=	Ť	Ť	- -	~	-1	0
Upper CI (80%)				<u> </u>				6	
								NA- there is	no diversity
Native Diversity								standard for	this community
Prevalence Index			1	1	1	1	1	1	
Weighted Prevalence Index			88	102	60	107	55	İ	
Sum of plant cover			88	102	60	107	55	89	

Green Banks LLC

#### TUALATIN VALLEY ENVIRONMENTAL BANK

			-																																		
2020 Vegetation Monitoring	Sample Date(s):	8/18/202 8/24/20	0-															Perc	ent (%	6) Cove	er															n L	
PFO Herbaceous Community		Wetland	T3-F	T4-F	T4-F	T5-F	T5-F	T7-F	Т7-F	T7-F	Т7-F	Т8-F	T8-F	T8-F	T8-F	T9-F	Т9-F	Т9-F	T9-F	Т9-F	Т9-F	Т9-Г	Т10-I	T10-	T10-	T10-	T11-	T11-	T11-	T11-	T11-	T11-	111-F	T11-F	T11-F		
Species	Origin (N NN I)	Status (1 - 5)	E	Ξ	H2	Ξ	H2	Ξ	H2	НЗ	H4	Η	H2	НЗ	H4	Ξ	H2	H	H4	5	Б	H7	8 원	FH3	FH4	FH5	FH2	FH3	FH4	FH5	FH6	FH7	H10	H11	H12	Row Average	
Native Herbaceous Species	(,, .)	(,																																			
Achillea millefolium	N	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	0	0	0	0	
Agrostis exarata	N	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15	0	0	0	0	0 0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bidens cernua	N	1	0	0	0	0	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	1	0	0	0	
Carex densa	N	1	0	0	0	0	8	0	0	0	0	0	0	0	0	0	0	0	15	0	0	0	0 0	0	0	0	0	0	0	0	0	0	0	0	0	1	
Deschampsia cespitosa	N	2	0	0	0	0	0	0	0	0	25	0	0	5	60	0	0	35	45	30	30	54	10 65	55	75	0	0	0	0	0	0	0	0	15	0	14	
Eleocharis palustris	N	1	0	0	0	0	0	0	75	0	0	0	80	0	0	0	0	0	0	0	0	0	0 0	0	0	0	0	92	35	75	0	0	0	0	0	11	
Elymus glaucus	N	4	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0	0	0	0	0	0	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	7	0	0	0 0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Epilobium densifiorum	N	2	0	0	0	0	0	0	0	0	1	5	0	0	0	15	0	0	0	0	0	0	3 0	0	0	0	0	0	0	0	0	0	0	0	0	1	
Equisetum arvense	N	3	30	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	0	0 0	0	0	0	0	0	0	0	0	0	0	0	0		
Galium trifidum	N	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	4	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	52	0	0	0	70	10	10	0	30	1	8	0	1	0 0	0	0	92	0	0	0	0	0	0	0	55	50	11	
Impatiens capensis	N	2	30	10	8	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	2	
Juncus patens	N	2	0	0	0	0	0	0	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	
Juncus tenuis	N	3	0	0	0	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		
Leersia oryzoides	N	1	0	0	0	0	0	0	5	0	0	45	20	0	0	0	0	0	0	0	0	0	0 0	0	0	0	0	0	5	0	1	0	0	0	0	4	
Lotus unifoliolatus (Acmispon americanus)	N	4	0	0	0	0	0	0	0	35	35	0	0	0	12	0	3	3	10	25	15	8 3	30 35	55	5	4	0	0	0	0	0	0	0	6	0	8	
Madia glomerata	N	5	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	2	0	1	4	20 0	0	1	0	0	0	0	0	0	0	0	0	0	1	
Plagiobothrys scouleri	N	2	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	0	0	0	0	0	0	0	0	0	0	
Polygonum (Persicaria) hydropiperoides	N	1	0	60	1	75	0	0	0	0	0	55	0	0	0	0	1	0	0	0	0	0	0 0	0	0	0	25	5	25	17	15	40	0	0	0	9	
Polygonum (Persicaria) lapathifolium	N	2	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	0	0	0	0	0	0	0	0	0	
Prunella vulgaris	N	4	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	0	0	0	0	0	0	
Rosa nutkana seediing Sebeenepleetus teberneementeni	N	3	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	12	0	0	0	0	0	0		
Schoenopiecus tabemaemontani	N	1	0	0	0	0	0	0	20	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	1	
Sparganium emersum	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	70	3	20	3	20	50	0	0	0	5	
Invasive Herbaceous Species													-		-		-			-		-						-		-	-			-			
Cirsium arvense	1	3	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	0	0	0	0	
Convolvulus arvensis	1	5	0	0	0	0	1	0	0	3	0	0	0	0	0	0	0	1	1	1	1	1	0 0	1	4	0	0	0	0	0	0	0	0	0	0	0	
Phalaris arundinacea		2	0	0	0	0	0	12	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	
Agrostic stolonifera	NN	3	0	0	0	0	0	0	1	0	0	0	0	0	0	0	35	5	0	0	0	0	0 0	0	0	0	0	0	0	0	0	0	0	0	0	<del>ا ا</del>	
Agrostis capillaris	NN	3	0	0	0	0	10	10	0	0	0	0	0	5	0	5	0	0	0	0	0	0	0 0	0	0	0	0	0	0	0	0	0	0	0	0	1	
Bromus hordeaceus	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	0	3	20	1	
Crepis setosa	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	1	0	0	0	0	0	0	0	0	5	0	
Geranium molle	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	0	0	0	0	0	0	1	0	0	
Kickxia elatine	NN	3	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0	0	0	0	0	1	0 0	0	2	0	0	0	0	0	0	0	0	0	0	0	
Lactuca serriola	NN	4	0	0	0	0	0	0	0	0	0	0	0	0	3	8	0	0	0	2	0	0	8 0	0	0	3	0	0	0	0	0	0	0	0	6	1	
Leontodon taraxacoldes ssp.taraxacoldes	NN	5	0	0	0	0	0	0	0	0	15	0	0	0	0	15	0	0	0	0	0	0	0 0	0	0	0	0	0	0	0	0	0	0	8	15		
Plantago major	NN	3	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	0	0	0	0	0	0	0	0	
Poa species (asssumed NN, FAC)	NN	3	3	0	5	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0 0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Ranunculus repens	NN	3	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	0	0	0	0	
Raphanus sativus	NN	5	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0	0	0	0	0	0	0 0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Rumex crispus	NN	3	0	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	0	0	0	0	0	0	
Solanum dulcamara	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	0	2	0	0	
Infiliolum species	NN		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	0	0	0		
																																				┟────┦	
																																				1 1	bare substrate is NA plots
Bare ground and/or moss			37	30	66	25	74	8	0	0	8	0	0	13	10	17	0	0	15	13	10	25	14 0	0	10	0	5	0	3	10	64	10	98	5	4	17	that have > 60% woody
Dead spraved weeds			0	0	0	0	0	60	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	2	onado
Unvegetated water			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	
Shade, Woody Stem Cover & Water Depth																																					
Shade from woody plants			95	100	100	100	100	0	10	40	0	0	60	75	10	15	40	50	0	0	5	3	0 0	0	0	3	0	0	0	0	95	0	100	30	0	30	
																																				1 .	
Stem (basal) cover on ground (w/ species 4-letter code)			0	0	0	0	0	0	0	0	0	0	0	0	0	0 0	OSE, FF	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/snrubs rooted in plot (W/			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	1 1	
Approx, water depth (feet)			0	0	0	0.3	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	0.0	
					-		-		-	-		-		-	-		-	-	-	-	Ţ	Ţ			-	-	-	-	-	-	-	-		<u> </u>	-	+	
			-	4	-	l	-	-	- I	-	-	-	-	-	-	-	-	-	-	-	-							-	÷	-		-	Ħ	Ħ	コ	1 1	
			÷ 4	4	4	5-	5-	7	14	ļ	7	8-F	°-	°-	<b>~</b>	9-	9 <del>.</del>	9-	9-	9-	9-	9-	9		0-	- -		-	-		Ξ	Ŧ	÷	1	1	1	
			Ξ	3	H2	Ξ	H2	Ξ	H2	꿇	<b>H</b>	H	H2	ᇰ	H4	프	H2	· · · ·	4	5	н	H	8 12	± H	Η̈́	Ë	Ξ	÷.	Ϊ	Ë	Η̈́	ΞH7	H	H	표	Habitat	
Summary Information																							10	~	-	0.	10	~	-	0.	0,	`	0	-	N	Average	Standard Error
Cover of Native Herbaceous Species			60	70	19	75	16	10	100	97	77	105	100	78	87	41	69	94	84	84	107	72	78 100	113	84	96	95	100	97	95	36	90	2	81	50	75	5.1
Lower CI (80%	6)																																			69	
Upper CI (80%	6)																																			82	
Cover of Invasive Herbaceous Species	~		0	0	0	0	1	12	0	3	0	0	0	0	0	0	0	1	1	1	1	2	0 0	1	4	0	0	0	0	0	0	0	0	0	0		0
Lower CI (809	6)		_		-																															0	
Dpper CI (80%	•)		NA	NA	NA	NIA	NIA	69	0	0	0	0	0	NA	10	17	0	0	15	12	10	25	14 0	0	10	0	5	0	2	10	NA	10	NA	5	4	<u> </u>	2
Lower CI (809	6		11/4	INA	INA	11/4	INA	00	0	0	0	0	0	INA	10	17	0	0	15	13	10	23	14 0	0	10	0	5	0	3	10	INA	10	INA	5	4	5	J
Upper CI (809	6)					1			1	<u> </u>																									<u> </u>	12	
																																				· · · · · ·	
						1			1																											10 plants meet di	versity criteria- DECE,
Nativo Divorcity						1			1																											ELPA, HOBR, LE	OR, LOUN, POHY, SPEM
Prevalence Index-herb strata		1	3	1	3	1	2	2	1	3	3	1	1	2	2	3	2	2	2	2	2	2	4 3	3	2	2	1	1	1	1	1	1	2	2	2	(Herds) + FRLA, S	N/A
Weighted Prevalence Inde	x	1	159	80	89	75	59	64	83	279	292	110	100	177	210	246	183	204	136	209	211	183 3	338 270	341	207	217	95	100	97	95	36	90	3	225	224	<u>ب</u>	
Sum of herbaceous plant cov	ər	1	63	70	34	75	27	32	101	100	92	105	100	87	90	95	104	100	85	87	108	75 8	86 100	119	90	100	95	100	97	95	36	90	2	95	96	ł	

TVEB 2020 Vegetation Monitoring

Appendix A

# Green Banks LLC

TUALATIN VALLEY		ONMEN	TAL I	BANK	(																	
2020 Vegetation Monitoring	8/18/2020- 8/24/20																					
PFO Tree and Shrub Data									Perce	ent Cov	ver %		•									
Spacies	Origin	Wetland Status (1	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	Bow Average	
Native Tree and Shrub Species:	(11, 111, 1)	3)																			now Average	
Alnus rubra	N	3	0	0	0	10	7	15	0	0	2	0	0	5	0	0	0	0	0	0	2	
Amelanchier alnifolia	N	4	0	0	0	0	0	0	0	0	20	0	0	0	0	0	0	0	0	0	1	
Cornus sericea ssp. sericea	N	2	5	0	0	10	15	2	4	0	0	5	2	3	2	0	0	0	0	4	3	
Corylus cornuta	N	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	
Crataegus douglasii	N	3	0	4	4	2	4	3	4	11	0	1	1	5	1	2	0	0	0	4	3	
Frangula purshiana	N	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Fraxinus latifolia	N	2	10	15	14	39	17	15	15	6	1	30	37	15	10	10	8	1	0	28	15	
Lonicera involucrata	N	3	0	0	0	2	2	1	0	0	0	0	4	2	5	1	0	0	0	2	1	
Mahonia aquifolium	N	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Malus fusca	N	2	0	0	0	0	1	1	1	0	0	0	0	1	0	1	0	0	0	0	0	
Physocarpus capitatus	N	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	
Populus balsamifera	N	2	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Rosa nutkana	N	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13	1	
Rosa pisocarpa	N	3	0	0	0	0	1	0	0	5	40	1	0	1	1	1	0	0	0	0	3	
Rubus spectabilis	N	3	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	
Salix hookeriana	N	2	15	55	60	0	20	4	11	0	0	6	4	8	0	0	0	14	8	0	11	
Salix lucida var. lasiandra	N	2	55	30	30	5	10	2	22	0	0	12	0	5	0	0	35	30	29	0	15	
Salix scouleriana	N	3	0	6	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
Salix sitchensis	N	2	8	0	0	1	2	2	2	0	0	0	0	0	0	0	0	5	1	0	1	
Spiraea douglasii	N	2	10	0	0	1	10	0	21	3	2	5	2	0	3	0	7	5	7	2	4	
Symphoricarpos albus	N	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	
Thuja plicata	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 Sp	ecies																					
Crataegus monogyna	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 Speci	ies																					
Rubus armeniacus	I	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Rubus species (cultivar)	I		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Native Shrub and Tree							w	oody S	tom Co	unt /T		d Chru	he)									
Count							vv	oouy a		unit (T	ees an	u Siliu	<b>D</b> 5)									
Alnus rubra	N	3	0	0	0	1	2	3	0	0	1	0	0	1	0	0	0	0	0	0	0	
Amelanchier alnifolia	N	4	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	
Cornus sericea ssp. sericea		-																				
(alba)	N	2	3	2	0	14	7	2	1	0	0	0	4	4	3	0	0	0	0	5	3	
Corylus cornuta	N	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	
Crataegus douglasii	N	3	0	0	1	4	2	3	5	9	0	0	2	3	1	4	0	0	0	2	2	
Frangula purshiana	N	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Fraxinus latifolia	N	2	1	6	3	22	14	10	19	1	1	15	30	18	15	20	1	2	0	5	10	
Lonicera involucrata	N	3	0	0	0	3	1	1	0	0	0	0	5	6	8	2	0	0	0	4	2	
Mahonia aquifolium	N	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Malus fusca	N	2	0	0	0	0	1	1	2	0	0	0	0	1	0	2	0	0	0	0	0	
Physocarpus capitatus	Ν	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	
Populus balsamifera	N	2	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Rosa nutkana	N	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	
Rosa pisocarpa	N	3	0	0	0	0	3	0	0	1	22	1	0	1	1	1	0	0	0	0	2	
Rubus spectabilis	N	3	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	
Salix hookeriana	N	2	5	20	23	0	3	4	1	0	0	5	1	2	0	0	0	1	1	0	4	
Salix lucida var. lasiandra	N	2	25	6	13	13	1	4	19	0	0	8	0	7	0	0	52	35	13	0	11	
Salix scouleriana	N	3	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Salix sitchensis	N	2	3	5	0	2	1	4	1	0	0	0	0	0	0	0	0	4	2	0	1	
Spiraea douglasii	N	2	6	0	0	3	8	0	19	3	2	2	1	0	6	0	4	4	5	1	4	
Sympnoricarpos albus	N	4	0	0	0	U O	0	0	0	0	0	0	0	0	0	U	0	U	0	12	1	
Thuja plicata	N	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
																					Habitat	ra
Summary Information																		-	_		Average	Error
Cover of Invasive Shrubs and Tr	ees		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lower CI (80%)																					0	
Upper CI (80%)	1	A		<u> </u>		<u> </u>			<u> </u>							ļ	<u> </u>	ļ	<u> </u>		0	
		Average	1007	1050	1 100	0004	1 400	1000	04.00	450	074	1000	1007	1007	1007	000	1000	0050	070	1000	1000	
Density of Woody Vegetation	1050	per acre	1387	1258	1420	2001	1420	1033	2162	452	8/1	1000	1387	1387	1097	968	1838	3259	8/0	1323	1386	
Plot Area (snrub/tree plot)	1350				-																	
plot area entered in B62 is in	43560																					
Percent Cover of Native Shrubs	and Trees	1	103	110	113	70	90	45	80	25	65	60	50	45	22	16	50	55	45	65	62	7
Lower CI (80%)																					53	
Upper CI (80%)			I .				I													I .	70	
Sum of native plants /plot	t		43	39	44	62	44	32	67	14	27	31	43	43	34	30	57	46	21	41	40	
Does Plot Pass Native Cover	r								[								[					
Standard based on > 50%		1		1	1	1			1								1					
Native Cover Y or N?	, 		Y	Y	Y	Y	Y	N	Y	N	N	N	N	N	N	N	N	N	N	Ν		
Does Plot Pass Native Cover	r																					
Standard based on > 1000	)	1		1	1	1			1								1					
plants or stems per acre Y or	r	1		1	1	1			1		1						1					
N?	2		Y	Y	Y	Y	Y	N	Y	N	Y	Y	Y	Y	Y	N	Y	Y	N	Y		
Prevalence Indexwoody strata			2	2	2	2	2	2	2	3	3	2	2	2	2	2	2	2	2	3	2	
Weighted Prevalence Index	( <u> </u>		206	230	235	154	194	109	164	66	212	122	105	103	51	37	100	110	90	167		
Sum of plant cover	1		103	110	113	70	90	45	80	25	65	60	50	45	22	16	50	55	45	65		

#### TUALATIN VALLEY ENVIRONMENTAL BANK

2020 Vegetation Monitoring	Sample Date(s):	8/18/2020- 8/24/20																			Р	ercent	: (%) Co	over																			
PSS Herbaceous Community Species	Origin (N, NN, I)	Wetland Status (1 - 5)	T1-SH1	T1-SH2	T1-SH3	T1-SH4	T1-SH5	T2-SH1	T2-SH2	T2-SH3	T2-SH4	T2-SH5	T2-SH6	T2-SH7	T2-SH8	T2-SH9	T2-SH10	T2-SH11	T2-SH12	T3-SH1	T3-SH2	T3-SH3	T3-SH4	T6-SH1	T6-SH3 T6-SH2	T6-SH4	T6-SH5	T6-SH6	T6-SH7	T6-SH8	T6-SH9	T6-SH10	T6-SH11	T6-SH12	T6-SH13	T6-SH14	T6-SH15	T6-SH16	T6-SH17	T6-SH18	T6-SH19	T6-SH20	low Average
Native Herbaceous Species																																											
Bidens cernua	N	1	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	1	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0
Epilobium ciliatum	N	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	2 0	5	0	0	0	0	0	0	1	0	3	0	0	0	1	0	0	0	0
Equisetum arvense	N	3	0	0	0	/	0	0	0	0	0	0	0	3	2	20	5	0	0	0	0	0	5	0	0 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Festuca rubra ssp. rubra	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	6	7	0	0	0	1	1	0	0	0	0	0
Impatients capensis	N	2	25	5	0	15	40	20	10	75	80	0	20	0	75	32	50	0	5	0	0	0	2	25	5 0	0	0	0	0	0	0	0	0	4	0	2	0	0	0	0	0	0	12
Juncus hufonius	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	0	0	0	0	0	0	0	0	0	0	
Juncus effusus	N	2	0	0 0	0	0	15	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	0	0	0	0	0	0	0	0	0	0	1
Leersia orvzoides	N	1	0	0	5	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	15	0	0	0	0 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Lemna minor	N	1	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	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
Lotus unifoliolatus (Acmispon americanus)	Ν	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	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Ludwigia palustris	Ν	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Polygonum (Persicaria) hydropiperoides	N	1	0	4	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0	0	0	4 1	3	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Scirpus microcarpus	N	1	0	0	0	0	0	0	0	0	0	0	60	0	15	40	0	0	0	0	0	0	85	0	0 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
Typha latifolia	N	1	0	0	0	0	10	5	10	0	U	0	0	0	5	0	0	0	15	80	0	0	0	U	0 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
Veronica americana	N	1	0	0	0	0	0	0	0	0	U	0	5	0	0	0	0	0	0	0	0	υ	U	U	U 0	0	0	0	0	0	0	0	0	0	0	0	0	U	0	0	0	0	0
Convolvulus anyonsis	1	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	10	0	0	3	0	0	0	0	0	0	0	0	0	0	
Holcus lanatus	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	15	30	0	0	0	0	0	0	0	0	0	0	1
Hypericum perforatum		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	3	0	2	2	0	0	1	0	0	0	0	0	0	0	
Rubus aremeniacus (seedlings)	i	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	0	0	0	0	0	0	0	0	0	0	0
Phalaris arundinacea		2	0	10	0	0	0	30	45	20	6	0	0	0	0	8	15	20	10	5	0	0	0	0	10 3	10	15	0	0	0	0	0	0	0	0	0	7	0	0	20	0	30	6
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	10	87	20	20	0	5	2	0	1	0	0	0	0	90	0	6
Agrostis stolonifera	NN	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	8	0	0	0 0	0	0	0	0	0	0	0	0	0	0	0	10	60	0	10	0	65	4
Agrostis species (assmed NN, FAC or wetter)	NN	3	0	0	0	0	0	0	0	0	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	0	0	0	0
Centaurium umbellatum (ervthraea)	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	1	2	1	0	0	0	0	0	0	0	0	0	0	0
Daucus carota	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	2	2	0	0	0	0	0	0	0	0	0	0	0	0
Lactuca serriola	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	0	0	0	0	1	1	1	0	0	0	0
Leucanthemum vulgare	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	3	0	0	0	0	0	0	0	0	0	0	0
Leontodon taraxacoides ssp.taraxacoides	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	2	30	7	0	0	0	0	0	0	0	0	0	0	1
Lotus corniculatus	NN	3	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	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Plantago lanceolata	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	6	0	1	0	0	0	0	0	0	0	0	0	0	0
Poa species (assumed NN, FAC)	NN	3	0	0	0	0	30	0	0	0	0	0	0	0	0	0	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	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	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0
Solanum dulcamara	NN	3	0	3	0	0	8	0	0	0	0	0	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
Vulpia brominoides	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	15	40	0	0	0	0	0	0	0	0	0	0	1
with > 60% shade)																																											
Bare ground and/or moss			75	79	89	78	35	45	35	5	14	97	8	89	2	5	30	79	79	10	28	90	5	75	76 95	5 82	63	90	0	65	14	7	87	92	96	89	80	37	70	70	10	5	53
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	0	0	0	0	0	0	0	0	0	0	0
Shade & Woody Stem Cover on Ground																																											
Shade from woody plants			95	85	100	100	75	70	55	75	25	75	30	100	80	80	100	100	100	85	100	100	100	100 1	00 10	0 100	) 100	90	0	0	0	50	80	100	100	95	100	100	100	90	40	20	78
Stem cover (basal) on ground (w/ species 4																																				60							
letter code)			0	0	0	0	0	10	0	0	0	0	0	0	0	0	0	75	2	0	0	0	0	0	0 0	0	0	0	0	0	0	0	0	0	0	(POBA)	0	0		0	0	0	
Summany lafamatian			T1-SH1	T1-SH2	T1-SH3	T1-SH4	T1-SH5	T2-SH1	T2-SH2	T2-SH3	T2-SH4	T2-SH5	T2-SH6	T2-SH7	T2-SH8	T2-SH9	T2-SH10	T2-SH11	T2-SH12	T3-SH1	T3-SH2	T3-SH3	T3-SH4	T6-SH1	T6-SH3	T6-SH4	T6-SH5	T6-SH6	T6-SH7	T6-SH8	T6-SH9	T6-SH10	T6-SH11	T6-SH12	T6-SH13	T6-SH14	T6-SH15	T6-SH16	T6-SH17	T6-SH18	T6-SH19	T6-SH20	abitat
Cover of Native Herbaceous Species		1	25	11	11	22	65	25	20	75	80	3	87	11	08	92	55	1	20	85	22	2	92	25	11 2	8	22	0	0	1	0	6	8	4	3	2	2	2	2	0	0	0	verage 24
Lower CL (80%)		<u> </u>	20			22	00	20	20	15	00	3	07		30	32	55		20	00	22	4	54	20		0	22	0	0		0	0	0	4	3	۷	2	4	4	U	U	U	18
Lipper CI (80%)																												-															31
Cover of Invasive Herbaceous Species		1	0	10	0	0	0	30	45	20	6	0	0	0	0	8	15	20	10	5	0	0	0	0	10 3	10	15	0	13	0	17	35	0	0	1	0	7	0	0	20	0	30	8
Lower CI (80%)			1 Č				-		-	-	-	-	-	-	-	-	-			-	-		-	-					1			'	-	-				-	-	-	-		6
Upper CI (80%)																																											10
Bare Substrate			NA	NA	NA	NA	NA	NA	35	NA	14	NA	8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA N/	A NA	NA	NA	0	65	14	7	NA	10	5	18							
Lower CI (80%)																																											9
Upper CI (80%)																																											26
Native Diversity																																										8 IN	plants meet div ICA,SCMI (herb
Prevalence Index-herb strata		t	2	2	1	2	2	2	2	2	2	1	1	2	2	2	2	2	2	1	1	3	1	2	2 2	2	1	3	3	3	3	3	1	1	3	1	2	3	2	2	3	3	2
Weighted Prevalence Index		t	50	47	11	51	234	105	120	190	172	3	136	25	177	180	- 145	42	- 78	95	40	26	104	50	47 8	33	52	30	323	116	292	298	17	6	10	3	49	185	7	70	270	255	
Sum of herbaceous plant cover			25	24	11	22	103	55	65	95	86	3	95	11	98	100	70	21	41	90	28	10	92	25	24 5	18	37	10	100	35	86	93	13	8	4	3	20	63	3	30	90	95	47

TUALATIN VALLEY ENVIRO	DNMEI	NTAL B	ANK																					
2020 Vegetation Monitoring	Sample Date(s):	8/18/2020- 8/24/20									P	ercent	Cover	%										
PSS Shrub and Tree Data		Wetland					_					_									Т	Т		
Native Shruh and Tree Species:	Origin (N, NN, I)	Status (1 - 5)	Υ.Γ	гı-s	[2-S	[2-S	[2-S	[2-S	[2-S	[3-S	[3-S	-6-S	-6-S	-6-S	-6-S	-6-S	[6-S	[6-S]	-6-S	[6-S	6-S10	S-S-1	Row Average	
Acer macrophyllum	N	4	0	0	0	0	<b>3</b> 0	4 0	0 0	0	0	0	0	<u></u> 0	4 0	0 0	<b>6</b>	70	<b>8</b>	<b>9</b> 0	0	0	0	
Alnus rubra	N	3	0	40	0	0	0	0	0	0	0	0	0	0	3	0	1	0	0	1	1	0	2	
Amelanchier alnifolia	N	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Cornus sericea ssp. sericea (alba)	N	2	5	5	5	0	5	5	10	0	0	12	8	25	16	1	1	3	0	1	1	0	5	
Corylus cornuta	N	4	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Frangula (Rhampus) purshiana	N	3	0	0	5	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	2	
Fraxinus latifolia	N	2	0	10	0	0	10	25	0	0	0	15	0	5	17	11	8	14	1	5	1	0	6	
Lonicera involucrata	N	3	0	0	0	5	0	2	0	0	0	4	4	6	2	5	1	0	0	0	0	0	1	
Malus fusca	N	2	0	0	0	0	5	2	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	
Physocarpus capitatus	N	2	0	0	0	0	4	0	3	0	0	0	0	2	0	0	0	1	0	0	0	0	1	
Populus baisarrinera Pseudostuga menziesii	N	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	0	0	24	0	0	13	
Quercus garryana	N	4	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	
Rosa nutkana	N	3	0	0	0	0	0	0	0	0	0	0	0	0	5	0	1	0	0	0	0	0	0	
Rosa pisocarpa	N	3	0	0	0	0	4	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	
Rubus leucodermis	N	4	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	
Rubus spectabilis Salix bookoriana	N	3	0 85	30	0	0 45	25	0 35	0	0 45	50	22	0 35	0	37	0	0	0	0	0	0 45	27	34	
Salix lucida var. lasiandra (lasiandra)	N	2	5	30	20	30	15	0	15	20	25	0	42	12	0	0	0	0	2	14	20	29	14	
Salix scouleriana	N	3	0	0	0	0	0	0	0	0	0	0	5	10	0	0	0	0	0	0	0	0	1	
Salix sitchensis	N	2	0	5	5	15	5	7	2	15	15	62	11	0	0	0	0	0	5	10	16	14	9	
Spiraea douglasii	N	2	5	3	5	5	0	10	10	3	10	0	0	5	0	3	7	0	1	0	0	0	3	
Non-Native Shrub and Tree Species	NINI	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Malus numila	NN	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Prunus species	NN	Ū	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Invasive Shrub and Tree Species																								
Rubus armeniacus		4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Native Shrub and Tree Count								١	Noody	Stem C	ount (	Trees a	nd Shr	ubs)										
	N	4	0	0	0	0	0	0	,	0	,	0	0	,	0	0	0	0	0	0	0	0	0	
Alnus rubra	N	3	0	3	0	0	0	0	0	0	0	0	0	0	2	0	1	0	0	0	1	0	0	
Amelanchier alnifolia	N	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Cornus sericea ssp. sericea (alba)	N	2	1	4	2	0	8	4	2	0	0	6	5	17	4	1	1	5	0	0	1	0	3	
Corylus cornuta	N	4	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Crataegus douglasii Eropgula (Phompue) purabiana	N	3	0	0	4	0	12	6	0	0	0	0	0	0	5	2	2	0	1	0	1	0	2	
Frangula (Friannus) pursniana	N	2	0	5	0	0	3	3	0	0	0	4	0	2	9	14	7	6	0	1	2	0	3	
Lonicera involucrata	N	3	0	0	0	5	0	0	0	0	0	2	1	4	1	8	1	0	0	0	0	0	1	
Malus fusca	N	2	0	0	0	0	4	2	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	
Physocarpus capitatus	N	2	0	0	0	0	6	1	1	0	0	0	0	1	0	0	0	1	0	0	0	0	1	
Populus balsamifera	N	3	0	0	2	0	0	0	0	0	0	0	0	0	0	16	14	22	48	23	0	0	6	
Pseudostuga menziesii Quercus garryana	N	4	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	
Rosa nutkana	N	3	0	0 0	0	0	0	0	0	0	0	0	0	0	5	0	1	0	0	0	0	0	0	
Rosa pisocarpa	N	3	0	0	0	0	6	0	0	0	0	0	0	1	3	0	0	0	0	0	0	0	1	
Rubus leucodermis	N	4	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	0	0	0	0	0	0	
Rubus spectabilis	N	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Salix hookeriana	N	2	26	8	30	11	/ /	6	12	11	15 0	10	18	6	3	0	2	1	6	10	29	22	12	
Salix lucida val. lasiandra (lasiandra) Salix scouleriana	N	2	0	0	0	0	4	0	0	0	0	0	20	3	0	0	0	0	0	5	0	0	5	
Salix sitchensis	N	2	1	2	6	8	1	2	1	7	4	16	4	0	ŏ	ŏ	ŏ	ŏ	1	1	3	11	3	
Spiraea douglasii	N	2	10	2	9	4	0	9	14	5	12	0	0	4	0	1	6	0	1	0	0	0	4	
Thuja plicata	N	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Standard
Summary Information																							Habitat Average	Standard
Cover of Invasive Shrubs and Trees			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	nabitat Average	0
Lower CI (80%)				Ť		-	Ť	-	-	-		Ť	-			-			-	-		-	0	
Upper CI (80%)																							0	
		Average	1000	1007	1000		1070	1005	1000	1000	1050	1000		1050	4000		1000		1001		1055	1001	10.00	
Density of Woody Vegetation	1350	per acre	1226	1097	1968	1129	1678	1065	1033	1000	1258	1226	1904	1258	1033	1517	1226	1194	1904	1484	1355	1291	1342	
entered in B63 is in someters or 43 560 for	43560				<u> </u>		L											<u> </u>						
Percent Cover of Native Shrubs and Trees	-0000		100	123	90	100	84	91	100	83	100	115	105	100	90	60	55	105	105	100	85	70	93	4
Lower CI (80%)																							88	
Upper CI (80%)																							98	
Sum of native plants/plot			38	34	61	35	52	33	32	31	39	38	59	39	32	47	38	37	59	46	42	40	42	
Does Plot Pass Native Cover Standard			v	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v	v		
Does Plot Pass Native Cover Standard			ř	r	T	Ť	r	r	T	ř	r	ĭ	ř	T	ľ	ř	ř	T	r	T	ř	r	╂────╂	
based on $\geq$ 1000 plants or stems per acre Y																								
or N?			Y	Y	Y	Ν	Y	Y	Ν	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
Prevalence Index-woody strata			2	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3	3	2	2	2	2	
Sum of plant cover			200 100	200 123	90	205 100	84	91	200	83	200 100	∠34 115	105	218 100	200 90	60	55	291	105	226	85	70	93	
San or plant Cover	1		100	120		100	04		100		100		100	100				100	100	100		, , ,		

Green Banks LLC

# TUALATIN VALLEY ENVIRONMENTAL BANK

2020 Vegetation Monitoring	Sample Date(s):	8/18/2020- 8/24/20													F	Percen	ot (%) (	Cover													
Buffer Herbaceous Community	Origin (N, NN, I)	Wetland Status (1 - 5)	T3-BH	ТЗ-ВН	T4-BH	T4-BH	T6-BH	т6-ВН	T6-BK	T6-BH	T7-BH1	Т7-ВН	Т7-ВН	T7-BH⁄	T7-BH	T7-BH	T8-BH	T8-BH	T8-BK	T8-BH⁄	T9-BH1	Т9-ВН	Т9-ВК	T9-BH	Т10-ВН	T10-BH	Т10-ВН	T10-BH	T11-BH	T11-BH	
Species			-	2	_	N	-	N	ω	4	-	N	3	4	5	6	-	8	ω	4	-	N	8	4	<u></u>	4	5	6	13	∓ Aver	age
Native Herbaceous Species																															-
Achillea millefolium	N	4	0	0	0	0	0	0	6	3	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Deschampsia cespitosa	N	2	0	0	0	0	5	0	0	0	0	0	0	0	50	0	0	0	4	0	0	0	0	7	25	10	0	0	0	10	4
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	10	0	0	0	0	0
Elymus glaucus Epilobium ciliatum	N	4	0	25	0	15	0	0	5	0	5	3	5	0	0	10	60	20	0	8	8	10	0	0	0	0	0	0	0	0	0
Eestuca idahoensis ssp. Roemeri	N	4	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Festuca rubra ssp. rubra	N	3	0	0	0	0	5	0	66	70	88	94	88	5	0	55	40	80	0	10	50	86	0	10	5	15	5	0	90	79	34
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
Hordeum brachyantherum	N	2	0	0	0	0	0	0	0	0	0	0	0	0	30	5	0	0	55	5	0	0	0	8	5	10	5	0	0	0	4
Madia glomerata	N	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	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	30	0	0	0	0	0	0	0	0	0	0	1
Invasive Herbaceous Species		2	0	0	0	0	0	0	0	0	0	4	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Convolvulus arvensis	1	5	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	7	0	0	0	10	0	0	2	0	0	0	1
Phalaris arundinacea		2	0	0	0	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
Holcus lanatus	1	3	10	20	15	20	0	0	15	15	7	0	0	40	0	12	0	0	0	0	2	3	0	0	0	0	0	0	0	0	6
Hypericum perforatum		4	0	0	0	0	0	0	0	1	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	15	0	20	0	35	60	0	5	0	0	0	0	0	0	0	0	0	10	0	0	0	0	0	0	0	0	0	0	5
Alopecurus pratensis	NN	3	0	0	0	0	20	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	0	25	0	0	0	2
Crenis setosa	NN	4	0	20	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	1	0	0	3	7	20	04	0	0	2
Daucus carota	NN	4	0	0	0	0	1	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	25	0	0	0	0	0	1
Geranium dissectum	NN	4	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	0
Hypochaeris radicata	NN	5	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0
Lactuca serriola	NN	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	12	0	0	0	6	0	4	7	0	0	1
Leontodon taraxacoides ssp.taraxacoides	NN	5	0	0	0	0	20	0	8	5	0	0	0	40	20	1	0	0	7	6	1	0	0	25	0	10	5	0	7	6	6
Lolium perenne	NN	3	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0
Rumex obtusifolius	NN	3	0	0	0	0	0	0	0	0	0	0	0	8	0	0	0	0	0	3	0	0	0	2	0	0	0	4	0	0	0
Sonchus asper	NN	4	0	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
Vicia hirsuta	NN	5	0	15	7	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
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
Vulpia brominoides	NN	4	0	0	0	5	0	0	0	0	0	0	0	0	0	5	0	0	25	0	0	0	0	20	0	15	15	0	0	15	4
Bare Substrate																-				10		-		10			-	-			
Bare ground and/or moss			70	15	65	26	9	10	0	0	0	0	1	4	0	2	0	0	4	16	17	0	8	10	8	9	3	0	0	0	10
Shade & Woody Stem 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	U
Shade from woody plants			100	10	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	0	15
Stem (basal) cover on ground			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0
Aerial cover of native trees/snrubs rooted in plot			0	0	v	0	0		0	- U	0		0	0	0	0	0	0	Ū	0	0	Ū	0	Ŭ	0	0	•	0	0	0	°
(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	0	0
			T3-BH1	T3-BH2	T4-BH1	T4-BH2	T6-BH1	T6-BH2	T6-BH3	T6-BH4	T7-BH1	T7-BH2	T7-BH3	T7-BH	T7-BH	T7-BH6	T8-BH1	T8-BH2	T8-BH3	T8-BH	T9-BH1	T9-BH2	T9-BH3	T9-BH	T10-BH	T10-BH	Т10-ВН	Т10-ВН	T11-BH	T1 BH Habit	at Standard
Summary Information			-	10	_	10	_	10	~	+	-	2	~	4	01	5,	_	10	~	+	_	10		-	3	4	5	6	3	Avera	ige Error
Cover of Native Herbaceous Species Lower CI (80%)			5	25	0	15	10	0	77	73	93	97	93	8	80	82	100	100	59	53	58	96	0	25	36	45	12	0	90	89	<b>51</b> 7.2
Upper CI (80%)							<u> </u>	1																	1						60
Cover of Invasive Herbaceous Species			10	20	15	20	0	5	15	15	7	1	6	40	0	12	0	0	0	7	2	3	0	10	0	0	2	0	0	0	<b>7</b> 1.7
Lower CI (80%)																															5
Upper CI (80%)			70	15	CE.	00	0	10	0	0	0	0	-	4	0	0	0	0	4	10	17	0	0	10	0	0	2	0	0	0	9
Lower CI (80%)			70	15	60	20	9	10	0	0	0	0	1	4	0	2	0	0	4	10	17	0	8	10	8	9	3	0	0	0	6
Upper CI (80%)																															14
Native Diversity																														Currer the div HOBR PSME	itly 5 species meet ersity criteria: (ELGL, , FERU; MAAQ, )
Prevalence Index			3	4	3	4	3	3	3	3	3	3	3	4	3	3	4	3	3	2	4	3		4	3	3	4	4	3	3	3
Weighted Prevalence Index			85	340	140	288	312	265	327	307	305	297	310	386	260	352	368	320	273	196	291	312	0	333	287	315	397	401	317	347	
Sum of nerbaceous plant cover			30	85	42	/4	91	90	100	100	100	98	99	99	100	108	102	100	96	84	83	100	U	90	92	91	97	100	100	110	

TUALATIN VALLEY ENVIRO	NMEN	ITAL BA	ANK															
		0/10/0000	1					_		-								
2020 Vegetation Monitoring	Date(s):	8/18/2020- 8/24/20						P	ercent	Cover	%							
Buffer Tree and Shrub Date														_	_	-		
Builer Tree and Shrub Data	Origin	Wotland	Т3-В	T4-B	Т6-В	Т6-В	Т7-В	Т7-В	T7-B	T8-B	T8-B	Т9-В	Т9-В	Г10-Е	-10-E	[]]]-E		
	(N, NN,	Status	Ë	Ë	Ξ	F2	Ë	F2	÷Ξ	Ë	F2	Ë	F2	3F2	BF3	3F2	Row	
Native Tree and Shrub Species:	I)	(1 - 5)	0	0	0	0	0	10	0	10	0	0	0	0	0	0	Average	
Acter circinatum	N	4	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	
Acer macrophyllum	N	4	5	15	0	2	0	0	0	0	0	0	1	1	2	2	2	
Alnus rubra	Ν	3	0	0	8	5	0	0	0	0	0	0	0	0	0	0	1	
Amelanchier alnifolia	N	4	2	3	0	1	0	0	0	0	1	1	1	0	0	0	1	
Francula (Rhamnus) purshiana	N	3	3	4	1	0	0	1	4	0	0	0	0	0	0	0	1	
Fraxinus latifolia	N	2	12	2	1	1	0	0	8	0	10	1	5	7	3	4	4	
Holodiscus discolor	N	4	0	3	0	0	0	0	0	0	0	2	0	0	0	0	0	
Lonicera involucrata	N	3	0	0	0	0	0	1	1	0	0	1	1	2	0	1	1	
Manonia aquilolium Malus fusca	N	4	0	2	2	0	2	0	0	2	20	3	0	5 1	0	0	0	
Oermleria cerasiformis	N	4	0	0	0	0	1	1	0	0	0	1	0	0	0	0	0	1
Philadelphus lewisii	N	5	0	0	0	1	0	0	0	0	0	0	1	0	1	0	0	
Physocarpus capitatus	N	2	0	0	0	0	1	1	1	0	0	0	0	1	0	1	0	
Pinus pondserosa Populus balsamifera	N	4	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Prunus emarginata	N	4	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	
Prunus virginiana	Ν	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Pseudotsuga menziesii	N	4	14	12	1	0	45	20	0	34	1	25	0	0	0	0	11	
Quercus garryana Ribes sanguinium	N N	4	3	1	1 0	0	0	1 0	0	0	0	0	0	0	3	0	1	
Rosa nutkana	N	3	0	0	0	1	2	1	3	2	3	3	4	5	2	5	2	1
Rosa pisocarpa	N	3	0	0	1	0	0	0	0	0	8	0	0	0	0	0	1	
Rubus parviflorus	N	4	0	0	0	0	5	0	1	0	0	0	2	0	0	0	1	
Sambucus nigra ssp. cerulea	N	4	8	0	0	0	0	0	0	0	0	0	0	0	1	0	1	
Symphoricarpos albus	N	4	1	1	1	1	3	5	4	1	2	4	1	7	3	2	3	
Thuja plicata	N	3	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	
Tsuga heterophylla	Ν	4	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	
Non-Native Shrub and Tree Species	NIN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
None this year	ININ	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Prunus species	NN		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Rosa rubignosa	NN	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Invasive Shrub and Tree Species	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	+
Rubus cultivar		3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
												-1						
Native Shrub and Tree Count						v	loody S	Stem Co	ount (I	rees ar	nd Shri	ibs)						
Abies grandis	N	4	0	0	0	0	2	7	0	3	0	0	0	0	0	0	1	
Acer circinatum	Ν	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Acer macrophyllum	N	4	6	10	0	4	0	0	0	0	0	0	2	1	2	2	2	+
Amus rubra Amelanchier alnifolia	N	3	1	3	3	2	0	0	0	0	2	0	1	0	0	0	1	ł
Crataegus douglasii	N	3	4	0	10	1	1	1	3	2	3	3	2	7	1	9	3	
Frangula (Rhamnus) purshiana	N	3	2	2	1	0	0	1	0	0	0	0	0	0	0	0	0	
Fraxinus latifolia	N	2	10	2	3	3	0	0	8	0	12	1	8	11	7	8	5	+
Lonicera involucrata	N	4	0	0	0	0	0	1	0	0	0	3	3	4	0	2	1	ł
Mahonia aquifolium	N	4	3	5	11	14	10	7	15	6	23	10	12	11	13	23	12	
Malus fusca	N	2	0	0	2	0	0	0	0	0	0	1	0	2	0	0	0	
Oermleria cerasiformis	N	4	0	0	0	0	1	1	0	0	0	1	0	0	0	0	0	
Physocarpus capitatus	N N	5	0	0	0	0	1	2	1	0	0	0	0	1	0	2	1	<u> </u>
Pinus ponderosa	N	4	1	0	1	Ő	0	0	0	0	0	0	1	0	1	0	0	1
Populus balsamifera	Ν	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Prunus emarginata	N	4	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	<u> </u>
Prendos virginiaria Pseudostuga menziesii	N	4 4	12	6	1	0	11	6	0	7	1	6	0	0	0	0	0 	
Quercus garryana	N	4	2	3	5	1	0	3	3	0	0	1	0	2	7	0	2	
Ribes sanguinium	Ν	4	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	
Rosa pisocarpa	N	3	0	0	4	0	0	0	0	0	9	0	0	0	0	0	1	
Hosa nutkana Rubus parviflorus	N	3	0	0	0	1	2	1	5	5	4	6	/ 	11	3	6	4	
Sambucus nigra ssp. cerulea	N	4	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	
Spiraea douglasii	Ν	2	0	0	0	0	0	0	22	0	7	0	0	0	0	0	2	
Symphoricarpos albus	N	4	0	3	3	2	13	12	5	3	3	13	4	9	3	1	5	
Thuja plicata	N	3	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	+
	IN	4	0	0	0	0		0	0	0	0	0	0	0	0	0	0	1
																	Habitat	Standard
Summary Information																	Average	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%)																	0	
		Average													1		0	
Density of Woody Vegetation		per acre	1420	1162	1420	1000	1387	1452	2065	839	2065	1549	1452	1904	1258	1710	1477	
Plot Area (shrub/tree plot)	1350																	
entered in B101 is in sq.meters or 43,560 for	43560																	
Percent Cover of Native Shrubs and Trees	<u> </u>	<u> </u>	68	45	20	18	65	48	45	50	55	45	23	35	25	30	41	4
Lower CI (80%)				<u> </u>		<u> </u>											35	
	4	1				1								L	1		40	<b>I</b>

Sum of native plants /plot		44	36	44	31	43	45	64	26	64	48	45	59	39	53	46	
Does Plot Pass Native Cover Standard based																	
on > 50% Native Cover Y or N?		Υ	Ν	Ν	Ν	Y	Ν	N	N	Y	Ν	Ν	Ν	Ν	N		
Does Plot Pass Native Cover Standard based																	
on > 1000 plants or stems per acre Y or N?		Y	Y	Ν	Ν	Y	Y	Y	N	Y	Y	Y	Y	N	Y		
Sum of plant cover		68	45	20	18	65	48	45	50	55	45	23	35	25	30	41	

#### **VEGETATION MONITORING NOTES:**

#### General

-Occasionally a native woody species was rooted in herbaceous plots in various habitat classes. The percent cover at ground level of "stems" as well as "rooted in" aerial cover was recorded in the tables followed by the 4-letter species code, but the woody cover recorded in herb plots was not added to the total native percent cover so as not to double up cover already captured in the woody plot data for the PFO, PSS & Buffer habitat classes.

- In the <u>herbaceous plot</u> data for the PFO, PSS & Buffer habitat classes, as of 2015, we started recording "shade from woody plants" i.e., aerial cover. Again this was <u>not added</u> to the native cover totals. *Starting in 2015, any herb plot with 60% or more aerial cover (shade) from woody plants is excluded from the bare substrate criteria.* 

-Several herbaceous plots in the wetlands are listed as having *Carex scoparia* and/or *C. ovalis*. These two species are very similar looking native FACW sedges; we did not key every sample but it is likely both species are present.

-The identification of *Microsteris gracillis*, present in low percentages in a few herb plots in the FACW/FAC communities, is somewhat tentative. **PEM-OBL Herbaceous Community** 

-There are some disagreements re: the nativity of *Sparganium emersum*. As per the Mitigation Bank Instrument, this species will be considered a native for this project.

-Both Potomogeton nodosus and P. natens are present in this community and have similar floating leaves (the submerged leaves differ).

Populations within plots identified as one or the other may include both. Both species are native OBL aquatic plants.

-Identification of *Stuckenia pectinata* (formerly *Potomogeton pectinatus*) and *Potomogeton foliosus* is somewhat tentative; no flowers were present in samples, but they matched the vegetative characteristics of these species. These species were not seen in 2016 or 2017 (possibly due to removing the deepest inundated plots) but may be seen again in future years.

#### PFO, PSS and Upland Buffers-Tree & Shrub Plots

-T7-F1: 50% of plot inundated

T8-F1: 60% of plot inundated

-T8-F3: About 50% of this plot is actually in the PEM habitat/

-T11-F2: most of the plot does not support woody species due to water.

-T11-F3: currently only 70% of plot supports woody species due to water.

-T11-F4: currently only 15% of plot supports woody species due to water.-

-Willows identified as Salix hookeriana (aka S. piperi) may occasionally include S. scouleriana plants; the two may look very similar when young.

#### **Removals of Plots in 2017:**

• This year we removed nine more of the permanently inundated OBL plots (T4-PEMOBL1, T4-PEMOBL2, T4-PEMOBL3, T4-PEMOBL4, T5-PEMOBL2, T7-PEMOBL1, T7-PEMOBL3, T9-PEMOBL1, and T10-PEMOBL3).

#### **Removals of Plots in 2016:**

- Two PFO herb plots were removed: T11-FH8 and T11-FH9 were inundated approximately 2 and 3 feet respectively and thus were not representative of the PFO habitat.
- Nine PEMOBL plots were removed: (T5-PEMOBL1, T8-PEMOBL1, T8-PEMOBL2, T9-PEMOBL2, T10-PEMOBL1, T10-PEMOBL2, T11-PEMOBL1, T11-PEMOBL2, and T11-PEMOBL3). They were too deeply inundated ( ≥ 1.5 foot to about 3 or more feet) to accurately estimate cover from a distance.

#### **Removals and Addition of Plots in 2015:**

- The five PSS herbaceous plots on Transect 6 (T6-SH2, T6-SH6, T6-SH11, T6-SH12, and T6-SH14) that had been removed in 2014 due to being in total shade provided by a few scattered mature trees were added back. However these herb plots (and any others with > 60% aerial cover from woody plants) are now excluded from the bare substrate criteria.
- Several plots were added on the eastern side of transect 10 in 2015 to ensure full coverage of the transect. These plots were T10-F3, T10-FH5, T10-BF3, T10-BH5, and T10-BH6.
- One of the inundated OBL plots, T7-PEMOBL2 was too deep to estimate cover from a distance so it was removed.

#### **Removals and Addition of Plots in 2014:**

- PFO herb plot T5-FH2 was added; it had originally thought to have been in the buffer but it is in wetland.
- Five PSS herbaceous plots on Transect 6 (T6-SH2, T6-SH6, T6-SH11, T6-SH12, and T6-SH14) were removed due to being in total shade provided by a few scattered mature trees.
- Two PFO woody plots (T10-F1 and T11-F1) and the two associated herbaceous plots (T10-FH1 and T11-FH1) were removed because they were located in the pre-existing mature wetland forest, where no woody and herbaceous planting had occurred.
- One PFO woody plot (T11-F5) was removed from the PFO community because it was approximately 70% inundated.
- In the buffer we initially sampled but then removed two woody plots (T10-BF1 and T11-BF1) and associated herb plots (T10-BH1 and T11-BH1) because they were in the existing mature forested unplanted buffer.

#### Alterations of Plot Location or Orientation in 2014:

- PFO woody plot T4-F1 and associated herb plot T4-FH1 were moved approximately 20 feet to the east to the plant community break because the woody plot had previously been partially within the PEM OBL habitat.
- PSS woody plot T6-S4 was moved and skewed (as in 2013) and the associated herb plot T6-SH6 was moved to the west to avoid placement in the road, however the resulting placement varied from slightly from the 2013 location.

• Buffer woody plot T7-BF2 and associated herb plot T7-BH3 were placed only about 30 feet east of the previous herb plot (rather than the usual 50 feet) so that the woody plot would fit within the mitigation buffer; the rectangular woody plot was also skewed so that the short edge was parallel to the transect for the same reason. Buffer woody plot T9-BF2 was similarly skewed.

#### **Removal or Re-Labeling of Plots in 2013:**

- Herb plot T10-PEM1 (initially placed in the FAC/FACW community) was re-labeled as T10-OBL3 since it was actually in the OBL community.
- Herb plot T12-PEM1 (also initially placed in the FAC/FACW community) was inundated on August 1, 2013 and was discarded.

#### Alterations of Plot Location or Orientation in 2012 or 2013:

- PSS herb plot T2-SH1 started 15 ft from property line because of bisecting property line (the 1st shrub plot was not associated with this herb plot for the same reason (it was with T2-SH2 instead))
- PFO woody plot T5-F1 was moved approximately 10 feet to the east of its original location because a portion of it was in the OBLdominated herbaceous habitat.
- PSS plots T6-S2 and T6-SH3 were skewed slightly because portions of them were in open water.
- PSS woody plot T6-S4 was moved approximately 25 feet west so it would be completely out of an unimproved access road, and the associated herb plot T6-SH6 was moved so it would be in the corner of the shrub plot.
- PSS woody plot T6-S11 was skewed north so that it would be entirely within one wetland habitat type.
- PFO woody plots T8-F1, T9-F1 and T10-F1 were skewed so that the short edge was parallel to the transect in order to fit within the community.

#### **Plant Nomenclature:**

-Plant nomenclature is generally up-to-date. The USDA PLANTS database (http://plants.usda.gov/java/) was our source for nomenclature. In cases where the latest nomenclature is different than that listed in the Corps WIS list, the name used name in the Corps' list, or closest synomy is in parentheses. Except for a few species as noted in the Mitigation Bank Instrument, this is also our source for nativity designations. -The Wetland Indicator Statuses (WIS) are from the 2016 list for the Western Mountains, Valleys and Coast Region as presented in the Corps' *State of OREGON 2016 Wetland Plant List* 

#### Principal Plant Identification Resources Used For This Project Technical Flora and Keys:

-Hitchcock, C. Leo and Cronquist. 1974. Flora of the Pacific Northwest. University of Washington Press.

-Hitchcock, C. Leo et. al. 1955, 1959, 1961, 1964 and 1969. Vascular Plants of the Pacific Northwest (5 Volumes). University of Washington Press.

-Kozloff, Eugene N. 2005. Plants of Western Oregon, Washington and British Columbia. Timber Press.

-Meyers, Stephen C. *et. al.* 2015. Flora of Oregon- Volume 1: Pteridophytes, Gymnosperms, and Monocots. Botanical Research Institute of Texas Press.

-Various authors. 2014. The on-line Oregon Flora Project keys and plant descriptions. URL http://www.oregonflora.org/

#### Field Guides:

-Cooke, Sarah Spear (Editor). 1997. A Field Guide to the Common Wetland Plants of Western Washington and Northwestern Oregon. Seattle Audubon Society

-Guard, B. Jennifer. 1995. Wetland Plants of Oregon and Washington. Lone Pine Publishing.

-Whitson, Tom D. (editor) et. al. 1996. Weeds of the West. 5th Edition. University of Wyoming Press.

#### -Other Resources:

-John Christy, Wetland ecologist for the Institute for Natural Resources was consulted in previous years concerning the identification of several native species.

-Richard Brainerd and others from the Carex Working Group in Corvallis, Oregon were consulted in previous years concerning the identification of several native *Bromus* species.

-Stephen C. Meyers, Taxonomic Director, Oregon Flora Project, Oregon State University was contacted in 2016 to confirm our identification of atypical samples of the native *Polygonum hydropiperoides* (aka *Persicaria hydropiperoides*) that had spotted leaves, a feature that is not described for this species in any regional flora. He confirmed our ID of *P. hydropiperoides* and speculated that there may have been hybridization with *Polygonum persicaria maculosa*) in past generations that had subsequently back-crossed with pure strains of *P. hydropiperoides*. Because this was an unusual plant he requested that we send a pressed specimen that will now be included in their herbarium.

-USDA PLANTS database URL http://plants.usda.gov/java/. This site provides drawings, photos and distribution maps plus useful links to other web sites including the CalPhotos website URL http://calphotos.berkeley.edu etc.

# **APPENDIX B: PHOTOGRAPHIC DOCUMENTATION**

Photographic Documentation:

![](_page_34_Picture_2.jpeg)

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

![](_page_34_Picture_4.jpeg)

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

![](_page_35_Picture_0.jpeg)

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

![](_page_35_Picture_2.jpeg)

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

![](_page_36_Picture_0.jpeg)

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

![](_page_36_Picture_2.jpeg)

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

![](_page_37_Picture_0.jpeg)

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

![](_page_37_Picture_2.jpeg)

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

![](_page_38_Picture_0.jpeg)

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

![](_page_38_Picture_2.jpeg)

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

![](_page_39_Picture_0.jpeg)

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

![](_page_39_Picture_2.jpeg)

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

![](_page_40_Picture_0.jpeg)

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

![](_page_40_Picture_2.jpeg)

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

![](_page_41_Picture_0.jpeg)

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

![](_page_41_Picture_2.jpeg)

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

![](_page_42_Picture_0.jpeg)

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

![](_page_42_Picture_2.jpeg)

Photo Point 12 NW: Photo displays upland buffer area.

![](_page_43_Picture_0.jpeg)

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

![](_page_43_Picture_2.jpeg)

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

![](_page_44_Picture_0.jpeg)

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

![](_page_44_Picture_2.jpeg)

Photo Point 16 SE: Photo displays primary log jam.

# APPENDIX C: VEGETATION MONITORING TRANSECT LOCATION TABLE

# TUALATIN VALLEY ENVIRONMENTAL BANK

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
Т9	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

Vegetation Monitoring Transect Locations:

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 impermiable 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 (2020)

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	withdrawl	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	withdrawl	State/Federal	Washington County	62020-GP, NWP-2019-00243	PEM; Slopes/Flats	0.034	0.7859			
7/16/2019	withdrawl	State/Federal	JT Smith Companies	61737-RF, NWP-2019-00035	PEM; Flats	0.34	0.4459			
10/31/2019	withdrawl	State/Federal	Tualatin Hills Parks and Recreation District	61830-RF, NWP-2018-00365	PEM; Slope/Flats	0.28	0.1659			
12/20/2019	withdrawl	State/Federal	Polygon Northwest	54853-FP, NWP-2013-00374	PEM; Flats	0.14	0.0259			
Credits Rele	ased 2020 (ac.):	0	Credits Withdrawn 2020 (ac.): 0							
Total Credit	s Released (ac.):	23.349	Total Credits Withdrawn (ac.): 23.3231	Balance (ac.):	0.0259					

#### TUALATIN VALLEY ENVIRONMENTAL BANK CREDIT LEDGER: 1/1/2019 - 12/9/20