CRITICAL AREA STUDY

4320 Island Crest Way, Mercer Island, WA

Prepared for:

City of Mercer Island
Development Services: Building & Planning
9611 SE 36th Street
Mercer Island, WA 98040

Prepared on behalf of:

Alan Chiu
Mercertech International, LLC
6955 SE 33rd St
Mercer Island, WA 98040

Prepared by:

THE WATERSHED COMPANY
750 Sixth Street South
Kirkland . WA 98033
p 425.822.5242
f 425.827.8136
watershedco.com

October 27, 2017

The Watershed Company Reference Number:
160905

Study Preparers:
Hugh Mortensen, PWS
Mark Daniel, AICP

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CRITICAL AREA STUDY

4320 ISLAND CREST WAY, MERCER ISLAND, WA

1 INTRODUCTION

This critical area study was prepared in support of corrective actions and proposed development for the property located at 4320 Island Crest Way in Mercer Island, Washington.

On August 10, 2016, the City Development Services Group issued a Notice of Correction (Code Compliance Case: CE16-0014) for the subject property. The notice stated that "This department has investigated the allegations that you are placing fill material such as wood chips into a water course, the buffer area, and possible wetlands on the subject property. Based on aerial mapping and a recent site visit with you it is clear that the wood chips fill is abundant and is within a protected environmental area of a water course and possible wetlands. Trees and shrubby vegetation have been cleared over time. You stated that you have removed several alder trees that were declining and hazardous." The notice identified corrective actions, including that a critical area study meeting the requirements of Mercer Island City Code (MICC) 19.07.050 be provided to the City.

In addition to addressing the issues identified in the Notice of Correction, the applicant also proposes to subdivide the subject property in anticipation of future single-family residential development. Plans showing the proposed subdivision are located in Appendix A of this critical area study. The proposed subdivision plans include actions, including wetland and watercourse buffer reduction, that require the submittal of a critical area study per the MICC.

In sum, both the Notice of Correction and the proposed subdivision plans require a critical area study. This critical area study has been prepared to meet these two requirements.

2 EXISTING CONDITIONS

2.1 Setting

The subject property, parcel number 1824059031, is located at 4320 Island Crest Way in the center of Mercer Island, Washington (see Figure 1). The subject property is situated in Section 18 of Township 24 North and Range 5 East. It is located in the Mercer Island drainage basin in the Cedar River/Lake Washington watershed, within the Cedar-Sammamish Water Resource Inventory Area (WRIA-8).

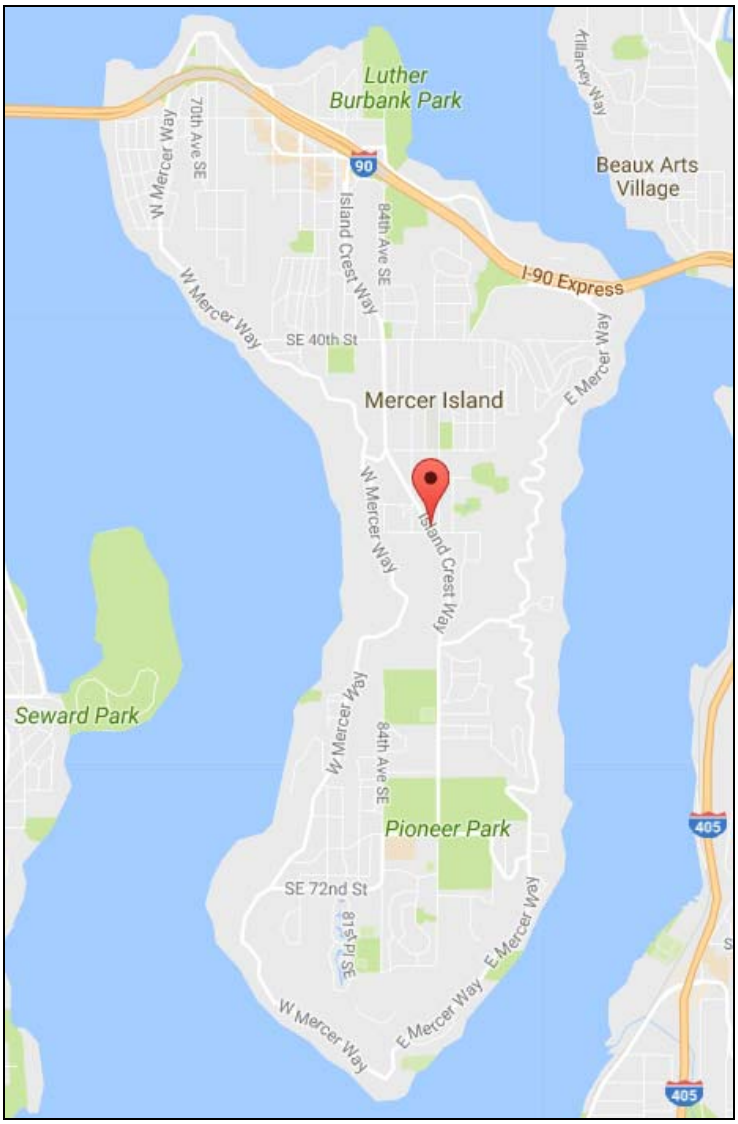


Figure 1. Vicinity map, with project location at red indicator.

2.2 Use & Development

The subject property and adjacent properties are zoned for single-family residential use (R-9.6). The subject property is rectangular in shape and measures 72,745 square feet or 1.67 acres.

Two residences and associated development are currently situated on the subject property. One residence is located in the northwest portion of the property; the other residence is located in the southwest portion of the property. According to the King County Department of Assessments, both structures date to the 1950s.

Each residence has a driveway connecting to Island Crest Way. The two residences are connected internally by a crushed rock driveway that runs north-south through the central portion of the subject property.

2.3 Wetlands & Watercourses

In September 2016, ecologists from The Watershed Company visited the property to identify and delineate jurisdictional wetlands and watercourses. Their findings are thoroughly documented in the Wetland and Watercourses Delineation Report provided in Appendix B of this critical area study.

In summary, the Wetland and Watercourses Delineation Report indicates that three wetlands and one watercourse on the subject property were identified and delineated. The three wetlands (designated "A," "B" and "C") all rate as Category III wetlands under the City's current wetland rating system. The watercourse (designated "A") is typed as both Type 2 (downstream of Wetland B) and Type 3 (upstream of Wetland B within Wetland A). These wetland and watercourse features can be seen in the plans located in Appendix A of this critical area study.

The Wetland and Watercourses Delineation Report describes the vegetation for each of the three wetlands, and is summarized as follows.

- Wetland A: The report states that Wetland A was originally forested with alder and cottonwood trees with possibly a few conifers, but has since been cleared. The current disturbed dominant vegetation consists of Himalayan blackberry, field bindweed, reed canarygrass, and soft rush. Small-fruited bulrush, skunk cabbage, yellow-flag iris, and mannagrass are present in the seasonally ponded areas.

- Wetland B: Dominant forested vegetation includes red alder and western red cedar trees with an understory of Scouler's willow, Himalayan blackberry, and salmonberry. Along the periphery and within the ponded

area, skunk cabbage, lady's thumb, yellow-flag iris, and watercress are present.

- Wetland C: Dominant vegetation consists of western red-cedar, salmonberry, Himalayan blackberry, skunk cabbage, knotweed, lady's thumb, and various grasses.

For more detailed information on these features, please see the Wetland and Watercourses Delineation Report.

3 LOCAL REGULATIONS

Wetlands and watercourses are regulated by the City under MICC Chapter 19.07, Environment. Trees are regulated by City under MICC Chapter 19.10, Trees.

3.1 Wetlands

The three wetlands on the subject property all rate as Category III wetlands under the 2004 Ecology rating system, the system currently used in MICC.

Per MICC 19.07.080.C, Category III wetlands have a standard buffer width of 50 feet and a minimum buffer width with enhancement of 25 feet. The City allows buffer averaging or reduction of buffer widths, provided that no-net-loss of wetland function occurs. In the case of buffer averaging, the total buffer area must also remain equivalent or greater after averaging, and may not be less than the minimum buffer width at any point.

Per MICC 19.07.080.D, Category III wetlands of less than one acre in size may be altered if the applicant can demonstrate that the wetland will be restored, enhanced, and/or replaced with a wetland area of equivalent or greater function.

3.2 Watercourses

The watercourse on the subject property is typed as both Type 2 (downstream of Wetland B) and Type 3 (upstream of Wetland B within Wetland A).

Per MICC 19.07.070.B, Type 2 watercourses have a standard buffer width of 50 feet and a minimum buffer width with enhancement of 25 feet. Type 3 watercourses have a standard buffer width of 35 feet and a minimum buffer width with enhancement of 25 feet. Watercourse segments within pipes or culverts have a standard buffer of 25 feet and a minimum buffer width with enhancement as determined by the code official. Buffer reduction may be

permitted with submittal of a critical area study and subject to guidelines listed in MICC 19.07.070.B.2.

Restoration of piped stream segments may only be permitted if it will result in improved function and will not increase the threat of other hazards, such as erosion or slope stability (MICC 19.07.070.B.4).

3.3 Trees

All trees cut on the subject property must be replaced pursuant to MICC 19.10.060, Tree replacement. MICC 19.10.060.D addresses the number of replacement trees required, and indicates that the City Arborist must apply a replacement ratio of 0:1 up to 4:1, depending on four criteria. One of the criteria is "proximity to critical tree areas and/or the existence and retention of vegetative cover in any critical tree area." "Critical tree areas" include, but are not limited to, wetlands, watercourses and their buffers. Additionally, all replacement trees must be maintained in a healthy condition for two years after planting, with the applicant obligated to replant any replacement tree that dies, becomes diseased, or is removed during the two-year time period (MICC 191.10.060.E).

4 PROPOSED PLANS

As alluded to the in Section 1, Introduction, the proposed mitigation and restoration plans have been prepared for the following two primary purposes:

1) To restore previously altered areas subject to a Notice of Correction; and

2) To mitigate wetland and watercourse buffers impacts associated with the proposed subdivision.

Section 4.1 addresses the restoration of previously altered areas. Section 4.2 addresses the mitigation of wetland and watercourse buffer impacts associated with the proposed subdivision. Section 4.3 discusses maintenance and monitoring measures applicable to both restoration and mitigation.

Mitigation and restoration plans for the proposed development are located in Appendix A of this critical area study.

4.1 Restoration Actions (to address Notice of Correction)

The proposed project would provide restoration actions to address the Notice of Correction. As discussed in Section 1 of this critical areas study, the Notice of Correction indicated that fill material such as wood chips had been placed on the subject property, and that trees and shrubby vegetation have been cleared over time. According to the property owner, several alder trees that were removed were declining and hazardous.

Based on site-reconnaissance and aerial photo interpretation, the area subject to the Notice of Correction appears to have been applied to approximately 12,713 square feet of the subject property (see sheet W2 of 9 in Appendix A of this critical area study). This area is located within Wetland A and is bisected by Watercourse A. During the delineation, the wood chip areas were evaluated and it was determined that, while wood chips did impact wetland vegetation, no loss of wetland area resulted from their placement. Approximately ten trees appear to have been removed from this area. The Wetland and Watercourses Delineation Report indicates that this area was originally forested with alder and cottonwood trees, and possibly a few conifers.

Restoration of the area subject to the Notice of Correction includes removal of the wood chips and non-native and invasive plant species, and the installation of a native tree, shrub and groundcover plant community. As discussed above in Section 3.3, Trees, MICC 19.10.060.D addresses the number of replacement trees required, and indicates that the City Arborist must apply a replacement ratio of 0:1 up to 4:1, depending on four criteria. One of the criteria is "proximity to critical tree areas and/or the existence and retention of vegetative cover in any critical tree area." "Critical tree areas" include, but are not limited to, wetlands, watercourses and their buffers. As the trees removed appear to have been located within a critical tree area, the project proposes tree replacement at the maximum replacement ratio of 4:1. Accordingly, 40 trees would be replanted in the area subject to the Notice of Correction. In addition, 400 shrubs would be planted in the area subject to the Notice of Correction.

4.2 Subdivision Impacts & Mitigation

In addition to addressing the Notice of Correction, the applicant also proposes to subdivide the subject property in anticipation of future single-family residential development. More specifically, the applicant proposes to subdivide the subject property into five single-family residential lots and one tract. The five residential lots would be located in the northwestern portion of the subject property. The tract would be located in the southwestern corner of the subject property. All five

residential lots would be accessed from a shared driveway off Island Crest Way. The project does not propose stormwater management facilities within wetlands, the watercourse, or their buffers.

Avoidance & Minimization of Impacts

By clustering the proposed residential lots in the northwestern portion of the subject property and through the thoughtful siting of associated development, the project avoids direct impacts to wetlands and watercourses. Further, the project minimizes impacts to wetlands and watercourses by requiring buffer reduction only where necessary to accommodate residential development. As required by the code, after buffer reduction, building pads are located outside of wetlands, the watercourse, and their buffers.

During construction, impacts will be avoided through project erosion control measures. Erosion control measures will be in place prior to clearing and grading.

Buffer Impacts & Mitigation

As allowed by the code, the project proposes buffer reduction with enhancement in areas adjacent to the proposed residential development. As discussed in Section 3, all wetlands and watercourses on the subject property have a minimum buffer width with enhancement of 25 feet. Enhancement of the existing degraded buffer areas includes the removal of non-native and invasive species, and the installation of a native tree, shrub and groundcover plant community. This enhancement is proposed to take place in areas previously degraded due to past land use and are outside of the recently-disturbed areas identified in the Notice of Correction. Additionally, the buffer reduction in the wetland as buffer areas adjacent to Lots 2 and 5, the current condition provides essentially no water quality or hydrologic function. This is due to the fact the buffer is sloping away from (west) of Wetland A in the area proposed for reduction. Buffer reduction is expected to result in no-net-loss of wetland or watercourse functions.

The proposed buffer reduction includes 1,979 square feet of wetland as buffer. "Wetland as buffer," also referred to as "paper fill," means that a wetland is being treated as though it were being filled in order to reduce its buffer, but does not mean that a wetland is actually being filled. As mentioned above in Section 3, Category III wetlands of less than one acre in size may be altered if the applicant can demonstrate that the wetland will be restored, enhanced, and/or replaced with a wetland area of equivalent or greater function Per MICC 19.07.080.D). To mitigate for the wetland as buffer, the creation of 2,779 square feet of wetland is proposed in the area between Wetlands A and B, as well as the area between Wetlands B and C.

As required under MICC 19.07.080.D the wetland creation area will replace the wetland as buffer area with equivalent or greater function. The proposed areas of wetland creation will establish more natural hydrologic functions by restoring prior landscape modifications. The main area of wetland creation (between Wetlands A and B) would occur in through the removal of the existing driveway. The other, smaller area of wetland creation would occur through the removal of a berm and footbridge. The total wetland creation area is 800 square feet larger than the wetland as buffer area. The entire wetland creation area would be planted with a native tree, shrub and emergent plant community. Five trees in the wetland creation are expected to be removed due to the grading associated with wetland creation. These trees will be replaced in accordance with City tree replacement requirements. Eleven trees are currently proposed in the wetland creation area.

For the long-term-protection of the wetlands, watercourse and buffers, these areas will be placed under a native growth protection easement. Additionally, split-rail fencing will be installed to demarcate these areas to prevent unauthorized intrusion and encroachment.

4.3 Maintenance & Monitoring

The proposed plans include five years of scheduled maintenance and monitoring. This time period is the maximum allowable under the City code (MICC 19.07.040.J.1). To promote project success, the maintenance and monitoring during this time frame will be overseen by a single entity (either the property owner or homeowner's association).

The project includes several performance standards intended to ensure the success of the project over time. These performance standards are as follows:

1. Survival:

    a. Achieve 100% survival of installed plants by the end of year 1.

    b. Achieve 80% survival of all installed plants by the end of year five.

    This standard can be met through plant establishment or through replanting as necessary to achieve the required numbers.

2. Cover:

    a. Achieve 60% cover of native trees and shrubs by year 3 within planted wetland and buffer areas. Volunteer species may count towards this cover standard.

b. Achieve 10% cover of native emergent plants within the created wetland area by year 3.

c. Achieve 80% cover of native trees and shrubs by year 5 within planted wetland and buffer areas. Volunteer species may count towards this cover standard.

d. Achieve 30% cover of native emergent plants within wetland areas by year 5.

3. Diversity:

   a. Establish at least three native tree species, five native shrub species, and two native groundcovers within the wetland restoration and buffer mitigation areas. Volunteer species may count towards this standard.

   b. Establish at least two native tree species, three native shrub species, and two native groundcovers within the wetland creation area.

      Establishment is defined as five or more individual plants of the same species alive and healthy.

4. Invasive cover: no more than 10% cover by invasive weed species within all planted areas in any monitoring year.

5. Hydrology standard (wetland creation area only):

   a. Evidence of wetland hydrology in the wetland creation area. Soil saturation within the upper 12 inches of the soil surface, present for two consecutive weeks during the growing season (March 1st to October 15th) during each monitoring year as measured per the protocol in the monitoring methods section, below.

6. Hydric soil standard (wetland creation area only):

   a. Hydric soils will be assumed present if the hydrology standard is met.

Monitoring reports addressing the project's compliance with the above performance standards will be submitted annually to the City. If any monitoring report reveals that the restoration plan has failed in whole or in part, and should

that failure be beyond the scope of routine maintenance, the applicant will submit a contingency plan to the City for approval.

5 SUMMARY

The Notice of Correction and the proposed subdivision plans require a critical area study. This critical area study has been prepared to meet these two requirements.

Two residences and associated development are currently situated on the subject property. Three wetlands and one watercourse on the subject property have been identified and delineated. The three wetlands (designated "A," "B" and "C") all rate as Category III wetlands under the City's current wetland rating system. The watercourse (designated "A") is typed as both Type 2 (downstream of Wetland B) and Type 3 (upstream of Wetland B within Wetland A).

The proposed project would provide restoration actions to address the Notice of Correction. Restoration of the area subject to the Notice of Correction includes removal of the wood chips and non-native and invasive plant species, and the installation of a native tree, shrub and groundcover plant community. Under the proposed plans, the previously cleared trees (an estimated 10 trees) would be replanted at a 4:1 ratio.

As allowed by the Code, the project proposes buffer reduction with enhancement in areas adjacent to the proposed residential development. All wetlands and watercourses on the subject property all have a minimum buffer width with enhancement of 25 feet. Enhancement of the existing degraded buffer areas will include the removal of non-native and invasive species, and the installation of a native tree, shrub and groundcover plant community. Buffer reduction is expected to result in no-net-loss of wetland or watercourse functions.

The proposed buffer reduction includes 1,979 square feet of wetland as buffer. To mitigate for the wetland as buffer, the creation of 2,779 square feet of wetland is proposed. As required under MICC 19.07.080.D the wetland creation area will replace the wetland as buffer area with equivalent or greater function.

To conclude, the proposed restoration and mitigation plans meet applicable requirements of the MICC.

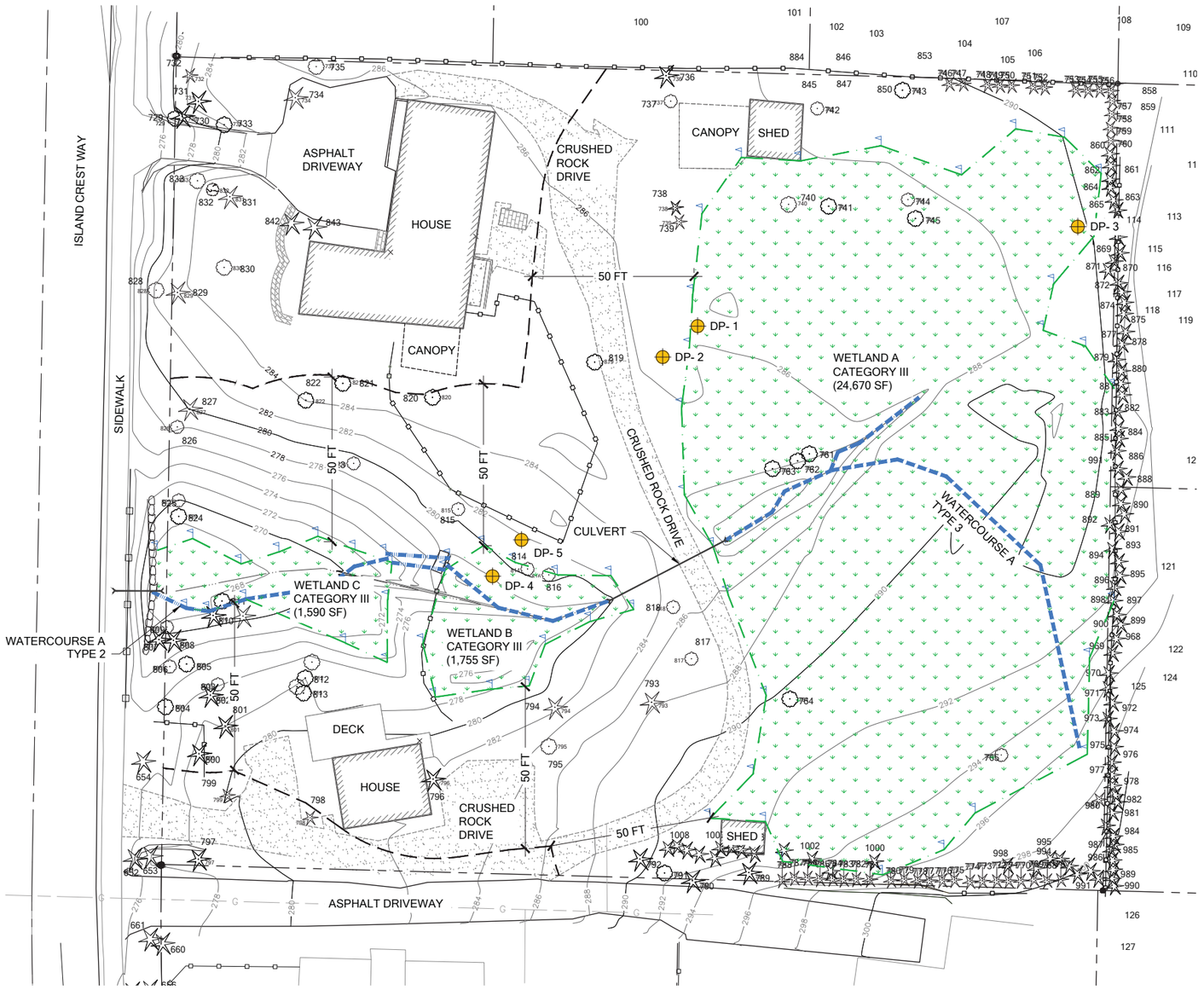
APPENDIX A

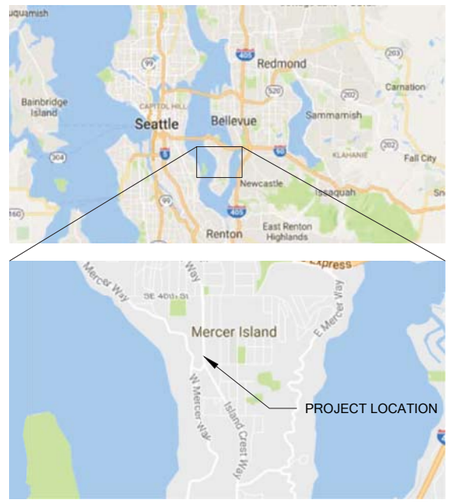
Mitigation & Restoration Plan

4320 Island Crest Way
Critical Area Study

MERCERTECH INTERNATIONAL LLC

LONG PLAT MITIGATION AND RESTORATION PLAN





VICINITY MAPS

LEGEND

- WETLAND BOUNDARY (DELINEATED)
- DATA POINT
- WATERCOURSE BOUNDARY (DELINEATED)
- WATERCOURSE BOUNDARY (APPROX.)
- STANDARD COMBINED WETLAND/WATERCOURSE BUFFER (50 FT)
- EXISTING TREE
- CULVERT

SHEET INDEX

NOTES

1. CRITICAL AREAS DELINEATED BY THE WATERSHED COMPANY ON SEPTEMBER 21, 2016.
2. ONLY LEFT BANK OF WATERCOURSE A DELINEATED WITHIN WETLAND C.
3. SURVEY RECEIVED FROM PLS, INC. 1595 NW GILMAN BOULEVARD, #15 ISSAQUAH, WA 98027. (425) 313-9378.

NFC

NOT FOR CONSTRUCTION

EXISTING CONDITIONS

0 10' 20' 40' 80'

THE WATERSHED COMPANY

750 Sixth Street South
Kirkland WA 98033

p 425.822.5242
www.watershedco.com
Science & Design

MERCERTECH INTERNATIONAL LLC
LONG PLAT MITIGATION AND RESTORATION PLAN
PREPARED FOR ALAN CHIU
PARCEL # 1824059031
4320 ISLAND CREST WAY
MERCER ISLAND, WA 98040

SUBMITTALS & REVISIONS

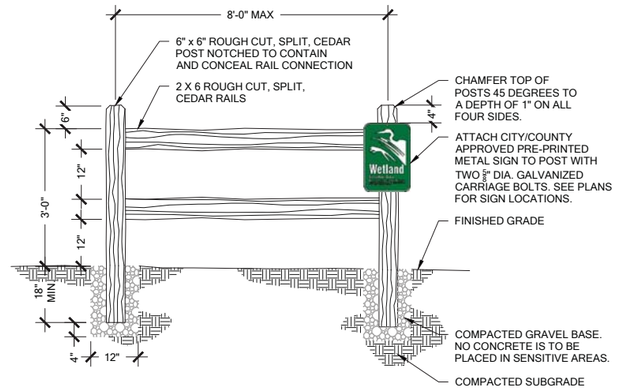
NO.	DATE	DESCRIPTION	BY
1	08-29-17	30% SUBMITTAL - PREAPP	LV
2	10/17/17	30% SUBMITTAL - PREAPP 2	RH
3	10/27/17	30% SUBMITTAL - APPLICAITON	RH

SHEET SIZE:
ORIGINAL PLAN IS 22" x 34".
SCALE ACCORDINGLY.

PROJECT MANAGER: HM
DESIGNED: LV, RH
DRAFTED: LV, RH
CHECKED: LV, AM
JOB NUMBER: 160905

SHEET NUMBER: W1 OF 9

DATE 10/27/17 | PRINTED BY ROEN HOHLFELD | FILENAME 160905 MERCER ISLAND CHIU MITIGATION PLAN.DWG



1 SPLIT RAIL FENCE WITH SIGN ON POST

Scale: NTS

LEGEND

EXISTING FEATURES

- EXISTING CONTOUR
- WETLAND BOUNDARY (DELINEATED)
- WATERCOURSE BOUNDARY (DELINEATED)
- WATERCOURSE BOUNDARY (APPROX.)
- COMBINED WETLAND/WATERCOURSE AREA BUFFER (50 FT)
- VIOLATION AREA (12,713 SF)
- EXISTING TREE

PROPOSED FEATURES

- 284 PROPOSED CONTOUR (WETLAND CREATION AREA ONLY)
- TREE TO BE REMOVED
- REDUCED WETLAND/WATERCOURSE BUFFER (25 FT)
- WETLAND AS BUFFER (1,979 SF)
- WETLAND CREATION AREA (2,779 SF)
- SPLIT RAIL FENCE WITH SIGN ON POST (1 / W2)
- APPROX. LIMIT OF GRADING (WETLAND CREATION AREA ONLY)

NOTES

1. TREE RETENTION PLAN AND CALCULATIONS NOT INCLUDED IN THIS PLAN: SEE CIVIL.
2. WETLAND VIOLATION AREA PER NOTICE OF CORRECTION FROM CITY OF MERCER ISLAND, DATED AUGUST 10, 2016.
3. EXISTING WETLAND VIOLATION AREA EXTRAPOLATED FROM 2015 KING COUNTY IMAP AERIAL PHOTOGRAPHY. BASED ON AERIAL PHOTO, APPROXIMATELY 10 TREES WERE REMOVED.
4. SEE CIVIL PLANS FOR GRADING OUTSIDE MITIGATION AREA.

NFC

NOT FOR CONSTRUCTION

IMPACT, RESTORATION, AND MITIGATION PLAN

0 10' 20' 40' 80'

THE WATERSHED COMPANY
750 Sixth Street South
Kirkland WA 98033
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PRINTED BY: ROEN HOHLFELD
DATE: 10/27/17
FILENAME: 160905 MERCER ISLAND CHIU MITIGATION PLAN.DWG

TESC NOTES - ALL AREAS

1. CONTRACTOR TO VERIFY TEMPORARY HIGH VISIBILITY FENCE IS INSTALLED AROUND THE LIMITS OF WORK PRE-CONSTRUCTION.
2. TREE RETENTION PLAN AND CALCULATIONS NOT INCLUDED IN THIS PLAN. SEE CIVIL.
3. SURVEY AND STAKE THE LIMITS OF WETLAND BUFFER ENHANCEMENT AREA PRE-CONSTRUCTION.
4. INSTALL SILT FENCE AND FIBER ROLL AS SHOWN ON THIS SHEET. MITIGATION CONTRACTOR SHALL COORDINATE WITH OTHER CONTRACTORS AS NEEDED TO ASSURE PROPER TESC MEASURES ARE IN-PLACE.

SOIL PREPARATION NOTES - WETLAND RESTORATION AREAS

1. REMOVE ALL WOOD CHIPS PLACED IN WETLAND AND DISPOSE OF OFF-SITE. WOOD CHIP REMOVAL IS TO BE DONE WITHOUT MECHANIZED TOOLS.
2. REMOVE INVASIVE PLANT SPECIES AS SPECIFIED IN INVASIVE SPECIES REMOVAL NOTES ON W4.
3. PLANT PER W6 AND W7.
4. INSTALL MULCH RINGS 4" DEEP WITH RADIUS OF 18" FROM PLANT STEM. SEE PLANTING PLAN FOR PLANT TYPE AND SPACING.

SOIL PREPARATION NOTES - WETLAND BUFFER AREAS

1. REMOVE INVASIVE PLANT SPECIES AS SPECIFIED ON W4.
2. BACKFILL ANY DIVOTS WITH TOPSOIL TO RETURN TO EXISTING GRADE.
3. PLANT PER W6 AND W7.
4. INSTALL MULCH RINGS 4" DEEP WITH RADIUS OF 18" FROM PLANT STEM. SEE PLANTING PLAN FOR PLANT TYPE AND SPACING.

LEGEND

EXISTING FEATURES

- EXISTING CONTOUR
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- WETLAND AS BUFFER (1,979 SF)
- WETLAND CREATION AREA (2,779 SF)
- SPLIT RAIL FENCE (1 / W2)
- FIBER ROLL (2 / W4)
- SILT FENCE (1 / W4)
- APPROX. LIMITS OF GRADING (WETLAND CREATION AREA)

TESC AND SITE PREPARATION PLAN

0 10' 20' 40' 80'

NFC

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INVASIVE SPECIES REMOVAL NOTES:

NOXIOUS WEED REMOVAL & CONTROL PROTOCOLS

NOTE:
1. ALL INVASIVE PLANTS TO BE DISPOSED OF OFF-SITE. NO INVASIVE SPECIES SHALL BE CHIPPED FOR REUSE AS MULCH.

REMOVE REED CANARYGRASS:

1. DIG WITH HAND TOOLS ALL REED CANARYGRASS RHIZOMES FROM THE PLANTING AREA.
2. REED CANARYGRASS CAN RESPROUT FROM BELOW-GROUND PORTIONS, SO ALL RHIZOMES SHALL BE GRUBBED OUT. AROUND SIGNIFICANT VEGETATION TO REMAIN, REED CANARYGRASS SHALL BE GRUBBED OUT BY HAND TO MINIMIZE DISRUPTION TO ADJACENT ROOTS.
3. AFTER REED CANARYGRASS HAS BEEN REMOVED, AREA SHOULD BE MULCHED AND PLANTED PER PLAN.
4. DISPOSE OF REMOVED MATERIAL OFF SITE AT A PROFESSIONAL FACILITY.

REMOVE HIMALAYAN/EVERGREEN BLACKBERRY:

1. CUT ABOVE GROUND PORTION OF BLACKBERRY AND REMOVE OFFSITE. ENSURE THAT NO NATIVE PLANTS ARE REMOVED.
2. CANES SHALL BE REMOVED FROM CANOPY OF TREES TO REMAIN TO THE EXTENT FEASIBLE AS DETERMINED BY THE RESTORATION SPECIALIST.
3. DIG UP OR PULL THE REMAINING ROOT BALL. ENSURE THAT NO NATIVE PLANT ROOTS ARE DAMAGED.
4. REPLACE ANY DIVOTS CREATED WHEN REMOVING THE PLANT WITH APPROVED TOPSOIL.
5. ALL CANES SHALL BE CUT BACK AND REMOVED WITHIN THE TEN (10) FEET ADJACENT TO THE PLANTING AREA, INCLUDING TREE CANOPY. CANES SHALL BE PULLED AND DISPOSED OF OFF-SITE.
6. REVEGETATE PER PLANTING PLAN. COVER WITH WOOD CHIP MULCH FOUR INCHES DEEP.
7. MONITOR SITE THROUGHOUT GROWING SEASON FOR EMERGING CANES AND GRUB OUT AND REMOVE ANY NEW PLANTS. CONTINUE TO CUT BACK CANES TEN (10) FEET FROM THE PLANTING AREA.

REMOVE ENGLISH IVY:

1. PHYSICALLY REMOVE ALL ENGLISH IVY VINES AND ROOTS FROM THE PLANTING AREA.
2. IF GROWING ON TREE TRUNKS, CUT VINES TO HEIGHT OF 4' OFF GROUND AND AROUND THE BASE OF EACH TREE, TO PREVENT THE IVY FROM GIRDLING. DO NOT PULL DOWN FROM TREE CROWNS. REMOVE STANDING VINES FROM THE LOWER 4' OF EVERY TREE TRUNK THAT CONTAINS ANY IVY.
3. IVY CAN RESPROUT FROM BELOW-GROUND PORTIONS, SO ALL ROOTS SHALL BE GRUBBED OUT BY HAND TO MINIMIZE DISRUPTION TO ADJACENT ROOTS.
4. AFTER IVY HAS BEEN REMOVED, AREA SHOULD BE MULCHED AND PLANTED PER PLAN.
5. DISPOSE OF REMOVED MATERIAL PROPERLY OFF SITE.

REMOVE JAPANESE KNOT WEED:

1. STAKE OUT INVASIVE CONTROL AREA AND VERIFY WITH RESTORATION SPECIALIST. INVASIVE PLANTS OTHER THAN KNOTWEED THAT IS NOT IN CONCENTRATED AREA ARE TO BE FLAGGED THROUGHOUT THE SITE AND THEN VERIFIED BY THE RESTORATION SPECIALIST FOR REMOVAL.
2. AT THE BEGINNING OF JUNE IN A CALENDAR YEAR CUT STEMS CLOSE TO THE GROUND USING A MACHETE, LOPPERS OR PRUNING SHEARS. BE SURE NOT TO SCATTER STEMS OR ROOT FRAGMENTS.
3. BE SURE THAT ALL PIECES OF STEMS AND CUT KNOTWEED ARE DISPOSED OF OFF-SITE PROPERLY TO PREVENT RE-INFESTATION.
4. ONCE STEMS HAVE BEEN CUT DOWN TO THE GROUND WAIT SIX (6) WEEKS FOR STEMS TO REGROW TO APPROXIMATELY 3'-6' ABOVE THE GROUND.
5. CUT ANY FLOWERS THAT HAVE APPEARED IN THE SHORT GROW BACK PERIOD.
6. TO ERADICATE THE KNOTWEED, EITHER SMOTHER CANES AT START OF PROJECT AND ON A REGULAR BASIS DURING THE GROWING SEASON, OR CUT AND REMOVE VEGETATED GROWTH REGULARLY DURING THE GROWING SEASON TO DEPLETE ENERGY STORES IN THE PLANT.
7. MONITOR KNOTWEED INFESTATION AND REPEAT AS NEW STARTS BEGIN TO COME BACK ONE MORE TIME BEFORE THE FIRST FROST.

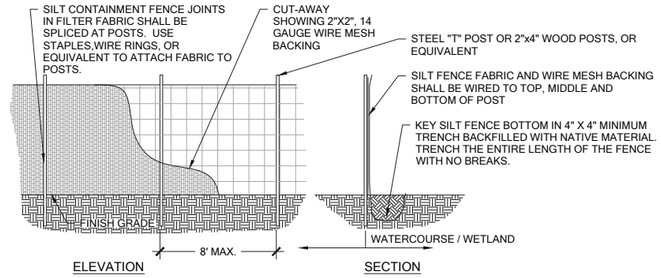
REMOVE ENGLISH LAUREL:

1. SMALL PLANTS CAN BE DUG UP WHEN SOIL IS MOIST (USE PROPER PERSONAL PROTECTIVE EQUIPMENT WHEN HANDLING BECAUSE THIS PLANT MAY BE POISONOUS).
2. TO CONTROL LARGER PLANTS, CUT STEMS AND TRUNKS BY HAND OR CHAINSAW, CUTTING AS CLOSE TO THE GROUND AS POSSIBLE, AND REMOVE STEMS TO MAKE IT EASIER TO CONTROL RE-GROWTH. LEAVING STEMS ON MOIST GROUND MIGHT RESULT IN SOME STEM-ROOTING.
3. AFTER CUTTING, PLANTS ARE VERY LIKELY TO RE-GROW. DIG OUT STUMPS INCLUDING AS MUCH ROOT AS POSSIBLE. TO AVOID REGROWTH, STUMPS SHOULD BE TURNED UPSIDE DOWN AND SOIL SHOULD BE BRUSHED OFF ROOTS. IF THE STUMPS ARE DUG UP, BE SURE TO STABILIZE THE AREA TO PREVENT EROSION.

REMOVE OLD MAN'S BEARD

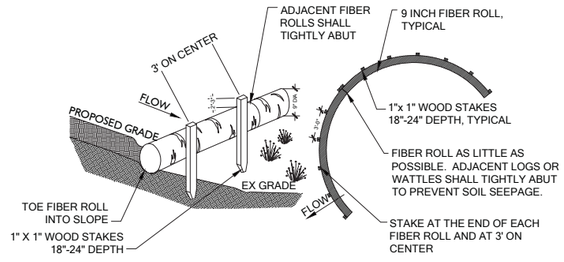
1. CUT VINES ON TREES OR FENCES AT ABOUT WAIST HEIGHT, FOLLOW THE VINE BACK TO THE ROOT AND DIG IT OUT. UPPER VINES CAN BE LEFT ON THE TREES SINCE THEY WILL DIE BACK, OR CAN BE REMOVED IF IT IS SAFE AND FEASIBLE TO DO SO.
2. MAKE SURE REMAINING VINES ARE NOT TOUCHING THE GROUND BECAUSE OLD MAN'S BEARD CAN FORM ROOTS AT STEM NODES
3. VINES GROWING ALONG THE GROUND SHOULD BE DUG UP AND REMOVED.
4. PULL SMALL PLANTS AND SEEDLINGS WHEN THE SOIL IS DAMP DURING WINTER OR SPRING. ALTHOUGH PLANTS CAN BE DUG UP YEAR ROUND, IT IS IDEAL TO DO SO DURING THE WINTER, WHEN MOST PLANTS ARE DORMANT, TO MINIMIZE DISTURBANCE TO THE SURROUNDING VEGETATION.

SILT FENCE MAINTENANCE STANDARDS:
1. ANY DAMAGE SHALL BE REPAIRED IMMEDIATELY.
2. SEDIMENT SHALL BE REMOVED WHEN ACCUMULATION EXCEEDS 6" IN DEPTH.



1 SILT FENCE

Scale: NTS



PLAN

NOTES
1. FIBER ROLL SHALL BE INSTALLED PRIOR TO START OF WORK.
2. FIBER ROLL SHALL BE 9 INCH IN DIAMETER.
3. STAKING: WOODEN STAKES ARE RECOMMENDED TO SECURE THE FIBER ROLL. BE SURE TO USE A STAKE THAT IS LONG ENOUGH TO PROTRUDE SEVERAL INCHES ABOVE THE COIR LOG OR STRAW WATTLE: 18" IS A GOOD LENGTH FOR HARD, ROCKY SOIL; FOR SOFT LOAMY SOIL USE A 24" STAKE.
4. WHEN INSTALLING RUNNING LENGTHS OF FIBER ROLL, BUTT THE SECOND LOG TIGHTLY AGAINST THE FIRST; DO NOT OVERLAP THE ENDS.
5. STAKE THE FIBER ROLLS AT EACH END AND THREE (3) FEET ON CENTER. STAKES SHOULD BE DRIVEN OUTSIDE THE FIBER ROLL, BUT CLOSE ENOUGH TO HOLD IT IN PLACE. LEAVE 2 - 3 INCHES OF THE STAKE PROTRUDING ABOVE THE FIBER ROLL. A HEAVY SEDIMENT LOAD WILL TEND TO PICK UP THE FIBER ROLL AND COULD PULL IT OFF THE STAKES IF THEY ARE DRIVEN DOWN TOO LOW.
6. WHEN FIBER ROLL IS USED FOR FLAT GROUND APPLICATIONS, DRIVE THE STAKES STRAIGHT DOWN; WHEN INSTALLING FIBER ROLL ON SLOPES, DRIVE THE STAKES PERPENDICULAR TO THE SLOPE. DRIVE THE FIRST END STAKE OF THE SECOND FIBER ROLL AT AN ANGLE TOWARD THE FIRST FIBER ROLL IN ORDER TO HELP ABUT THEM TIGHTLY TOGETHER.

2 FIBER ROLL

Scale: NTS

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TESC DETAILS AND INVASIVE SPECIES REMOVAL NOTES

THE WATERSHED COMPANY
750 Sixth Street South
Kirkland WA 98033
p 425.822.5242
www.watershedco.com
Science & Design

MERCERTECH INTERNATIONAL LLC
LONG PLAT MITIGATION AND RESTORATION PLAN
PREPARED FOR ALAN CHIU
PARCEL # 1824059031
4320 ISLAND CREST WAY
MERCER ISLAND, WA 98040

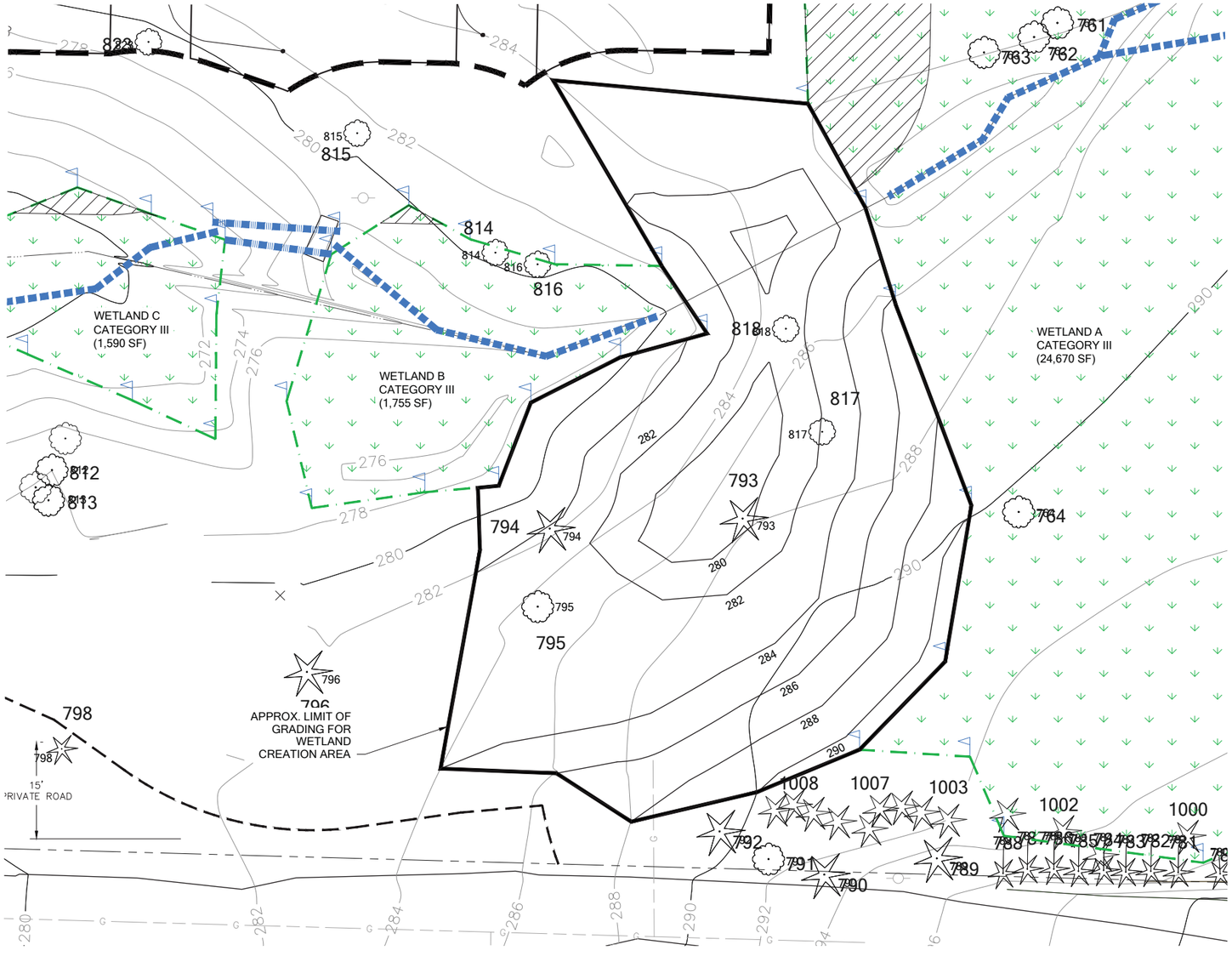
SUBMITTALS & REVISIONS

NO.	DATE	DESCRIPTION	BY
1	08-29-17	30% SUBMITTAL - PREAPP	LV
2	10/17/17	30% SUBMITTAL - PREAPP 2	RH
3	10/27/17	30% SUBMITTAL - APPLICAITON	RH

SHEET SIZE:
ORIGINAL PLAN IS 22" x 34".
SCALE ACCORDINGLY.

PROJECT MANAGER: HM
DESIGNED: LV, RH
DRAFTED: LV, RH
CHECKED: LV, AM
JOB NUMBER: 160905
SHEET NUMBER: W4 OF 9

DATE 10/27/17
PRINTED BY RGEN HOHLFELD
FILENAME 160905 MERCER ISLAND CHIU MITIGATION PLAN DWG



LEGEND

EXISTING FEATURES

- EXISTING CONTOUR
- WETLAND BOUNDARY (DELINEATED)
- WATERCOURSE BOUNDARY (DELINEATED)
- WATERCOURSE BOUNDARY (APPROX.)
- COMBINED WETLAND/WATERCOURSE BUFFER (50 FT)
- EXISTING TREE

PROPOSED FEATURES

- 284 PROPOSED CONTOUR
- TREE TO BE REMOVED
- REDUCED COMBINED WETLAND/WATERCOURSE BUFFER (25 FT)
- WETLAND AS BUFFER (1,979 SF)
- APPROX. LIMIT OF GRADING

PRELIMINARY GRADING SEQUENCE FOR WETLAND CREATION AREA

1. MECHANIZED EXCAVATION SHALL BE AVOIDED IN WETLAND AND STREAM.
2. REMOVE ROAD BED TO MATCH ADJACENT GRADES.
3. CONDUCT SUBSURFACE EVALUATION BY GEOTECHNICAL ENGINEER TO DETERMINE DEPTH OF ADDITIONAL ROAD BED EXCAVATION.
4. COMPLETE ROAD BED EXCAVATION PER GEOTECHNICAL ENGINEER RECOMMENDATIONS.
5. BACKFILL ROAD BED EXCAVATION AREA WITH APPROVED WETLAND SOILS TO ACHIEVE PROPOSED GRADES.
6. COMPLETE PROPOSED GRADING.

NOTES

1. SEE CIVIL ENGINEER PLANS FOR ALL GRADING PLANS OUTSIDE OF WETLAND CREATION AREA.
2. GRADING SHOWN IS CONCEPTUAL AND SUPERFICIAL IN NATURE. SUBSURFACE EVALUATION IS REQUIRED TO ASSESS DRAINAGE CONDITION.

WETLAND CREATION AREA GRADING PLAN

0 5' 10' 20' 40'

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SHEET NUMBER: W5 OF 9

DATE 10/27/17 | PRINTED BY ROEN HOHLFELD | FILENAME 160905 MERCER ISLAND CHIU MITIGATION PLAN.DWG

LEGEND

EXISTING FEATURES

- EXISTING CONTOUR
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- WATERCOURSE BOUNDARY (DELINEATED)
- WATERCOURSE BOUNDARY (APPROX.)
- COMBINED WETLAND/WATERCOURSE AREA BUFFER (50 FT)
- EXISTING TREE

PROPOSED FEATURES

- 284 PROPOSED CONTOUR
- TREE TO BE REMOVED
- REDUCED COMBINED WETLAND/WATERCOURSE BUFFER (25 FT)
- WETLAND AS BUFFER PLANTING (1,979 SF)
- WETLAND CREATION PLANTING (2,779 SF)
- WETLAND RESTORATION PLANTING (12,713 SF)
- BUFFER MITIGATION PLANTING (15,564 SF)

NOTES

1. TREE RETENTION PLAN AND CALCULATIONS NOT INCLUDED IN THIS PLAN: SEE CIVIL.
2. SEE SHEET W7 FOR PLANTING SCHEDULE.

PLANTING PLAN

0 10' 20' 40' 80'

NFC

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CHECKED: LV, AM
JOB NUMBER: 160905
SHEET NUMBER: W6 OF 9

PRINTED BY: ROEN HOHLFELD
DATE: 10/27/17
FILENAME: 160905 MERCER ISLAND CHIU MITIGATION PLAN.DWG

WETLAND CREATION CANDIDATE PLANT SCHEDULE (2,779 SF)

TREES* *ALL TREES TO BE 6' HEIGHT MINIMUM	QTY	MIN. SPACING	SIZE	NOTE
ALNUS RUBRA / RED ALDER	5	8' O.C.	6" HEIGHT	ALL PLANTS TO BE FULL AND WELL ROOTED
THUJA PLICATA / WESTERN REDCEDAR	6	8' O.C.	6" HEIGHT	
SHRUBS				
CORNUS SERICEA / REDTWIG DOGWOD	30	6' O.C.	1 GAL.	
PHYSOCARPUS CAPITATUS / PACIFIC NINEBARK	30	6' O.C.	1 GAL.	
RUBUS SPECTABILIS / SALMONBERRY	30	6' O.C.	1 GAL.	
GROUNDCOVER** **SPECIES TO BE PLACED IN GROUPS OF 9 - 15 AND SPACED TRIANGULARLY				
CAREX OBNUPTA / SLOUGH SEDGE	200	24" O.C.	4" POT	
JUNCUS EFFUSUS/ SOFT RUSH	200	24" O.C.	4" POT	
SCIRPUS MICROCARPUS / SMALL-FRUITED BULRUSH	200	24" O.C.	4" POT	

BUFFER MITIGATION CANDIDATE PLANT SCHEDULE (15,564 SF)

TREES* *ALL TREES TO BE 6' HEIGHT MINIMUM	QTY	MIN. SPACING	SIZE	NOTE
ACER MACROPHYLLUM / BIG-LEAF MAPLE	10	8' O.C.	2 GAL.	ALL PLANTS TO BE FULL AND WELL ROOTED
PSEUDOTSUGA MENZIESII / DOUGLAS-FIR	10	8' O.C.	2 GAL.	
TSUGA HETEROPHYLLA / WESTERN HEMLOCK	10	8' O.C.	2 GAL.	
SHRUBS				
OEMLERIA CERASIFORMIS / OSOBERRY	100	6' O.C.	1 GAL.	
SAMBUCUS RACEMOSA / RED ELDERBERRY	100	6' O.C.	1 GAL.	
CORYLUS CORNUTA / BEAKED HAZELNUT	100	6' O.C.	1 GAL.	
RUBUS SPECTABILIS / SALMONBERRY	100	6' O.C.	1 GAL.	
GROUNDCOVER** ** SPECIES TO BE SPACED TRIANGULARLY				
FRAGARIA CHILOENSIS / COASTAL STRAWBERRY	1000	3' O.C.	4" POT	
POLYSTICHUM MUNITUM / WESTERN SWORDFERN	1000	3' O.C.	4" POT	
MAHONIA NERVOSA / LOW OREGON GRAPE	1000	3' O.C.	4" POT	

WETLAND RESTORATION CANDIDATE PLANT SCHEDULE (12,713 SF)

TREES* *ALL SPECIES TO BE 6' HEIGHT MINIMUM	QTY	MIN. SPACING	SIZE	NOTE
FRAXINUS LATIFOLIA / OREGON ASH	8	9' O.C.	2 GAL.	ALL PLANTS TO BE FULL AND WELL ROOTED
SALIX SITCHENSIS / SITKA WILLOW	8	9' O.C.	2 GAL.	
PICEA SITCHENSIS / SITKA SPRUCE	8	9' O.C.	2 GAL.	
PRUNUS EMARGINATA / BITTER CHERRY	8	9' O.C.	2 GAL.	
THUJA PLICATA / WESTERN REDCEDAR	8	9' O.C.	2 GAL.	
SHRUBS				
CORNUS SERICEA / REDTWIG DOGWOOD	100	6' O.C.	1 GAL.	
PHYSOCARPUS CAPITATUS / PACIFIC NINEBARK	100	6' O.C.	1 GAL.	
ROSA PISOCARPA / CLUSTER ROSE	100	6' O.C.	1 GAL.	
SPIRAEA DOUGLASII / HARDHACK	100	6' O.C.	1 GAL.	

WETLAND AS BUFFER CANDIDATE PLANT SCHEDULE (1,979 SF)

USE WETLAND RESTORATION PALETTE

NFC

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TYPICAL PLANTING SCHEDULES

THE WATERSHED COMPANY
750 Sixth Street South
Kirkland WA 98033
p 425.822.5242
www.watershedco.com
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PROJECT MANAGER: HM
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JOB NUMBER: 160905
SHEET NUMBER: W7 OF 9

FILENAME: 160905 MERCER ISLAND CHIU MITIGATION PLAN DWG
PRINTED BY: ROEN HOHLFELD
DATE: 10/27/17

PLANT INSTALLATION SPECIFICATIONS

GENERAL NOTES

QUALITY ASSURANCE
1. PLANTS SHALL MEET OR EXCEED THE SPECIFICATIONS OF FEDERAL, STATE, AND LOCAL LAWS REQUIRING INSPECTION FOR PLANT DISEASE AND INSECT CONTROL.
2. PLANTS SHALL BE HEALTHY, VIGOROUS, AND WELL-FORMED, WITH WELL DEVELOPED, FIBROUS ROOT SYSTEMS, FREE FROM DEAD BRANCHES OR ROOTS. PLANTS SHALL BE FREE FROM DAMAGE CAUSED BY TEMPERATURE EXTREMES, LACK OR EXCESS OF MOISTURE, INSECTS, DISEASE, AND MECHANICAL INJURY. PLANTS IN LEAF SHALL BE WELL FOLIATED AND OF GOOD COLOR. PLANTS SHALL BE HABITUATED TO THE OUTDOOR ENVIRONMENTAL CONDITIONS INTO WHICH THEY WILL BE PLANTED (HARDENED-OFF).
3. TREES WITH DAMAGED, CROOKED, MULTIPLE OR BROKEN LEADERS WILL BE REJECTED. WOODY PLANTS WITH ABRASIONS OF THE BARK OR SUN SCALD WILL BE REJECTED.
4. NOMENCLATURE: PLANT NAMES SHALL CONFORM TO FLORA OF THE PACIFIC NORTHWEST BY HITCHCOCK AND CRONQUIST, UNIVERSITY OF WASHINGTON PRESS, 1973 AND/OR TO A FIELD GUIDE TO THE COMMON WETLAND PLANTS OF WESTERN WASHINGTON & NORTHWESTERN OREGON, ED. SARAH SPEAR COOKE, SEATTLE AUDUBON SOCIETY, 1997.

DEFINITIONS
1. PLANTS/PLANT MATERIALS. PLANTS AND PLANT MATERIALS SHALL INCLUDE ANY LIVE PLANT MATERIAL USED ON THE PROJECT. THIS INCLUDES BUT IS NOT LIMITED TO CONTAINER GROWN, B&B OR BAREROOT PLANTS; LIVE STAKES AND FASCINES (WATTLES); TUBERS, CORMS, BULBS, ETC..; SPRIGS, PLUGS, AND LINERS.
2. CONTAINER GROWN. CONTAINER GROWN PLANTS ARE THOSE WHOSE ROOTBALLS ARE ENCLOSED IN A POT OR BAG IN WHICH THAT PLANT GREW.

SUBSTITUTIONS
1. IT IS THE CONTRACTOR'S RESPONSIBILITY TO OBTAIN SPECIFIED MATERIALS IN ADVANCE IF SPECIAL GROWING, MARKETING OR OTHER ARRANGEMENTS MUST BE MADE IN ORDER TO SUPPLY SPECIFIED MATERIALS.
2. SUBSTITUTION OF PLANT MATERIALS NOT ON THE PROJECT LIST WILL NOT BE PERMITTED UNLESS AUTHORIZED IN WRITING BY THE RESTORATION CONSULTANT.
3. IF PROOF IS SUBMITTED THAT ANY PLANT MATERIAL SPECIFIED IS NOT OBTAINABLE, A PROPOSAL WILL BE CONSIDERED FOR USE OF THE NEAREST EQUIVALENT SIZE OR ALTERNATIVE SPECIES, WITH CORRESPONDING ADJUSTMENT OF CONTRACT PRICE.
4. SUCH PROOF WILL BE SUBSTANTIATED AND SUBMITTED IN WRITING TO THE CONSULTANT AT LEAST 30 DAYS PRIOR TO START OF WORK UNDER THIS SECTION.

INSPECTION
1. PLANTS SHALL BE SUBJECT TO INSPECTION AND APPROVAL BY THE RESTORATION CONSULTANT FOR CONFORMANCE TO SPECIFICATIONS, EITHER AT TIME OF DELIVERY ON-SITE OR AT THE GROWER'S NURSERY. APPROVAL OF PLANT MATERIALS AT ANY TIME SHALL NOT IMPAIR THE SUBSEQUENT RIGHT OF INSPECTION AND REJECTION DURING PROGRESS OF THE WORK.
2. PLANTS INSPECTED ON SITE AND REJECTED FOR NOT MEETING SPECIFICATIONS MUST BE REMOVED IMMEDIATELY FROM SITE OR RED-TAGGED AND REMOVED AS SOON AS POSSIBLE.
3. THE RESTORATION CONSULTANT MAY ELECT TO INSPECT PLANT MATERIALS AT THE PLACE OF GROWTH. AFTER INSPECTION AND ACCEPTANCE, THE RESTORATION CONSULTANT MAY REQUIRE THE INSPECTED PLANTS BE LABELED AND RESERVED FOR PROJECT. SUBSTITUTION OF THESE PLANTS WITH OTHER INDIVIDUALS, EVEN OF THE SAME SPECIES AND SIZE, IS UNACCEPTABLE.

MEASUREMENT OF PLANTS
1. PLANTS SHALL CONFORM TO SIZES SPECIFIED UNLESS SUBSTITUTIONS ARE MADE AS OUTLINED IN THIS CONTRACT.
2. HEIGHT AND SPREAD DIMENSIONS SPECIFIED REFER TO MAIN BODY OF PLANT AND NOT BRANCH OR ROOT TIP TO TIP. PLANT DIMENSIONS SHALL BE MEASURED WHEN THEIR BRANCHES OR ROOTS ARE IN THEIR NORMAL POSITION.
3. WHERE A RANGE OF SIZE IS GIVEN, NO PLANT SHALL BE LESS THAN THE MINIMUM SIZE AND AT LEAST 50% OF THE PLANTS SHALL BE AS LARGE AS THE MEDIAN OF THE SIZE RANGE. (EXAMPLE: IF THE SIZE RANGE IS 12" TO 18", AT LEAST 50% OF PLANTS MUST BE 15" TALL.).

SUBMITTALS

PROPOSED PLANT SOURCES
1. WITHIN 45 DAYS AFTER AWARD OF THE CONTRACT, SUBMIT A COMPLETE LIST OF PLANT MATERIALS PROPOSED TO BE PROVIDED DEMONSTRATING CONFORMANCE WITH THE REQUIREMENTS SPECIFIED. INCLUDE THE NAMES AND ADDRESSES OF ALL GROWERS AND NURSERIES.

PRODUCT CERTIFICATES
1. PLANT MATERIALS LIST - SUBMIT DOCUMENTATION TO CONSULTANT AT LEAST 30 DAYS PRIOR TO START OF WORK UNDER THIS SECTION THAT PLANT MATERIALS HAVE BEEN ORDERED. ARRANGE PROCEDURE FOR INSPECTION OF PLANT MATERIAL WITH CONSULTANT AT TIME OF SUBMISSION.
2. HAVE COPIES OF VENDOR'S OR GROWERS' INVOICES OR PACKING SLIPS FOR ALL PLANTS ON SITE DURING INSTALLATION. INVOICE OR PACKING SLIP SHOULD LIST SPECIES BY SCIENTIFIC NAME, QUANTITY, AND DATE DELIVERED (AND GENETIC ORIGIN IF THAT INFORMATION WAS PREVIOUSLY REQUESTED).

DELIVERY, HANDLING, & STORAGE

NOTIFICATION
CONTRACTOR MUST NOTIFY CONSULTANT 48 HOURS OR MORE IN ADVANCE OF DELIVERIES SO THAT CONSULTANT MAY ARRANGE FOR INSPECTION.

PLANT MATERIALS
1. TRANSPORTATION - DURING SHIPPING, PLANTS SHALL BE PACKED TO PROVIDE PROTECTION AGAINST CLIMATE EXTREMES, BREAKAGE AND DRYING. PROPER VENTILATION AND PREVENTION OF DAMAGE TO BARK, BRANCHES, AND ROOT SYSTEMS MUST BE ENSURED.
2. SCHEDULING AND STORAGE - PLANTS SHALL BE DELIVERED AS CLOSE TO PLANTING AS POSSIBLE. PLANTS IN STORAGE MUST BE PROTECTED AGAINST ANY CONDITION THAT IS DETRIMENTAL TO THEIR CONTINUED HEALTH AND VIGOR.
3. HANDLING - PLANT MATERIALS SHALL NOT BE HANDLED BY THE TRUNK, LIMBS, OR FOLIAGE BUT ONLY BY THE CONTAINER, BALL, BOX, OR OTHER PROTECTIVE STRUCTURE, EXCEPT BAREROOT PLANTS SHALL BE KEPT IN BUNDLES UNTIL PLANTING AND THEN HANDLED CAREFULLY BY THE TRUNK OR STEM.
4. LABELS - PLANTS SHALL HAVE DURABLE, LEGIBLE LABELS STATING CORRECT SCIENTIFIC NAME AND SIZE. TEN PERCENT OF CONTAINER GROWN PLANTS IN INDIVIDUAL POTS SHALL BE LABELED. PLANTS SUPPLIED IN FLATS, RACKS, BOXES, BAGS, OR BUNDLES SHALL HAVE ONE LABEL PER GROUP.

WARRANTY

PLANT WARRANTY
PLANTS MUST BE GUARANTEED TO BE TRUE TO SCIENTIFIC NAME AND SPECIFIED SIZE, AND TO BE HEALTHY AND CAPABLE OF VIGOROUS GROWTH.

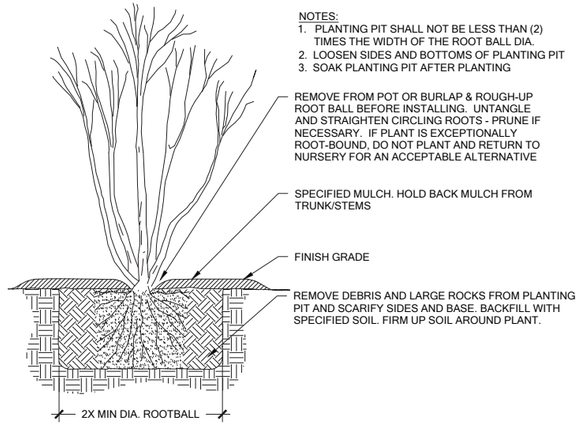
REPLACEMENT
1. PLANTS NOT FOUND MEETING ALL OF THE REQUIRED CONDITIONS AT THE CONSULTANT'S DISCRETION MUST BE REMOVED FROM SITE AND REPLACED IMMEDIATELY AT THE CONTRACTOR'S EXPENSE.
2. PLANTS NOT SURVIVING AFTER ONE YEAR TO BE REPLACED AT THE CONTRACTOR'S EXPENSE.

PLANT MATERIAL

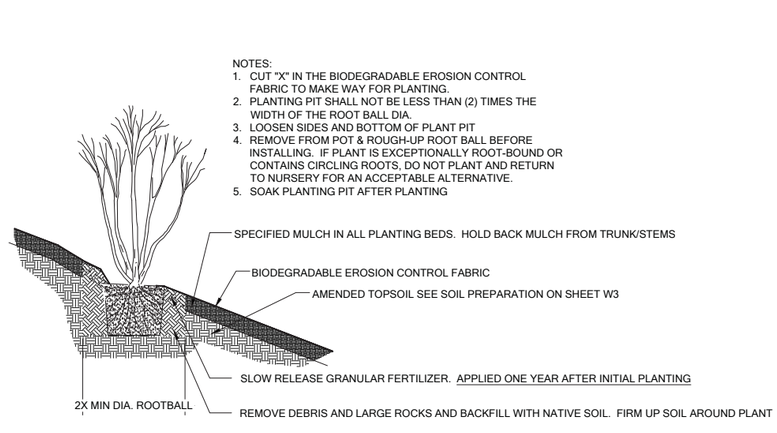
GENERAL
1. PLANTS SHALL BE NURSERY GROWN IN ACCORDANCE WITH GOOD HORTICULTURAL PRACTICES UNDER CLIMATIC CONDITIONS SIMILAR TO OR MORE SEVERE THAN THOSE OF THE PROJECT SITE.
2. PLANTS SHALL BE TRUE TO SPECIES AND VARIETY OR SUBSPECIES. NO CULTIVARS OR NAMED VARIETIES SHALL BE USED UNLESS SPECIFIED AS SUCH.

QUANTITIES
SEE PLANT LIST ON ACCOMPANYING PLANS AND PLANT SCHEDULES.

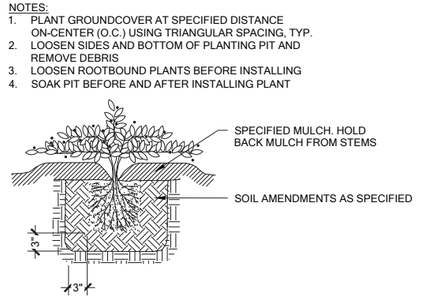
ROOT TREATMENT
1. CONTAINER GROWN PLANTS (INCLUDES PLUGS): PLANT ROOT BALLS MUST HOLD TOGETHER WHEN THE PLANT IS REMOVED FROM THE POT, EXCEPT THAT A SMALL AMOUNT OF LOOSE SOIL MAY BE ON THE TOP OF THE ROOTBALL.
2. PLANTS MUST NOT BE ROOT-BOUND; THERE MUST BE NO CIRCLING ROOTS PRESENT IN ANY PLANT INSPECTED.
3. ROOTBALLS THAT HAVE CRACKED OR BROKEN WHEN REMOVED FROM THE CONTAINER SHALL BE REJECTED.



1 TREE AND SHRUB PLANTING
Scale: NTS



2 TREE AND SHRUB PLANTING ON A SLOPE
Scale: NTS



3 GROUNDCOVER PLANTING
Scale: NTS

PLANT INSTALLATION DETAILS AND NOTES

NFC
NOT FOR CONSTRUCTION

THE WATERSHED COMPANY
750 Sixth Street South
Kirkland WA 98033
p 425.822.5242
www.watershedco.com
Science & Design

MERCERTECH INTERNATIONAL LLC
LONG PLAT MITIGATION AND RESTORATION PLAN
PREPARED FOR ALAN CHIU
PARCEL # 1824059031
4320 ISLAND CREST WAY
MERCER ISLAND, WA 98040

SUBMITTALS & REVISIONS

NO.	DATE	DESCRIPTION	BY
1	08-29-17	30% SUBMITTAL - PREAPP	LV
2	10/17/17	30% SUBMITTAL - PREAPP 2	RH
3	10/27/17	30% SUBMITTAL - APPLICAITON	RH

SHEET SIZE:
ORIGINAL PLAN IS 22" x 34".
SCALE ACCORDINGLY.

PROJECT MANAGER: HM
DESIGNED: LV, RH
DRAFTED: LV, RH
CHECKED: LV, AM
JOB NUMBER: 160905
SHEET NUMBER: W8 OF 9

FILENAME: 160905 MERCER ISLAND CHIU MITIGATION PLAN DWG
PRINTED BY: ROEN HOHLFELD
DATE: 10/27/17

MITIGATION / RESTORATION SPECIFICATIONS

PROJECT SUMMARY

THIS PLAN HAS BEEN PREPARED 1) TO RESTORE PREVIOUSLY ALTERED AREAS SUBJECT TO A NOTICE OF CORRECTION AND 2) TO MITIGATE WETLAND AND WATERCOURSE BUFFER IMPACTS ASSOCIATED WITH THE PROPOSED SUBDIVISION.

THE NOTICE OF CORRECTION INDICATED THAT FILL MATERIAL SUCH AS WOOD CHIPS HAD BEEN PLACED ON THE SUBJECT PROPERTY, AND THAT TREES AND SHRUBBY VEGETATION HAVE BEEN CLEARED OVER TIME. THE AREA SUBJECT TO THE NOTICE OF CORRECTION APPEARS TO HAVE BEEN APPLIED TO APPROXIMATELY 12,713 SQUARE FEET OF THE SUBJECT PROPERTY. RESTORATION OF THE AREA SUBJECT TO THE NOTICE OF CORRECTION INCLUDES REMOVAL OF THE WOOD CHIPS AND NON-NATIVE AND INVASIVE PLANT SPECIES, AND THE INSTALLATION OF A NATIVE TREE, SHRUB AND GROUNDCOVER PLANT COMMUNITY.

THE PROJECT PROPOSES BUFFER REDUCTION WITH ENHANCEMENT IN AREAS ADJACENT TO THE PROPOSED RESIDENTIAL DEVELOPMENT. ENHANCEMENT OF THE EXISTING DEGRADED BUFFER AREAS WILL INCLUDE THE REMOVAL OF NON-NATIVE AND INVASIVE SPECIES, AND THE INSTALLATION OF A NATIVE TREE, SHRUB AND GROUNDCOVER PLANT COMMUNITY.

THE PROPOSED BUFFER REDUCTION INCLUDES WETLAND AS BUFFER. TO MITIGATE FOR THE WETLAND AS BUFFER, THE CREATION OF 2,779 SQUARE FEET OF WETLAND IS PROPOSED. THE WETLAND CREATION AREA WOULD BE PLANTED WITH A NATIVE TREE, SHRUB AND EMERGENT PLANT COMMUNITY.

WORK SEQUENCE (SEE MATERIALS SECTION FOR MATERIAL INFORMATION)

A RESTORATION SPECIALIST SHALL MAKE SITE VISITS TO VERIFY THE FOLLOWING PROJECT MILESTONES:

1. BEFORE BEGINNING CONSTRUCTION WORK, ESTABLISH AND DEFINE THE WORK AREA. IDENTIFY AND DEMARCATE THE LIMITS OF PROJECT GRADING AND CLEARING WITH HIGH VISIBILITY FENCING OR SIMILAR MEANS.
2. INSTALL TEMPORARY EROSION CONTROL MEASURES AS IDENTIFIED ON THE TESC PLANS.
3. CLEAR AND GRUB THE MITIGATION AND RESTORATION AREAS. CLEARING AND GRUBBING IN WETLAND AND WATERCOURSE AREAS TO BE PERFORMED USING HAND TOOLS ONLY.
4. REMOVE PREVIOUSLY PLACED WOOD CHIPS FROM VIOLATION AREA. REMOVAL TO BE PERFORMED USING HAND TOOLS ONLY.
5. SURVEY AND PAINT PROPOSED 1-FOOT CONTOURS AND STAKE CUT/FILL DEPTHS WITHIN THE WETLAND CREATION AREA BASED ON THE APPROVED PLAN SET.
6. EXCAVATE AS NECESSARY TO TIE INTO THE SURROUNDING GRADE AND CREATE WETLAND TOPOGRAPHY. ALL EXCAVATED MATERIAL NOT NEEDED FOR RE-USE IS TO BE DISPOSED OF OFFSITE. OVER-EXCAVATION MAY BE RECOMMENDED TO ACCOMMODATE THE PLACEMENT OF TOPSOIL AND/OR COMPOST AMENDMENTS. EQUIPMENT USED TO CONDUCT EXCAVATION WOULD LIKELY INCLUDE TRACKED EXCAVATORS AND DUMP TRUCKS.
7. UNDER THE DIRECTION OF THE RESTORATION SPECIALIST, PERFORM FINISHING TOUCHES ON THE WETLAND AND RESTORATION AREAS. COMPLETE ANY ADDITIONAL TOUCH-UP WORK AS DIRECTED.
8. PRIOR TO FINISH GRADING, THE RESTORATION SPECIALIST SHALL INSPECT THE SOIL CONDITION AND DETERMINE IF SOIL AMENDMENTS OTHER THAN COMPOST ARE NECESSARY.
9. INCORPORATE 5 INCHES OF COMPOST INTO THE FINISH GRADE OF THE WETLAND CREATION AREA. SEE SHEET W3 FOR SOIL PREPARATION NOTES.
10. INCORPORATE 3 INCHES OF COMPOST INTO THE FINISH GRADE OF THE BUFFER AREAS, INCLUDING THE RESTORED PORTION OF THE CONSTRUCTION ACCESS AREAS. SEE SHEET W3 FOR SOIL PREPARATION NOTES.
11. LAYOUT PLANTS PER SEQ W7
12. INSTALL NATIVE PLANTS PER PLANTING DETAILS ON SHEET W8.

A. NATIVE PLANT INSTALLATION SHALL OCCUR DURING THE DORMANT SEASON (OCTOBER 15TH THROUGH MARCH 1ST) IN FROST-FREE PERIODS ONLY.

B. LAYOUT PLANT MATERIAL PER PLAN FOR INSPECTION BY THE RESTORATION SPECIALIST. PLANT SUBSTITUTIONS WILL NOT BE ALLOWED WITHOUT PRIOR WRITTEN APPROVAL OF THE RESTORATION SPECIALIST.

C. INSTALL PLANTS PER PLANTING DETAILS

12. WATER EACH PLANT THOROUGHLY TO REMOVE AIR POCKETS.
13. INSTALL A TEMPORARY IRRIGATION SYSTEM CAPABLE OF SUPPLYING AT LEAST 1-INCH OF WATER PER WEEK TO THE ENTIRE PLANTED AREA DURING THE DRY SEASON (JUNE 1ST THROUGH SEPTEMBER 30TH).
14. ONE YEAR AFTER INITIAL PLANTING, APPLY A SLOW-RELEASE, PHOSPHOROUS-FREE, GRANULAR FERTILIZER TO EACH INSTALLED PLANT.
15. PLANT GROUNDCOVERS IN WETLAND RESTORATION AREA IN YEAR 3 AFTER INVASIVE PLANTS HAVE BEEN SUCCESSFULLY MANAGED.

MAINTENANCE

THE SITE SHALL BE MAINTAINED FOR FIVE YEARS FOLLOWING SUCCESSFUL INSTALLATION.

1. REPLACE EACH PLANT FOUND DEAD IN THE SUMMER MONITORING VISITS IN THE FOLLOWING DORMANT SEASON (OCTOBER 15 - MARCH 1). REPLACEMENT SHALL BE OF THE SAME SPECIES AND SIZE PER PLAN UNLESS OTHERWISE APPROVED BY THE RESTORATION SPECIALIST.
2. GENERAL WEEDING FOR ALL PLANTED AREAS

A. AT LEAST TWICE ANNUALLY, REMOVE COMPETING GRASSES AND WEEDS FROM AROUND THE BASE OF EACH INSTALLED PLANT TO A RADIUS OF 12 INCHES. WEEDING SHOULD OCCUR AT LEAST ONCE IN THE SPRING AND ONCE IN THE SUMMER. THOROUGH WEEDING WILL RESULT IN LOWER PLANT MORTALITY AND ASSOCIATED PLANT REPLACEMENT COSTS.

B. MORE FREQUENT WEEDING MAY BE NECESSARY DEPENDING ON WEED CONDITIONS THAT DEVELOP AFTER PLANT INSTALLATION.

C. NOXIOUS WEEDS MUST BE REMOVED FROM THE ENTIRE MITIGATION AREA, AT LEAST TWICE ANNUALLY.

D. DO NOT USE STRING TRIMMERS IN THE VICINITY OF INSTALLED PLANTS, AS THEY MAY DAMAGE OR KILL THE PLANTS.

3. MAINTAIN A FOUR-INCH-THICK LAYER OF WOODCHIP MULCH ACROSS THE ENTIRE BUFFER MITIGATION PLANTING AREA. MULCH SHOULD BE PULLED BACK TWO INCHES FROM THE PLANT STEMS. 4. INSPECT AND REPAIR THE IRRIGATION SYSTEM AS NECESSARY EACH SPRING. DURING AT LEAST THE FIRST TWO GROWING SEASONS, MAKE SURE THAT THE ENTIRE PLANTING AREA RECEIVES A MINIMUM OF ONE INCH OF WATER PER WEEK FROM JUNE 1ST THROUGH SEPTEMBER 30TH.

GOALS

1. RESTORE 12,713 SQUARE FEET OF DEGRADED WETLAND AREA.

A. CREATE A DENSE, NATIVE TREE AND SHRUB COMMUNITY.

B. REMOVE NON-NATIVE AND INVASIVE PLANT SPECIES FROM THE WETLAND RESTORATION AREA.

2. ENHANCE 15,564 SQUARE FEET OF DEGRADED BUFFER AREA.

A. CREATE A DENSE, NATIVE TREE AND SHRUB COMMUNITY.

B. REMOVE NON-NATIVE AND INVASIVE PLANT SPECIES FROM THE BUFFER ENHANCEMENT AREA.

3. CREATE 2,779 SQUARE FEET OF ADDITIONAL WETLAND AREA.

A. CREATE A DENSE, NATIVE SHRUB AND EMERGENT COMMUNITY.

4. ENHANCE 1,979 SQUARE FEET OF DEGRADED WETLAND AS BUFFER AREA

A. CREATE A DENSE, NATIVE TREE AND SHRUB COMMUNITY.

B. REMOVE NON-NATIVE AND INVASIVE PLANT SPECIES FROM THE WETLAND RESTORATION AREA.

PERFORMANCE STANDARDS

THE FOLLOWING PERFORMANCE STANDARDS WILL BE USED TO GAUGE THE SUCCESS OF THE PROJECT OVER TIME. IF ALL PERFORMANCE STANDARDS HAVE BEEN SATISFIED BY THE END OF YEAR FIVE, THE PROJECT SHALL BE CONSIDERED COMPLETE AND THE CITY OF MERCER ISLAND SHALL RELEASE THE PERFORMANCE BOND (IF REQUIRED).

2. SURVIVAL:

a. ACHIEVE 100% SURVIVAL OF INSTALLED PLANTS BY THE END OF YEAR 1.

b. ACHIEVE 80% SURVIVAL OF ALL INSTALLED PLANTS BY THE END OF YEAR FIVE.

THIS STANDARD CAN BE MET THROUGH PLANT ESTABLISHMENT OR THROUGH REPLANTING AS NECESSARY TO ACHIEVE THE REQUIRED NUMBERS.

2. COVER:

a. ACHIEVE 60% COVER OF NATIVE TREES AND SHRUBS BY YEAR 3 WITHIN PLANTED WETLAND AND BUFFER AREAS. VOLUNTEER SPECIES MAY COUNT TOWARDS THIS COVER STANDARD.

b. ACHIEVE 10% COVER OF NATIVE EMERGENT PLANTS WITHIN THE CREATED WETLAND AREA BY YEAR 3.

c. ACHIEVE 80% COVER OF NATIVE TREES AND SHRUBS BY YEAR 5 WITHIN PLANTED WETLAND AND BUFFER AREAS. VOLUNTEER SPECIES MAY COUNT TOWARDS THIS COVER STANDARD.

d. ACHIEVE 30% COVER OF NATIVE EMERGENT PLANTS WITHIN WETLAND AREAS BY YEAR 5.

3. DIVERSITY:

a. ESTABLISH AT LEAST THREE NATIVE TREE SPECIES, FIVE NATIVE SHRUB SPECIES, AND TWO NATIVE GROUNDCOVERS WITHIN THE WETLAND RESTORATION AND BUFFER MITIGATION AREAS. VOLUNTEER SPECIES MAY COUNT TOWARDS THIS STANDARD.

b. ESTABLISH AT LEAST TWO NATIVE TREE SPECIES, THREE NATIVE SHRUB SPECIES, AND TWO NATIVE GROUNDCOVERS WITHIN THE WETLAND CREATION AREA.

ESTABLISHMENT IS DEFINED AS FIVE OR MORE INDIVIDUAL PLANTS OF THE SAME SPECIES ALIVE AND HEALTHY.

4. INVASIVE COVER: NO MORE THAN 10% COVER BY INVASIVE WEED SPECIES WITHIN ALL PLANTED AREAS IN ANY MONITORING YEAR.

5. HYDROLOGY STANDARD (WETLAND CREATION AREA ONLY):

a. EVIDENCE OF WETLAND HYDROLOGY IN THE WETLAND CREATION AREA. SOIL SATURATION WITHIN THE UPPER 12 INCHES OF THE SOIL SURFACE, PRESENT FOR TWO CONSECUTIVE WEEKS DURING THE GROWING SEASON (MARCH 1ST TO OCTOBER 15TH) DURING EACH MONITORING YEAR AS MEASURED PER THE PROTOCOL IN THE MONITORING METHODS SECTION, BELOW.

6. HYDRIC SOIL STANDARD (WETLAND CREATION AREA ONLY):

a. HYDRIC SOILS WILL BE ASSUMED PRESENT IF THE HYDROLOGY STANDARD IS MET.

MONITORING

PRIOR TO THE COMMENCEMENT OF THE MONITORING PHASE, AN AS-BUILT PLAN DOCUMENTING THE SUCCESSFUL INSTALLATION OF THE PROJECT WILL BE SUBMITTED TO THE CITY OF MERCER ISLAND. IF NECESSARY, THE AS-BUILT REPORT MAY INCLUDE A MARK-UP OF THE ORIGINAL PLAN THAT NOTES ANY SIGNIFICANT CHANGES OR SUBSTITUTIONS THAT OCCURRED. DURING THE AS-BUILT INSPECTION, THE RESTORATION SPECIALIST WILL ESTABLISH AT LEAST FOUR PERMANENT PHOTO-POINTS.

DURING THE AS-BUILT INSPECTION, THE RESTORATION SPECIALIST SHALL INSTALL AT LEAST TWO REPRESENTATIVELY LOCATED SHALLOW GROUNDWATER WELLS IN THE WETLAND CREATION AREA. GROUNDWATER WELLS SHALL BE INSTALLED TO A MINIMUM DEPTH OF 24 INCHES. WELLS TO BE CONSTRUCTED OF 2-INCH DIAMETER PVC PIPE WITH CAPS. BELOW GROUND PORTIONS ARE TO BE PERFORATED WITH ¼" HOLES SPACED NO FARTHER THAN ½" APART. ALTERNATIVELY, AUTOMATED GROUNDWATER MONITORING DATA LOGGING DEVICES MAY BE USED IN-LIEU OF MANUALLY MONITORED WELLS.

THE SITE WILL BE MONITORED TWICE ANNUALLY FOR FIVE YEARS BEGINNING WITH APPROVAL OF THE AS-BUILT REPORT. EACH SPRING THE RESTORATION SPECIALIST WILL CONDUCT A BRIEF MAINTENANCE INSPECTION FOLLOWED BY A MEMO SUMMARIZING MAINTENANCE ITEMS NECESSARY FOR THE UPCOMING GROWING SEASON. THE FORMAL LATE-SEASON MONITORING INSPECTION WILL TAKE PLACE ONCE ANNUALLY DURING LATE SUMMER OR EARLY FALL. DURING EACH LATE-SEASON MONITORING INSPECTION, THE FOLLOWING DATA WILL BE COLLECTED:

1. PERCENT SURVIVAL OF ALL INSTALLED PLANTINGS, INCLUDING SPECIES SPECIFIC COUNTS OF INSTALLED TREE AND SHRUB PLANTINGS (NOTE: GROUNDCOVER PLANTS COUNTED IN YEAR-1 ONLY, FOR WARRANTY PURPOSES).
2. NATIVE WOODY COVER AS DETERMINED USING VISUAL COVER CLASS ESTIMATES.
3. NATIVE GROUNDCOVER PLANT COVER AS DETERMINED USING VISUAL COVER CLASS ESTIMATES.
4. ESTIMATES OF INVASIVE HERBACEOUS PLANTS OR GROUNDCOVER USING VISUAL COVER ESTIMATES.
5. THE SPECIES COMPOSITION, NOTING WHETHER A SPECIES IS NATIVE OR EXOTIC AND WHETHER PLANTS WERE INSTALLED OR ARE VOLUNTEERS.
6. THE GENERAL HEALTH AND VIGOR OF THE INSTALLED VEGETATION.
7. PHOTOGRAPHS FROM FIXED PHOTO-POINTS ESTABLISHED DURING THE AS-BUILT INSPECTION.
8. ANY EVIDENCE OF WILDLIFE USAGE.
9. DEPTH OF GROUNDWATER BELOW THE SOIL SURFACE SHALL BE RECORDED AT ESTABLISHED WELLS IN THE WETLAND CREATION AREA.

MONITORING REPORTS SHALL BE SUBMITTED ANNUALLY TO THE CITY. REPORTS SHALL DOCUMENT THE CONDITIONS OF THE SITE, INCLUDING QUANTITATIVE DATA COLLECTED DURING THE MONITORING INSPECTION, AND SHALL PROVIDE MAINTENANCE RECOMMENDATIONS THAT MAY BE NECESSARY TO HELP THE SITE ACHIEVE THE STATED PERFORMANCE STANDARDS.

CONTINGENCY PLAN

IF ANY MONITORING REPORT REVEALS THAT THE RESTORATION PLAN HAS FAILED IN WHOLE OR IN PART, AND SHOULD THAT FAILURE BE BEYOND THE SCOPE OF ROUTINE MAINTENANCE, THE APPLICANT WILL SUBMIT A CONTINGENCY PLAN TO THE CITY OF MERCER ISLAND FOR APPROVAL. THIS PLAN MAY INCLUDE REPLANTING, SOIL AMENDMENTS OR TOPDRESSING, SUBSTITUTIONS FOR SPECIES SELECTED IN THE ORIGINAL PLAN, AND ADAPTIVE WEED CONTROL METHODS.

MATERIALS

1. WOODCHIP MULCH: "ARBORIST CHIPS" (CHIPPED WOODY MATERIAL) APPROXIMATELY ONE TO THREE INCHES IN MAXIMUM DIMENSION (NOT SAWDUST). THIS MATERIAL IS COMMONLY AVAILABLE IN LARGE QUANTITIES FROM ARBORISTS OR TREE-PRUNING COMPANIES. THIS MATERIAL IS SOLD AS "ANIMAL FRIENDLY HOG FUEL" AT PACIFIC TOPSOILS [(800) 884-7645]. MULCH SHALL NOT CONTAIN APPRECIABLE QUANTITIES OF GARBAGE, PLASTIC, METAL, SOIL, AND DIMENSIONAL LUMBER OR CONSTRUCTION/DEMOLITION DEBRIS. APPROX. QUANTITY REQUIRED: 60 CUBIC YARDS.
2. COMPOST: CEDAR GROVE COMPOST OR EQUIVALENT "COMPOSTED MATERIAL" PER WASHINGTON ADMIN. CODE 173-350-220. QUANTITY REQUIRED: 35 CUBIC YARDS
3. FERTILIZER: SLOW-RELEASE, PHOSPHOROUS-FREE GRANULAR FERTILIZER. MOST COMMERCIAL NURSERIES CARRY THIS PRODUCT. FOLLOW MANUFACTURER'S INSTRUCTIONS FOR USE. KEEP FERTILIZER IN WEATHER-TIGHT CONTAINER WHILE ON-SITE. FERTILIZER IS ONLY TO BE APPLIED IN YEARS TWO AND THREE, NOT IN YEAR ONE.
4. RESTORATION SPECIALIST: QUALIFIED PROFESSIONAL ABLE TO EVALUATE AND MONITOR THE CONSTRUCTION OF ENVIRONMENTAL RESTORATION PROJECTS.
5. FERTILIZER (FOR NEAR AQUATIC ENVIRONMENTS): SLOW-RELEASE, PHOSPHOROUS-FREE GRANULAR FERTILIZER. LABEL MUST INDICATE THAT PRODUCT IS SAFE FOR AQUATIC ENVIRONMENTS. FOLLOW MANUFACTURER'S INSTRUCTIONS FOR USE. KEEP FERTILIZER IN WEATHER-TIGHT CONTAINER WHILE ON-SITE. FERTILIZER IS ONLY TO BE APPLIED IN YEARS TWO AND THREE, NOT IN YEAR ONE.

NFC

NOT FOR CONSTRUCTION

MITIGATION AND RESTORATION NOTES

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SHEET SIZE:
ORIGINAL PLAN IS 22" x 34".
SCALE ACCORDINGLY.

PROJECT MANAGER: HM
DESIGNED: LV, RH
DRAFTED: LV, RH
CHECKED: LV, AM
JOB NUMBER: 160905
SHEET NUMBER: W9 OF 9

DATE 10/27/17 | PRINTED BY RGEN HOHLFELD | FILENAME 160905 MERCER ISLAND CHIU MITIGATION PLAN.DWG

APPENDIX B

Wetland & Watercourses Delineation Report

4320 Island Crest Way
Critical Area Study

May 31, 2017

Alan Chiu
Mercertech International, LLC
4320 Island Crest Way,
Mercer Island, WA 98040

Re: Chiu property at 4320 Island Crest Way, Wetland and Watercourses Delineation Report

The Watershed Company Reference Number: 160905

Dear Alan:

On September 21, 2016, ecologists Anna Hoenig and Rose Whitson visited the Chiu property located at 4320 Island Crest Way on Mercer Island to delineate jurisdictional wetland and watercourses (parcel no. 1824059031). Three wetlands and one watercourse were identified and delineated. This letter summarizes the findings of this study and details applicable federal, state, and local regulations. The following documents are enclosed:

- Photographs
- Field Delineation Sketch
- Wetland Determination Data Forms
- 2004 Ecology Rating Forms

Methods

Public-domain information on the subject properties was reviewed for this reconnaissance study. These sources include:

- USDA Natural Resources Conservation Service Soil maps (WebSoil);
- U.S. Fish and Wildlife Service National Wetland Inventory (NWI) maps;
- Washington Department of Fish and Wildlife interactive mapping programs (PHS on the Web);
- Washington Department of Natural Resources, Forest Practices Application Mapping Tool (FPARS);

- King County's GIS mapping website (iMAP); and
- City of Mercer Island GIS interactive mapping application

Wetlands

The study area was evaluated for wetlands using methodology from the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region Version 2.0* (Regional Supplement) (US Army Corps of Engineers [Corps] May 2010). The wetland boundary was determined on the basis of an examination of vegetation, soils, and hydrology. Areas meeting the criteria set forth in the Regional Supplement were determined to be wetland. Soil, vegetation, and hydrologic parameters were sampled at several locations along the wetland boundary to make the determination. Five recorded data point locations were marked with yellow- and black-striped flagging.

After determining the wetland edge, pink- and black-stripped flagging was hung along each wetland boundary (see attached sketch). Identified wetlands within the property were then classified using the *Washington State Wetland Rating System for Western Washington, Version 2* (Publication #04-06-025) (Rating System).

Watercourses

Watercourses were identified according to the Mercer Island Municipal Code definition The ordinary high water mark (OHWM) was evaluated based on the definition provided by the Washington Department of Fish and Wildlife, WAC 173-22-030. The OHWM is located by examining the bed and bank physical characteristics and vegetation to ascertain the water elevation for mean annual floods. The left OHWM and right OHWM were marked with blue- and white-striped flagging when the watercourses formed the outer edge of a wetland and for segments of watercourses outside of wetland boundaries.

Findings

The subject property is situated in Section 18 of Township 24 North and Range 5 East. It is located in the Mercer Island drainage basin in the Cedar River/Lake Washington watershed, within the Cedar-Sammamish Water Resource Inventory Area (WRIA-8).

The property is zoned by the City of Mercer Island as R-9.6 Single Family and has two dwelling units. Gravel driveways connect each of the structures to one another and to Island Crest Way. There are also associated lawn areas and several dilapidated appurtenant structures, including an old chicken coop and an old shed. The remainder of the property is comprised of three wetlands and one watercourse, described below.

Wetland A

Wetland A is a slope-depressional wetland that comprises most of the east half of the subject parcel. It was originally forested with alder and cottonwood trees with possibly a few conifers (King County iMap 2013 aerial basemap), but has since been cleared and partially filled with wood chips. The current disturbed dominant vegetation consists of Himalayan blackberry, field bindweed, reed canarygrass, and soft rush. Small-fruited bulrush, skunk cabbage, yellow-flag iris, and mannagrass are present in the seasonally ponded areas. The hydrologic indicator soil layer at data point 1 (DP-1) consists of dark brown (10YR 3/2) gravelly loam with redoximorphic concentrations in the pore linings and matrix, while the indicator layer at DP-3 contains a mixed matrix with the dominant percentage of the matrix consisting of a depleted sandy loam with forty percent redoximorphic concentrations in the matrix and pore linings. Oxidized rhizospheres are present at both sampling locations. Hydrology is provided primarily by ground water. Watercourse A originates in Wetland A.

Wetland A is rated based on a combination of presumed wetland conditions prior to the recent alterations. This included a review of aerial imagery and conditions seen in the field. It rates moderately for water quality function based on capacity to trap nutrients in an area presumed to have been greater than 95% persistent ungrazed vegetation based on dense canopy coverage in aerial imagery. The outlet, which is the culvert by which Watercourse A exits, is also constricted. Hydrologic function is high due to landscape position and capacity to slow and store potential flooding. Habitat function is moderate, but limited in landscape connectivity by surrounding development.

Wetland B

Wetland B is a slope-depressional wetland. It consists of ponding resulting from a man-made berm and possible excavation occurring between 1946 and 1963 (Mercer Island GIS mapping application, historical aerial basemaps). It is difficult to determine if Wetland B is a man-made feature. Historic wetland and watercourse studies for this site could not be identified, and aerial photography in 1946 and prior show only dense forested canopy. However, given the hydrology of the surrounding area in present day, it is likely that the area was either wetland or watercourse even prior to the implementation of the berm.

Wetland B contains aquatic bed and palustrine forested Cowardin vegetation classes. Dominant forested vegetation include red alder and western red cedar trees with an understory of Scouler's willow, Himalayan blackberry, and salmonberry. Along the periphery and within the ponded area, skunk cabbage, lady's thumb, yellow-flag iris, and watercress are present. The hydrologic soil indicator layer at DP-4 is depleted (10YR 4/1) loam with ten percent redoximorphic concentrations along pore linings and in the matrix. Oxidized rhizospheres are present. The primary hydrology inputs are ground water and Watercourse A, which is piped through a culvert underneath the gravel road

from Wetland A. Watercourse A exits Wetland B through a culvert in the manmade berm and via overbank flooding over the berm, as well.

It rates moderately for water quality function based on capacity to trap nutrients based on area of seasonal ponding and moderate coverage of persistent vegetation. The outlet is also constricted. Hydrologic function is moderate due to landscape position and limited live storage to slow and store potential flooding. Habitat function is moderate, but limited in landscape connectivity by surrounding development.

Wetland C

Wetland C is a palustrine forested slope-riverine wetland that continues along Watercourse A downstream of the man-made berm until the watercourse exits the subject property via a culvert under Island Crest Way. Dominant vegetation consists of western red-cedar, salmonberry, Himalayan blackberry, skunk cabbage, knotweed, lady's thumb, and various grasses. Soils are mapped by NRCS as Argents and Alderwood material at six to fifteen percent slopes (AmC). The primary hydrological inputs are Watercourse A and groundwater.

There is no recorded data point within Wetland C due to a separation of Wetland B and C into separate wetlands units after fieldwork within the office; however, as part of standard delineation methodology, the field ecologist team did regularly check soils, vegetation, and hydrology while hanging flags along the wetland boundary.

It rates moderately for water quality function based on capacity to trap nutrients via dense tree and shrub coverage and opportunity based on landscape position. Hydrologic function also is moderate based on ability of dense vegetation to slow flood waters. Habitat function is moderate, but limited in landscape connectivity by surrounding development.

Watercourse A

Watercourse A originates in Wetland A and flows west, exiting Wetland A via a culvert into Wetland B. Only parts of Watercourse A contained water at the time of the site visit. The bed was mostly silt with some cobble and gravel. Watercourse A is intermittent in this upstream segment.

Within Wetland B, Watercourse A loses stream definition. Water exists Wetland B through a constricted culvert under a manmade berm and via flooding over the berm in times of peak flooding. Bed and bank characteristics become defined once again as it exists the culvert and flows west through Wetland C before exiting via a culvert underneath Island Crest Way. Watercourse A is perennial through Wetlands B and C, with flowing water observed during this late summer site visit.

Watercourse A does not likely to support fish passage due to downstream segments of steep slopes of 20 percent or greater slope. These slope approximations are based on analysis of contours provided by both Mercer Island GIS mapping services and King County iMap.

Local Regulations

Wetlands and watercourses are regulated in the City of Mercer Island in the Mercer Island Municipal Code (MIMC), Chapter 19.07 "Environment".

Wetlands A, B, and C all rate as Category III wetlands under the 2004 rating system, summarized in Table 1. Per MIMC 19.07.080, they each have 50-foot standard buffers widths; the minimum buffer width permitted is also provided in the buffer summary below (Table 2).

Mercer Island permits buffer averaging or reduction of buffer widths, provided that no-net-loss of wetland function occurs. In the case of buffer averaging, total buffer area must also remain equivalent or greater after averaging and may not be less than the minimum buffer width at any point.

Table 1. Summary of 2004 Rating System wetland ratings and classification.

	HGM[1]	Water Quality	Hydrologic	Habitat	Total	Category
Wetland A	Depressional	14	20	16	50	III
Wetland B	Depressional	16	16	15	47	III
Wetland C	Riverine	14	16	15	45	III

[1] HGM = hydrogeomorphic classification

Type 2 Watercourses are defined as watercourses or reaches of watercourses with year-round flow, not used by fish, while Type 3 watercourses or reaches of watercourses have intermittent or seasonal flow and not used by fish. As described above, the high gradient (greater than 20%) precludes fish use as defined by the WAC 173-22-030. Watercourse A is typed as a Type 3 intermittent watercourse upstream of Wetland B within Wetland A, and is typed as a perennial Type 2 watercourse downstream of Wetland B. The water type break was determined based upon observations of flow (or lack thereof) at the time of the visit in late summer/ early fall of 2016.

Buffer widths are summarized below in Table 2 based on MIMC 19.07.070. Type 3 watercourses receive a 35-foot standard buffer width, while Type 2 watercourses receive a 25-foot standard buffer width. Watercourse segments within pipes or culverts also

receive a 25-foot standard buffer width. Buffer reduction may be permitted with submittal of a critical areas study and subject to guidelines listed in MIMC 19.07.070.B.2. Restoration of piped stream segments may only be permitted if it will result in improved function and will not increase the threat of other hazards, such as erosion or slope stability (MIMC 19.07.070.B.4).

Table 2. Wetland and watercourse buffer summary

	Category or Type	Standard Buffer[1]	Minimum Buffer Width with Enhancement[2]
Wetland A	III	50	25
Wetland B	III	50	25
Wetland C	III	50	25
Watercourse A (seasonal)	3	35	25
Watercourse A (perennial)	2	50	25
Watercourse A (piped)	Piped or Restored	25	Determined by MI official

[1] Buffer averaging permitted

[2] Buffer width reduction only permitted with no net loss of function

State and Federal Regulations

Wetlands are also regulated by the Corps under section 404 of the Clean Water Act. Any proposed filling or other direct impacts to Waters of the U.S., including wetlands (except isolated wetlands), would require notification and permits from the Corps. Wetlands A, B, and C would not considered isolated due to surface water connections. A formal isolated status inquiry can be requested from the Corps through the Jurisdictional Determination process. Note that a new Clean Water Rule for wetlands and other Waters of the U.S. went into effect in August 2015; however, the rule was recently "stayed" nationwide by the 6th Circuit Court due to pending litigation. Therefore, the prior rule is in effect until further notice.

Federally permitted actions that could affect endangered species may also require a biological assessment study and consultation with the U.S. Fish and Wildlife Service and/or the National Marine Fisheries Service. Application for Corps permits may also require an individual 401 Water Quality Certification and Coastal Zone Management Consistency determination from Ecology and a cultural resource study in accordance with Section 106 of the National Historic Preservation Act.

In general, neither the Corps nor Ecology regulates wetland buffers, unless direct impacts are proposed. When direct impacts are proposed, affected wetlands will need to be re-rated using the 2014 Update to the Wetland Rating System. Mitigated wetlands may be required to employ buffers based on Corps and Ecology joint regulatory guidance.

Disclaimer

The information contained in this letter or report is based on the application of technical guidelines currently accepted as the best available science and in conjunction with the manuals and criteria outlined in the methods section. All discussions, conclusions and recommendations reflect the best professional judgment of the author(s) and are based upon information available to us at the time the study was conducted. All work was completed within the constraints of budget, scope, and timing. The findings of this report are subject to verification and agreement by the appropriate local, State and Federal regulatory authorities. No other warranty, expressed or implied, is made.

Please call if you have any questions or if we can provide you with any additional information.

Sincerely,

Anna Hoenig
Ecologist

Enclosures

Figure 1. Wetland A, facing northeast corner of parcel

Figure 2. Wetland A, facing east; wood chip fill

Figure 3. Wetland B, facing south

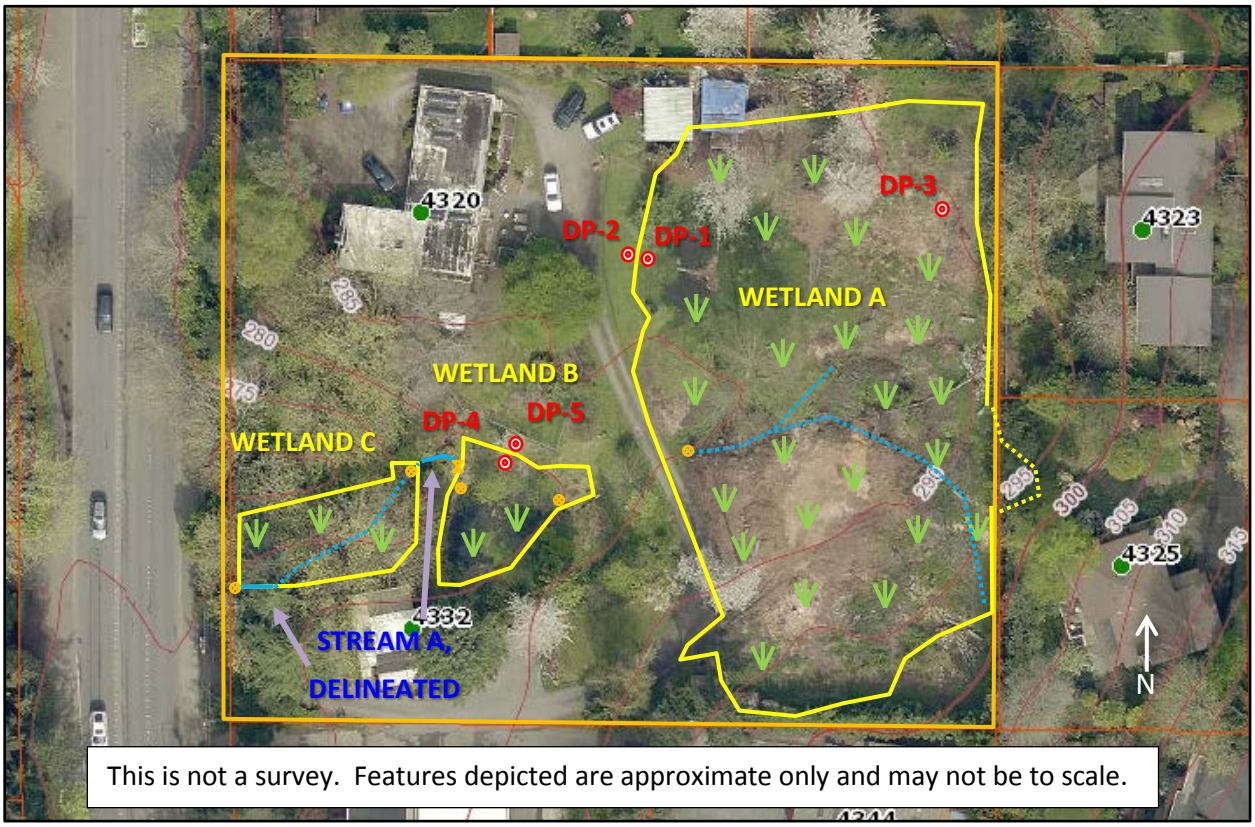
Figure 4. Wooden bridge over manmade berm, between Wetlands B and C

Figure 5. Wetland C: skunk cabbage, salmonberry, and Himalayan blackberry

Figure 2. Watercourse A exiting Wetland C, with culverts under Island Crest Way

THE WATERSHED COMPANY

750 Sixth Street South | Kirkland | WA 98033
p 425.822.5242 f 425.827.8136



Wetland Delineation Sketch

Parcel number: 1824059031
Jurisdiction: City of Mercer Island
Site visit: September 21, 2016
Prepared for: Alan Chiu

- Subject Parcel
- Approx. stream location
- Delineated stream
- Delineated wetland edge
- Approx. wetland edge off-site
- Wetland Area
- Data Point Location
- Culverts
- Bridge

Notes for Survey:

These notes supersede instructions written on field flagging due to post-processing modifications in office.

Data Points: 5 yellow- and black-stripped flag

Stream A: 8 blue- and white-stripped flags, limited segments delineated as follows

- Left OHWM only: WMA-1L to WMA-4L
- Left and right OHWM: WMA-5L to WMA -6L; WMA-1R to WMA-2R

Wetland A: 30 pink- and black-striped flags (A); do not connect A-9 to A-10.

Wetland B: 12 pink- and black-striped flags (B and BB); B-7 through B-15; BB-7 through BB-9; connect two lines to form closed unit.

Wetland C: 12 pink- and black-striped flags (B and BB); Connect stream flag WMA - 4L to wetland flag B-1; connect B-6 to BB-6; connect BB-1 to WMA-1L

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WETLAND DETERMINATION DATA FORM

Western Mountains, Valleys, and Coast Supplement to the 1987 COE Wetlands Delineation Manual

DP- 1

750 Sixth Street South
Kirkland, Washington 98033
(425) 822-5242
watershedco.com

Project Site:	**4320 Island Crest Way (parcel no. 1824059031)**	Sampling Date:	**9/21/2016**
Applicant/Owner:	**Alan Chiu**	Sampling Point:	DP- **1**
Investigator:	**R. Whitson, A. Hoenig**	City/County:	**Mercer Island / King**
Sect., Township, Range:	S **18** T **24N** R **5E**	State:	**WA**
Landform (hillslope, terrace, etc): **hillslope**	Slope (%): **<5**	Local relief (concave, convex, none): **none**	
Subregion (LRR): **A**	Lat:	Long:	Datum:
Soil Map Unit Name: **AmC- Argents, Alderwood material, 6-15 percent slopes**		NWI classification: **none listed**	

Are climatic/hydrologic conditions on the site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks.)
Are "Normal Circumstances" present on the site? ☐ Yes ☒ No
Are Vegetation☒, Soil ☐, or Hydrology ☐ significantly disturbed?
Are Vegetation☐, Soil ☐, or Hydrology ☐ naturally problematic (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☒	No ☐	**Is the Sampling Point within a Wetland?**	Yes ☒	No ☐
Hydric Soils Present?	Yes ☒	No ☐			
Wetland Hydrology Present?	Yes ☒	No ☐			

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 5m diam.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 3m diam.)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 1m diam.)			
1. ***Ranunculus repens***	**95**	**Y**	**FAC**
2. **Grasses (mowed, presumed FAC)**	**20**	**N**	**FAC***
3. ***Convolvulus arvensis***	**30**	**Y**	**FACU**
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	145 = Total Cover		
Woody Vine Stratum (Plot size:)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum:

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC:	**1**	(A)
Total Number of Dominant Species Across All Strata:	**2**	(B)
Percent of Dominant Species that are OBL, FACW, or FAC:	**50**	(A/B)

Prevalence Index Worksheet

	Total % Cover of	Multiply by
OBL species		x 1 =
FACW species		x 2 =
FAC species	**115**	x 3 = **345**
FACU species	**30**	x 4 = **120**
UPL species		x 5 =
Column totals	(A) 145	(B) 465

Prevalence Index = B / A = **3.2**

Hydrophytic Vegetation Indicators

- ☐ Dominance test is > 50%
- ☐ Prevalence test is ≤ 3.0 *
- ☐ Morphological Adaptations * (provide supporting data in remarks or on a separate sheet)
- ☐ Wetland Non-Vascular Plants *
- ☒ Problematic Hydrophytic Vegetation * (explain)

* Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic Vegetation Present? Yes ☒ No ☐

Remarks: **Bindweed is aggressive and invasive; since it is prevalent throughout site, in obviously wetland areas as well upland areas, it is considered problematic. When excluded based on this factor, the dominance test is 100% dominant FAC or wetter species. Hydrology and soil indicators are also present (see next page).**

SOIL **Sampling Point – DP-1**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-8	**10YR 2/2**	**100**					**Gravelly loam**	**Trace redox**
8-14	**10YR 3/2**	**93**	**5YR 4/6**	**7**	**C**	**M, PL**	**Gravelly loam**	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains

[2]Loc: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☒ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]

- ☐ 2cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)
- ☐

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric soil present? Yes ☒ No ☐

Remarks: **Medium to large gravel in both layers**

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required: check all that apply):

- ☐ Surface water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (**except MLRA 1, 2, 4A & 4B**) (B9)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☒ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☐ Other (explain in remarks)

Secondary Indicators (2 or more required):

- ☐ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A & 4B**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (**LRR A**)
- ☐ Frost-Heave Hummocks

Field Observations

Surface Water Present?	Yes ☐	No ☒	Depth (in):
Water Table Present?	Yes ☐	No ☒	Depth (in):
Saturation Present? (includes capillary fringe)	Yes ☐	No ☒	Depth (in):

Wetland Hydrology Present? Yes ☒ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

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WETLAND DETERMINATION DATA FORM

Western Mountains, Valleys, and Coast Supplement to the 1987 COE Wetlands Delineation Manual

DP- 2

750 Sixth Street South
Kirkland, Washington 98033
(425) 822-5242
watershedco.com

Project Site:	**4320 Island Crest Way (parcel no. 1824059031)**	Sampling Date:	**9/21/2016**
Applicant/Owner:	**Alan Chiu**	Sampling Point:	DP- **2**
Investigator:	**R. Whitson, A. Hoenig**	City/County:	**Mercer Island / King**
Sect., Township, Range:	S **18** T **24N** R **5E**	State:	**WA**

Landform (hillslope, terrace, etc): **top of hill**	Slope (%): **0**	Local relief (concave, convex, none): **convex**
Subregion (LRR): **A**	Lat:	Long: Datum:
Soil Map Unit Name: **AmC- Argents, Alderwood material, 6-15 percent slopes**		NWI classification: **none listed**

Are climatic/hydrologic conditions on the site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks.)
Are "Normal Circumstances" present on the site? ☐ Yes ☒ No
Are Vegetation☒, Soil ☐, or Hydrology ☐ significantly disturbed?
Are Vegetation☐, Soil ☐, or Hydrology ☐ naturally problematic (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☐	No ☒			
Hydric Soils Present?	Yes ☐	No ☒	**Is the Sampling Point within a Wetland?**	Yes ☐	No ☒
Wetland Hydrology Present?	Yes ☐	No ☒			

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 5m diam.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 3m diam.)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 1m diam.)			
1. ***Achillea millefolium***	**30**	**Y**	**FACU**
2. **Grasses (mowed, presumed FAC)**	**10**	**N**	**FAC**
3. ***Taraxacum officinale***	**30**	**Y**	**FACU**
4. ***Ranunculus repens***	**30**	**Y**	**FAC**
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	100 = Total Cover		
Woody Vine Stratum (Plot size:)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum:

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: **1** (A)
Total Number of Dominant Species Across All Strata: **3** (B)
Percent of Dominant Species that are OBL, FACW, or FAC: **33** (A/B)

Prevalence Index Worksheet

	Total % Cover of	Multiply by
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column totals	(A)	(B)

Prevalence Index = B / A =

Hydrophytic Vegetation Indicators

☐ Dominance test is > 50%
☐ Prevalence test is ≤ 3.0 *
☐ Morphological Adaptations * (provide supporting data in remarks or on a separate sheet)
☐ Wetland Non-Vascular Plants *
☐ Problematic Hydrophytic Vegetation * (explain)

* Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic Vegetation Present? Yes ☐ No ☒

Remarks:

SOIL **Sampling Point – DP-2**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-12	**10YR 3/2**	**100**					**Gravelly loam**	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains

[2]Loc: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]

- ☐ 2cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)
- ☐

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric soil present? Yes ☐ No ☒

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required: check all that apply):

- ☐ Surface water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (**except MLRA 1, 2, 4A & 4B**) (B9)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☐ Other (explain in remarks)

Secondary Indicators (2 or more required):

- ☐ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A & 4B**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (**LRR A**)
- ☐ Frost-Heave Hummocks

Field Observations

Surface Water Present? Yes ☐ No ☒ Depth (in):

Water Table Present? Yes ☐ No ☒ Depth (in):

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (in):

Wetland Hydrology Present? Yes ☐ No ☒

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

THE WATERSHED COMPANY

WETLAND DETERMINATION DATA FORM

Western Mountains, Valleys, and Coast Supplement to the 1987 COE Wetlands Delineation Manual

DP- 3

750 Sixth Street South
Kirkland, Washington 98033
(425) 822-5242
watershedco.com

Project Site:	**4320 Island Crest Way (parcel no. 1824059031)**	Sampling Date:	**9/21/2016**
Applicant/Owner:	**Alan Chiu**	Sampling Point:	DP- **1**
Investigator:	**R. Whitson, A. Hoenig**	City/County:	**Mercer Island / King**
Sect., Township, Range:	S **18** T **24N** R **5E**	State:	**WA**
Landform (hillslope, terrace, etc): **hillslope**	Slope (%): **2**	Local relief (concave, convex, none): **none**	
Subregion (LRR): **A**	Lat:	Long:	Datum:
Soil Map Unit Name: **AmC- Argents, Alderwood material, 6-15 percent slopes**		NWI classification: **none listed**	

Are climatic/hydrologic conditions on the site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks.)
Are "Normal Circumstances" present on the site? ☒ Yes ☐ No
Are Vegetation☐, Soil ☐, or Hydrology ☐ significantly disturbed?
Are Vegetation☐, Soil ☐, or Hydrology ☐ naturally problematic (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☒	No ☐	**Is the Sampling Point within a Wetland?**	Yes ☒	No ☐
Hydric Soils Present?	Yes ☒	No ☐			
Wetland Hydrology Present?	Yes ☒	No ☐			

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 5m diam.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 3m diam.)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 1m diam.)			
1. ***Chamerion angustifolium***	**10**	**N**	**FACU**
2. ***Equisetum telmateia***	**60**	**Y**	**FACW**
3. ***Juncus effusus***	**40**	**Y**	**FACW**
4. ***Phalaris arundinacea***	**60**	**Y**	**FACW**
5. **Other grasses (presumed FAC)**	**20**	**N**	**FAC**
6. ***Veronica americana***	**2**	**N**	**OBL**
7. ***Convolvulus arvensis***	**2**	**N**	**FACU**
8.			
9.			
10.			
11.			
	194 = Total Cover		
Woody Vine Stratum (Plot size:)			
1. ***Rubus armeniacus***	**<5**	**N**	**FAC**
2.			
	= Total Cover		
% Bare Ground in Herb Stratum:			

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: **3** (A)
Total Number of Dominant Species Across All Strata: **3** (B)
Percent of Dominant Species that are OBL, FACW, or FAC: **100** (A/B)

Prevalence Index Worksheet

	Total % Cover of	Multiply by
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column totals	(A)	(B)

Prevalence Index = B / A =

Hydrophytic Vegetation Indicators

☒ Dominance test is > 50%
☐ Prevalence test is ≤ 3.0 *
☐ Morphological Adaptations * (provide supporting data in remarks or on a separate sheet)
☐ Wetland Non-Vascular Plants *
☐ Problematic Hydrophytic Vegetation * (explain)

* Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic Vegetation Present? Yes ☒ No ☐

Remarks:

SOIL **Sampling Point – DP-3**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-8	**10YR 2/2**	**100**					**Loam**	
8-14	**10YR 2/2 10YR 4/2**	**20 40**	**- 7.5YR 4/6**	**- 40**	**- C**	**- M, PL**	**Sandy loam**	**Mixed matrix**

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains [2]Loc: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]

- ☐ 2cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☒ Other (explain in remarks)
- ☐

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric soil present? Yes ☒ No ☐

Remarks: **Mixed/jumbled; strong redox**

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required: check all that apply):

- ☐ Surface water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (**except MLRA 1, 2, 4A & 4B**) (B9)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☒ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☐ Other (explain in remarks)

Secondary Indicators (2 or more required):

- ☐ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A & 4B**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☒ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (**LRR A**)
- ☐ Frost-Heave Hummocks

Field Observations

Surface Water Present? Yes ☒ No ☐ Depth (in):

Water Table Present? Yes ☒ No ☐ Depth (in):

Saturation Present? (includes capillary fringe) Yes ☒ No ☐ Depth (in):

Wetland Hydrology Present? Yes ☒ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

THE WATERSHED COMPANY

WETLAND DETERMINATION DATA FORM

Western Mountains, Valleys, and Coast Supplement to the 1987 COE Wetlands Delineation Manual

DP- 4

750 Sixth Street South
Kirkland, Washington 98033
(425) 822-5242
watershedco.com

Project Site:	**4320 Island Crest Way (parcel no. 1824059031)**	Sampling Date:	**9/21/2016**
Applicant/Owner:	**Alan Chiu**	Sampling Point:	DP- **1**
Investigator:	**R. Whitson, A. Hoenig**	City/County:	**Mercer Island / King**
Sect., Township, Range:	S **18** T **24N** R **5E**	State:	**WA**

Landform (hillslope, terrace, etc): **hillslope**	Slope (%): **2**	Local relief (concave, convex, none): **concave**
Subregion (LRR): **A**	Lat:	Long: Datum:
Soil Map Unit Name: **AmC- Argents, Alderwood material, 6-15 percent slopes**		NWI classification: **none listed**

Are climatic/hydrologic conditions on the site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks.)
Are "Normal Circumstances" present on the site? ☒ Yes ☐ No
Are Vegetation☐, Soil ☐, or Hydrology ☐ significantly disturbed?
Are Vegetation☐, Soil ☐, or Hydrology ☐ naturally problematic (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☒	No ☐	**Is the Sampling Point within a Wetland?**	Yes ☒	No ☐
Hydric Soils Present?	Yes ☒	No ☐			
Wetland Hydrology Present?	Yes ☒	No ☐			

Remarks: **Slope above pond, Wetland B**

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 5m diam.)	Absolute % Cover	Dominant Species?	Indicator Status
1. ***Salix scouleriana***	**30**	**Y**	**FAC**
2. ***Alnus rubra***	**25**	**Y**	**FAC**
3.			
4.			
	55	= Total Cover	
Sapling/Shrub Stratum (Plot size: 3m diam.)			
1.			
2.			
3.			
4.			
5.			
		= Total Cover	
Herb Stratum (Plot size: 1m diam.)			
1. ***Juncus effusus***	**30**	**Y**	**FACW**
2. ***Convolvulus arvensis***	**5**	**N**	**FACU**
3. ***Iris pseudacoris***	**2**	**N**	**OBL**
4. ***Ranunculus repens***	**10**	**N**	**FAC**
5. ***Equisetum telmateia***	**90**	**Y**	**FACW**
6.			
7.			
8.			
9.			
10.			
11.			
	137	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum:

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: **4** (A)

Total Number of Dominant Species Across All Strata: **4** (B)

Percent of Dominant Species that are OBL, FACW, or FAC: **100** (A/B)

Prevalence Index Worksheet

	Total % Cover of	Multiply by
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column totals	(A)	(B)

Prevalence Index = B / A =

Hydrophytic Vegetation Indicators

☒ Dominance test is > 50%
☐ Prevalence test is ≤ 3.0 *
☐ Morphological Adaptations * (provide supporting data in remarks or on a separate sheet)
☐ Wetland Non-Vascular Plants *
☐ Problematic Hydrophytic Vegetation * (explain)

* Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic Vegetation Present? Yes ☒ No ☐

Remarks:

SOIL **Sampling Point – DP-4**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-6	**10YR 3/2**	**100**					**Loam**	
6-12	**10YR 4/1**	**90**	**7.5YR 4/6**	**10**	**C**	**PL, M**	**loam**	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains

[2]Loc: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ☐ Loamy Gleyed Matrix (F2)
- ☒ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]

- ☐ 2cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)
- ☐

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric soil present? Yes ☒ No ☐

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required: check all that apply):

- ☐ Surface water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (**except MLRA 1, 2, 4A & 4B**) (B9)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☒ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☐ Other (explain in remarks)

Secondary Indicators (2 or more required):

- ☐ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A & 4B**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☒ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (**LRR A**)
- ☐ Frost-Heave Hummocks

Field Observations

Surface Water Present?	Yes ☐	No ☒	Depth (in):
Water Table Present?	Yes ☐	No ☒	Depth (in):
Saturation Present? (includes capillary fringe)	Yes ☐	No ☒	Depth (in):

Wetland Hydrology Present? Yes ☒ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: **Depleted layer is damp, upper layer is dry, no saturation- summer/early fall delineation**

THE WATERSHED COMPANY

WETLAND DETERMINATION DATA FORM

Western Mountains, Valleys, and Coast Supplement to the 1987 COE Wetlands Delineation Manual

DP- 5

750 Sixth Street South
Kirkland, Washington 98033
(425) 822-5242
watershedco.com

Project Site:	**4320 Island Crest Way (parcel no. 1824059031)**	Sampling Date:	**9/21/2016**
Applicant/Owner:	**Alan Chiu**	Sampling Point:	DP- **5**
Investigator:	**R. Whitson, A. Hoenig**	City/County:	**Mercer Island / King**
Sect., Township, Range:	S **18** T **24N** R **5E**	State:	**WA**
Landform (hillslope, terrace, etc): **hillslope**	Slope (%): **<1**	Local relief (concave, convex, none): **none**	
Subregion (LRR): **A**	Lat:	Long:	Datum:
Soil Map Unit Name: **AmC- Argents, Alderwood material, 6-15 percent slopes**		NWI classification: **none listed**	

Are climatic/hydrologic conditions on the site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks.)
Are "Normal Circumstances" present on the site? ☒ Yes ☐ No
Are Vegetation☐, Soil ☐, or Hydrology ☐ significantly disturbed?
Are Vegetation☐, Soil ☐, or Hydrology ☐ naturally problematic (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☐	No ☒	**Is the Sampling Point within a Wetland?**	Yes ☐	No ☒
Hydric Soils Present?	Yes ☐	No ☒			
Wetland Hydrology Present?	Yes ☐	No ☒			

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 5m diam.)	Absolute % Cover	Dominant Species?	Indicator Status
1. ***Prunus avium***	**5**	**Y**	**FACU**
2.			
3.			
4.			
	5 = Total Cover		
Sapling/Shrub Stratum (Plot size: 3m diam.)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 1m diam.)			
1. ***Dactylis glomerata***	**20**	**N**	**FACU**
2. ***Ranunculus repens***	**20**	**N**	**FAC**
3. ***Phalaris arundinacea***	**2**	**N**	**FACW**
4. ***Taraxacum officinale***	**40**	**Y**	**FACU**
5. ***Equisetum telmateia***	**2**	**N**	**FACW**
6. **Other grasses (presumed FAC)**	**60**	**Y**	**FAC**
7. ***Holcus lanatus***	**30**	**N**	**FAC**
8.			
9.			
10.			
11.			
	174 = Total Cover		
Woody Vine Stratum (Plot size:)			
1.			
2.			
	= Total Cover		
% Bare Ground in Herb Stratum:			

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: **1** (A)

Total Number of Dominant Species Across All Strata: **3** (B)

Percent of Dominant Species that are OBL, FACW, or FAC: **33** (A/B)

Prevalence Index Worksheet

	Total % Cover of	Multiply by
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column totals	(A)	(B)

Prevalence Index = B / A =

Hydrophytic Vegetation Indicators

☐ Dominance test is > 50%
☐ Prevalence test is ≤ 3.0 *
☐ Morphological Adaptations * (provide supporting data in remarks or on a separate sheet)
☐ Wetland Non-Vascular Plants *
☐ Problematic Hydrophytic Vegetation * (explain)

* Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic Vegetation Present? Yes ☐ No ☒

Remarks:

SOIL **Sampling Point – DP-5**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-16	**10YR 3/3**	**100**					**loam**	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains [2]Loc: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]

- ☐ 2cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)
- ☐

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric soil present? Yes ☐ No ☒

Remarks: **dry**

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required: check all that apply):

- ☐ Surface water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (**except MLRA 1, 2, 4A & 4B**) (B9)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☐ Other (explain in remarks)

Secondary Indicators (2 or more required):

- ☐ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A & 4B**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (**LRR A**)
- ☐ Frost-Heave Hummocks

Field Observations

Surface Water Present? Yes ☐ No ☒ Depth (in):

Water Table Present? Yes ☐ No ☒ Depth (in):

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (in):

Wetland Hydrology Present? Yes ☐ No ☒

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND RATING FORM – WESTERN WASHINGTON
Version 2 – Updated July 2006 to increase accuracy and reproducibility among users
Updated Oct 2008 with the new WDFW definitions for priority habitats

Name of wetland: Wetland A Date of Site visit: 9/21/2016

Rated by: R. Whitson, A. Hoenig Trained by Ecology? Yes☒ No☐ Date of Training: 3/2015, 10/2015*

SEC: 18 TWNSHP: 24N RNGE: 05E Is S/T/R in Appendix D? Yes☐ No ☒

**training for new 2014 Update, not 2004 system*

SUMMARY OF RATING

Category based on FUNCTIONS provided by wetland

I ☐ II ☐ III ☒ IV ☐

Category I = Score ≥70
Category II = Score 51-69
Category III = Score 30-50
Category IV = Score < 30

Score for Water Quality Functions	14
Score for Hydrologic Functions	20
Score for Habitat Functions	16
TOTAL score for functions	**50**

Category based on SPECIAL CHARACTERISTICS of wetland

I ☐ II ☐ Does not Apply ☒

Final Category (choose the "highest" category from above) **III**

Check the appropriate type and class of wetland being rated.

Wetland Type		Wetland Class	
Estuarine	☐	**Depressional**	☒
Natural Heritage Wetland	☐	**Riverine**	☐
Bog	☐	**Lake-fringe**	☐
Mature Forest	☐	**Slope**	☐
Old Growth Forest	☐	**Flats**	☐
Coastal Lagoon	☐	**Freshwater Tidal**	☐
Interdunal	☐		
None of the above	☐	Check if unit has multiple HGM classes present	☒

Does the wetland unit being rated meet any of the criteria below?

If you answer YES to any of the questions below you will need to protect the wetland according to the regulations regarding the special characteristics found in the wetland.

Check List for Wetlands That May Need Additional Protection (in addition to the protection recommended for its category)	YES	NO
SP1. *Has the wetland unit been documented as a habitat for any Federally listed Threatened or Endangered **animal** or **plant** species (T/E species)?* For the purposes of this rating system, "documented" means the wetland is on the appropriate state or federal database.		X*
SP2. *Has the wetland unit been documented as habitat for any State listed Threatened or Endangered **animal** species?* For the purposes of this rating system, "documented" means the wetland is on the appropriate state database. Note: Wetlands with State listed plant species are categorized as Category I Natural Heritage Wetlands (see p. 19 of data form).		X*
SP3. *Does the wetland unit contain individuals of Priority species listed by the WDFW for the state?*		X*
SP4. *Does the wetland unit have a local significance in addition to its functions*? For example, the wetland has been identified in the Shoreline Master Program, the Critical Areas Ordinance, or in a local management plan as having special significance.		X

***The study area was reviewed for the presence of endangered, threatened, and priority species using WDFW online Priority Habitat and Species Data, PHS on the Web (http://wdfw.wa.gov/mapping/phs/).**

To complete the next part of the data sheet you will need to determine the Hydrogeomorphic Class of the wetland being rated.

The hydrogeomorphic classification groups wetlands into those that function in similar ways. Classifying the wetland first simplifies the questions needed to answer how it functions. The Hydrogeomorphic Class of a wetland can be determined using the key below. See p. 24 for more detailed instructions on classifying wetlands.

Classification of Wetland Units in Western Washington

If the hydrologic criteria listed in each question do not apply to the entire unit being rated, you probably have a unit with multiple HGM classes. In this case, identify which hydrologic criteria in Questions 1-7 apply, and go to Question 8.

1. Are the water levels in the wetland unit usually controlled by tides (i.e. except during floods)?

☒ NO – go to 2 ☐ **YES** – the wetland class is **Tidal Fringe**

If yes, is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)? **YES – Freshwater Tidal Fringe NO – Saltwater Tidal Fringe (Estuarine)**

*If your wetland can be classified as a Freshwater Tidal Fringe use the forms for **Riverine** wetlands. If it is Saltwater Tidal Fringe it is rated as an **Estuarine** wetland.* Wetlands that were called estuarine in the first and second editions of the rating system are called Salt Water Tidal Fringe in the Hydrogeomorphic Classification. Estuarine wetlands were categorized separately in the earlier editions, and this separation is being kept in this revision. To maintain consistency between editions, the term "Estuarine" wetland is kept. Please note, however, that the characteristics that define Category I and II estuarine wetlands have changed (see p.).

2. The entire wetland unit is flat and precipitation is only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit

☒ NO – go to 3 ☐ **YES** – The wetland class is **Flats**

If your wetland can be classified as a "Flats" wetland, use the form for **Depressional** wetlands.

3. Does the entire wetland unit **meet both** of the following criteria?

☐ The vegetated part of the wetland is on the shores of a body of open water (without any vegetation on the surface) at least 20 acres (8 ha) in size;

☐ At least 30% of the open water area is deeper than 6.6 ft (2 m)?

☒NO – go to 4 ☐**YES –** The wetland class is **Lake-fringe (Lacustrine Fringe)**

4. Does the entire wetland unit **meet all** of the following criteria?

☐ The wetland is on a slope (*slope can be very gradual*),

☐ The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks.

☐ The water leaves the wetland **without being impounded**?

NOTE: *Surface water does not pond in these types of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3ft diameter and less than a foot deep).*

☒ NO – go to 5 ☐ **YES –** The wetland class is **Slope**

5. Does the entire wetland unit **meet all** of the following criteria?

☐ The unit is in a valley, or stream channel, where it gets inundated by overbank flooding from that stream or river.

☐ The overbank flooding occurs at least once every two years

NOTE: The riverine unit can contain depressions that are filled with water when the river is not flooding.

☒ NO - go to 6 ☐ **YES** – The wetland class is **Riverine**

6. Is the entire wetland unit in a topographic depression in which water ponds, or is saturated to the surface, at some time during the year. *This means that any outlet, if present, is higher than the interior of the wetland.*

☒ NO – go to 7 ☐ **YES –** The wetland class is **Depressional**

7. Is the entire wetland unit located in a very flat area with no obvious depression and no overbank flooding. The unit does not pond surface water more than a few inches. The unit seems to be maintained by high groundwater in the area. The wetland may be ditched, but has no obvious natural outlet.

☒ NO – go to 8 ☐ **YES –** The wetland class is **Depressional**

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM classes. For example, seeps at the base of a slope may grade into a riverine floodplain, or a small stream within a depressional wetland has a zone of flooding along its sides. GO BACK AND IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-7 APPLY TO DIFFERENT AREAS IN THE UNIT (make a rough sketch to help you decide). Use the following table to identify the appropriate class to use for the rating system if you have several HGM classes present within your wetland. NOTE: Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the class listed in column 2 is less than 10% of the unit, classify the wetland using the class that represents more than 90% of the total area.

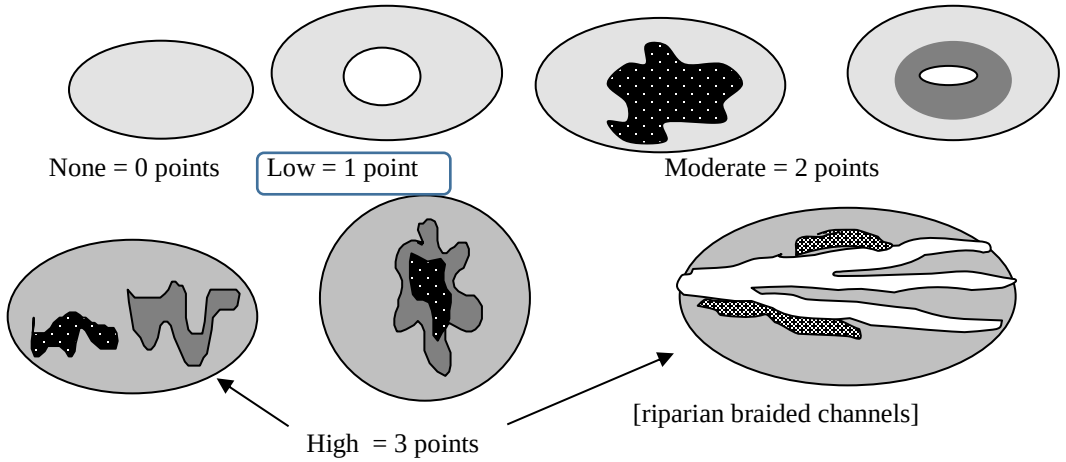
HGM classes within the wetland unit being rated	*HGM Class to Use in Rating*
Slope + Riverine	Riverine
Slope + Depressional	Depressional
Slope + Lake-fringe	Lake-fringe
Depressional + Riverine along stream within boundary	Depressional
Depressional + Lake-fringe	Depressional
Salt Water Tidal Fringe and any other class of freshwater wetland	Treat as ESTUARINE under wetlands with special characteristics

If you are unable still to determine which of the above criteria apply to your wetland, or you have more than 2 HGM classes within a wetland boundary, classify the wetland as **Depressional** for the rating.

D	Depressional and Flats Wetlands	Points
	WATER QUALITY FUNCTIONS - Indicators that wetland functions to improve water quality	
D	**D 1. Does the wetland have the potential to improve water quality?**	***(see p. 38)***
D	D 1.1 Characteristics of surface water flows out of the wetland: Unit is a depression with no surface water leaving it (no outlet) .....points = 3 Unit has an intermittently flowing, or highly constricted permanently flowing outlet .....points = 2 Unit has an unconstricted, or slightly constricted, surface outlet *(permanently flowing)*..points = 1 Unit is a "flat" depression (Q.7 on key), or in the Flats class, with permanent surface outflow **and no obvious natural outlet**, and/or outlet is a man-made ditch .....points = 1 (*If ditch is not permanently flowing treat unit as "intermittently flowing")*	2
D	D 1.2 The soil 2 inches below the surface (or duff layer) is clay or organic (*use NRCS definitions*). YES points = 4 NO points = 0	0
D	D 1.3 Characteristics of persistent vegetation (emergent, shrub, and/or forest Cowardin class): Wetland has persistent, ungrazed, vegetation > = 95% of area .....points = 5 Wetland has persistent, ungrazed, vegetation > = 1/2 of area .....points = 3 Wetland has persistent, ungrazed vegetation > = 1/10 of area .....points = 1 Wetland has persistent, ungrazed vegetation <1/10 of area .....points = 0	5
D	D1.4 Characteristics of seasonal ponding or inundation. *This is the area of the wetland unit that is ponded for at least 2 months, but dries out sometime during the year. Do not count the area that is permanently ponded. Estimate area as the average condition 5 out of 10 yrs.* Area seasonally ponded is > ½ total area of wetland .....points = 4 Area seasonally ponded is > ¼ total area of wetland .....points = 2 Area seasonally ponded is < ¼ total area of wetland .....points = 0 NOTE: *See text for indicators of seasonal and permanent inundation.*	0
D	**Total for D 1** *Add the points in the boxes above*	7
D	**D 2. Does the wetland unit have the opportunity to improve water quality?** Answer YES if you know or believe there are pollutants in groundwater or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes or groundwater downgradient from the wetland? *Note which of the following conditions provide the sources of pollutants. A unit may have pollutants coming from several sources, but any single source would qualify as opportunity.* ☐ Grazing in the wetland or within 150 ft ☐ Untreated stormwater discharges to wetland ☐ Tilled fields or orchards within 150 ft of wetland ☐ A stream or culvert discharges into wetland that drains developed areas, residential areas, farmed fields, roads, or clear-cut logging ☒ Residential, urban areas, golf courses are within 150 ft of wetland ☐ Wetland is fed by groundwater high in phosphorus or nitrogen ☐ Other_____ **YES** multiply score in D 1. **by 2** **NO** multiply score in D 1. **by 1**	***(see p. 44)*** multiplier 2
D	**TOTAL - Water Quality Functions** Multiply the score from D1 by D2 ***Add score to table on p. 1***	**14**

D	**Depresssional and Flats Wetlands**	
	HYDROLOGIC FUNCTIONS - Indicators that wetland functions to reduce flooding and stream degradation	
	D 3. Does the wetland have the potential to reduce flooding and erosion?	***(see p. 46)***
D	D 3.1 Characteristics of surface water flows out of the wetland unit Unit is a depression with no surface water leaving it (no outlet) .....points = 4 Unit has an intermittently flowing, or highly constricted permanently flowing outlet .....points = 2 Unit is a "flat" depression (Q.7 on key), or in the Flats class, with permanent surface outflow **and no obvious natural outlet**, and/or outlet is a man-made ditch .....points = 1 (*If ditch is not permanently flowing treat unit as "intermittently flowing")* Unit has an unconstricted, or slightly constricted, surface outlet (*permanently flowing*)..points = 0	2
D	D 3.2 Depth of storage during wet periods *Estimate the height of ponding above the bottom of the outlet For units with no outlet measure from the surface of permanent water or deepest part (if dry).* Marks of ponding are at least 3 ft or more above the surface or bottom of outlet .....points = 7 The wetland is a "headwater" wetland".....points = 5 Marks of ponding between 2 ft to < 3 ft from surface or bottom of outlet .....points = 5 Marks are at least 0.5 ft to < 2 ft from surface or bottom of outlet.....points = 3 Unit is flat (yes to Q.2 or Q.7 on key) but has small depressions on the surface that trap water.....points = 1 Marks of ponding less than 0.5 ft .....points = 0	5
D	D 3.3 Contribution of wetland unit to storage in the watershed *Estimate the ratio of the area of upstream basin contributing surface water to the wetland to the area of the wetland unit itself.* The area of the basin is less than 10 times the area of the unit.....points = 5 The area of the basin is 10 to 100 times the area of the unit.....points = 3 The area of the basin is more than 100 times the area of the unit.....points = 0 Entire unit is in the FLATS class.....points = 5	3
D	**Total for D 3** *Add the points in the boxes above*	10
D	**D 4. Does the wetland unit have the opportunity to reduce flooding and erosion?** Answer YES if the unit is in a location in the watershed where the flood storage, or reduction in water velocity, it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows. Answer NO if the water coming into the wetland is controlled by a structure such as flood gate, tide gate, flap valve, reservoir etc. OR you estimate that more than 90% of the water in the wetland is from groundwater in areas where damaging groundwater flooding does not occur. *Note which of the following conditions apply.* ☒ Wetland is in a headwater of a river or stream that has flooding problems ☐ Wetland drains to a river or stream that has flooding problems ☐ Wetland has no outlet and impounds surface runoff water that might otherwise flow into a river or stream that has flooding problems ☐ Other _____ ☒ **YES** multiplier is **2** ☐ **NO** multiplier is **1**	*(see p. 49)* **2** multiplier
D	**TOTAL - Hydrologic Functions** Multiply the score from D 3 by D 4 ***Add score to table on p. 1***	**20**

These questions apply to wetlands of all HGM classes. **HABITAT FUNCTIONS - Indicators that wetland functions to provide important habitat**	
H 1. Does the wetland have the potential to provide habitat for many species?	
H 1.1 Vegetation structure ***(see p. 72)*** *Check the types of vegetation classes present (as defined by Cowardin) if the class is ¼ acre or covers more than 10% of the area of the wetland if unit smaller than 2.5 acres.* ☐ Aquatic bed ☐ Emergent plants ☐ Scrub/shrub (areas where shrubs have >30% cover) ☒ Forested (areas where trees have >30% cover) ☒ Forested areas have 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the forested polygon *Add the number of vegetation types that qualify. If you have:* 4 structures or more.....points = 4 3 structures.....points = 2 2 structures.....points = 1 1 structure.....points = 0	1
H 1.2. Hydroperiods ***(see p. 73)*** *Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or ¼ acre to count. (see text for descriptions of hydroperiods)* ☐ Permanently flooded or inundated ☒ Seasonally flooded or inundated ☐ Occasionally flooded or inundated ☒ Saturated only 4 or more types present .....points = 3 3 types present.....points = 2 2 types present .....points = 1 1 types present…….points = 0 ☐ Permanently flowing stream or river in, or adjacent to, the wetland ☒ Seasonally flowing stream in, or adjacent to, the wetland ☐ ***Lake-fringe wetland* = 2 points** ☐ ***Freshwater tidal wetland* = 2 points**	2
H 1.3. Richness of Plant Species ***(see p. 75)*** Count the number of plant species in the wetland that cover at least 10 ft^2. (*different patches of the same species can be combined to meet the size threshold)* *You do not have to name the species.* *Do not include Eurasian milfoil, reed canarygrass, purple loosestrife, Canadian thistle* If you counted: > 19 species.....points = 2 5 - 19 species.....points = 1 < 5 species.....points = 0 *List species below if you want to:*	2

H 1.4. Interspersion of habitats ***(see p. 76)*** Decide from the diagrams below whether interspersion between Cowardin vegetation classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, medium, low, or none.  None = 0 points Low = 1 point Moderate = 2 points [riparian braided channels] High = 3 points NOTE: If you have four or more vegetation types or three vegetation types and open water the rating is always "high".	1
H 1.5. Special Habitat Features: ***(see p. 77)*** *Check the habitat features that are present in the wetland. The number of checks is the number of points you put into the next column.* ☒ Large, downed, woody debris within the wetland (>4in. diameter and 6 ft long). ☒ Standing snags (diameter at the bottom > 4 inches) in the wetland ☐ Undercut banks are present for at least 6.6 ft (2m) and/or overhanging vegetation extends at least 3.3 ft (1m) over a stream for at least 33 ft (10m) ☐ Stable steep banks of fine material that might be used by beaver or muskrat for denning (>30degree slope) OR signs of recent beaver activity are present ☐ At least ¼ acre of thin-stemmed persistent vegetation or woody branches are present in areas that are permanently or seasonally inundated.*(structures for egg-laying by amphibians)* ☐ Invasive plants cover less than 25% of the wetland area in each stratum of plants *Note: The 20% stated in early printings of the manual on page 78 is an error.*	2
H 1. TOTAL Score - potential for providing habitat *Add the scores from H1.1, H1.2, H1.3, H1.4, H1.5*	8

H 2. Does the wetland have the opportunity to provide habitat for many species?	
H 2.1 Buffers ***(see p. 80)*** *Choose the description that best represents condition of buffer of wetland. The highest scoring criterion that applies to the wetland is to be used in the rating. See text for definition of "undisturbed."* ☐ 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% of circumference. No developed areas within undisturbed part of buffer. (relatively undisturbed also means no-grazing) ..... Points = 5 ☐ 100 m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 50% circumference. ..... Points = 4 ☐ 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% circumference. ..... Points = 4 ☐ 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 25% circumference ..... Points = 3 ☐ 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water for > 50% circumference. ..... Points = 3 **If buffer does not meet any of the criteria above** ☐ No paved areas (except paved trails) or buildings within 25 m (80ft) of wetland > 95% circumference. Light to moderate grazing, or lawns are OK. ..... Points = 2 ☐ No paved areas or buildings within 50m of wetland for >50% circumference. Light to moderate grazing, or lawns are OK. ..... Points = 2 ☐ Heavy grazing in buffer. ..... Points = 1 ☐ Vegetated buffers are <2m wide (6.6ft) for more than 95% of the circumference (e.g. tilled fields, paving, basalt bedrock extend to edge of wetland ..... Points = 0 ☒ Buffer does not meet any of the criteria above……..……...Points = 1	1
H 2.2 Corridors and Connections ***(see p. 81)*** H 2.2.1 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 150 ft wide, has at least 30% cover of shrubs, forest or native undisturbed prairie, that connects to estuaries, other wetlands or undisturbed uplands that are at least 250 acres in size? (*dams in riparian corridors, heavily used gravel roads, paved roads, are considered breaks in the corridor*). YES = **4 points** (*go to H 2.3*) **NO** = go to H 2.2.2 H 2.2.2 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 50ft wide, has at least 30% cover of shrubs or forest, and connects to estuaries, other wetlands or undisturbed uplands that are at least 25 acres in size? **OR** a **Lake-fringe** wetland, if it does not have an undisturbed corridor as in the question above? YES = **2 points** (*go to H 2.3*) **NO** = H 2.2.3 H 2.2.3 Is the wetland: within 5 mi (8km) of a brackish or salt water estuary OR within 3 mi of a large field or pasture (>40 acres) OR within 1 mi of a lake greater than 20 acres? YES = **1 point** NO = **0 points**	1

H 2.3 Near or adjacent to other priority habitats listed by WDFW ***(see new and complete descriptions of WDFW priority habitats, and the counties in which they can be found, in the PHS report http://wdfw.wa.gov/hab/phslist.htm)*** Which of the following priority habitats are within 330ft (100m) of the wetland? *(NOTE: the connections do not have to be relatively undisturbed)* ☐ **Aspen Stands:** Pure or mixed stands of aspen greater than 0.4 ha (1 acres). ☐ **Biodiversity Areas and Corridors:** Areas of habitat that are relatively important to various species of native fish and wildlife (*full description in WDFW PHS report p. 152*) ☐ **Herbaceous Balds:** Variable size patches of grass and forbs on shallow soils over bedrock. ☐ **Old-growth/Mature forests:** (Old-growth west of Cascade crest) Stands of at least 2 tree species, forming a multi-layered canopy with occasional small openings; with at least 20 trees/ha (8 trees/acre) > 81 cm (32 in) dbh or > 200 years of age. (Mature forests.) Stands with average diameters exceeding 53 cm (21 in) dbh; crown cover may be less that 100%; crown cover may be less that 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80 - 200 years old west of the Cascade crest. ☐ **Oregon white Oak:** Woodlands Stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important (*full descriptions in WDFW PHS report p. 158.)* ☒ **Riparian**: The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other. ☐ **Westside Prairies:** Herbaceous, non-forested plant communities that can either take the form of a dry prairie or a wet prairie (*full descriptions in WDFW PHS report p. 161*) ☒ **Instream:** The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources. ☐ **Nearshore:** Relatively undisturbed nearshore habitats. These include Coastal Nearshore, Open Coast Nearshore, and Puget Sound Nearshore. *(full descriptions of habitats and the definition of relatively undisturbed are in WDFW report: pp. 167-169 and glossary in Appendix A.)* ☐ **Caves:** A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human. ☐ **Cliffs:** Greater than 7.6 m (25 ft) high and occurring below 5000 ft. ☐ **Talus:** Homogenous areas of rock rubble ranging in average size 0.15 - 2.0 m (0.5 - 6.5 ft), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs. ☐ **Snags and Logs:** Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of >51 cm (20 in) in western Washington and are > 2 m (6.5 ft) in height. Priority logs are > 30cm (12 in) in diameter at the largest end, and > 6m (20 ft) long. If wetland has **3 or more** priority habitats **= 4 points** If wetland has **2** priority habitats = **3 points** If wetland has **1** priority habitat **= 1 point** No habitats = **0 points** *Note: All vegetated wetland are by definition a priority habitat but are not included in this list. Nearby wetlands are addressed in question H2.4.*	3

H 2.4 Wetland Landscape *(choose the **one** description of the landscape around the wetland that best fits*) ***(see p. 84)*** There are at least 3 other wetlands within ½ mile, and the connections between them are relatively undisturbed (light grazing between wetlands OK, as is lake shore with some boating, but connections should NOT be bisected by paved roads, fill, fields, or other development. ..... points = 5 The wetland is Lake-fringe on a lake with little disturbance and there are 3 other lake-fringe wetlands within ½ mile ..... points = 5 There are at least 3 other wetlands within ½ mile, BUT the connections between them are disturbed ..... points = 3 The wetland is Lake-fringe on a lake **with** disturbance and there are 3 other lake-fringe wetland within ½ mile ..... points = 3 There is at least 1 wetland within ½ mile. ..... points = 2 There are no wetlands within ½ mile. ..... points = 0	3
H 2. TOTAL Score - opportunity for providing habitat *Add the scores from H2.1, H2.2, H2.3, H2.4*	8
TOTAL for H1 from page 14	8
Total Score for Habitat Functions – add the points for H 1, H 2 and record the result on p. 1	16

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Please determine if the wetland meets the attributes described below and circle the appropriate Category.

Wetland Type *Check off any criteria that apply to the wetland. Circle the Category when the appropriate criteria are met.*	**Category**
SC 1.0 Estuarine wetlands (*see p. 86)* Does the wetland unit meet the following criteria for Estuarine wetlands? ☐ The dominant water regime is tidal, ☐ Vegetated, and ☐ With a salinity greater than 0.5 ppt. YES = Go to SC 1.1 NO ☒	
SC 1.1 Is the wetland unit within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-151? ☐ YES = Category I ☐ NO = go to SC 1.2	**Cat. I**
SC 1.2 Is the wetland unit at least 1 acre in size and meets at least two of the following three conditions? ☐ YES = Category I ☐ NO = Category II ☐ The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of non-native plant species. If the non-native Spartina spp. are the only species that cover more than 10% of the wetland, then the wetland should be given a dual rating (I/II) The are aof Spartina would be rated a Category II while the relatively undisturbed upper marsh with native species would be a Category I. Do not, however, exclude the area of Spartina in determining the size threshold of 1 acre. ☐ At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed wetland. ☐ The wetland has at least 2 or the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands.	**Cat. I** **Cat. II** **Dual rating I/II**

SC 2.0 Natural Heritage Wetlands ***(see p. 87)*** Natural Heritage wetlands have been identified by the Washington Natural Heritage Program/DNR as either high quality undisturbed wetlands or wetlands that support state Threatened, Endangered, or Sensitive plant species. SC 2.1 Is the wetland being rated in a Section/Township/Range that contains a Natural Heritage wetland? *(this question is used to screen out most sites before you need to contact WNHP/DNR)* S/T/R information from Appendix D ☐ or accessed from WNHP/DNR web site ☒ YES ☐ – contact WNHP/DNR (see p. 79) and go to SC 2.2 NO ☒ SC 2.2 Has DNR identified the wetland as a high quality undisturbed wetland or as or as a site with state threatened or endangered plant species? YES = Category I NO ☐ Not a Heritage Wetland	**Cat. I**
SC 3.0 Bogs ***(see p. 87)*** Does the wetland (or any part of the unit) meet both the criteria for soils and vegetation in bogs? *Use the key below to identify if the wetland is a bog. If you answer yes, you will still need to rate the wetland based on its functions.* 1. Does the wetland have organic soils horizons (i.e. layers of organic soil), either peats or mucks, that compose 16" or more of the first 32 inches of the soil profile? (See Appendix B for a field key to identify organic soils.) Yes - go to Q.3 NO - go to Q.2 2. Does the wetland have organic soils, either peats or mucks, that are less than 16 inches deep over bedrock or an impermeable hardpan such as clay or volcanic ash, or that are floating on top of a lake or pond? Yes - go to Q.3 NO ☒ is not a bog for purpose of rating 3. Does the wetland have more than 70% cover of mosses at ground level, AND other plants, if present, consist of the "bog" species listed in Table 3 as a significant component of the vegetation (more than 30% of the total shrub and herbaceous cover consists species in Table 3)? Yes – Is a bog for purpose of rating NO - go to Q.4 *NOTE: If you are uncertain about the extent of mosses in the understory, you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16" deep. If the pH is less than 5.0 and the "bog" plant species in Table 3 are present, the wetland is a bog.* 4. Is the wetland forested (>30% cover) with sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Englemann's spruce, or western white pine, WITH any of the species (or combination of species) on the bog species plant list in Table 3 as a significant component of the ground cover (*>30% coverage of the total shrub/herbaceous* cover)? YES = Category I NO ☐ is not a bog for purpose of rating	**Cat. I**

SC 4.0 Forested Wetlands *(see p. 90)*	
Does the wetland have at least 1 acre of forest that meet one of these criteria for the Department of Fish and Wildlife's forests as priority habitats? *If you answer yes you will still need to rate the wetland based on its functions.*	
☐ Old growth forests: (west of Cascade crest) Stands of at least two tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/acre (20 trees/hectare) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 inches (81 cm) or more. *Note: The criterion for dbh is based on measurements for upland forests. Two hundred year old trees in wetlands will often have a smaller dbh because their growth rates are often slower. The DFW criterion is and "OR" so old-growth forests do not necessarily have to have trees of this diameter.*	
☐ Mature forests: (west of the Cascade crest) Stands where the largest trees are 80-200 years old OR have average diameters (dbh) exceeding 21 in (53 cm); crown cover may be less than 100%; decay, decadence, numbers of snags, and quanitity of large downed material is generally less than that found in old-growth	
YES = Category 1 NO ☒ not a forested wetland with special characteristics	**Cat. I**
SC 5.0 Wetlands in Coastal Lagoons (see p. 91)	
Does the wetland meet all of the following criteria of a wetland in a coastal lagoon?	
☐ The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks.	
☐ The lagoon in which the wetland is located contains surgace water that is saline or brackish (> 0.5 ppt) during most of the year in at least a portion of the lagoon (*needs to be measured near the bottom*)	
YES – Go to SC 5.1 NO ☒ not a wetland in a coastal lagoon	**Cat. I**
SC 5.1 Does the wetland meet all of the following three conditions?	
☐ The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 20% cover of invasive plant species (see list of invasive species on p. 74).	
☐ At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland.	**Cat. II**
☐ The wetalnd is larger than 1/10 acre (4350 square feet)	
YES = Category I NO = Category II	

SC 6.0 Interdunal Wetlands (see p. 93) Is the wetalnd unit west of the 1889 line (also called the Westarn Boundary of Upland Ownership or WBUO)? YES – go to SC 6.1 NO ☒ not an interdunal wetland for rating *If you answer yes you will still need to rate the wetland based on its functions.* In practical terms that means the following geographic areas: – Long Beach Peninsula – lands west of SR 103 – Grayland-Westport – lands west of SR 105 – Ocean Shores-Copalis – lands west of SR 115 and SR 109 SC 6.1 Is the wetland 1 acre or larger, or is it in a mosaic of wetlands that is 1 acre or larger? YES = Category II NO – go to SC 6.2 SC 6.2 Is the unit between 0.1 and 1 acre, or is it in a mosaic of wetlands that is between 0.1 and 1 acre? YES = Category III	**Cat. II** **Cat. III**
Category of wetland based on Special Characteristics *Choose the "highest" rating if wetland falls into several categorie, and record on p. 1 .* If you answered NO for all types enter "Not Applicable" on p.1.	**N/A**

WETLAND RATING FORM – WESTERN WASHINGTON
Version 2 – Updated July 2006 to increase accuracy and reproducibility among users
Updated Oct 2008 with the new WDFW definitions for priority habitats

Name of wetland: Wetland B Date of Site visit: 9/21/2016

Rated by: R. Whitson, A. Hoenig Trained by Ecology? Yes☒ No☐ Date of Training: 3/2015*, 10/2015*

SEC: 18 TWNSHP: 24N RNGE: 05E Is S/T/R in Appendix D? Yes☐ No ☒

**trained for 2014 update, not original 2004 rating system.*

SUMMARY OF RATING

Category based on FUNCTIONS provided by wetland

I ☐ II ☐ III ☒ IV ☐

Category I = Score ≥70
Category II = Score 51-69
Category III = Score 30-50
Category IV = Score < 30

Score for Water Quality Functions	14
Score for Hydrologic Functions	16
Score for Habitat Functions	15
TOTAL score for functions	**45**

Category based on SPECIAL CHARACTERISTICS of wetland

I ☐ II ☐ Does not Apply ☒

Final Category (choose the "highest" category from above) **III**

Check the appropriate type and class of wetland being rated.

Wetland Type		Wetland Class	
Estuarine	☐	**Depressional**	☒
Natural Heritage Wetland	☐	**Riverine**	☐
Bog	☐	**Lake-fringe**	☐
Mature Forest	☐	**Slope**	☐
Old Growth Forest	☐	**Flats**	☐
Coastal Lagoon	☐	**Freshwater Tidal**	☐
Interdunal	☐		
None of the above	☐	Check if unit has multiple HGM classes present	☒

Does the wetland unit being rated meet any of the criteria below?

If you answer YES to any of the questions below you will need to protect the wetland according to the regulations regarding the special characteristics found in the wetland.

Check List for Wetlands That May Need Additional Protection (in addition to the protection recommended for its category)	YES	NO
SP1. *Has the wetland unit been documented as a habitat for any Federally listed Threatened or Endangered **animal** or **plant** species (T/E species)?* For the purposes of this rating system, "documented" means the wetland is on the appropriate state or federal database.		X*
SP2. *Has the wetland unit been documented as habitat for any State listed Threatened or Endangered **animal** species?* For the purposes of this rating system, "documented" means the wetland is on the appropriate state database. Note: Wetlands with State listed plant species are categorized as Category I Natural Heritage Wetlands (see p. 19 of data form).		X*
SP3. *Does the wetland unit contain individuals of Priority species listed by the WDFW for the state?*		X*
SP4. *Does the wetland unit have a local significance in addition to its functions*? For example, the wetland has been identified in the Shoreline Master Program, the Critical Areas Ordinance, or in a local management plan as having special significance.		X

***The study area was reviewed for the presence of endangered, threatened, and priority species using WDFW online Priority Habitat and Species Data, PHS on the Web (http://wdfw.wa.gov/mapping/phs/).**

To complete the next part of the data sheet you will need to determine the Hydrogeomorphic Class of the wetland being rated.

The hydrogeomorphic classification groups wetlands into those that function in similar ways. Classifying the wetland first simplifies the questions needed to answer how it functions. The Hydrogeomorphic Class of a wetland can be determined using the key below. See p. 24 for more detailed instructions on classifying wetlands.

Classification of Wetland Units in Western Washington

If the hydrologic criteria listed in each question do not apply to the entire unit being rated, you probably have a unit with multiple HGM classes. In this case, identify which hydrologic criteria in Questions 1-7 apply, and go to Question 8.

1. Are the water levels in the wetland unit usually controlled by tides (i.e. except during floods)?

☒ NO – go to 2 ☐ **YES** – the wetland class is **Tidal Fringe**

If yes, is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)? **YES – Freshwater Tidal Fringe NO – Saltwater Tidal Fringe (Estuarine)**

*If your wetland can be classified as a Freshwater Tidal Fringe use the forms for **Riverine** wetlands. If it is Saltwater Tidal Fringe it is rated as an **Estuarine** wetland.* Wetlands that were called estuarine in the first and second editions of the rating system are called Salt Water Tidal Fringe in the Hydrogeomorphic Classification. Estuarine wetlands were categorized separately in the earlier editions, and this separation is being kept in this revision. To maintain consistency between editions, the term "Estuarine" wetland is kept. Please note, however, that the characteristics that define Category I and II estuarine wetlands have changed (see p.).

2. The entire wetland unit is flat and precipitation is only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit

☒ NO – go to 3 ☐ **YES** – The wetland class is **Flats**

If your wetland can be classified as a "Flats" wetland, use the form for **Depressional** wetlands.

3. Does the entire wetland unit **meet both** of the following criteria?

☐ The vegetated part of the wetland is on the shores of a body of open water (without any vegetation on the surface) at least 20 acres (8 ha) in size;

☐ At least 30% of the open water area is deeper than 6.6 ft (2 m)?

☒NO – go to 4 ☐**YES –** The wetland class is **Lake-fringe (Lacustrine Fringe)**

4. Does the entire wetland unit **meet all** of the following criteria?

☒ The wetland is on a slope (*slope can be very gradual*),

☒ The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks.

☒ The water leaves the wetland **without being impounded**?

NOTE: *Surface water does not pond in these types of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3ft diameter and less than a foot deep).*

☐ NO – go to 5 ☐ **YES –** The wetland class is **Slope**

5. Does the entire wetland unit **meet all** of the following criteria?

☐ The unit is in a valley, or stream channel, where it gets inundated by overbank flooding from that stream or river.

☐ The overbank flooding occurs at least once every two years

NOTE: The riverine unit can contain depressions that are filled with water when the river is not flooding.

☒ NO - go to 6 ☐ **YES** – The wetland class is **Riverine**

6. Is the entire wetland unit in a topographic depression in which water ponds, or is saturated to the surface, at some time during the year. *This means that any outlet, if present, is higher than the interior of the wetland.*

☐ NO – go to 7 ☒ **YES –** The wetland class is **Depressional**

7. Is the entire wetland unit located in a very flat area with no obvious depression and no overbank flooding. The unit does not pond surface water more than a few inches. The unit seems to be maintained by high groundwater in the area. The wetland may be ditched, but has no obvious natural outlet.

☒ NO – go to 8 ☐ **YES –** The wetland class is **Depressional**

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM classes. For example, seeps at the base of a slope may grade into a riverine floodplain, or a small stream within a depressional wetland has a zone of flooding along its sides. GO BACK AND IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-7 APPLY TO DIFFERENT AREAS IN THE UNIT (make a rough sketch to help you decide). Use the following table to identify the appropriate class to use for the rating system if you have several HGM classes present within your wetland. NOTE: Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the class listed in column 2 is less than 10% of the unit, classify the wetland using the class that represents more than 90% of the total area.

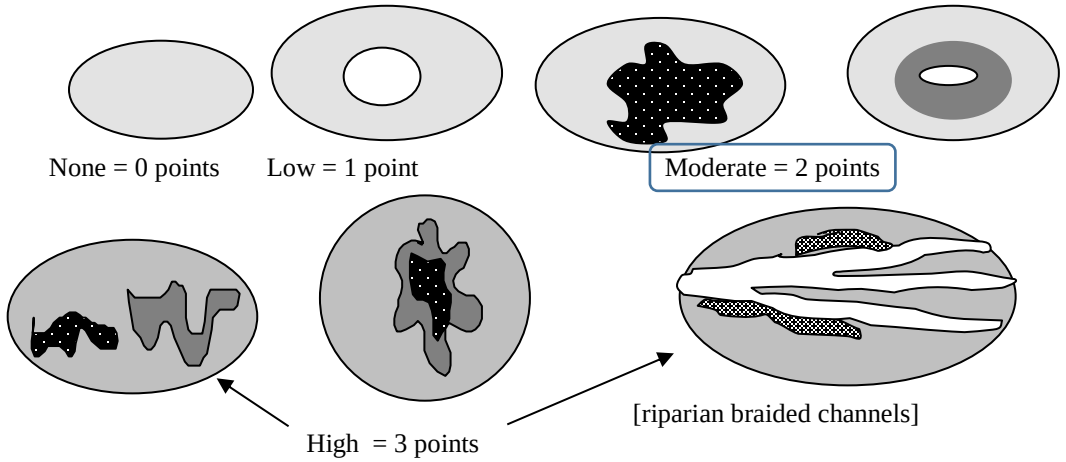
HGM classes within the wetland unit being rated	*HGM Class to Use in Rating*
Slope + Riverine	Riverine
Slope + Depressional	Depressional
Slope + Lake-fringe	Lake-fringe
Depressional + Riverine along stream within boundary	Depressional
Depressional + Lake-fringe	Depressional
Salt Water Tidal Fringe and any other class of freshwater wetland	Treat as ESTUARINE under wetlands with special characteristics

If you are unable still to determine which of the above criteria apply to your wetland, or you have more than 2 HGM classes within a wetland boundary, classify the wetland as **Depressional** for the rating.

D	Depressional and Flats Wetlands	Points
	WATER QUALITY FUNCTIONS - Indicators that wetland functions to improve water quality	
D	**D 1. Does the wetland have the potential to improve water quality?**	***(see p. 38)***
D	D 1.1 Characteristics of surface water flows out of the wetland: Unit is a depression with no surface water leaving it (no outlet) .....points = 3 Unit has an intermittently flowing, or highly constricted permanently flowing outlet .....points = 2 Unit has an unconstricted, or slightly constricted, surface outlet *(permanently flowing)*..points = 1 Unit is a "flat" depression (Q.7 on key), or in the Flats class, with permanent surface outflow **and no obvious natural outlet**, and/or outlet is a man-made ditch .....points = 1 (*If ditch is not permanently flowing treat unit as "intermittently flowing")*	2
D	D 1.2 The soil 2 inches below the surface (or duff layer) is clay or organic (*use NRCS definitions*). YES points = 4 NO points= 0	0
D	D 1.3 Characteristics of persistent vegetation (emergent, shrub, and/or forest Cowardin class): Wetland has persistent, ungrazed, vegetation > = 95% of area .....points = 5 Wetland has persistent, ungrazed, vegetation > = 1/2 of area .....points = 3 Wetland has persistent, ungrazed vegetation > = 1/10 of area .....points = 1 Wetland has persistent, ungrazed vegetation <1/10 of area .....points = 0	3
D	D1.4 Characteristics of seasonal ponding or inundation. *This is the area of the wetland unit that is ponded for at least 2 months, but dries out sometime during the year. Do not count the area that is permanently ponded. Estimate area as the average condition 5 out of 10 yrs.* Area seasonally ponded is > ½ total area of wetland .....points = 4 Area seasonally ponded is > ¼ total area of wetland .....points = 2 Area seasonally ponded is < ¼ total area of wetland .....points = 0 NOTE: *See text for indicators of seasonal and permanent inundation.*	2
D	**Total for D 1** *Add the points in the boxes above*	7
D	**D 2. Does the wetland unit have the opportunity to improve water quality?** Answer YES if you know or believe there are pollutants in groundwater or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes or groundwater downgradient from the wetland? *Note which of the following conditions provide the sources of pollutants. A unit may have pollutants coming from several sources, but any single source would qualify as opportunity.* ☐ Grazing in the wetland or within 150 ft ☐ Untreated stormwater discharges to wetland ☐ Tilled fields or orchards within 150 ft of wetland ☒ A stream or culvert discharges into wetland that drains developed areas, residential areas, farmed fields, roads, or clear-cut logging ☒ Residential, urban areas, golf courses are within 150 ft of wetland ☐ Wetland is fed by groundwater high in phosphorus or nitrogen ☐ Other_____ **YES** multiply score in D 1. **by 2** **NO** multiply score in D 1. **by 1**	***(see p. 44)*** multiplier 2
D	**TOTAL - Water Quality Functions** Multiply the score from D1 by D2 ***Add score to table on p. 1***	**14**

D	**Depresssional and Flats Wetlands**	
	HYDROLOGIC FUNCTIONS - Indicators that wetland functions to reduce flooding and stream degradation	
	D 3. Does the wetland have the potential to reduce flooding and erosion?	*(see p. 46)*
D	D 3.1 Characteristics of surface water flows out of the wetland unit Unit is a depression with no surface water leaving it (no outlet) .....points = 4 Unit has an intermittently flowing, or highly constricted permanently flowing outlet .....points = 2 Unit is a "flat" depression (Q.7 on key), or in the Flats class, with permanent surface outflow **and no obvious natural outlet**, and/or outlet is a man-made ditch .....points = 1 (*If ditch is not permanently flowing treat unit as "intermittently flowing")* Unit has an unconstricted, or slightly constricted, surface outlet (*permanently flowing*)..points = 0	2
D	D 3.2 Depth of storage during wet periods *Estimate the height of ponding above the bottom of the outlet For units with no outlet measure from the surface of permanent water or deepest part (if dry).* Marks of ponding are at least 3 ft or more above the surface or bottom of outlet .....points = 7 The wetland is a "headwater" wetland".....points = 5 Marks of ponding between 2 ft to < 3 ft from surface or bottom of outlet .....points = 5 Marks are at least 0.5 ft to < 2 ft from surface or bottom of outlet .....points = 3 Unit is flat (yes to Q.2 or Q.7 on key) but has small depressions on the surface that trap water .....points = 1 Marks of ponding less than 0.5 ft .....points = 0	3
D	D 3.3 Contribution of wetland unit to storage in the watershed *Estimate the ratio of the area of upstream basin contributing surface water to the wetland to the area of the wetland unit itself.* The area of the basin is less than 10 times the area of the unit.....points = 5 The area of the basin is 10 to 100 times the area of the unit.....points = 3 The area of the basin is more than 100 times the area of the unit.....points = 0 Entire unit is in the FLATS class.....points = 5	3
D	**Total for D 3** *Add the points in the boxes above*	8
D	**D 4. Does the wetland unit have the opportunity to reduce flooding and erosion?** Answer YES if the unit is in a location in the watershed where the flood storage, or reduction in water velocity, it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows. Answer NO if the water coming into the wetland is controlled by a structure such as flood gate, tide gate, flap valve, reservoir etc. OR you estimate that more than 90% of the water in the wetland is from groundwater in areas where damaging groundwater flooding does not occur. *Note which of the following conditions apply.* ☐ Wetland is in a headwater of a river or stream that has flooding problems ☒ Wetland drains to a river or stream that has flooding problems ☐ Wetland has no outlet and impounds surface runoff water that might otherwise flow into a river or stream that has flooding problems ☐ Other _____ ☒ **YES** multiplier is **2** ☐ **NO** multiplier is **1**	*(see p. 49)* multiplier 2
D	**TOTAL - Hydrologic Functions** Multiply the score from D 3 by D 4 ***Add score to table on p. 1***	**16**

These questions apply to wetlands of all HGM classes. **HABITAT FUNCTIONS - Indicators that wetland functions to provide important habitat**	
H 1. Does the wetland have the <u>potential</u> to provide habitat for many species?	
H 1.1 <u>Vegetation structure</u> ***(see p. 72)*** *Check the types of vegetation classes present (as defined by Cowardin) if the class is ¼ acre or covers more than 10% of the area of the wetland if unit smaller than 2.5 acres.* ☒ Aquatic bed ☐ Emergent plants ☐ Scrub/shrub (areas where shrubs have >30% cover) ☒ Forested (areas where trees have >30% cover) ☒ Forested areas have 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the forested polygon *Add the number of vegetation types that qualify. If you have:* 4 structures or more.....points = 4 3 structures.....points = 2 2 structures.....points = 1 1 structure.....points = 0	2
H 1.2. <u>Hydroperiods</u> ***(see p. 73)*** *Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or ¼ acre to count. (see text for descriptions of hydroperiods)* ☒ Permanently flooded or inundated ☒ Seasonally flooded or inundated ☐ Occasionally flooded or inundated ☒ Saturated only ☐ Permanently flowing stream or river in, or adjacent to, the wetland ☐ Seasonally flowing stream in, or adjacent to, the wetland ☐ ***Lake-fringe wetland* = 2 points** ☐ ***Freshwater tidal wetland* = 2 points** 4 or more types present .....points = 3 3 types present.....points = 2 2 types present .....points = 1 1 types present…….points = 0	2
H 1.3. <u>Richness of Plant Species</u> ***(see p. 75)*** Count the number of plant species in the wetland that cover at least 10 ft^2. (*different patches of the same species can be combined to meet the size threshold)* *You do not have to name the species.* *Do not include Eurasian milfoil, reed canarygrass, purple loosestrife, Canadian thistle* If you counted: *List species below if you want to:* > 19 species.....points = 2 5 - 19 species.....points = 1 < 5 species.....points = 0	1

H 1.4. Interspersion of habitats ***(see p. 76)*** Decide from the diagrams below whether interspersion between Cowardin vegetation classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, medium, low, or none.  None = 0 points Low = 1 point Moderate = 2 points High = 3 points [riparian braided channels] NOTE: If you have four or more vegetation types or three vegetation types and open water the rating is always "high".	2
H 1.5. Special Habitat Features: ***(see p. 77)*** *Check the habitat features that are present in the wetland. The number of checks is the number of points you put into the next column.* ☐ Large, downed, woody debris within the wetland (>4in. diameter and 6 ft long). ☐ Standing snags (diameter at the bottom > 4 inches) in the wetland ☐ Undercut banks are present for at least 6.6 ft (2m) and/or overhanging vegetation extends at least 3.3 ft (1m) over a stream for at least 33 ft (10m) ☐ Stable steep banks of fine material that might be used by beaver or muskrat for denning (>30degree slope) OR signs of recent beaver activity are present ☐ At least ¼ acre of thin-stemmed persistent vegetation or woody branches are present in areas that are permanently or seasonally inundated.*(structures for egg-laying by amphibians)* ☐ Invasive plants cover less than 25% of the wetland area in each stratum of plants *Note: The 20% stated in early printings of the manual on page 78 is an error.*	0
H 1. TOTAL Score - potential for providing habitat *Add the scores from H1.1, H1.2, H1.3, H1.4, H1.5*	7

H 2. Does the wetland have the opportunity to provide habitat for many species?	
H 2.1 Buffers ***(see p. 80)*** *Choose the description that best represents condition of buffer of wetland. The highest scoring criterion that applies to the wetland is to be used in the rating. See text for definition of "undisturbed."* ☐ 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% of circumference. No developed areas within undisturbed part of buffer. (relatively undisturbed also means no-grazing) ..... Points = 5 ☐ 100 m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 50% circumference. ..... Points = 4 ☐ 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% circumference. ..... Points = 4 ☐ 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 25% circumference ..... Points = 3 ☐ 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water for > 50% circumference. ..... Points = 3 **If buffer does not meet any of the criteria above** ☐ No paved areas (except paved trails) or buildings within 25 m (80ft) of wetland > 95% circumference. Light to moderate grazing, or lawns are OK. ..... Points = 2 ☐ No paved areas or buildings within 50m of wetland for >50% circumference. Light to moderate grazing, or lawns are OK. ..... Points = 2 ☐ Heavy grazing in buffer. ..... Points = 1 ☐ Vegetated buffers are <2m wide (6.6ft) for more than 95% of the circumference (e.g. tilled fields, paving, basalt bedrock extend to edge of wetland ..... Points = 0 ☒ Buffer does not meet any of the criteria above……..……...Points = 1	1
H 2.2 Corridors and Connections ***(see p. 81)*** H 2.2.1 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 150 ft wide, has at least 30% cover of shrubs, forest or native undisturbed prairie, that connects to estuaries, other wetlands or undisturbed uplands that are at least 250 acres in size? (*dams in riparian corridors, heavily used gravel roads, paved roads, are considered breaks in the corridor*). YES = **4 points** (*go to H 2.3*) **NO** = go to H 2.2.2 H 2.2.2 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 50ft wide, has at least 30% cover of shrubs or forest, and connects to estuaries, other wetlands or undisturbed uplands that are at least 25 acres in size? **OR** a **Lake-fringe** wetland, if it does not have an undisturbed corridor as in the question above? YES = **2 points** (*go to H 2.3*) **NO** = H 2.2.3 H 2.2.3 Is the wetland: within 5 mi (8km) of a brackish or salt water estuary OR within 3 mi of a large field or pasture (>40 acres) OR within 1 mi of a lake greater than 20 acres? YES = **1 point** NO = **0 points**	1

H 2.3 Near or adjacent to other priority habitats listed by WDFW ***(see new and complete descriptions of WDFW priority habitats, and the counties in which they can be found, in the PHS report http://wdfw.wa.gov/hab/phslist.htm)*** Which of the following priority habitats are within 330ft (100m) of the wetland? *(NOTE: the connections do not have to be relatively undisturbed)* ☐ **Aspen Stands:** Pure or mixed stands of aspen greater than 0.4 ha (1 acres). ☐ **Biodiversity Areas and Corridors:** Areas of habitat that are relatively important to various species of native fish and wildlife (*full description in WDFW PHS report p. 152*) ☐ **Herbaceous Balds:** Variable size patches of grass and forbs on shallow soils over bedrock. ☐ **Old-growth/Mature forests:** (Old-growth west of Cascade crest) Stands of at least 2 tree species, forming a multi-layered canopy with occasional small openings; with at least 20 trees/ha (8 trees/acre) > 81 cm (32 in) dbh or > 200 years of age. (Mature forests.) Stands with average diameters exceeding 53 cm (21 in) dbh; crown cover may be less that 100%; crown cover may be less that 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80 - 200 years old west of the Cascade crest. ☐ **Oregon white Oak:** Woodlands Stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important (*full descriptions in WDFW PHS report p. 158.)* ☒ **Riparian**: The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other. ☐ **Westside Prairies:** Herbaceous, non-forested plant communities that can either take the form of a dry prairie or a wet prairie (*full descriptions in WDFW PHS report p. 161*) ☒ **Instream:** The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources. ☐ **Nearshore:** Relatively undisturbed nearshore habitats. These include Coastal Nearshore, Open Coast Nearshore, and Puget Sound Nearshore. *(full descriptions of habitats and the definition of relatively undisturbed are in WDFW report: pp. 167-169 and glossary in Appendix A.)* ☐ **Caves:** A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human. ☐ **Cliffs:** Greater than 7.6 m (25 ft) high and occurring below 5000 ft. ☐ **Talus:** Homogenous areas of rock rubble ranging in average size 0.15 - 2.0 m (0.5 - 6.5 ft), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs. ☐ **Snags and Logs:** Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of >51 cm (20 in) in western Washington and are > 2 m (6.5 ft) in height. Priority logs are > 30cm (12 in) in diameter at the largest end, and > 6m (20 ft) long. ~~If wetland has **3 or more** priority habitats = **4 points**~~ If wetland has **2** priority habitats = **3 points** If wetland has **1** priority habitat = **1 point** No habitats = **0 points** *Note: All vegetated wetland are by definition a priority habitat but are not included in this list. Nearby wetlands are addressed in question H2.4.*	3

H 2.4 Wetland Landscape *(choose the **one** description of the landscape around the wetland that best fits)* ***(see p. 84)*** There are at least 3 other wetlands within ½ mile, and the connections between them are relatively undisturbed (light grazing between wetlands OK, as is lake shore with some boating, but connections should NOT be bisected by paved roads, fill, fields, or other development. ..... points = 5 The wetland is Lake-fringe on a lake with little disturbance and there are 3 other lake-fringe wetlands within ½ mile ..... points = 5 There are at least 3 other wetlands within ½ mile, BUT the connections between them are disturbed ..... points = 3 The wetland is Lake-fringe on a lake **with** disturbance and there are 3 other lake-fringe wetland within ½ mile ..... points = 3 There is at least 1 wetland within ½ mile. ..... points = 2 There are no wetlands within ½ mile. ..... points = 0	3
H 2. TOTAL Score - opportunity for providing habitat *Add the scores from H2.1, H2.2, H2.3, H2.4*	8
TOTAL for H1 from page 14	7
Total Score for Habitat Functions – add the points for H 1, H 2 and record the result on p. 1	15

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Please determine if the wetland meets the attributes described below and circle the appropriate Category.

Wetland Type *Check off any criteria that apply to the wetland. Circle the Category when the appropriate criteria are met.*	**Category**
SC 1.0 Estuarine wetlands (*see p. 86)* Does the wetland unit meet the following criteria for Estuarine wetlands? ☐ The dominant water regime is tidal, ☐ Vegetated, and ☐ With a salinity greater than 0.5 ppt. YES = Go to SC 1.1 NO ☒	
SC 1.1 Is the wetland unit within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-151? ☐ YES = Category I ☐ NO = go to SC 1.2	**Cat. I**
SC 1.2 Is the wetland unit at least 1 acre in size and meets at least two of the following three conditions? ☐ YES = Category I ☐ NO = Category II ☐ The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of non-native plant species. If the non-native Spartina spp. are the only species that cover more than 10% of the wetland, then the wetland should be given a dual rating (I/II) The are aof Spartina would be rated a Category II while the relatively undisturbed upper marsh with native species would be a Category I. Do not, however, exclude the area of Spartina in determining the size threshold of 1 acre. ☐ At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed wetland. ☐ The wetland has at least 2 or the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands.	**Cat. I** **Cat. II** **Dual rating I/II**

SC 2.0 Natural Heritage Wetlands ***(see p. 87)*** Natural Heritage wetlands have been identified by the Washington Natural Heritage Program/DNR as either high quality undisturbed wetlands or wetlands that support state Threatened, Endangered, or Sensitive plant species. SC 2.1 Is the wetland being rated in a Section/Township/Range that contains a Natural Heritage wetland? *(this question is used to screen out most sites before you need to contact WNHP/DNR)* S/T/R information from Appendix D ☐ or accessed from WNHP/DNR web site ☒ YES ☐ – contact WNHP/DNR (see p. 79) and go to SC 2.2 NO ☒ SC 2.2 Has DNR identified the wetland as a high quality undisturbed wetland or as or as a site with state threatened or endangered plant species? YES = Category I NO ☐ Not a Heritage Wetland	**Cat. I**
SC 3.0 Bogs ***(see p. 87)*** Does the wetland (or any part of the unit) meet both the criteria for soils and vegetation in bogs? *Use the key below to identify if the wetland is a bog. If you answer yes, you will still need to rate the wetland based on its functions.* 1. Does the wetland have organic soils horizons (i.e. layers of organic soil), either peats or mucks, that compose 16" or more of the first 32 inches of the soil profile? (See Appendix B for a field key to identify organic soils.) Yes - go to Q.3 NO - go to Q.2 2. Does the wetland have organic soils, either peats or mucks, that are less than 16 inches deep over bedrock or an impermeable hardpan such as clay or volcanic ash, or that are floating on top of a lake or pond? Yes - go to Q.3 NO ☒ is not a bog for purpose of rating 3. Does the wetland have more than 70% cover of mosses at ground level, AND other plants, if present, consist of the "bog" species listed in Table 3 as a significant component of the vegetation (more than 30% of the total shrub and herbaceous cover consists species in Table 3)? Yes – Is a bog for purpose of rating NO - go to Q.4 *NOTE: If you are uncertain about the extent of mosses in the understory, you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16" deep. If the pH is less than 5.0 and the "bog" plant species in Table 3 are present, the wetland is a bog.* 4. Is the wetland forested (>30% cover) with sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Englemann's spruce, or western white pine, WITH any of the species (or combination of species) on the bog species plant list in Table 3 as a significant component of the ground cover (*>30% coverage of the total shrub/herbaceous* cover)? YES = Category I NO ☐ is not a bog for purpose of rating	**Cat. I**

SC 4.0 Forested Wetlands *(see p. 90)*	
Does the wetland have at least 1 acre of forest that meet one of these criteria for the Department of Fish and Wildlife's forests as priority habitats? *If you answer yes you will still need to rate the wetland based on its functions.*	
☐ Old growth forests: (west of Cascade crest) Stands of at least two tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/acre (20 trees/hectare) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 inches (81 cm) or more. *Note: The criterion for dbh is based on measurements for upland forests. Two hundred year old trees in wetlands will often have a smaller dbh because their growth rates are often slower. The DFW criterion is and "OR" so old-growth forests do not necessarily have to have trees of this diameter.*	
☐ Mature forests: (west of the Cascade crest) Stands where the largest trees are 80-200 years old OR have average diameters (dbh) exceeding 21 in (53 cm); crown cover may be less than 100%; decay, decadence, numbers of snags, and quanitity of large downed material is generally less than that found in old-growth	
YES = Category 1 NO ☒ not a forested wetland with special characteristics	**Cat. I**
SC 5.0 Wetlands in Coastal Lagoons (see p. 91)	
Does the wetland meet all of the following criteria of a wetland in a coastal lagoon?	
☐ The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks.	
☐ The lagoon in which the wetland is located contains surgace water that is saline or brackish (> 0.5 ppt) during most of the year in at least a portion of the lagoon (*needs to be measured near the bottom*)	
YES – Go to SC 5.1 NO ☒ not a wetland in a coastal lagoon	**Cat. I**
SC 5.1 Does the wetland meet all of the following three conditions?	
☐ The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 20% cover of invasive plant species (see list of invasive species on p. 74).	
☐ At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland.	**Cat. II**
☐ The wetalnd is larger than 1/10 acre (4350 square feet)	
YES = Category I NO = Category II	

SC 6.0 Interdunal Wetlands (see p. 93) Is the wetalnd unit west of the 1889 line (also called the Westarn Boundary of Upland Ownership or WBUO)? YES – go to SC 6.1 NO ☒ not an interdunal wetland for rating *If you answer yes you will still need to rate the wetland based on its functions.* In practical terms that means the following geographic areas: – Long Beach Peninsula – lands west of SR 103 – Grayland-Westport – lands west of SR 105 – Ocean Shores-Copalis – lands west of SR 115 and SR 109 SC 6.1 Is the wetland 1 acre or larger, or is it in a mosaic of wetlands that is 1 acre or larger? YES = Category II NO – go to SC 6.2 SC 6.2 Is the unit between 0.1 and 1 acre, or is it in a mosaic of wetlands that is between 0.1 and 1 acre? YES = Category III	**Cat. II** **Cat. III**
Category of wetland based on Special Characteristics *Choose the "highest" rating if wetland falls into several categorie, and record on p. 1 .* If you answered NO for all types enter "Not Applicable" on p.1.	**N/A**

WETLAND RATING FORM – WESTERN WASHINGTON
Version 2 – Updated July 2006 to increase accuracy and reproducibility among users
Updated Oct 2008 with the new WDFW definitions for priority habitats

Name of wetland: Wetland C Date of Site visit: 9/21/2016

Rated by: R. Whitson, A. Hoenig Trained by Ecology? Yes☒ No☐ Date of Training: 3/2015*, 10/2015*

SEC: 18 TWNSHP: 24N RNGE: 05E Is S/T/R in Appendix D? Yes☐ No ☒

**trained for 2014 update, not for original 2004 system*

SUMMARY OF RATING

Category based on FUNCTIONS provided by wetland

I ☐ II ☐ III ☒ IV ☐

Category I = Score ≥70
Category II = Score 51-69
Category III = Score 30-50
Category IV = Score < 30

Score for Water Quality Functions	16
Score for Hydrologic Functions	16
Score for Habitat Functions	15
TOTAL score for functions	**47**

Category based on SPECIAL CHARACTERISTICS of wetland

I ☐ II ☐ Does not Apply ☒

Final Category (choose the "highest" category from above) **III**

Check the appropriate type and class of wetland being rated.

Wetland Type		Wetland Class	
Estuarine	☐	**Depressional**	☐
Natural Heritage Wetland	☐	**Riverine**	☒
Bog	☐	**Lake-fringe**	☐
Mature Forest	☐	**Slope**	☐
Old Growth Forest	☐	**Flats**	☐
Coastal Lagoon	☐	**Freshwater Tidal**	☐
Interdunal	☐		
None of the above	☐	Check if unit has multiple HGM classes present	☒

Does the wetland unit being rated meet any of the criteria below?

If you answer YES to any of the questions below you will need to protect the wetland according to the regulations regarding the special characteristics found in the wetland.

Check List for Wetlands That May Need Additional Protection (in addition to the protection recommended for its category)	YES	NO
SP1. *Has the wetland unit been documented as a habitat for any Federally listed Threatened or Endangered **animal** or **plant** species (T/E species)?* For the purposes of this rating system, "documented" means the wetland is on the appropriate state or federal database.		X*
SP2. *Has the wetland unit been documented as habitat for any State listed Threatened or Endangered **animal** species?* For the purposes of this rating system, "documented" means the wetland is on the appropriate state database. Note: Wetlands with State listed plant species are categorized as Category I Natural Heritage Wetlands (see p. 19 of data form).		X*
SP3. *Does the wetland unit contain individuals of Priority species listed by the WDFW for the state?*		X*
SP4. *Does the wetland unit have a local significance in addition to its functions*? For example, the wetland has been identified in the Shoreline Master Program, the Critical Areas Ordinance, or in a local management plan as having special significance.		X

***The study area was reviewed for the presence of endangered, threatened, and priority species using WDFW online Priority Habitat and Species Data, PHS on the Web (http://wdfw.wa.gov/mapping/phs/).**

To complete the next part of the data sheet you will need to determine the Hydrogeomorphic Class of the wetland being rated.

The hydrogeomorphic classification groups wetlands into those that function in similar ways. Classifying the wetland first simplifies the questions needed to answer how it functions. The Hydrogeomorphic Class of a wetland can be determined using the key below. See p. 24 for more detailed instructions on classifying wetlands.

Classification of Wetland Units in Western Washington

If the hydrologic criteria listed in each question do not apply to the entire unit being rated, you probably have a unit with multiple HGM classes. In this case, identify which hydrologic criteria in Questions 1-7 apply, and go to Question 8.

1. Are the water levels in the wetland unit usually controlled by tides (i.e. except during floods)?

☒ NO – go to 2 ☐ **YES** – the wetland class is **Tidal Fringe**

If yes, is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)? **YES – Freshwater Tidal Fringe NO – Saltwater Tidal Fringe (Estuarine)**

*If your wetland can be classified as a Freshwater Tidal Fringe use the forms for **Riverine** wetlands. If it is Saltwater Tidal Fringe it is rated as an **Estuarine** wetland.* Wetlands that were called estuarine in the first and second editions of the rating system are called Salt Water Tidal Fringe in the Hydrogeomorphic Classification. Estuarine wetlands were categorized separately in the earlier editions, and this separation is being kept in this revision. To maintain consistency between editions, the term "Estuarine" wetland is kept. Please note, however, that the characteristics that define Category I and II estuarine wetlands have changed (see p.).

2. The entire wetland unit is flat and precipitation is only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit

☒ NO – go to 3 ☐ **YES** – The wetland class is **Flats**

If your wetland can be classified as a "Flats" wetland, use the form for **Depressional** wetlands.

3. Does the entire wetland unit **meet both** of the following criteria?

☐ The vegetated part of the wetland is on the shores of a body of open water (without any vegetation on the surface) at least 20 acres (8 ha) in size;

☐ At least 30% of the open water area is deeper than 6.6 ft (2 m)?

☐NO – go to 4 ☐**YES –** The wetland class is **Lake-fringe (Lacustrine Fringe)**

4. Does the entire wetland unit **meet all** of the following criteria?

☒ The wetland is on a slope (*slope can be very gradual*),

☒ The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks.

☒ The water leaves the wetland **without being impounded**?

NOTE: *Surface water does not pond in these types of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3ft diameter and less than a foot deep).*

☐ NO – go to 5 ☐ **YES –** The wetland class is **Slope**

5. Does the entire wetland unit **meet all** of the following criteria?

☒ The unit is in a valley, or stream channel, where it gets inundated by overbank flooding from that stream or river.

☒ The overbank flooding occurs at least once every two years

NOTE: The riverine unit can contain depressions that are filled with water when the river is not flooding.

☐ NO - go to 6 ☐ **YES** – The wetland class is **Riverine**

6. Is the entire wetland unit in a topographic depression in which water ponds, or is saturated to the surface, at some time during the year. *This means that any outlet, if present, is higher than the interior of the wetland.*

☒ NO – go to 7 ☐ **YES –** The wetland class is **Depressional**

7. Is the entire wetland unit located in a very flat area with no obvious depression and no overbank flooding. The unit does not pond surface water more than a few inches. The unit seems to be maintained by high groundwater in the area. The wetland may be ditched, but has no obvious natural outlet.

☒ NO – go to 8 ☐ **YES –** The wetland class is **Depressional**

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM classes. For example, seeps at the base of a slope may grade into a riverine floodplain, or a small stream within a depressional wetland has a zone of flooding along its sides. GO BACK AND IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-7 APPLY TO DIFFERENT AREAS IN THE UNIT (make a rough sketch to help you decide). Use the following table to identify the appropriate class to use for the rating system if you have several HGM classes present within your wetland. NOTE: Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the class listed in column 2 is less than 10% of the unit, classify the wetland using the class that represents more than 90% of the total area.

HGM classes within the wetland unit being rated	*HGM Class to Use in Rating*
Slope + Riverine	Riverine
Slope + Depressional	Depressional
Slope + Lake-fringe	Lake-fringe
Depressional + Riverine along stream within boundary	Depressional
Depressional + Lake-fringe	Depressional
Salt Water Tidal Fringe and any other class of freshwater wetland	Treat as ESTUARINE under wetlands with special characteristics

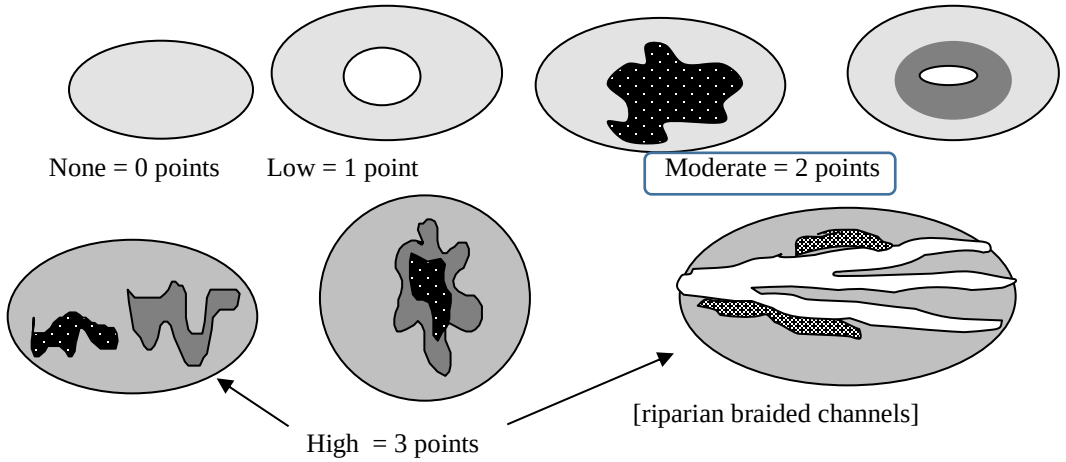
If you are unable still to determine which of the above criteria apply to your wetland, or you have more than 2 HGM classes within a wetland boundary, classify the wetland as **Depressional** for the rating.

R	Riverine and Freshwater Tidal Fringe Wetlands	Points
	WATER QUALITY FUNCTIONS - Indicators that wetland functions to improve water quality	
R	**R 1. Does the wetland have the potential to improve water quality?**	*(see p. 52)*
R	R 1.1 Area of surface depressions within the riverine wetland that can trap sediments during a flooding event: Depressions cover >3/4 area of wetland.....points = 8 Depressions cover > 1/2 area of wetland.....points = 4 Depressions present but cover < 1/2 area of wetland .....points = 2 No depressions present.....points = 0	0
R	R 1.2 Characteristics of the vegetation in the wetland (areas with > 90% cover at person height): Forest or shrub > 2/3 the area of the wetland .....points = 8 Forest or shrub > 1/3 area of the wetland .....points = 6 Ungrazed, emergent plants > 2/3 area of wetland .....points = 6 Ungrazed emergent plants > 1/3 area of wetland .....points = 3 Forest, shrub, and ungrazed emergent < 1/3 area of wetland .....points = 0	8
R	**Total for R 1** *Add the points in the boxes above*	8
R	**R 2. Does the wetland have the opportunity to improve water quality?** *(see p. 53)* Answer YES if you know or believe there are pollutants in groundwater or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes or groundwater downgradient from the wetland? *Note which of the following conditions provide the sources of pollutants.* ☐ Grazing in the wetland or within 150 ft ☐ Untreated stormwater discharges to wetland ☐ Tilled fields or orchards within 150 ft of wetland ☒ A stream or culvert discharges into wetland that drains developed areas, residential areas, farmed fields, roads, or clear-cut logging ☒ Residential, urban areas, golf courses are within 150 ft of wetland ☐ The river or stream linked to the wetland has a contributing basin where human activities have raised levels of sediment, toxic compounds or nutrients in the river water above standards for water quality ☐ Other_____ **YES** multiplier is **2** **NO** multiplier is **1**	multiplier 2
R	**TOTAL - Water Quality Functions** Multiply the score from R 1 by R 2 ***Add score to table on p. 1***	**16**

Comments

R	**Riverine and Freshwater Tidal Fringe Wetlands**	
	HYDROLOGIC FUNCTIONS - Indicators that wetland functions to reduce flooding and stream erosion	
	R 3. Does the wetland have the <u>potential</u> to reduce flooding and erosion?	***(see p. 54)***
R	R 3.1 Characteristics of the overbank storage the wetland provides: *Estimate the average width of the wetland perpendicular to the direction of the flow and the width of the stream or river channel (distance between banks). Calculate the ratio: (width of wetland)/(width of stream).* If the ratio is more than 20.....points = 9 If the ratio is between 10 – 20 .....points = 6 If the ratio is 5- <10 .....points = 4 If the ratio is 1- <5 .....points = 2 If the ratio is < 1 .....points = 1	1
R	R 3.2 Characteristics of vegetation that slow down water velocities during floods: *Treat large woody debris as "forest or shrub". Choose the points appropriate for the best description.* (polygons need to have >90% cover at person height NOT Cowardin classes) Forest or shrub for >1/3 area OR Emergent plants > 2/3 area .....points = 7 Forest or shrub for > 1/10 area OR Emergent plants > 1/3 area .....points = 4 Vegetation does not meet above criteria.....points = 0	7
R	**Total for R 3** *Add the points in the boxes above*	8
R	**R 4. Does the wetland have the <u>opportunity</u> to reduce flooding and erosion?** ***(see p. 57)*** Answer YES if the wetland is in a location in the watershed where the flood storage, or reduction in water velocity, it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows. *Note which of the following conditions apply.* ☒ There are human structures and activities downstream (roads, buildings, bridges, farms) that can be damaged by flooding. ☒ There are natural resources downstream (e.g. salmon redds) that can be damaged by flooding ☐ Other_____ *(Answer NO if the major source of water to the wetland is controlled by a reservoir or the wetland is tidal fringe along the sides of a dike)* **YES** multiplier is **2** **NO** multiplier is **1**	(see p. 57) multiplier 2
R	**TOTAL - Hydrologic Functions** Multiply the score from R 3 by R 4 ***Add score to table on p. 1***	16

These questions apply to wetlands of all HGM classes. **HABITAT FUNCTIONS - Indicators that wetland functions to provide important habitat**	
H 1. Does the wetland have the <u>potential</u> to provide habitat for many species?	
H 1.1 <u>Vegetation structure</u> ***(see p. 72)*** *Check the types of vegetation classes present (as defined by Cowardin) if the class is ¼ acre or covers more than 10% of the area of the wetland if unit smaller than 2.5 acres.* ☐ Aquatic bed ☐ Emergent plants ☒ Scrub/shrub (areas where shrubs have >30% cover) ☒ Forested (areas where trees have >30% cover) ☒ Forested areas have 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the forested polygon *Add the number of vegetation types that qualify. If you have:* 4 structures or more.....points = 4 3 structures.....points = 2 2 structures.....points = 1 1 structure.....points = 0	2
H 1.2. <u>Hydroperiods</u> ***(see p. 73)*** *Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or ¼ acre to count. (see text for descriptions of hydroperiods)* ☐ Permanently flooded or inundated — 4 or more types present .....points = 3 ☐ Seasonally flooded or inundated — 3 types present.....points = 2 ☒ Occasionally flooded or inundated — 2 types present .....points = 1 ☐ Saturated only — 1 types present…….points = 0 ☒ Permanently flowing stream or river in, or adjacent to, the wetland ☐ Seasonally flowing stream in, or adjacent to, the wetland ☐ ***Lake-fringe wetland* = 2 points** ☐ ***Freshwater tidal wetland* = 2 points**	1
H 1.3. <u>Richness of Plant Species</u> ***(see p. 75)*** Count the number of plant species in the wetland that cover at least 10 ft^2. (*different patches of the same species can be combined to meet the size threshold)* *You do not have to name the species.* *Do not include Eurasian milfoil, reed canarygrass, purple loosestrife, Canadian thistle* If you counted: > 19 species.....points = 2 *List species below if you want to:* 5 - 19 species.....points = 1 < 5 species.....points = 0	1

H 1.4. Interspersion of habitats ***(see p. 76)*** Decide from the diagrams below whether interspersion between Cowardin vegetation classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, medium, low, or none.  None = 0 points Low = 1 point Moderate = 2 points High = 3 points [riparian braided channels] NOTE: If you have four or more vegetation types or three vegetation types and open water the rating is always "high".	2
H 1.5. Special Habitat Features: ***(see p. 77)*** *Check the habitat features that are present in the wetland. The number of checks is the number of points you put into the next column.* ☐ Large, downed, woody debris within the wetland (>4in. diameter and 6 ft long). ☐ Standing snags (diameter at the bottom > 4 inches) in the wetland ☒ Undercut banks are present for at least 6.6 ft (2m) and/or **overhanging vegetation extends at least 3.3 ft (1m) over a stream for at least 33 ft (10m)** ☐ Stable steep banks of fine material that might be used by beaver or muskrat for denning (>30degree slope) OR signs of recent beaver activity are present ☐ At least ¼ acre of thin-stemmed persistent vegetation or woody branches are present in areas that are permanently or seasonally inundated.*(structures for egg-laying by amphibians)* ☐ Invasive plants cover less than 25% of the wetland area in each stratum of plants *Note: The 20% stated in early printings of the manual on page 78 is an error.*	1
H 1. TOTAL Score - potential for providing habitat *Add the scores from H1.1, H1.2, H1.3, H1.4, H1.5*	7

H 2. Does the wetland have the opportunity to provide habitat for many species?	
H 2.1 Buffers ***(see p. 80)*** *Choose the description that best represents condition of buffer of wetland. The highest scoring criterion that applies to the wetland is to be used in the rating. See text for definition of "undisturbed."* ☐ 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% of circumference. No developed areas within undisturbed part of buffer. (relatively undisturbed also means no-grazing) ..... Points = 5 ☐ 100 m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 50% circumference. ..... Points = 4 ☐ 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% circumference. ..... Points = 4 ☐ 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 25% circumference ..... Points = 3 ☐ 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water for > 50% circumference. ..... Points = 3 **If buffer does not meet any of the criteria above** ☐ No paved areas (except paved trails) or buildings within 25 m (80ft) of wetland > 95% circumference. Light to moderate grazing, or lawns are OK. ..... Points = 2 ☐ No paved areas or buildings within 50m of wetland for >50% circumference. Light to moderate grazing, or lawns are OK. ..... Points = 2 ☐ Heavy grazing in buffer. ..... Points = 1 ☐ Vegetated buffers are <2m wide (6.6ft) for more than 95% of the circumference (e.g. tilled fields, paving, basalt bedrock extend to edge of wetland ..... Points = 0 ☒ Buffer does not meet any of the criteria above……..……...Points = 1	1
H 2.2 Corridors and Connections ***(see p. 81)*** H 2.2.1 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 150 ft wide, has at least 30% cover of shrubs, forest or native undisturbed prairie, that connects to estuaries, other wetlands or undisturbed uplands that are at least 250 acres in size? (*dams in riparian corridors, heavily used gravel roads, paved roads, are considered breaks in the corridor*). YES = **4 points** (*go to H 2.3*) **NO** = go to H 2.2.2 H 2.2.2 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 50ft wide, has at least 30% cover of shrubs or forest, and connects to estuaries, other wetlands or undisturbed uplands that are at least 25 acres in size? **OR** a **Lake-fringe** wetland, if it does not have an undisturbed corridor as in the question above? YES = **2 points** (*go to H 2.3*) **NO** = H 2.2.3 H 2.2.3 Is the wetland: within 5 mi (8km) of a brackish or salt water estuary OR within 3 mi of a large field or pasture (>40 acres) OR within 1 mi of a lake greater than 20 acres? YES = **1 point** NO = **0 points**	1

H 2.3 Near or adjacent to other priority habitats listed by WDFW ***(see new and complete descriptions of WDFW priority habitats, and the counties in which they can be found, in the PHS report http://wdfw.wa.gov/hab/phslist.htm)*** Which of the following priority habitats are within 330ft (100m) of the wetland? *(NOTE: the connections do not have to be relatively undisturbed)* ☐ **Aspen Stands:** Pure or mixed stands of aspen greater than 0.4 ha (1 acres). ☐ **Biodiversity Areas and Corridors:** Areas of habitat that are relatively important to various species of native fish and wildlife (*full description in WDFW PHS report p. 152*) ☐ **Herbaceous Balds:** Variable size patches of grass and forbs on shallow soils over bedrock. ☐ **Old-growth/Mature forests:** (Old-growth west of Cascade crest) Stands of at least 2 tree species, forming a multi-layered canopy with occasional small openings; with at least 20 trees/ha (8 trees/acre) > 81 cm (32 in) dbh or > 200 years of age. (Mature forests.) Stands with average diameters exceeding 53 cm (21 in) dbh; crown cover may be less that 100%; crown cover may be less that 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80 - 200 years old west of the Cascade crest. ☐ **Oregon white Oak:** Woodlands Stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important (*full descriptions in WDFW PHS report p. 158.)* ☒ **Riparian**: The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other. ☐ **Westside Prairies:** Herbaceous, non-forested plant communities that can either take the form of a dry prairie or a wet prairie (*full descriptions in WDFW PHS report p. 161*) ☒ **Instream:** The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources. ☐ **Nearshore:** Relatively undisturbed nearshore habitats. These include Coastal Nearshore, Open Coast Nearshore, and Puget Sound Nearshore. *(full descriptions of habitats and the definition of relatively undisturbed are in WDFW report: pp. 167-169 and glossary in Appendix A.)* ☐ **Caves:** A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human. ☐ **Cliffs:** Greater than 7.6 m (25 ft) high and occurring below 5000 ft. ☐ **Talus:** Homogenous areas of rock rubble ranging in average size 0.15 - 2.0 m (0.5 - 6.5 ft), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs. ☐ **Snags and Logs:** Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of >51 cm (20 in) in western Washington and are > 2 m (6.5 ft) in height. Priority logs are > 30cm (12 in) in diameter at the largest end, and > 6m (20 ft) long. If wetland has **3 or more** priority habitats **= 4 points** If wetland has **2** priority habitats = **3 points** If wetland has **1** priority habitat **= 1 point** No habitats = **0 points** *Note: All vegetated wetland are by definition a priority habitat but are not included in this list. Nearby wetlands are addressed in question H2.4.*	3

H 2.4 Wetland Landscape *(choose the **one** description of the landscape around the wetland that best fits*) ***(see p. 84)*** There are at least 3 other wetlands within ½ mile, and the connections between them are relatively undisturbed (light grazing between wetlands OK, as is lake shore with some boating, but connections should NOT be bisected by paved roads, fill, fields, or other development. ..... points = 5 The wetland is Lake-fringe on a lake with little disturbance and there are 3 other lake-fringe wetlands within ½ mile ..... points = 5 There are at least 3 other wetlands within ½ mile, BUT the connections between them are disturbed ..... points = 3 The wetland is Lake-fringe on a lake **with** disturbance and there are 3 other lake-fringe wetland within ½ mile ..... points = 3 There is at least 1 wetland within ½ mile. ..... points = 2 There are no wetlands within ½ mile. ..... points = 0	3
H 2. TOTAL Score - opportunity for providing habitat *Add the scores from H2.1, H2.2, H2.3, H2.4*	8
TOTAL for H1 from page 14	7
Total Score for Habitat Functions – add the points for H 1, H 2 and record the result on p. 1	15

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Please determine if the wetland meets the attributes described below and circle the appropriate Category.

Wetland Type *Check off any criteria that apply to the wetland. Circle the Category when the appropriate criteria are met.*	**Category**
SC 1.0 Estuarine wetlands (*see p. 86)* Does the wetland unit meet the following criteria for Estuarine wetlands? ☐ The dominant water regime is tidal, ☐ Vegetated, and ☐ With a salinity greater than 0.5 ppt. YES = Go to SC 1.1 NO ☒	
SC 1.1 Is the wetland unit within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-151? ☐ YES = Category I ☐ NO = go to SC 1.2	**Cat. I**
SC 1.2 Is the wetland unit at least 1 acre in size and meets at least two of the following three conditions? ☐ YES = Category I ☐ NO = Category II ☐ The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of non-native plant species. If the non-native Spartina spp. are the only species that cover more than 10% of the wetland, then the wetland should be given a dual rating (I/II) The are aof Spartina would be rated a Category II while the relatively undisturbed upper marsh with native species would be a Category I. Do not, however, exclude the area of Spartina in determining the size threshold of 1 acre. ☐ At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed wetland. ☐ The wetland has at least 2 or the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands.	**Cat. I** **Cat. II** **Dual rating I/II**

SC 2.0 Natural Heritage Wetlands ***(see p. 87)*** Natural Heritage wetlands have been identified by the Washington Natural Heritage Program/DNR as either high quality undisturbed wetlands or wetlands that support state Threatened, Endangered, or Sensitive plant species. SC 2.1 Is the wetland being rated in a Section/Township/Range that contains a Natural Heritage wetland? *(this question is used to screen out most sites before you need to contact WNHP/DNR)* S/T/R information from Appendix D ☐ or accessed from WNHP/DNR web site ☒ YES ☐ – contact WNHP/DNR (see p. 79) and go to SC 2.2 NO ☒ SC 2.2 Has DNR identified the wetland as a high quality undisturbed wetland or as or as a site with state threatened or endangered plant species? YES = Category I NO ☒ Not a Heritage Wetland	**Cat. I**
SC 3.0 Bogs ***(see p. 87)*** Does the wetland (or any part of the unit) meet both the criteria for soils and vegetation in bogs? *Use the key below to identify if the wetland is a bog. If you answer yes, you will still need to rate the wetland based on its functions.* 1. Does the wetland have organic soils horizons (i.e. layers of organic soil), either peats or mucks, that compose 16" or more of the first 32 inches of the soil profile? (See Appendix B for a field key to identify organic soils.) Yes - go to Q.3 NO - go to Q.2 2. Does the wetland have organic soils, either peats or mucks, that are less than 16 inches deep over bedrock or an impermeable hardpan such as clay or volcanic ash, or that are floating on top of a lake or pond? Yes - go to Q.3 NO ☒ is not a bog for purpose of rating 3. Does the wetland have more than 70% cover of mosses at ground level, AND other plants, if present, consist of the "bog" species listed in Table 3 as a significant component of the vegetation (more than 30% of the total shrub and herbaceous cover consists species in Table 3)? Yes – Is a bog for purpose of rating NO - go to Q.4 *NOTE: If you are uncertain about the extent of mosses in the understory, you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16" deep. If the pH is less than 5.0 and the "bog" plant species in Table 3 are present, the wetland is a bog.* 4. Is the wetland forested (>30% cover) with sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Englemann's spruce, or western white pine, WITH any of the species (or combination of species) on the bog species plant list in Table 3 as a significant component of the ground cover (*>30% coverage of the total shrub/herbaceous* cover)? YES = Category I NO ☒ is not a bog for purpose of rating	**Cat. I**

SC 4.0 Forested Wetlands *(see p. 90)*	
Does the wetland have at least 1 acre of forest that meet one of these criteria for the Department of Fish and Wildlife's forests as priority habitats? *If you answer yes you will still need to rate the wetland based on its functions.*	
☐ Old growth forests: (west of Cascade crest) Stands of at least two tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/acre (20 trees/hectare) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 inches (81 cm) or more. *Note: The criterion for dbh is based on measurements for upland forests. Two hundred year old trees in wetlands will often have a smaller dbh because their growth rates are often slower. The DFW criterion is and "OR" so old-growth forests do not necessarily have to have trees of this diameter.*	
☐ Mature forests: (west of the Cascade crest) Stands where the largest trees are 80-200 years old OR have average diameters (dbh) exceeding 21 in (53 cm); crown cover may be less than 100%; decay, decadence, numbers of snags, and quanitity of large downed material is generally less than that found in old-growth	
YES = Category 1 NO ☒ not a forested wetland with special characteristics	**Cat. I**
SC 5.0 Wetlands in Coastal Lagoons (see p. 91)	
Does the wetland meet all of the following criteria of a wetland in a coastal lagoon?	
☐ The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks.	
☐ The lagoon in which the wetland is located contains surgace water that is saline or brackish (> 0.5 ppt) during most of the year in at least a portion of the lagoon (*needs to be measured near the bottom*)	
YES – Go to SC 5.1 NO ☒ not a wetland in a coastal lagoon	**Cat. I**
SC 5.1 Does the wetland meet all of the following three conditions?	
☐ The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 20% cover of invasive plant species (see list of invasive species on p. 74).	
☐ At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland.	**Cat. II**
☐ The wetland is larger than 1/10 acre (4350 square feet)	
YES = Category I NO = Category II	

SC 6.0 Interdunal Wetlands (see p. 93) Is the wetalnd unit west of the 1889 line (also called the Westarn Boundary of Upland Ownership or WBUO)? YES – go to SC 6.1 NO ☒ not an interdunal wetland for rating *If you answer yes you will still need to rate the wetland based on its functions.* In practical terms that means the following geographic areas: – Long Beach Peninsula – lands west of SR 103 – Grayland-Westport – lands west of SR 105 – Ocean Shores-Copalis – lands west of SR 115 and SR 109 SC 6.1 Is the wetland 1 acre or larger, or is it in a mosaic of wetlands that is 1 acre or larger? YES = Category II NO – go to SC 6.2 SC 6.2 Is the unit between 0.1 and 1 acre, or is it in a mosaic of wetlands that is between 0.1 and 1 acre? YES = Category III	**Cat. II** **Cat. III**
Category of wetland based on Special Characteristics *Choose the "highest" rating if wetland falls into several categories, and record on p. 1.* If you answered NO for all types enter "Not Applicable" on p.1.	**N/A**