
COWEEMAN RIVER MITIGATION BANK MITIGATION BANKING INSTRUMENT

KELSO, WASHINGTON



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1 **MITIGATION BANKING INSTRUMENT**
2 **Coweeman River Mitigation Bank**
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5 This Mitigation Banking Instrument (hereinafter, the “Instrument”) regarding the establishment,
6 use, operation, and maintenance of the Coweeman River Mitigation Bank (hereinafter, the
7 “Bank”) is made and entered into by and among Habitat Bank, LLC (hereinafter, the “Sponsor”),
8 the U.S. Army Corps of Engineers (hereinafter, the “Corps”), the Washington State Department
9 of Ecology (hereinafter, “Ecology”) and National Oceanic Atmospheric Administration National
10 Marine Fisheries Service (hereinafter, “NMFS”), (hereinafter, collectively, the “Parties”), with
11 reference to the following:
12

13 **I. PREAMBLE**
14

15 **A. Purpose:** The purpose of this Instrument is to specify responsibilities for the
16 establishment, use, operation, and maintenance of the Bank. It consists of this “Basic
17 Agreement” establishing the central obligations assumed and consideration provided by each
18 Party, as well as Appendices (hereinafter, the “Appendices”) that establish the detailed Bank
19 implementation plan, including site-specific conditions, standards and procedural requirements
20 applicable to the Bank. The terms and provisions of the Appendices are incorporated into the
21 Instrument. The Bank will provide compensatory mitigation for unavoidable impacts to waters
22 of the United States and waters of the State, including wetlands, as well as adverse effects on
23 aquatic habitat including habitat for both fish listed under the Endangered Species Act (ESA) and
24 non-listed fish, and to other natural resources that result from activities authorized by Federal,
25 State, and local authorities, when use of the Bank has been specifically approved by the
26 appropriate regulatory agencies.
27

28 **B. Location and Ownership of Parcel:** Whereas, the Sponsor has been granted use by
29 four parties including Lopes, Wharton, Sari, and the City of Kelso for the use of approximately
30 302.0 acres of land located along the Coweeman River in the City of Kelso, and unincorporated
31 Cowlitz County, Cowlitz County, Washington within portions of Section 36, Township 8 North,
32 Range 2 and Section 31, Township 8 North, Range 1 West of the Willamette Meridian. See
33 Appendix A for detailed description and map. All real property to be included within Phase 1 of
34 the Bank site area is more completely described in the legal description attached as Exhibit A to
35 this Instrument. Parcels of real property reflected as comprising Phase 2 in Table 1, below, will
36 be addressed as necessary in an amendment to this Basic Agreement.
37

38 **Table 1. Property Information Summary**

Survey Map Identifier	Property Owner	Parcel Number	Zoning	Acreage
Phase 1				
1	Wharton	WI3608001 WI3605001	Farm and Agricultural	13.4
2	Lopes/Sari	WI3605002	Farm and Agricultural	26.0
3	Lopes	WI3602008	Farm and	13.5

			Agricultural	
4	City of Kelso	WI3601001	Public Land	40.6
5	City of Kelso	24125	Public Land	208.5
			Phase 1 Total	302.0¹
Phase 2				
6	Murray	WE3101003	Farm and Agricultural	18.9
			Phase 2 Total	18.9
			Total Bank Site Acreage	320.9¹
Easements Phase 1				
2, 5	Olympic Pipeline Company	WI3605002, 24125	---	5.14
4	Bonneville Power Administration	WI3601001	---	.45
2, 3	Pacific Fiber Link	WI3605002, WI3602008	---	0.17
			Total Phase 1	5.76
Easements Phase 2				
6	Bonneville Power Administration	WE3101003	---	4.33
			Total Phase 2	4.33
			All Easements	10.09
Other				
Coweeman River	---	---	---	7.75

¹ Easement and Coweeman River acreage are incorporated into each parcels' total acreage; therefore, are included in the Total Bank Site Acreage calculation.

C. Project Description: Whereas, the Sponsor has expressed intent to establish, re-establish, rehabilitate, enhance and preserve approximately 320.9 acres of aquatic and associated upland habitat in accordance with the provisions of this Instrument, and to then maintain each established phase of the Bank in accordance with the provisions of this Instrument. The Bank is projected to, among other purposes, provide in Phase 1, 21.33 acres of new created wetland area, 14.68 acres of rehabilitated wetland area, 14.53 acres of enhanced wetland area, 8.44 acres of preserved wetland area, 28.89 acres of enhanced riparian upland area and 206.38 acres of preserved old growth and second growth forested hillside (Table 2). Phase 2 will create approximately 8.90 acres of additional wetland area and enhance approximately 10 acres of riparian uplands as detailed in Appendices A and B of this Instrument. Phase 2 is considered an optional Bank phase, and inclusion of real property reflected in Table 2 as comprising Phase 2 of the Bank would require authorization from the landowner and an amendment to the Basic Agreement, as well as County approval.

1 The Bank site encompasses areas that shall not generate Bank credits, consisting of utility
 2 corridor easements, a portion of the Coweeman River, and a 100-foot buffer. The 100-foot
 3 buffer around the perimeter of the site is based upon current and anticipated land-use intensities
 4 on adjacent properties and the risk of impacts to the Bank from those activities. Phase 1 of the
 5 Bank includes 302.0 acres and includes 5.76 acres of utility corridor easements, 7.75 acres of the
 6 Coweeman River, and 30.22 acres of non-creditable buffer. The available area for credit
 7 generation in Phase 1 is 258.27 acres.

8
 9 The project will specifically address fish habitat impacts by improving connectivity
 10 between the Coweeman River, floodplain wetlands and the associated tributaries in the preserved
 11 upland areas and will create off channel rearing and refuge areas along the Coweeman River
 12 with large woody material and engineered log jams to provide protection and habitat. Gravel
 13 will be placed in appropriate locations along the Coweeman River in created alcoves and
 14 enhanced stream areas to encourage spawning by Coho and Chum.

15
 16 The project will preserve, enhance and create aquatic resources throughout an entire area
 17 within the watershed from tributary headwaters in old growth forest through floodplain wetlands
 18 down to the tidally influenced Coweeman River in the Lower Columbia Floodplain as detailed in
 19 Table 2. The aquatic systems are connected and protected from the top of the sub-basin to the
 20 Coweeman River creating a protected ecosystem and highly functioning corridors to benefit fish
 21 and wildlife.

22
 23 **Table 2. Proposed Bank Activity**

Mitigation Activity By Area	Habitat Type	Total Acres ¹
PHASE 1		
Area A in the Floodplain		67.46
Wetland Creation:	PFO/PSS/PEM Mosaic	12.31
Riparian Wetland Bench Creation:	PSS/PEM Mosaic	1.68
Wetland A Preservation:	Existing PAB	6.12
Wetland A Enhancement:	Existing PFO/PSS	14.17
Wetland A Rehabilitation:	Existing PEM	13.22
Riparian Upland Enhancement:	PFO/PSS	19.96
Area A Hillside Preservation		208.70
Riparian Upland Preservation:	Old Growth Forest Riparian Corridor ²	41.76
Riparian Upland Preservation:	2 nd Growth Forest Riparian Corridor	4.56
Upland Preservation:	Non Riparian Old Growth Forest	132.25
Upland Preservation:	Non Riparian 2 nd Growth Forest	27.81
Upland Enhancement:	Invasive Species Removal	N/A
Wetland Preservation:	Existing PFO/PSS/PEM&PEM Wetlands	2.32
Area B		11.38
Wetland Creation:	PFO/PSS/PEM Mosaic	5.28
Riparian Wetland Bench Creation:	PSS/PEM Mosaic	0.32
Wetland B Rehabilitation:	Existing PEM	0.44
Riparian Upland Enhancement:	PFO/PSS	5.34
Area C		6.71

Wetland Creation:	PFO/PSS/PEM Mosaic	1.74
Wetland C Rehabilitation	Existing PSS/PEM	1.02
Wetland D Enhancement:	Existing PSS/PEM	.36
Riparian Upland Enhancement:	PFO/PSS	3.59
PHASE 1 TOTAL (Area A, B and C)		294.25
Floodplain Area Summary		
Wetland Creation (not including riparian wetland bench)		19.33
Riparian Wetland Bench Creation		2.00
Wetland Enhancement		14.53
Wetland Rehabilitation		14.68
Wetland Preservation		6.12
Riparian Upland Enhancement		28.89
Coweeman River Total		7.75
PHASE 2		
Area D		
Wetland Creation:	PFO/PSS/PEM Mosaic	8.90
Riparian Upland Enhancement:	PFO/PSS	10.00

¹Total Acres includes areas within bank buffer and easements

D. Bank Overview: Whereas, the general goals of Bank establishment are to restore site hydrology and floodplain connectivity to existing and created aquatic areas, increase habitat function and complexity for anadromous fish and other aquatic dependent wildlife, and reestablish wetland and riparian vegetation communities typically found in the Lower Columbia River floodplain environment. The bank development plan will restore site conditions to a pre-agricultural, pre-logging state while operating within the confines of existing site constraints.

The Bank site is located in Water Resource Inventory Area (WRIA) 26 in the lower portion of the Coweeman River Watershed approximately 3 miles above the Coweeman River’s confluence with the Cowlitz River. Just over 100 acres, making up the north section of the project is level-to-undulating Coweeman River floodplain and has been actively used for agriculture and cattle grazing for at least three-quarters of a century. A large palustrine forested/shrub/emergent/aquatic bed wetland complex locally known as “Hart’s Lake” (Wetland A) exists within the floodplain of the Bank site as well as some other small and heavily disturbed emergent wetlands in other portions of the Bank site floodplain area.

The Coweeman River forms the majority of the northern boundary of the Bank site; however, two parcels totaling 13.4 acres are included in the Bank and are located on the north side of the river in an old river oxbow. The Bank project includes approximately 1.5 miles of the Coweeman River, measured from river mile (RM) 3.8 to RM 5.3 above the confluence with the Cowlitz River. The Coweeman River is tidally influenced throughout the Bank project area most likely until RM 7.5 within the Murray Family parcel. This section of the Coweeman River is also within the historical floodplain of the Columbia River.

1 The remaining approximately 200 acres of the Bank site southward is forested woodland and
2 approximately 176 acres of that total meets priority habitat standards for Old Growth Forest, as
3 defined by the Washington Department of Fish and Wildlife (WDFW) (*Priority Habitats and*
4 *Species List*, August 2008). The remaining 24 woodland acres is well established mature second
5 growth forest that does not yet meet criteria to be considered old growth forest. This parcel was
6 either never logged or was only selectively logged in the late 1800s or early 1900s. The second
7 growth forest provides a functional buffer to the old growth forest and will eventually transition
8 into a forest that meets old growth criteria and functionality. Lowland old growth forest is rare in
9 the region and provides significant habitat functions for wildlife as well as high quality riparian
10 and wetland habitat, beneficial to the onsite tributaries and fish and wildlife.

11
12 The project grading, planting, and habitat feature development plans propose to reconstruct a
13 mosaic of habitat types within the floodplain environment, consistent with what would have
14 historically been found in this dynamic riverine environment, prior to human alteration during
15 the late 19th and early 20th centuries. Before the Coweeman River was cleared of woody material
16 and diked in the Kelso area, aquatic areas and floodplain uplands within the bank site would
17 have had a more consistent and sustained hydrologic connection to the Coweeman River. The
18 lowering and incising of the Coweeman River as a result of these activities has drained wetlands
19 and lowered tributary elevations, creating points of hydrologic disconnect and incisement
20 throughout this floodplain environment. Additionally, historical aerial photographs and
21 topographic mapping shows a mixture of trees and shrubs in the floodplain that are no longer
22 present because of the last 100 years of clearing and agricultural activities on the bank site.

23
24 The bank project design proposes to create, rehabilitate, enhance, and preserve wetlands, as well
25 as enhance and preserve tributary streams, forested uplands and riparian corridors. Existing
26 wetlands will be planted to create or enhance Palustrine Forested, Scrub-Shrub, and Emergent
27 vegetation communities and preserve Palustrine Aquatic Bed habitat as defined by Cowardin
28 (1979). In most areas these habitat types will be interspersed to create a mosaic of different
29 Cowardin classes, which would most likely be present in the unaltered floodplain environment of
30 the Coweeman River, where differences in hydrologic regime, sedimentation, large woody
31 material (LWM) transport and beaver activity created clustered and varied vegetation
32 communities. This is documented by historical aerial photography, surveys and the existing
33 conditions in and around Wetland A. In addition to the work within the floodplain, the Bank
34 includes the preservation of old growth and second growth forest which include six hillside
35 tributaries to the Coweeman River and associated wetland areas.

36
37 **E. Interagency Review Team:** Whereas, in consideration of the establishment and
38 maintenance of the Bank, the Interagency Review Team (IRT) is willing to award compensatory
39 mitigation credits in the form of aquatic resource credits and fish conservation credits, in
40 accordance with the procedures outlined in this Instrument. These Bank credits will be made
41 available to serve as compensatory mitigation pursuant to applicable Federal and Washington
42 State laws and regulations. The Corps and Ecology serve as Co-Chairs of the IRT. The IRT is
43 the group of Federal, State, tribal, and local agencies that has reviewed, and will advise the Co-
44 Chairs regarding, the establishment and management of the Bank pursuant to the provisions of
45 the Instrument.

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7 NOW, THEREFORE, the Parties agree to the following:
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10 **II. LEGAL AUTHORITIES**

11
12 **A. Authorities:** The establishment, use, operation, and maintenance of the Bank shall
13 be carried out in accordance with the following principal authorities.
14

15 1. Federal:

- 16
17 a. Clean Water Act (33 USC §§ 1251 et seq.)
18
19 b. Rivers and Harbors Act of 1899 (33 USC § 403)
20
21 c. Regulatory Programs of the Corps of Engineers, Final Rule (33 CFR Parts
22 320-332)
23
24 d. U.S. Army Corps of Engineers Regulatory Guidance Letter 05-1,
25 *Guidance on Use of Financial Assurances, and Suggested Language*
26 *for Special Conditions for Department of the Army Permits Requiring*
27 *Performance Bonds*, U.S. Army Corps of Engineers, February 14,
28 2005
29
30 e. Guidelines for the Specification of Disposal Sites for Dredged and Fill
31 Material (“404(b)(1) Guidelines,” 40 CFR Part 230)
32
33 f. National Environmental Policy Act (42 USC §§ 4321 et seq.)
34
35 g. Council on Environmental Quality Procedures for Implementing the
36 National Environmental Policy Act (40 CFR Parts 1500-1508)
37
38 h. Executive Order 11990 (Protection of Wetlands)
39
40 i. Executive Order 11988 (Protection of Floodplains)
41
42 j. Executive Order 13112 (Invasive Species)
43
44 k. Fish and Wildlife Coordination Act (16 USC §§ 661 et seq.)
45
46 l. Fish and Wildlife Service Mitigation Policy (46 FR 7644-7663, 1981)

- m. Endangered Species Act (16 USC §§ 1531 et seq.)
- n. Magnuson-Stevens Fishery Conservation and Management Act (16 USC §§ 1801 et seq.)
- o. National Historic Preservation Act, as amended (16 USC § 470)
- p. Coastal Zone Management Act (16 USC § 1451 et seq.)

2. State of Washington:

- a. Washington Water Pollution Control Act, RCW 90.48 et seq.
- b. State of Washington Wetlands Mitigation Banking Statute (RCW 90.84)
- c. Washington State Rule on Wetland Mitigation Banking (WAC 173-700, Wetland Mitigation Banks)
- d. Washington State Environmental Policy Act (“SEPA” RCW 43.21C and WAC 197-11)
- e. Growth Management Act (RCW 36.70A)
- f. Washington State Hydraulic Code (RCW 77.55, WAC 220-110, and Hydraulic Permit Approval)
- g. Washington State Shoreline Management Act (RCW 90.58, WAC 173-27 as amended)
- h. Washington State Salmon Recovery Act (RCW 77.85)
- i. Washington State Aquatic Resources Act (RCW 90.74)
- j. Executive orders 89-10 and 90-04, Protection of Wetlands,

III. ESTABLISHMENT OF THE BANK

A. Permits: The Sponsor shall obtain all appropriate environmental documentation, permits and other authorizations needed to establish and maintain the applicable phase of the Bank, prior to the award of any Bank credits. Compliance with this Instrument does not fulfill the requirement, or substitute, for such authorizations. Local authorizations and permits include,

1 but are not limited to, Cowlitz County approvals, permits, and authorizations issued under the
2 statutory and regulatory provisions listed in the Appendices of this Instrument.
3

4 **B. Bank Establishment:** The Sponsor agrees to establish the Bank as described in
5 Appendix B and to satisfactorily accomplish all performance standards reflected in Appendix C.
6 In recognition thereof, compensatory mitigation credits will be awarded to the Sponsor in
7 accordance with the procedures and schedules prescribed in the Appendices, particularly in
8 Appendices C and D. In establishing the Bank, deviations from the prescribed Bank
9 development plan and design, including deviations from any performance standards, may only be
10 made with the prior approval of the Corps and Ecology, acting with the concurrence of NMFS
11 when fish conservation credits are involved, and in consultation with the other members of the
12 IRT. To propose modifications to the Bank development plan, the Sponsor shall submit a
13 written request to the Corps and Ecology. Documentation of implemented modifications shall be
14 made consistent with Article VI.B.2. of this Instrument. The Establishment Period of the Bank is
15 defined in Article IV.K.
16

17 **C. Financial Assurance Requirements:** The Sponsor agrees to provide the following
18 financial assurances for the work described in this Instrument:
19

20 **1. Financial Assurance Mechanisms for Mitigation Bank Establishment:** The
21 Sponsor shall furnish either a Letter of Credit or a Surety Bond to provide financial assurance
22 underlying the establishment and initial functionality of each phase of the Bank. This Letter of
23 Credit or Surety Bond must be initiated by the Sponsor, in a form and content approved by the
24 Corps and Ecology, and shall conform to the requirements of Appendix H, before any
25 construction or implementation activities may be conducted on-site as part of the establishment
26 period of the Bank, as defined in Article IV.K., and prior to the award of any Bank credits. Any
27 construction or implementation activities conducted on-site for Phase 1 prior to the inception of
28 the establishment period must cease as of the effective date of this Instrument pursuant to Article
29 VI.B.1, until an approved Letter of Credit or Surety Bond is initiated for that phase. Construction
30 on subsequent phases cannot commence until an approved Letter of Credit or Surety Bond is
31 initiated for each phase. The Corps and Ecology will notify the Sponsor that construction and
32 implementation activities are authorized to commence for Phase 1, by granting the initial award
33 of Bank credits in recognition of meeting all the performance standards under Objective 1,
34 pursuant to Appendix D.
35
36

37 a. The Corps and Ecology must specifically approve all terms and
38 conditions of the Letter of Credit or Surety Bond, as well as the identity of the financial
39 institution issuing and underwriting the Letter of Credit or Surety Bond.
40

41 i. For Letters of Credit, only federally-insured institutions rated
42 investment grade or higher may issue the Letter of Credit. The Sponsor shall provide the Corps
43 and Ecology with a credit rating that indicates the financial institution has the required rating as
44 of the date of first issuance of the Letter of Credit. This credit rating shall be from a recognized
45 commercial rating service as specified in the Office of Federal Procurement Policy Pamphlet No.
46 7, available through the website of the Office of Management and Budget, Executive Office of

1 the President. Provided the required credit rating is held, approval of the financial institution
2 selected by the Sponsor shall not be unreasonably withheld. If the Corps or Ecology determines
3 that the credit rating of the financial institution issuing the Letter of Credit has subsequently
4 failed to adhere to these requirements, the Corps or Ecology may direct the Sponsor to provide an
5 acceptable substitute Letter of Credit within 30 days. If an acceptable substitute is not provided
6 within the prescribed period, the Corps or Ecology may immediately draw on the Letter of Credit
7 up to its full value without any further notice to the Sponsor. If notice of non-renewal as
8 delineated in section H.1.B. of Appendix H has been provided, and the Sponsor does not furnish
9 an acceptable replacement Letter of Credit or other approved financial assurance at least 30 days
10 before the Letter of Credit's expiration, the Corps or Ecology may immediately draw on the
11 existing Letter of Credit up to its full value without any notice to the Sponsor.
12

13 ii. For Surety Bonds, the surety must be currently certified on the
14 Department of the Treasury, Financial Management Service's Circular 570, Listing of Approved
15 Corporate Sureties. The penalty amount of the Surety Bond must fall within the per-bond
16 underwriting limitation prescribed in Circular 570, unless the amount which exceeds the specified
17 underwriting limit is coinsured or reinsured by a corporate surety currently certified in the
18 applicable list in Circular 570, and unless the amount of excess risk covered by coinsurance or
19 reinsurance does not exceed the underwriting limit of each coinsurer or reinsurer. The terms and
20 conditions of any coinsurance or reinsurance agreement must conform to the requirements of 31
21 Code of Federal Regulations sections 223.10 and 223.11, and the coinsurance or reinsurance
22 agreement must itself be specifically approved by the Corps and Ecology. Provided the required
23 certification is held and the applicable underwriting limitations are not exceeded, approval of the
24 surety selected by the Sponsor shall not be unreasonably withheld. If the Corps or Ecology
25 determines that the surety's certification under Circular 570 has been terminated, or that the per-
26 bond underwriting limitation prescribed in Circular 570 has been exceeded, the Corps or Ecology
27 may direct the Sponsor to provide an acceptable substitute Surety Bond within 30 days. If an
28 acceptable substitute financial assurance is not provided within the prescribed period, the Corps
29 or Ecology may immediately demand payment upon the Surety Bond up to its full value without
30 any further notice to the Sponsor. If notice of non-renewal as delineated in section H.1.2.B of
31 Appendix H has been provided, and the Sponsor does not furnish an acceptable replacement
32 Surety Bond or other approved financial assurance at least 30 days before the Surety Bond's
33 expiration, the Corps or Ecology may immediately demand payment upon the penal sum of the
34 existing Surety Bond up to its full value without any notice to the Sponsor.
35

36 iii. If a replacement financial assurance is required, no further
37 credits will be awarded to the Bank without an effective Letter of Credit, Surety Bond, or other
38 approved financial assurance.
39

40 iv. If the financial assurance applicable to the Bank shall expire by
41 its own terms prior to rescission or cancelation pursuant to the terms of Article III.C.1.f., the
42 Sponsor must reinitiate an acceptable financial assurance so that there is no interval in which
43 there is no approved financial assurance in effect. No further credits will be awarded to the Bank
44 while the Bank lacks an effective financial assurance instrument.
45

1 b. The Corps or Ecology, acting independently or in concert, may direct
2 disbursement from the credit funds account on a Letter of Credit, or payment of the penal sum on
3 a Surety Bond, as applicable, under the following circumstances: upon abandonment of Bank
4 establishment efforts; upon a failure stemming from any cause to achieve any of the Bank
5 Objectives or Performance Standards as reflected in Appendix C, including, but not limited to,
6 deficient design, ineffective establishment, deterioration of functionality or performance, or
7 financial limitations of the Sponsor; or upon the Sponsor's failure to maintain in force, or to
8 promptly reinstate, renew, or extend, the Letter of Credit or Surety Bond, as applicable, as
9 required by this Article III.C.1 and Appendix H. The Corps and/or Ecology shall provide
10 specific and express written direction for corrective action to the Sponsor in accordance with
11 Article IV.H. of this Instrument and Appendix F, Section 1.1.4 ninety (90) calendar days prior to
12 accessing funds pursuant to a Letter of Credit, or ninety (90) calendar days prior to requiring
13 payment of the penal sum on a Surety Bond. If, within ninety (90) days of delivery of notice of
14 the demand for corrective action, the Sponsor has initiated compliance efforts and the Corps and
15 Ecology have determined, in their sole discretion, that substantial progress has been made toward
16 completion of corrective action, the Corps and Ecology will defer accessing the Letter of Credit
17 or requiring payment on the Surety Bond, as applicable. The Corps and/or Ecology need not
18 provide the prior notice to the Sponsor prescribed in this Article III.C.1: (a) when requiring
19 payment on a Letter of Credit due to failure to maintain the necessary credit rating or certification
20 under Office of Federal Procurement Policy Pamphlet No. 7; (b) when requiring payment on a
21 Surety Bond due to failure to maintain the necessary credit rating or certification under Financial
22 Management Service Circular 570; or (c) in the event that notice of non-renewal has been
23 provided under Article III.C.1.a.i. or Article III.C.1.a.ii.
24

25 c. Following consultation with the IRT, the Corps and/or Ecology may
26 access the funds guaranteed by the Letter of Credit, or require payment on the Surety Bond, as
27 applicable, to ensure accomplishment of any of the following objectives or features of the Bank:
28 construction, establishment, monitoring, maintenance, or remedial action activities reflected in, or
29 directly supporting accomplishment of, the Objectives and Performance Standards reflected in
30 Appendix C. The Sponsor expressly waives any and all opportunity to challenge, delay, or
31 require substantiation for any direction by the Corps or Ecology accessing and disbursing the
32 funds guaranteed by the Letter of Credit, or requiring payment on the Surety Bond, as applicable.
33 The Corps and/or Ecology may elect, in consultation with the IRT, to accomplish all of the
34 Objectives and Performance Standards prescribed in Appendix C, Section 2.1 and for which the
35 Sponsor has assumed responsibility under Article III.B. of this Instrument. In lieu of
36 accomplishing all Objectives and Performance Standards in Appendix C, the Corps and/or
37 Ecology, in their sole discretion, acting with the concurrence of NMFS when fish conservation
38 credits are involved, and in consultation with the other members of the IRT, may accomplish only
39 that component or those components of the Objectives and Performance Standards that are
40 deemed reasonably necessary to achieve a project that is stable, self-sustaining, and provides a
41 level of general benefit to the aquatic resources of the watershed that the Corps and/or Ecology
42 deem appropriate under the circumstances. Accomplishment of corrective or remedial actions
43 determined to be necessary in order to achieve the Sponsor's obligations under the objectives and
44 performance standards will be achieved by a Third Party Designee designated by the Corps
45 and/or Ecology. Eligible Third Party Designees may include, but are not limited to, non-profit
46 entities, state or local agencies, tribal components, or private mitigation providers. Such

1 corrective or remedial action to accomplish specified Sponsor responsibilities under the
2 objectives and performance standards shall be achieved in accordance with a plan developed by
3 the Third Party Designee and approved by the Corps and Ecology as conforming to the
4 provisions of this Instrument.

5
6 d. Any Letter of Credit shall take the general form of an agreement on the
7 part of the issuing financial institution to honor the engagement reflected therein as directed by
8 one or both of the beneficiaries in the event that the Corps and/or Ecology determine, in their sole
9 and exclusive discretion, that the principal has failed to fulfill any of the obligations established
10 in this Instrument. Any Surety Bond shall take the general form of an indemnity contract in a
11 sum certain obliging the surety to pay the full face value of the bond as directed by one or both of
12 the beneficiaries in the event that the Corps and/or Ecology determine, in their sole and exclusive
13 discretion, that the principal has failed to fulfill any of the obligations established in this
14 Instrument. A Letter of Credit or Surety Bond, as applicable, shall be furnished to guarantee the
15 establishment activities of the phases of the Bank, in the following amounts:

16
17 (i): Phase 1: \$712,088

18
19 (ii): Phase 2: \$250,000

20
21 e. Upon certification by the Corps and Ecology that the following
22 performance standards, as prescribed in Appendix C and Table D-4 of Appendix D, have been
23 achieved, the Corps and Ecology will authorize in writing that the required amount of the Letter
24 of Credit, or the required penal sum of the Surety Bond, as applicable for each phase, be
25 modified as follows:

26
27 i. Following issuance of credit for Performance Standard 2A the
28 Grading As-Built Report and installation of Habitat Features Performance Standard 5A for Phase
29 1, a revised required amount of \$430,260.

30
31 ii. Following issuance of credit for Performance Standard 3A the
32 Planting Plan as Built Report and all Year 1 performance standards for Phase 1, a revised
33 required amount of \$199,860;

34
35 iii. Following completion of all Year 3 performance standards
36 for Phase 1, a revised required amount of \$76,044;

37
38 iv. Following completion of all Year 7 performance standards
39 for Phase 1, a revised required amount of \$34,116.

40
41 f. Upon satisfaction of all objectives and performance standards
42 required in Appendix C, and upon a determination by the Corps and Ecology that the Sponsor
43 has satisfied the additional requirements reflected in Article IV.K. of this Instrument for
44 termination of the establishment period of the Bank, the Corps and Ecology will waive their right
45 to payment under, and authorize rescission or cancellation of, the financial assurance instrument.

1 g. Notwithstanding the fact that the financial assurance may have been
2 accessed, or that payment upon that financial assurance may have been required, and full or
3 partial remedial or corrective action may have been taken by the Third Party Designee, unless
4 this Instrument is terminated pursuant to Article IV.J. or VI.B. the Sponsor shall remain
5 responsible for the timely and effective achievement of all the Objectives and Performance
6 Standards mandated in Appendix C.
7

8 h. Alternatively, the Sponsor may request, and the Corps and Ecology may
9 approve, a substitute financial assurance instrument for the financial assurance required under
10 this Instrument. The form and content of any financial assurance instrument must be specifically
11 approved before a substitution is utilized in satisfaction of the financial assurance obligations
12 during the establishment period of the Bank. The Corps and Ecology must specifically approve
13 the identity of the financial institution issuing and underwriting the financial assurance
14 instrument. The provisions of the substitute financial assurance instrument must conform to each
15 of the material requirements of this Article III.C.1., as well as Appendix H, within this
16 Instrument. Additionally, the substitute financial assurance must extend for the full period of
17 time that the financial assurance it replaces must extend, and may be terminated pursuant to this
18 Article III.C.1. and Appendix H. The replacement financial assurance instrument must be
19 instituted so that there is no portion of the establishment period, following initiation of
20 construction or other implementation activities on-site, during which there is no financial
21 assurance in effect. No further Bank credits will be awarded from any phase of the Bank while
22 any phase lacks an effective financial assurance instrument. The replacement financial assurance
23 instrument must be described in an amendment to the Instrument.
24

25 **2. Long-Term Management and Maintenance Endowment Fund:** The
26 Sponsor shall institute an endowment fund, established and maintained through an escrow
27 account, to fund management and maintenance actions as defined in Article IV.M.1. of this
28 Instrument and Appendix G, Section 1.2., following the termination of the establishment period
29 of the Bank. This Long-Term Management and Maintenance (LTMM) Endowment Fund shall
30 be incrementally funded throughout the establishment period of the Bank, with the funds
31 disbursed to a Long-Term Steward upon the Sponsor's relinquishment of responsibility for long-
32 term management and maintenance of the Bank. The Sponsor agrees to continue to deposit funds
33 in the LTMM Endowment Fund escrow account, pursuant to Article III.C.2.a. of this Instrument,
34 until the LTMM Endowment Fund is fully funded in accordance with Article III.C.2.b. of this
35 Instrument.
36

37 a. The LTMM Endowment Fund escrow account shall be funded
38 throughout the establishment period of the Bank by depositing a designated sum corresponding
39 to each sale or transfer of Bank credits, or use of Bank credits by the Sponsor as compensatory
40 mitigation for its own activities causing adverse impacts to the aquatic environment. This
41 designated sum shall be \$2,700.00 per credit sold, used, or transferred. Deposits to the LTMM
42 Endowment Fund must be completed within 30 days of the sale, use, or transfer transaction. The
43 Corps and Ecology must specifically approve the identity of the institution in which the escrow
44 account is established, as well as the form of that account. Approval of the identity of the
45 financial institution at which the escrow account is established, and the form of the investment
46 account, shall not be unreasonably withheld.

1
2 b. The LTMM Endowment Fund shall be considered to be fully funded
3 when the total value of the escrow account, including the principal amounts deposited and
4 earnings, has accumulated to a total of \$131,429.

5
6 c. The Sponsor shall enter into an escrow agreement with both the Corps
7 and Ecology conforming to the requirements of Appendix H, Section 1.2. The escrow agreement
8 for the LTMM Endowment Fund shall be signed prior to the release of any Bank credits, for any
9 phase of the Bank, and before any construction or implementation activities may be conducted
10 on-site during the establishment period of the Bank, as defined in Article IV.K.

11
12 d. Upon receipt of written instructions signed by the Sponsor, Corps, and
13 Ecology, the LTMM Endowment Fund escrow account shall be terminated and all funds
14 disbursed pursuant to the instructions of the Corps and Ecology.

15
16 **D. Real Estate Provisions:** All real property to be included within the Bank is presently
17 owned in fee simple by four (4) different landowners, Greg Lopes, Greg Lopes and Phil Sari,
18 Mitch Wharton and The City of Kelso, as detailed in Appendix A. The Sponsor is responsible
19 for ensuring each landowner burdens the title to their real property upon which the Bank is
20 located through a grant of a conservation easement, pursuant to the provisions of Appendix G,
21 Section 1.1. Each conservation easement must be approved, initiated, and recorded pursuant to
22 Appendix G, Section 1.1., prior to the award of any Bank credits and before any construction or
23 implementation activities may be conducted on-site during the establishment period of the Bank,
24 as defined in Article IV.K. Any construction or implementation activities conducted on-site
25 prior to the inception of the establishment period must cease as of the effective date of this
26 Instrument pursuant to Article VI.B.1., until all approved conservation easements are recorded.
27 The Corps and Ecology will notify the Sponsor that construction and implementation activities
28 are authorized to commence, by granting the initial award of bank credits in recognition of
29 meeting all performance standards under Objective 1, pursuant to Appendix D.

30
31 **E. Implementation of Additional Phases:** The Sponsor shall request approval to
32 implement subsequent phases of the Bank from the Corps and Ecology. The Corps and Ecology
33 will obtain the concurrence of NMFS when fish conservation credits are involved and will
34 consult with the other members of the IRT prior to approval of implementation. The Corps and
35 Ecology will only approve the implementation of subsequent Bank phases that have been
36 specifically identified in Appendices A – H.

37
38 **IV. OPERATION OF THE BANK**

39
40 **A. Service Area:** The Bank is approved to provide compensatory mitigation for impacts
41 to the Waters of the United States and waters of the State, including wetlands and other aquatic
42 habitat resources, including habitat for ESA-listed and non-listed fish, within the Service Areas
43 specific to each mitigation type. A detailed description and map of the Service Area are included
44 in Appendix E.

1 1. The Service Area for Universal Credits extends in the historic floodplain of the
2 Columbia River upstream to the I-5 Bridge in Vancouver, Washington and downstream to the
3 western edge of the Hunt Creek Sub-Basin (HUC 17080030602) at River Mile (RM) 56 near
4 Stella, west of the City of Longview in Washington. The Service Area includes Water Resource
5 Inventory Area (WRIA) 26 – Cowlitz River Watershed and its major tributaries below the
6 Mayfield Dam.
7

8 The Service Area for the use of DSAYs for offsetting permanent or temporary
9 habitat impacts to ESA-designated and proposed critical habitat for listed fish species, as well as
10 impacts to non-listed fish and stream habitat includes portions of the Lower Columbia River
11 Basin, associated tributaries and portions of the Cowlitz River Watershed (WRIA-26).
12

13 The Bank may be used to compensate for an impact that occurs within the
14 appropriate Service Area if specifically approved by the regulatory agency(ies) that have
15 jurisdiction over that impact, pursuant to the procedures and criteria prescribed in Appendix E.
16

17 2. In exceptional situations, the Bank may be used to compensate for an impact that
18 occurs outside of the Service Area if specifically approved by the regulatory agency(ies) having
19 jurisdiction over that impact and by the Corps and Ecology, acting with the concurrence of
20 NMFS when fish conservation credits are involved, and in consultation with the other members
21 of the IRT pursuant to the procedures and criteria prescribed in Appendix E, Section 1.1. If the
22 Corps and/or Ecology determine that the Sponsor has sold, used, or transferred Bank credits at
23 any time to provide compensatory mitigation outside of the Service Area without prior approval,
24 the Corps and/or Ecology, in consultation with the IRT, may direct that the sale, use or other
25 transfer of Bank credits immediately cease, and will determine, with the concurrence of NMFS
26 when fish conservation credits are involved, and in consultation with the other members of the
27 IRT, the Sponsor and the appropriate regulatory authority, what remedial actions are necessary to
28 correct the situation and will direct their performance prior to the award of any additional Bank
29 credits. Notwithstanding the fact that ceasing sale, use or other transfer of Bank credits may
30 have been required, unless this Instrument is terminated pursuant to Article IV.J. or VI.B., the
31 Sponsor shall remain responsible for the timely and effective achievement of all the Objectives
32 and Performance Standards mandated in Appendix C.
33

34 **B. Access to the Bank Site:** The Sponsor will allow, or otherwise provide for, access to
35 the Bank site by members of the IRT or their agents or designees, as reasonably necessary for the
36 purpose of inspection, compliance monitoring, and remediation consistent with the terms and
37 conditions of this Instrument and the Appendices, throughout the periods of Bank establishment,
38 operational life, and long-term management and maintenance. Inspecting parties shall provide
39 the Sponsor reasonable prior notice of a scheduled inspection, and shall not unreasonably disrupt
40 or disturb activities on the property.
41

42 **C. Availability of Bank Credits:**
43

44 1. **Availability and Sale, Transfer, or Use of Bank Credits:** Subject to the
45 documentation and scheduling provisions of Appendix D, the Sponsor may submit to the IRT
46 written evidence that particular performance standards have been achieved. If the Corps and

1 Ecology, with the concurrence of NMFS when fish conservation credits are involved, and after
2 consulting with the other members of the IRT and the Sponsor, concur that certain performance
3 standards have been achieved in full, the Corps and Ecology will respond in writing to the
4 Sponsor that the Bank credits associated with those performance standards are available for sale,
5 transfer, or use by the Sponsor as compensatory mitigation for its own activities causing adverse
6 impacts to the aquatic environment. Each instance of sale or any other transfer of Bank credits to
7 a third party shall be reflected in a credit transaction agreement, retained by the Sponsor and
8 made available for Corps and/or Ecology review, as well as NMFS when fish conservation
9 credits are involved. Each such credit transaction agreement must include the name, address,
10 and telephone number of the purchaser or transferee. Each transaction agreement that is
11 associated with a permit must also indicate the permit number of the impacting project, the
12 number of Bank credits involved in the transaction, and must expressly specify that the Sponsor,
13 and its successors and assigns, assume legal responsibility for accomplishment and maintenance
14 of the transferee's compensatory mitigation requirements associated with the impacting project,
15 upon completion of the credit transaction. Each credit transaction agreement that is associated
16 with a permit shall be recorded with the county auditor. A copy of the recorded transaction
17 agreement shall be provided to the Corps and Ecology.

18
19 **2. Availability of Bank Credits in the Event Financial Assurances are**
20 **Accessed:** In the event the Corps and/or Ecology, acting pursuant to Articles III.C.1.a. or
21 III.C.1.b. of this Instrument, accesses the financial assurances established pursuant to Article
22 III.C.1. of this Instrument and accomplishes any objectives, performance standards, or features
23 of the Bank, the Corps and Ecology, in consultation with the IRT, may award Bank credits for
24 sale, use, or transfer by the Sponsor, in a quantity reflecting the objectives and performance
25 standards achieved as a result of such remedial action.

26
27 **D. Credit Deficit or Fraudulent Transactions:** If the Corps and/or Ecology determine
28 at any point that the Bank is operating at a deficit, or has engaged in fraudulent transactions in
29 the sale, use, or other transfer of Bank credits, the Corps and/or Ecology will cease the award of,
30 and will direct the Sponsor to immediately cease sale, use or other transfer of, Bank credits. The
31 Corps and/or Ecology will determine, in consultation with the IRT and the Sponsor, what
32 remedial actions are necessary to correct the situation and will direct their performance prior to
33 the award of any additional Bank credits.

34
35 **E. Provisions For Use of the Mitigation Bank Area:** The Corps and/or Ecology may
36 consider the Sponsor as being in material default of a provision of this Instrument and proceed
37 accordingly under Article IV.J. should the Corps and/or Ecology, in consultation with the IRT,
38 determine that either of the following has occurred:

39
40 1. The grant of additional easements, rights of way, or any other property interest
41 in the Bank site without written notification to the Corps and Ecology in accordance with Article
42 IV.N.

43
44 2. The use, or authorization of the use, or suffering the use of any areas within the
45 Bank for any purpose that is contrary to the provisions of this Instrument or the conservation
46 easement, or which interferes with the conservation purposes of the Bank.

1
2 **F. Maintenance Provisions:** Following achievement of the performance standards, the
3 Sponsor agrees to perform all necessary work to maintain those standards as prescribed in
4 Appendix F, Section 1.1.5.
5

6 **G. Monitoring Provisions:** The Sponsor agrees to perform all necessary work, pursuant
7 to Appendix F, to monitor the Bank during the establishment period to demonstrate compliance
8 with the performance standards established in Appendix C.
9

10 **H. Contingency Plans/Remedial Actions:** In the event the Bank fails to achieve one or
11 more of the performance standards within the specific time schedule delineated in Appendix D,
12 the Sponsor shall develop necessary contingency plans and implement appropriate remedial and
13 monitoring actions for the Bank as specified in Appendix F, Section 1.1.4, to attain those project
14 objectives and performance standards. Prior to implementing any remediation, supplemental
15 monitoring, or other corrective measures, the Sponsor shall obtain approval of the contingency
16 plans from the Corps and Ecology. The Corps and Ecology will obtain the concurrence of
17 NMFS when fish conservation credits are involved, and will consult with the other members of
18 the IRT prior to approval of the plans. All appropriate environmental documentation, permits,
19 and other authorizations needed to implement the contingency plan or take remedial action shall
20 be obtained by the Sponsor. In the event the Sponsor fails to implement necessary contingency
21 actions within the period prescribed by the Corps and Ecology in the notification of approval of
22 the contingency plan, the Corps and/or Ecology, with the concurrence of NMFS when fish
23 conservation credits are involved, and in consultation with the Sponsor and the other members of
24 the IRT, will direct remedial, corrective, and/or sanctioning action in accordance with the
25 procedures specified in Appendix F, Section 1.1.4. Alternatively, the Corps and/or Ecology may
26 accomplish such remedial action directly, acting through a Third Party Designee, by accessing
27 the financial assurance instrument pursuant to Articles III.C.1.a. and III.C.1.b. of this Instrument.
28

29 **I. Force Majeure:** The Sponsor may request pursuant to Article III.B., and the Corps
30 and Ecology may approve, changes to the construction, operation, objectives, performance
31 standards, timelines, or credit generation and award schedule of the Bank, pursuant to the
32 standards and procedures specified in Appendix F, if all of the following occur: an act or event
33 causes substantial damage such that it is determined to be a result of force majeure; such act or
34 event has a significant adverse impact on the quality of the aquatic functions, native vegetation,
35 or soils of the Bank site; and such act or event was beyond the reasonable control of the Sponsor,
36 its agents, contractors, or consultants to prevent or mitigate.

37 1. The evaluation of the damage caused by force majeure and the resulting
38 changes to mitigation requirements involve a communicative process. If the Sponsor asserts a
39 mitigation site has sustained significant adverse impacts due to an event or act which may be
40 determined to be force majeure, the Sponsor shall give written notice to the Corps, Ecology and
41 the IRT as soon as is reasonably practicable. After receiving written notice, the Corps and
42 Ecology, with the concurrence of NMFS when fish conservation credits are involved, and in
43 consultation with the Sponsor and the other members of the IRT, shall evaluate whether the
44 event qualifies as force majeure. The Corps and Ecology, with the concurrence of NMFS when
45 fish conservation credits are involved, and in consultation with the Sponsor and the other

1 members of the IRT, will then evaluate whether significant adverse impacts have occurred to the
2 site. If a force majeure event is determined to have occurred and significant adverse impacts are
3 found to have occurred to the site, the Corps and Ecology, with the concurrence of NMFS when
4 fish conservation credits are involved, and in consultation with the other members of the IRT and
5 the Sponsor, will evaluate whether and to what extent changes to the Bank site will be in the best
6 interest of the site and the aquatic environment, and may approve such changes as detailed
7 above. The Corps and Ecology retain sole discretion over the final determination of whether an
8 act or event constitutes force majeure, whether significant adverse impacts to the Bank site have
9 occurred, and to what extent changes to the Bank site or its management will be permitted.

10 2. Force majeure events include natural or human-caused catastrophic events or
11 deliberate and unlawful acts by third parties.

12 a. Examples of a natural catastrophic event include, but are not limited
13 to: a flood equal to or greater in magnitude than the 100-year flood event; an earthquake of a
14 force projected from an earthquake with a return period of 475 years; drought that is significantly
15 longer than the periodic multi-year drought cycles that are typical of weather patterns in the
16 Pacific Northwest; as well as events of the following type when they reach a substantially
17 damaging nature: disease, wildfire, depredation, regional pest infestation, or significant
18 fluviogeomorphic change.

19
20 b. Examples of a human-caused catastrophic event include, but are not
21 limited to, substantial damage resulting from the following: war, insurrection, riot or other civil
22 disorders, spill of a hazardous or toxic substance, or fire.

23
24 c. Examples of a deliberate and unlawful act include, but are not limited
25 to, substantial damage resulting from the following: the dumping of a hazardous or toxic
26 substance, as well as significant acts of vandalism or arson.

27
28 3. The consequences of any events of force majeure recognized as such by the
29 Corps and Ecology shall not affect the status of previously released Bank credits, whether or not
30 they have yet been sold, used, or transferred; provided, however, that where fish credits for ESA-
31 listed species habitat are involved, reinitiation of consultation may be required to determine the
32 status of previously released Bank credits.

33
34 **J. Default:** Should the Corps and/or Ecology, in consultation with the IRT, determine
35 that the Sponsor is in material default of any provision of this Instrument, the Corps and/or
36 Ecology may cease award of Bank credits, and may notify the Sponsor that the award, sale,
37 and/or transfer of Bank credits, or use by the Sponsor of Bank credits as compensatory
38 mitigation for its own activities causing adverse impacts to the aquatic environment, are
39 suspended until the delineated deficiencies are rectified. Upon written notification of
40 suspension, the Sponsor agrees to immediately cease any sale or transfer transactions not yet
41 finally completed, and/or to cease any use by the Sponsor of Bank credits as compensatory
42 mitigation for its own activities causing adverse impacts to the aquatic environment where a
43 Corps or Ecology permit or authorization, as required, has not yet been issued, until informed by
44 the notifying agency that award, sale, use, or transfer of Bank credits may be resumed. Should

1 the Sponsor remain in default for a period of 90 days, the Corps and Ecology, with the
2 concurrence of NMFS and in consultation with the other members of the IRT, may terminate this
3 Instrument and any subsequent banking operations. In the event such termination action is
4 commenced, the Sponsor agrees to fulfill its pre-existing obligations to perform all
5 establishment, monitoring, maintenance, management, and remediation responsibilities that arise
6 directly from Bank credits that have already been awarded, sold, used, or transferred at the time
7 of termination. In the event of termination, no further sale or transfer of Bank credits may occur,
8 nor any use by the Sponsor of Bank credits as compensatory mitigation for its own activities
9 causing adverse impacts to the aquatic environment within the Service Area where a Corps or
10 Ecology permit or authorization, as required, has not yet been issued.

11
12 **K. Establishment Period of the Bank:** The establishment period of a particular phase
13 of the Bank will commence on the date the Instrument takes effect pursuant to Article VI.B.1.
14 Prior to termination of the establishment period of a particular phase of the Bank, the Corps, and
15 Ecology, in consultation with the IRT, will perform a final compliance inspection to evaluate
16 whether all performance standards have been achieved. The establishment period for the Bank
17 or a particular phase of the Bank will terminate, and the period of long-term management and
18 maintenance will commence, when the Corps and Ecology determine, with the concurrence of
19 NMFS and in consultation with the other members of the IRT and the Sponsor, that the
20 following conditions have been met:

21
22 (1) all applicable performance standards prescribed in Appendix C for that phase
23 have been achieved;

24
25 (2) all available Bank credits for that phase have been awarded, or the Corps and
26 Ecology, in consultation with the IRT, have approved the Sponsor's written request to
27 permanently cease banking activities;

28
29 (3) the Sponsor has prepared a Long-Term Management and Maintenance Plan
30 that has been approved by the Corps and Ecology, pursuant to Article IV.M.1 and Appendix G,
31 Section 1.2.;

32
33 (4) the Sponsor has either: (i) assumed responsibilities for accomplishing the
34 Long-Term Management and Maintenance Plan, in which case the Sponsor will fulfill the role of
35 Long-Term Steward, or (ii) assigned those responsibilities to another Long-Term Steward
36 pursuant to Article IV.M.2. of this Instrument;

37
38 (5) the LTMM Endowment Fund has been fully funded;

39
40 (6) the contents of the LTMM Endowment Fund have been transferred to the
41 Long-Term Steward; and

42
43 (7) the Bank has complied with the terms of this Instrument.

44
45 **L. Operational Life of the Bank:** The operational life of the Bank will commence on
46 the date the Instrument takes effect pursuant to Article VI.B.1. Following the termination of the
47 establishment period of a particular phase of the Bank, and (1) upon sale, transfer, or use by the

1 Sponsor as compensatory mitigation for its own activities causing adverse impacts to the aquatic
2 environment, of all Bank credits, or (2) upon approval by the Corps and Ecology, in consultation
3 with the IRT, of the Sponsor's written request to permanently cease banking activities, the
4 operational life of the Bank will terminate.

5
6 **M. Long-Term Management and Maintenance:**
7

8 1. The Sponsor shall develop a Long-Term Management and Maintenance Plan
9 consistent with the guidelines and objectives specified in Appendix G, Section 1.2, and submit
10 the Long-Term Management and Maintenance Plan for approval by the Corps and Ecology, with
11 the concurrence of NMFS and in consultation with the other members of the IRT. The Sponsor
12 is responsible, as Long-Term Steward, for execution of the approved Long-Term Management
13 and Maintenance Plan. The Sponsor may only deviate from the approved Long-Term
14 Management and Maintenance Plan upon written approval by the Corps and Ecology, acting
15 with the concurrence of NMFS when fish conservation credits are involved, and following
16 consultation with the Sponsor and the other members of the IRT.
17

18 2. The Sponsor may assign its long-term management and maintenance
19 responsibilities to a third party assignee, which will then serve as Long-Term Steward in place of
20 the Sponsor. The identity of the assignee and the terms of the long-term management and
21 maintenance assignment agreement between the Sponsor and the assignee must be approved by
22 the Corps and Ecology, with the concurrence of NMFS and in consultation with the other
23 members of the IRT, in advance of long-term management and maintenance assignment.
24

25 3. Upon execution of a long-term management and maintenance assignment
26 agreement and the transfer of the contents of the LTMM Endowment Fund, and upon satisfaction
27 of the remaining requirements for termination of the establishment period of the Bank under
28 Article IV.K. of this Instrument, the Sponsor shall be relieved of all further long-term
29 management and maintenance responsibilities under this Instrument.
30

31 **N. Accomplishment of Sponsor Responsibilities; Transfer of Ownership of the Bank Site:**

32 The Sponsor shall remain responsible for complying with the provisions of this Instrument
33 throughout the operational life of the Bank, regardless of the ownership status of the underlying
34 real property, unless those responsibilities have been assigned pursuant to the provisions of
35 Article VI.C. of this Instrument. The Sponsor shall provide written notice at least 60 days in
36 advance of any transfer of ownership of all or a portion of the Bank real property or rights to
37 another party, by any owners of real property comprising the Bank site, or their successors or
38 assigns.
39

40
41 **V. RESPONSIBILITIES OF THE CORPS AND ECOLOGY**
42

43 **A.** The Corps and Ecology agree to provide appropriate oversight in carrying out
44 provisions of this Instrument.
45

1 **B.** The Corps and Ecology agree to review and provide comments on project plans,
2 monitoring reports, contingency and remediation proposals, and similar submittals from the
3 Sponsor in a timely manner. The Corps and Ecology will coordinate their review with the IRT.
4

5 **C.** The Corps and Ecology agree to review requests to modify the terms of this
6 Instrument, determine achievement of performance standards in order to evaluate the award of
7 Bank credits for each phase of the Bank, or approve the Long-Term Management and
8 Maintenance Plan. The Corps and Ecology will coordinate the review with the IRT so that a
9 decision is rendered, or comments detailing deficiencies are provided, in a timely manner. The
10 Corps and Ecology agree to not unreasonably withhold or delay decisions on such requests.
11

12 **D.** The Corps and Ecology agree to act in good faith when rendering decisions about
13 acceptability of financial assurances, requiring corrective or remedial actions, requiring long-
14 term management and maintenance actions, and awarding Bank credits. The Corps and Ecology
15 will exercise good judgment in accessing financial assurances and will utilize those monies only
16 to the extent they reasonably and in good faith conclude that such remedial or corrective actions
17 are an effective and efficient expenditure of resources. In implementing the process delineated
18 in Article III.C.1 of this Instrument, the Corps and Ecology will act in good faith in determining
19 the scope and nature of corrective actions to be undertaken; shall act in good faith in conducting
20 monitoring, developing reports, and assessing compliance with performance standards; and will
21 not unreasonably limit corrective action activities or otherwise apply their discretion so as to
22 unduly prejudice the Sponsor as to the timing or number of Bank credits awarded. Corps and
23 Ecology approval of the identity of any assignee responsible for executing the LTMM Plan, and
24 approval of the terms of any long-term management and maintenance assignment agreement,
25 will not be unreasonably withheld.
26

27 **E.** The Corps and Ecology will periodically inspect the Bank site as necessary, in
28 consultation with the IRT, to evaluate the achievement of performance standards, to assess the
29 results of any corrective measures taken, to monitor implementation of the LTMM Plan, and, in
30 general, to verify the Sponsor's compliance with the provisions of this Instrument.
31

32 **F.** Upon satisfaction of the requirements of Article IV.K. for any phase of the Bank
33 under this Instrument, the Corps and Ecology will jointly issue a letter certifying that the
34 establishment period of that phase of the Bank has terminated, and that the period of long-term
35 management and maintenance has begun, in consultation with the IRT. Upon satisfaction of the
36 requirements of Article IV.L. of this Instrument, the Corps and Ecology will jointly issue a letter
37 certifying that the operational life of that phase of the Bank has terminated.
38
39

40 **VI. GENERAL PROVISIONS**

41
42 **A. Decision Making by Consensus:** The Corps and Ecology will strive to achieve
43 consensus among the IRT regarding issues that arise pertaining to the establishment, operation,
44 maintenance, and management of the Bank. The Corps and Ecology will coordinate the review
45 and oversight activities of the IRT to best facilitate opportunity to reach the desired consensus.
46 Review and oversight decisions will take into account the views of the Sponsor to the maximum

1 extent practicable. Where consensus cannot otherwise be reached within a reasonable
2 timeframe, after seeking concurrence of NMFS as described herein and following full
3 consideration of the comments of the IRT and following consultation with the Sponsor, the
4 Corps holds the responsibility and authority under Section 404 of the Clean Water Act, and
5 Ecology holds independent responsibility and authority under Section 401 of the Clean Water
6 Act and ch. 90.48 RCW, to make final decisions regarding the application of the terms of this
7 Instrument.
8

9 **B. Entry into Effect, Modification or Amendment, and Termination of the**
10 **Instrument:**
11

12 1. This Instrument, consisting of both this Basic Agreement and the Appendices,
13 will enter into effect upon the signature by authorized representatives of each of Corps, Ecology,
14 NMFS, the City of Kelso and Cowlitz County each fulfilling their role as the “local jurisdiction”
15 acting pursuant to RCW 90.84.040, and the Sponsor, as of the date of the last of these signatures.
16

17 2. This Basic Agreement portion of the Instrument may be amended or modified
18 only with the written approval of the Sponsor, the Program Manager for Shorelands and
19 Environmental Assistance on behalf of Ecology, the West Coast Region Regional Administrator
20 on behalf of NMFS, and the Seattle District Engineer on behalf of the Corps, or their designees.
21 Any such modifications or amendments will take effect in consultation with the IRT.
22 Amendment or modification of the provisions of the Appendices may be effectuated through an
23 exchange of letters signed by the Sponsor, the Mitigation Program Manager serving as Co-Chair
24 on behalf of the Corps, and the Wetland Section Manager serving as Co-Chair on behalf of
25 Ecology, acting with the concurrence of NMFS when fish conservation credits are involved, and
26 following consultation with the other members of the IRT, provided the exchange of letters
27 expresses mutual agreement as to the exact language to be deleted or modified, and the exact
28 language to be inserted.
29

30 3. This Instrument may be terminated by the mutual agreement of the Sponsor,
31 Corps, Ecology and NMFS, following consultation with the IRT, or may be terminated under the
32 terms of Article IV.J. of this Instrument in the case of default by the Sponsor. In the event any
33 termination action is commenced, the Sponsor agrees to fulfill its pre-existing obligations to
34 perform all establishment, monitoring, maintenance, management, and remediation
35 responsibilities that arise directly from Bank credits that have already been sold, used, or
36 transferred at the time of termination.
37

38 4. Upon termination of the operational life of the Bank pursuant to Article IV.L.,
39 and certification to that effect pursuant to Article V.F., this Instrument shall terminate without
40 further action by any Party. Thereafter, the Long-Term Management and Maintenance Plan
41 developed, approved, and instituted in accordance with Article IV.M. shall govern the continuing
42 obligations of the Sponsor, or its assignee as applicable.
43

44 **C. Assignment of Obligations under this Instrument:** The Sponsor may be permitted
45 to assign its obligations, responsibilities, and entitlements under this Instrument to a third party.
46 The Corps, Ecology and NMFS, following consultation with the IRT, must approve the identity

1 of the assignee in order for any assignment to effectively relieve the Sponsor of those
2 obligations. In evaluating a prospective assignee, the Corps, Ecology, and NMFS may consider
3 characteristics such as environmental mitigation expertise, wetlands mitigation project or
4 analogous experience, expertise in salmon and salmonid habitat ecology, and financial strength
5 and stability. Approval of the identity of the assignee will not be unreasonably withheld. The
6 assignee must execute a mitigation banking instrument with the Corps, Ecology and NMFS
7 under terms identical, to the extent practicable, to the present Instrument. The applicable
8 financial assurances established pursuant to Articles III.C.1. and III.C.2. of this Instrument must
9 be initiated. The obligations, responsibilities, and entitlements under this Instrument may reside
10 in only a single entity at any one time, and may not be severed or transferred piecemeal.
11 However, the physical ownership of the Bank site real property and the obligations,
12 responsibilities, and entitlements under this Instrument are separate and distinct; thus, ownership
13 may be transferred pursuant to the provisions of Article IV.N., independently of assignment of
14 this Instrument. Once assignment of this Instrument has been properly accomplished, the
15 Sponsor will be relieved of all its obligations and responsibilities under this Instrument. Specific
16 additional provisions pertaining to the assignment of long-term management and maintenance
17 obligations are described at Article IV.M.

18
19 **D. Specific Language of this Basic Agreement Shall Be Controlling:** To the extent
20 that specific provisions of this Basic Agreement portion of the Instrument are inconsistent with
21 any terms and conditions contained in the Appendices, or inconsistent with other documents that
22 are incorporated into this Instrument by reference and that are not legally binding, the specific
23 language within this Basic Agreement shall be controlling.

24
25 **E. Notice:** Any notice required or permitted hereunder shall be deemed to have been
26 given either (i) when delivered by hand, or (ii) three (3) days following the date deposited in the
27 United States mail, postage prepaid, by registered or certified mail, return receipt requested, or
28 (iii) when sent by Federal Express or similar next-day nationwide delivery system, addressed as
29 follows (or addressed in such other manner as the party being notified shall have requested by
30 written notice to the other party):

31
32 Habitat Bank, LLC
33 801 E 1st St. Suite B-107
34 Cle Elum, WA 98922
35 425-785-8428
36

37 U.S. Army Corps of Engineers, Seattle District
38 Mitigation Banking Specialist/Co-Chair of the IRT
39 Regulatory Branch
40 Seattle District, Corps of Engineers
41 4735 E. Marginal Way South
42 P.O. Box 3755
43 Seattle, WA 98124-3755
44 206-764-3495
45
46

1 Washington State Department of Ecology
2 Mitigation Banking Specialist/Co-Chair of the IRT
3 Shorelands and Environmental Assistance Program
4 P.O. Box 47600
5 300 Desmond Drive
6 Olympia, WA 98504-7600
7 360-407-6000
8

9 National Marine Fisheries Service, West Coast Region
10 Washington Coast Lower Columbia River Branch Chief,
11 510 Desmond Drive, Suite 102
12 Lacey, WA 98503
13 360-534-9342
14

15 **F. Entire Agreement:** This Instrument, consisting of both this Basic Agreement and the
16 Appendices, constitutes the entire agreement between the Parties concerning the subject matter
17 hereof.
18

19 **G. Invalid Provisions:** In the event any one or more of the provisions contained in this
20 Instrument are held to be invalid, illegal or unenforceable in any respect, such invalidity,
21 illegality or unenforceability will not affect any other provisions hereof, and this Instrument shall
22 be construed as if such invalid, illegal or unenforceable provision had not been contained herein.
23

24 **H. Effect of Agreement:**

25
26 1. This Instrument does not in any manner affect statutory authorities and
27 responsibilities of the signatory Parties. This Instrument is not intended, nor may it be relied
28 upon, to create any rights in third parties enforceable in litigation with the United States or the
29 State of Washington. This Instrument does not authorize, nor shall it be construed to permit, the
30 establishment of any lien, encumbrance, or other claim with respect to the Bank site, with the
31 sole exception of the right on the part of the Corps and Ecology to require the Sponsor to
32 implement the provisions of this Instrument, including recording the conservation easement,
33 required as a condition of approval of the crediting plan reflected in this Instrument and the
34 issuance of any permits for discharges of dredged and fill material into waters of the United
35 States associated with construction, operation and maintenance of the Bank.
36

37 2. Corps approval of this Instrument constitutes the regulatory approval required
38 for Coweeman River Mitigation Bank to be used to provide compensatory mitigation for
39 Department of the Army permits pursuant to 33 C.F.R. 332.8(a)(1). This Instrument is not a
40 contract between the Sponsor or property owner and the Corps or any other agency of the
41 Federal government. Any dispute arising under this Instrument will not give rise to any claim by
42 the Sponsor or property owner for monetary damages. This provision is controlling
43 notwithstanding any other provision or statement in the Instrument to the contrary.
44

1 **I. Attorneys' Fees:** If any action at law or equity, including any action for declaratory
2 relief, is brought to enforce or interpret the provisions of this Instrument, each party to the
3 litigation shall bear its own attorneys' fees and costs of litigation.
4

5 **J. Availability of Funds:** Implementation of this Instrument is subject to the
6 requirements of the Anti-Deficiency Act, 32 U.S.C. § 1341, and the availability of appropriated
7 funds. Nothing in this Instrument may be construed to require the obligation, appropriation, or
8 expenditure of any money from the United States Treasury, in advance of an appropriation for
9 that purpose.
10

11 **K. Headings and Captions:** Any paragraph heading or caption contained in this
12 Instrument shall be for convenience of reference only and shall not affect the construction or
13 interpretation of any provision of this Instrument.
14

15 **L. Counterparts:** This Instrument may be executed by the Parties in any combination,
16 in one or more counterparts, all of which together shall constitute one and the same instrument.
17

18 **M. Binding:** This Instrument, consisting of both this Basic Agreement and the
19 Appendices, shall be immediately, automatically, and irrevocably binding upon the Sponsor and
20 its heirs, successors, assigns and legal representatives upon execution by the Corps, Ecology,
21 NMFS, the City of Kelso and Cowlitz County each fulfilling their role as the "local jurisdiction"
22 acting pursuant to RCW 90.84.040, and the Sponsor.
23

1 IN WITNESS WHEREOF, the Parties hereto have executed this Instrument on the date herein
2 below last written.

3

4 **PARTIES:**

5

6 By the Sponsor:

7

8

9

10 _____
11 Victor Woodward
12 Manager, Habitat Bank, LLC

_____ Date

13 By the Corps:

14

15

16

17 _____
18 John G. Buck
19 Colonel, Corps of Engineers
20 Seattle District Engineer

_____ Date

21 By Ecology:

22

23

24

25 _____
26 Gordon White
27 Program Manager, Shorelands and Environmental Assistance Program
28 Washington State Department of Ecology

_____ Date

29 By NMFS:

30

31

32

33 _____
34 Will Stelle
35 Regional Administrator, NW Region
36 National Marine Fisheries Service

_____ Date

37

38

39

40 **OTHER IRT MEMBERS:**

41

42

43

44

45

46

Signature by other IRT members indicates assent on the part of the represented organization to the provisions of this Instrument, but does not give rise to any affirmative obligations, express or implied. This Instrument is not binding on the other IRT members.

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Stephen Taylor
City Manager
City of Kelso

Date

E. Elaine Placido,
Director, Department of Building and Planning
Cowlitz County

Date

R. David Allnut
Director, Office of Ecosystems, Tribal and Public Affairs
Environmental Protection Agency
Region 10

Date

Jeff Davis
Habitat Program Director
Washington Department of Fish and Wildlife

Date

COWEEMAN MITIGATION BANK

Appendices to the Mitigation Banking Instrument

Habitat Bank, LLC
801 E 1st St. Suite B #107
Cle Elum, WA 98922

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APPENDIX A GENERAL BANK INFORMATION

A.1 Business Purpose and Ecological Goals of the Bank

The purpose of the Bank is to generate mitigation credits for projects that will have an adverse impact on the aquatic environment and/or to federally listed species, and that need to compensate for those impacts as a condition of their permits or other regulatory requirements resulting from project impacts.

The primary ecological goals and objectives of the Coweeman River Mitigation Bank are as follows:

- Improve hydrology, hydrologic and habitat functions within the existing wetlands onsite. Create additional (associated) wetland area and function through site grading and an improved connection of the wetland areas to the Coweeman River.
- Create off-channel rearing, refuge, forage, and potential spawning habitat for anadromous fish species (including species listed under the Endangered Species Act as threatened or endangered) and increase channel complexity and habitat function within the main stem of the Coweeman River and aquatic areas within the floodplain.
- Reconnect the highly incised Coweeman River to its floodplain by pulling back portions of the bank, installing large woody material (LWM), and creating an overflow notch to allow more frequent hydrologic connectivity with Wetland A (Hart's Lake).
- Remove livestock to improve water quality and plant riparian areas to increase shading and recruitment of LWM in the Coweeman River.
- Remove invasive plant species and reintroduce native vegetation to increase habitat complexity in the floodplain. Plant native trees, shrubs, and herbaceous species to reestablish a mosaic of habitat communities.
- Improve habitat structure within the floodplain specifically for fish, birds, and amphibians by installing LWM, including: standing snags, root wads, downed logs, and brush piles.
- Preserve and protect forested habitat, including old growth, mature second growth forest, tributaries, and wetland areas within the hillside area of the Bank project. Reconnect floodplain wetlands to those upstream tributaries through re-contouring Tributaries 2 and 5 within the floodplain.

Relevant documentation supporting the technical information in these appendices is included in the project Resource Folder. The Resource Folder is not considered part of the MBI but is prepared by the Sponsor and provided to all IRT members to serve as a reference document. The Resource Folder includes the wetland delineation report, wetland functional assessment, vegetation survey, hydrologic monitoring and modeling, basis of design report, and other technical information that was used to establish baseline conditions at the Bank and support the design for the site.

A.2 Bank Location and Legal Description

The Coweeman River Mitigation Bank (Bank) site, which includes a Phase 1 and an optional Phase 2, encompasses 320.90 acres within Section 36, Township 8 North, Range 2 West of the Willamette Meridian, and lies within both the City of Kelso and Cowlitz County jurisdictions (**Figure A-1, Vicinity Map**). The Bank consists of seven different Tax Parcels (WI3602008, WI3608001, WI3605001, WI3605002, WE3101003, WI3601001, 24125) which are owned in fee simple by six different parties (see Table 1 Property Information Summary) including the City of Kelso which owns Tax Parcels WI3601001 and 24125 (**Figures A-2 through A-2f, Site Survey**). The 18.90 acre Murray Family Parcel (Parcel WE3101003) is included in the Bank as an optional Phase 2 of the Bank project. Specific details of existing conditions within this area will be discussed in an addendum if Phase 2 moves forward. A legal description of the Bank project boundary is provided in Exhibit A to Appendix A.

Table 1. Property Information Summary

Survey Map Identifier	Property Owner	Parcel Number	Zoning	Acreage
Phase 1				
1	Wharton	WI3608001 WI3605001	Farm and Agricultural	13.4
2	Lopes/Sari	WI3605002	Farm and Agricultural	26.0
3	Lopes	WI3602008	Farm and Agricultural	13.5
4	City of Kelso	WI3601001	Public Land	40.6
5	City of Kelso	24125	Public Land	208.5
			Phase 1 Total	302.0¹
Phase 2				
6	Murray	WE3101003	Farm and Agricultural	18.9
			Phase 2 Total	18.9
			Total Bank Site Acreage	320.9¹
Easements (Phases 1 and 2)				
2, 5	Olympic Pipeline Company	WI3605002, 24125	---	5.14
4, 6	Bonneville Power Association	WI3601001, WE3101003	---	4.78
2, 3	Pacific Fiber Link	WI3605002, WI3602008	---	0.17
			Total	10.09
Bank Site Buffer (Phase 1)				
Buffer	--	--	--	30.67
Other				
Coweeman River	---	---	---	7.75

¹ Easement and Coweeman River acreage are incorporated into each parcels' total acreage; therefore, are included in the Total Bank Site Acreage calculation.

Three easements, not included within the credit-generating area of the Bank, are present on the Bank property and are displayed on **Figure A-3** as follows:

1) a 50-foot-wide gas pipeline easement runs north and south through the western part of the Bank site within Parcels WI3605002 and 24125, 2) a 15-foot-wide fiber optic easement extends through parcels WI3605002 and WI3602008 along an access road from the west and meets the gas pipeline easement, and 3) a 200-foot-wide Bonneville Power Administration (BPA) easement runs through the Murray family parcel (WE3101003) and the northeastern tip of the City of Kelso parcel (WI3601001) (**Figure A-3**). One BPA tower is located on the Murray Family parcel.

. The Bank site is located within the Coweeman River Watershed and is part of Water Resource Inventory Area (WRIA) 26. The Coweeman River enters the Cowlitz River at River Mile 1.4 in the City of Kelso, approximately 3 miles downstream of the Bank site. Land use zoning around the Bank site is residential, rural residential, agricultural, and forest-timber land.

All properties within Phase 1 of the Bank project have been pledged for use in the Bank in a manner consistent with this Instrument. Phase 2 is considered an optional second phase of the project. The total Bank site area (Phases 1 and 2) is 320.9 acres which includes creditable areas and areas excluded from the credit-generating areas of the Bank, including site buffers, utility easements and portions of the Coweeman River as described in Table 1 above. After considering the buffer areas, the utility easements, and portions of the Coweeman River as discussed above, the available area for credit generation in Phase 1 is 258.27 acres. The inclusion of the aforementioned property in the Bank and the granting of conservation easements restricting future land uses for the benefit of the Bank shall not convey or establish any property interest on the part of any Party to this Instrument, nor convey or establish any interest in Bank credits. The Instrument does not authorize, nor shall it be construed to permit, the establishment of any lien, encumbrance, or other claim with respect to the property, with the sole exception of the right on the part of the Corps and Ecology to require the Sponsor to implement elements of this Instrument, including recording the conservation easements, in exchange for Corps and Ecology approval of this Instrument and the program of development and use of mitigation credits delineated herein.

A.3 Land Use History and Project Overview

A.3.1 Site Description

The Bank site is located in WRIA 26 in the lower portion of the Coweeman River Watershed approximately 3 miles above the Coweeman River's confluence with the Cowlitz River. The Coweeman River forms the majority of the northern boundary of the Bank site; however, two parcels totaling 13.4 acres are located on the north side of the river in an old river oxbow. The Bank project includes approximately 1.5 miles of the Coweeman River, measured from river mile (RM) 3.8 to RM 5.3 above the confluence with the Cowlitz River. The Coweeman River is

tidally influenced throughout the Bank project area, most likely until RM 7.5 above the Murray Family parcel. This section of the Coweeman River is also within the historical floodplain of the Columbia River (**Figures A-3 Aerial Photograph and A-4, Site Topography**).

The Bank site (Phase 1 and 2) includes 7.75 acres of the Coweeman River and 104.45 acres of level-to-undulating Coweeman River floodplain that has been actively used for agriculture and cattle grazing for at least three-quarters of a century. Farming practices and cattle grazing have altered both the upland floodplain and the aquatic habitat areas within the Bank site. A large (33.51 acres) palustrine forested/shrub/emergent/aquatic bed wetland complex locally known as “Hart’s Lake” (Wetland A) and three smaller wetlands (Wetlands B, C, and D) are located within the floodplain of the Bank site. These aquatic areas have been accessible to cattle or have been hayed each summer which has significantly degraded their conditions.

The remaining 208.7 acres of land in the Bank site southward is relatively undisturbed lowland forest, including six tributary streams, 2.32 acres of associated wetlands, and 174.01 acres meeting priority habitat standards for Old Growth Forest, as defined by the Washington Department of Fish and Wildlife (WDFW) (*Priority Habitats and Species List*, August 2008). The remaining 32.37 woodland acres is well-established mature second growth forest that does not yet meet criteria to be considered old growth. The second growth forest provides a functional buffer to the old growth forest and will eventually transition into a forest that meets old growth criteria and functionality. Lowland old growth forest is rare in the region and provides significant habitat value for wildlife as well as high quality riparian and wetland habitat which is beneficial to the onsite tributaries and fish and wildlife that use them, as described in later sections of this appendix.

The Coweeman River Watershed supports wild populations of anadromous fish including Chinook salmon (*Oncorhynchus tshawytscha*), coho salmon (*O. kisutch*), chum salmon (*O. keta*), as well as steelhead (*O. mykiss*), and coastal cutthroat trout (*O. clarki clarki*) (WDFW 2013). With the exception of cutthroat trout, these species are federally protected as *threatened* under the Endangered Species Act. Coweeman River populations are part of the Lower Columbia Evolutionary Significant Unit (ESU; Myers et al. 2006), and Chinook, coho, chum, and steelhead populations in this watershed have been listed as primary populations for the purpose of recovery planning (LCFRB 2010). The Coweeman River is also designated critical habitat for Chinook, chum, and steelhead, and proposed as critical habitat for coho (Federal Register 2005). Specifically unique to the Coweeman River system is the existence of a Fall Tule Chinook salmon population that is a genetically distinct stock (Myers et al. 2006) within the lower Columbia River Basin. For these reasons, actions taken to restore fish habitat on the Bank property have the potential to create significant value for anadromous fish species within the WRIA-26 watershed and lower Columbia River Basin.

A.3.2 Land Use History

Prior to European settlement, the Lower Columbia River floodplain and tributaries including the Sandy, Washougal, Willamette, Lewis, Kalama, Coweeman and Cowlitz Rivers, and lesser streams, were connected with tidally influenced river processes that were very similar in nature. Higher energy tributary rivers and streams entered the slower moving, but massive Columbia River, within a region of repetitious and periodic slack water and fast moving flows under the

influence of Pacific Ocean tides. Sediment deposition and periodic floods were common. A Corps of Engineers topography map based on U.S. Coast and Geodetic Survey Charts from 1909 prior to diking of the Coweeman River depicts the floodplain areas of the Bank site as a large wetland area. Following settlement of the region, interest in agriculture, timber, and continued development resulted in construction of levees and large ditch systems to protect lowlands from flood impacts and splash dam logging methods for timber harvesting.

The lower floodplain areas within the project boundary and main stem of the Coweeman River have been severely impacted over time from splash-dam logging, diking, and agricultural practices. There is evidence of historic-period logging in the upland forested area south of Wetland A (AINW, 2013) and extensive and ongoing logging in the watershed has increased sedimentation and runoff into the Coweeman River and its tributaries (Weyerhaeuser, 1995). From the late 1800s through the 1930s, extensive splash-dam logging occurred in the upper Coweeman watershed (Weyerhaeuser, 1995). Splash dams were a practice to build small dams and fill them with water to float cut timber. Cut logs were stored in the splash dam reservoirs and were then released, pushing logs downstream to mill sites in Kelso and Longview during high-flow events. Dynamiting downstream obstacles such as large boulders and log jams was also protocol for splash dam logging as is evidenced by the lack of woody material in the river through the Bank site. This practice has led to channel degradation, scour, incision, and bank erosion along the Coweeman River. The resulting channel degradation has adversely impacted fish habitat and reduced structural complexity, leading to a loss of large wood features within the floodplain, reduction of spawning gravels, and lack of floodplain connectivity.

The floodplain portion of the Bank site is currently used for haying and cattle grazing. Riparian vegetation removal and cattle accessing the river in summer for water, has led to bank erosion and stability issues, and loss of cover for fish habitat. Site clearing and cattle grazing has contributed to soil compaction, poor water quality, a lack of native vegetation (excluding portions of Wetland A), and limited riparian floodplain function. A series of ditches have altered the hydrology of the wetland areas, especially the large wetland complex known as Hart's Lake, as well as the existing tributaries within the Bank site boundary that contribute to wetland hydrology and provide fish habitat.

A.4 Bank Site Baseline Conditions

A.4.1 Summary of Existing Habitat Types

The 320.9 acre Bank site encompasses a diverse range of upland, wetland, and stream habitats in various conditions. These areas include: in-stream (Coweeman River and six tributaries), riparian, floodplain, open pasture, wetland (forested, scrub-shrub, emergent, and aquatic bed), old growth forest, and well-developed second growth forest (**See Figure A-3**). A general summary of the Bank site existing conditions and features is as follows:

- 1.5 river miles of the Coweeman River,
- Three complete tributary systems from the headwaters to the mouth,
- Portions of three additional tributary systems,
- 20 wetlands totaling approximately 37.65 acres
- 104.45 acres of floodplain/riparian area ,

- 174.01 acres of old growth forest, and,
- 32.37 acres of second growth forest.

A.4.2 Cultural Resources

AINW Inc. conducted an archaeological survey for the Bank site on behalf of the project in 2013. The current Bank design avoids any grading activities or large woody material placement within areas known, or thought to have the potential for cultural resources and historic properties within the Bank site boundary.

A.4.3 Site Geology

The project area is located in the Puget Trough physiographic province in the South Cascades physiographic region (Shannon Wilson Inc. 2014). The project area is geologically mapped as containing Quaternary non-glacial alluvium along the floodplain and lower Oligocene and upper Eocene volcanic andesite flow deposits along the ridge slope in the southern portion of the project area. The project site is underlain by bedrock, alluvium, and colluvium, ranging from 50 million years (bedrock) to 16 years (Aldercrest-Banyon Landslide) old. Geologic maps indicate that the river floodplain is underlain by alluvium. The depths of alluvium, based on drilling and sampling completed for this project in 2014 by Shannon Wilson Inc., range from 43 feet to greater than 50 feet. Geologic conditions are further described in the project's geologic assessment completed by Shannon Wilson Inc. (2014) located within the project's Resource Folder.

Landslide hazard areas have been mapped by Cowlitz County in the vicinity of the project site (**Figure A-8**). Wegmann (2003) notes that many of the larger landslide areas have sporadic movement histories, with recently reactivated parts of deep-seated slides. The Aldercrest-Banyon Landslide was a significant, slow-moving landslide that occurred in 1998-1999 and led to the condemnation of over 100 homes. This slide was in the City of Kelso to the south of the Bank site within the western portion of the drainage basin to Tributary 1.

To the west of the Aldercrest-Banyon Landslide area, and adjacent to the southern boundary of Wetland C in Area C, is the Davis Terrace landslide complex. Wegmann (2003) notes that this area is a large, predominantly dormant, deep-seated landslide area with many small, active, superimposed landslides.

A comprehensive landslide inventory was completed by the Washington State Department of Natural Resources (DNR) (Wegmann, 2003) for the Cowlitz County urban corridor. This included the Davis Terrace neighborhood in Kelso. In that report, the entire north slope of Davis Terrace was shown to be a field-verified, inactive landslide. The Aldercrest-Banyon Landslide, oriented toward the east and Tributary 1, is shown to be an active landslide.

A geologic field reconnaissance and report completed for the Bank project identified features of unstable topography in the vicinity of the north-facing slope of Davis Terrace and elsewhere adjoining the upper part of the forested preservation area. Recommendations were prepared by a licensed geologist for this project in a geologic assessment report and have been incorporated into the Bank design to avoid landslide hazard areas and other geologically unstable features.

A.4.4 Soils

The USDA Soil Conservation Service maps the onsite soils as Clato silt loam, 0 to 3 percent slopes (#32), Hazeldell gravelly silt loam, 20 to 30 percent slopes (#77), Hazeldell gravelly silt loam, 30 to 65 percent slopes (#78), Newberg fine sandy loam, 0 to 3 percent slopes (#141), and Olympic silt loam, 20 to 30 percent slopes (#148) (**Figure A-7 Soil Survey Map**). None of the soils onsite are listed on the state hydric soil list (NRCS 2013), although NRCS soils maps are typically used to gather soils information on a regional level and are limited in accuracy for localized analysis.

Detailed descriptions of soil colors and properties found in field visits are included in data sheets in Appendix A of the Critical Areas Report (ELS 2014) located in the project’s Resource Folder. Soils analyzed within sample test plots demonstrated a mixture of silts, clays and fine sands, typical of the alluvial bottomlands within the lower Coweeman, Cowlitz, and Columbia Rivers. Upland soils were generally dark grayish brown (10YR3/2) to brown (10YR4/3) silt loams and silty clay loams. Wetland soils generally consisted of silt loams and silty clay loams with a matrix of 10YR 4/2 or 10YR 3/2 with redoximorphic concentrations ranging from 5YR 4/4 to 7.5 YR 5/8 meeting the F3 or F6 hydric soil indicators. Upland soils generally matched their corresponding soil survey description; however hydric soils are present onsite contrary to the soil survey description. Although there are no hydric soils mapped onsite by the NRCS, mapped hydric soils do not necessarily mean that the area is a wetland. Hydrology and hydrophytic vegetation, must also be present to classify an area as a wetland. Conversely, wetlands may be found in areas where the soils are not mapped as hydric as is the case on the Bank site.

In June 2013, eleven pits were dug with an excavator in upland areas and the wetland fringe area in the vicinity of Wetland A to determine the approximate groundwater levels over the site and observe the soil profiles. The test pits were left open for approximately 30 minutes each, then filled in and compacted to existing grade to prevent injury to livestock. Results of the pits are summarized in Table 2 below. Test pit locations are shown on **Figure A-4**). In general, ground water was deeper closer to the river and was encountered between 11 and 40 inches below ground surface in those pits farther from the river. Soils throughout the pits consistently contained a higher clay content moving lower in the profile and no gravel or sand layers were encountered which would indicate rapid draining of soils, excluding those plots closest to the river which had a higher sand and gravel content deeper in the soil profile.

Table 2. Hydrology Test Pit Summary

Test Pit	Depth to Bottom (inches bgs ¹)	Depth to Saturation (inches bgs ¹)	Depth to Water (inches bgs ¹)
1	48	20	30
2	72	48	60
3	24	Surface	11
4	55	29	40
5	78	None	>78

6	40	10	23
7	62	38	50
8	84	70	76
9	96	72	90
10	90	72	84
11	84	60	64

A.4.5 Bank Site Access

The main access to the Bank property is from the end of Valley View Drive on a gated private gravel road. There are abandoned logging roads with various short branches that extend through the western portion of the hillside preservation area from property to the west. These were likely accessible from the Aldercrest development for hiking and walking prior to condemnation approximately 17 years ago. Vehicular access is currently blocked by barricades at the Aldercrest development and the roads are overgrown enough that vehicles cannot drive on them. The roads are naturally revegetating and now mostly resemble trails. Similar old logging roads are present at the southern end of the Bank property that are also naturally recovering. The pipeline corridor may also provide access to the Bank from the southern end as the corridor is free of tree and shrub vegetation and is wide enough for vehicles to access; however, a gate blocks the access onto the parcel and the gradient in several locations is far too steep for vehicles to drive. These roads and pipeline corridor are accessible by walking and potentially horseback riders.

A.4.6 Wetlands and Streams Overview

Ecological Land Services Inc. (ELS) delineated 20 wetlands totaling approximately 37.65 acres within the Bank boundary, most of which are associated with six small tributary streams onsite. Wetlands are labeled and referred to as A through U and tributaries are labeled 1 through 6 in the MBI, appendices, and figures (**Figures A-3, A-4, and A-4a Wetland Details**). Four small tributary streams flow into Wetland A (Hart's Lake) which is the largest wetland at 33.51 acres. Tributary 1 flows directly into to the Coweeman River and Tributary 6 flows into Wetland D. All wetlands were rated using the Department of Ecology *Washington State Wetland Rating System for Western Washington, Revised* (Hruby, August 2004). A summary of the size, rating, and function assessment score of the wetlands is provided in Table 3 below.

Stream types were defined using the Washington State Department of Natural Resources (DNR) Water Typing Classifications for flow and fish access. The riparian corridor widths listed on **Figure A-5** and Table 4 below are based on DNR forest practices water typing system. The riparian corridors are also mapped for the tributaries in Figure B-2b of Appendix B as they will be utilized to determine credit generation values in Appendix B within the preservation area of the Bank.

A.4.6.1 Wetlands

The primary sources of wetland hydrology within the floodplain area of the Bank site includes a shallow groundwater table, precipitation, and input from the hillside tributary streams. Annual peak flows and high tides can also back up water into Wetland A through the outlet tributary. These events occur several times a year.

The dominant sources of hydrology for wetlands within the hillside area of the site are precipitation and surface water runoff. The hydrogeomorphic (HGM) classifications of the hillside wetlands include riverine, depressional, and slope wetlands within relatively undisturbed old and second growth forest and shrub habitats. Table 3 below is a summary of the existing conditions of wetlands on the site:

Table 3. Wetland Summary

Wetland	Size (ac. onsite)	Cowardin Class	HGM Classification	Ecology Rating	Total Functional Assessment Score	Habitat Functions Score
A	33.51	FO/SS/EM	Depressional	I	70	34
B	0.44	EM	Depressional	III	30	10
C	1.02	FO/SS/EM	Depressional	III	45	19
D	0.36	FO/EM	Depressional	III	42	16
E	0.01	FO/SS/EM	Riverine	II	55	23
F	0.05		Depressional	III	32	21
G	0.05		Riverine	II	54	24
I	0.41	EM	Riverine	II	63	29
J	0.17		Riverine	II	60	20
K	0.12	FO/SS/EM	Riverine	II	52	30
L	0.10		Depressional	III	38	27
M	0.06		Depressional	III	37	26
N	0.01		Depressional	III	35	20
O	0.28		Depressional	III	44	27
P	0.13		Depressional	III	45	28
Q	0.19		Riverine	II	51	28
R	0.17		Riverine	II	51	28
S	0.08		Riverine	III	47	26
T	0.05		Riverine	III	48	24
U	0.44	Slope	III	44	28	
Total	37.65					

Below is a summary of the existing or baseline conditions for each wetland within the project boundary. The locations of the wetlands on the Bank site are shown on **Figures A-3** through **A-4a**.

Wetlands associated with Tributary 1:

Wetland E is a 0.01-acre riverine wetland located on the east stream bank near the tail waters of Tributary 1, south of the cow pasture and prior to the tributary's confluence with the Coweeman River. Wetland E is formed on a combination of side slope erosion and fluvial sediment deposits. Soils are mucky near the toe slope and become increasingly gravel-filled as the wetland edge approaches the stream channel. Tributary 1, surface runoff from the adjacent side slope, and topography-driven subsurface drainage patterns are the primary sources of wetland hydrology. Vegetation in Wetland E consists of big leaf maple (*Acer macrophyllum*) and Western red cedar (*Thuja plicata*) in the canopy layer with vine maple (*Acer circinatum*), salmonberry (*Rubus*

spectabilis), and Himalayan blackberry (*Rubus armeniacus*) as the dominant shrubs and youth-on-age (*Tolmiea menziesii*), lady fern (*Athyrium filix-femina*), maiden hair fern (*Aidatum pedatum*), and skunk cabbage (*Lysichiton americanus*) in the herbaceous layer. A Himalayan blackberry infestation is encroaching Wetland E from the west.

Wetland F is a 0.05-acre sloped depressional wetland located on the east stream bank, upstream from Wetland E. The primary source of hydrology stems from a seep entering the wetland from the southwest. The seep's drainage forms a channel that bisects the wetland and outflows into Tributary 1. Skunk cabbage is rooted in the seep channel; water parsley (*Oenanthe sarmentosa*) is distributed throughout the wetland area. Soils are mucky in and adjacent to the seep channel with gravel and sand increasing in the soil composition as distance from the seep increases and proximity to the tributary decreases. Vegetation in Wetland F consists of salmonberry and red osier dogwood (*Cornus sericea*) with an herbaceous layer composed of lady fern, water parsley, youth-on-age, horsetail (*Equisetum arvense*), skunk cabbage, Reed canarygrass (*Phalaris arundinacea*), and stinging nettle (*Urtica dioica*).

Wetland G is a 0.05-acre riverine wetland formed on fluvial sediment deposits. Soils are mucky near the toe slope and become increasingly gravel-filled as the wetland edge approaches the stream channel. Tributary 1, surface runoff from the adjacent side slope, and topography-driven subsurface drainage patterns are the primary sources of wetland hydrology. Vegetation in Wetland G consists of beaked hazelnut (*Corylus cornuta*) and salmonberry with an herbaceous layer of youth-on-age, lady fern, skunk cabbage, maiden hair fern, and sword fern (*Polystichum munitum*). Beaked hazelnut is rooted in the upland fringe, is growing parallel to the wetland's surface, and extends over the entire wetland area.

Wetland I is a 0.41-acre ponded, riverine wetland formed by a beaver dam. Hydrology forming Wetland I is primarily supplied by Tributary 1 with additional, off-site tributaries entering the wetland from the west. Dominant vegetation consists of creeping buttercup (*Ranunculus repens*) and soft rush (*Juncus effusus*) along the north, west, and southern boundaries and Douglas fir (*Pseudotsuga menziesii*), salal (*Gaultheria shallon*), red huckleberry (*Vaccinium parvifolium*), and sword fern overhanging the eastern boundary. Approximately ten snags are located in the north end of the wetland near the beaver dam; these range in size from 40 to 50 inches diameter and about 80 feet tall. The south and east boundaries of Wetland I are generally composed of overhanging banks with well drained soils; poorly drained, mucky soils form the western boundary. Water becomes increasingly ponded to the north as the stream channel approaches the beaver dam. Approximate ponding depth at the deepest point is 8 feet.

Wetland J is a 0.17-acre riverine wetland formed by sediment deposits from Tributary 1 with wetland hydrology primarily stemming from the tributary. A roadbed crosses the wetland's northern end and constricts outflow through a 12-inch culvert which likely causes additional impoundment. Dominant vegetation consists of Reed canarygrass, stinging nettle, and soft rush. Red alder (*Alnus rubra*) and salmonberry are rooted along the wetland's perimeter and overhang into the wetland area. Soils in Wetland J are poorly drained and relatively soft.

Wetland K is a 0.12-acre riverine wetland formed in a low gradient section of Tributary 1 with water levels influenced by a beaver dam. In addition to the dam, other factors contributing to the wetland's development include tributary meanders becoming longer, the floodplain is slightly

wider, and sedimentary deposits are more stable and consist of finer material. Hydrology forming Wetland K is primarily supplied by Tributary 1; Stems 1 and 2 also outlet into Wetland K. Dominant vegetation consists of Reed canarygrass, creeping buttercup (*Ranunculus repens*), cattail, Himalayan blackberry, soft rush, and horsetail; stinging nettle and duckweed (*Lemna minor*) are present in the south end of the wetland. Eight pieces of large woody material exist in the north end of Wetland K; these range in size from 32 to 40 inches diameter and about 50 feet long. There are six snags over 100 feet tall and 30 to 40 inches diameter with another 3 snags less than 15 feet tall and approximately 10 inches diameter. The southeast section of Wetland K includes saturated soils and shallow inundation interspersed with sand bars and oblong sedimentary deposits from the input of Tributary 1. Ponding increases in depth to the north as the stream channel approaches the beaver dam. Approximate ponding at the deepest point is 6 feet. The southern end of the wetland is dominated by Himalayan blackberry and Reed canarygrass.

Wetland L is a 0.10-acre headwater wetland located on Stem 1 of Tributary 1. Stem 1 flows from Wetland P into a defined channel and outlets into the south end of Wetland K. Wetland L is a pinnately formed sloped depression wetland supporting multiple undefined braided channels and interspersed with upland hummocks. Vegetation consists of Western red cedar, red alder, and Douglas fir with salmonberry and wax currant in the understory and water parsley, lady fern, youth-on-age, and skunk cabbage in the herbaceous layer. Water is flowing with perceptible current in each of the lobes and shallow pools have formed behind upland hummocks and in areas where the slope becomes more gradual. There are no distinct drainage channels in Wetland L leaving flow patterns to be directed by the general rise and fall of local topography. Approximately 4/5 of all hydrology in Wetland L outflows into Stem 1 and roughly 1/5 forms shallow pools on the southern perimeter and seeps into the ground. This hydrology is likely the source of a seep that surfaces approximately 30 feet downslope from Wetland L and forms a distinct drainage channel intersecting Tributary 1. Two primary segments of large woody material are dispersed in Wetland L measuring approximately 38 inches diameter and extending 70 feet in length; additional segments of smaller woody material are present throughout the wetland.

Wetland M is a 0.06-acre sloped depression wetland that receives hydrology from Wetland O as well as drainage from surrounding topography. Soils are inundated in the south end of the wetland and saturated at the west end of the wetland. Wetland M is a natural depression but inundation is likely compounded by the berm of an adjacent old access road near the wetland's low-point which may slow drainage. Vegetation in Wetland M consists of salmonberry and wax currant with horsetail, stinging nettle, lady fern, youth-on-age, and skunk cabbage in the herbaceous layer. Leaf-litter and fragments of woody debris account for the remainder of the surface area.

Wetland N is a 0.01-acre depression slope wetland without direct connectivity to Wetlands L, M, or O but, due to geomorphic position, hydrology in Wetland N is likely systemic with these three wetlands. Soils in the northeast lobe of Wetland N are saturated, transitioning to 2 to 5 inches inundation in the west and southwest wetland lobes. Vegetation is primarily water parsley, youth-on-age, and lady fern; bare ground and small diameter moss-covered woody material account for the majority of the surface area. Drainage patterns flow east to west with water becoming impounded in the western end. Impoundment is likely due to a fragment of old growth timber which blocks the natural topographical outlet. Hydrology seeps into the ground at

the western end of Wetland N without establishing a defined channel or outlet. A seep emerges approximately 30 feet downslope, forming an incised drainage channel to Stem 2, and hydrology for the seep possibly stems from Wetland N.

Wetland O is a 0.28-acre sloped depression wetland formed on a terraced slope adjacent to an old graveled access road. A second defined drainage channel intersects Wetland O from the west, paralleling a second old gravel access road. Hydrology is likely directed from the roadway into this channel as well as intercepting drainage from side slopes to the south. The wetland supports areas of shallow inundation near the center, ranging from 0.5 to 2 inches deep, and impounds water in the north ranging from surface saturation to 5 inches at the fringe, and 5 to 10 inches deep in the center. Water impoundment is likely affected by the access roads adjacent to the wetland which could slow drainage north. Vegetation in Wetland O includes Western red cedar, Douglas fir, big leaf maple, and red alder as the dominant canopy layer, salmonberry and vine maple in the shrub layer, and sword fern, skunk cabbage, youth-on-age, water parsley, slough sedge (*Carex obnupta*), and lady fern in the herbaceous layer. Large woody material is present as three logs whose diameters range from 10 to 22 inches and lengths range from 15 to 20 feet. There are no snags. Hydrology in Wetland O exits through a defined channel parallel to an old graveled access road, outflows directly into the road, and is dispersed by the road's surface into approximately three primary flow directions and numerous rivulets.

Wetland P is a 0.13-acre headwater wetland in Stem 1 of Tributary 1. The wetland is formed in a localized bowl-shaped drainage basin that has developed on a side slope. There were no drainage patterns to indicate the presence of seeps or other channelized flows entering the wetland. Primary sources of hydrology are likely generated from topographical drainage patterns and precipitation. There were pockets of shallow inundation averaging 0.5 to 2 inches deep and 2 to 3 feet in diameter in the south and central sections of the wetland. Small upland hummocks are present, created from accumulation of organic debris at the base of trees and near drip lines. These hummocks influence drainage patterns in the wetland and provide a platform for sword fern which is established in various places within the wetland boundary. Inundation is present in the southern end of the wetland with depths ranging from surface saturation to 5 inches at the fringe, and 8 to 15 inches deep in the center. Vegetation in Wetland P includes Western red cedar, big leaf maple, and Douglas fir composing the canopy layer with salmonberry as the dominant shrub and sword fern, water parsley, skunk cabbage, horsetail, and youth-on-age in the herbaceous layer. Slough sedge represents approximately 80 percent of the herbaceous cover in the south end of the wetland. Sedge is rooted in the fringe areas of the deepest inundation but is not present in other areas of the wetland. Large woody material approximately 12 to 16 inches diameter and 25 feet long is scattered through the wetland's center. A few small snags ranging from 4 to 6 inches diameter and 8 to 10 feet in height are also present. English holly (*Ilex aquifolium*) is encroaching from the southwest and is rooted in approximately 10 percent of the total wetland area. Wetland P outflows into a defined channel that drains directly into Wetland O.

Wetland Q is a 0.19-acre riverine wetland associated with Tributary 1, formed on fluvial sediment deposits. The primary source of hydrology is Tributary 1 with additional hydrology provided by two seeps near the wetland's outlet, entering from the west and east, respectively. Downed woody material consists of one log approximately 36 inches diameter and 30 feet long. Soils in Wetland Q are primarily mucky with surface saturation, becoming sand and gravel

dominated as the wetland edge approaches the stream channel. Vegetation in Wetland Q consists of big leaf maple, Western red cedar, and red alder in the canopy layer with salmonberry as the dominant shrub and water parsley, youth-on-age, skunk cabbage, lady fern, sword fern, and slough sedge in the herbaceous layer. Himalayan blackberry, Reed canarygrass, and horsetail are present in the northern section of the wetland prior to outflow into Wetland K.

Wetland R is a 0.17-acre riverine wetland associated with Tributary 1, formed on fluvial sediment deposits, and is located downstream from Wetland S. The primary source of hydrology is Tributary 1. One seep enters Wetland R from the west. Downed woody material consists of seven to ten logs approximately 30 feet long and 24 inches in diameter, and one log approximately 36 inches diameter and 50 feet long. Soils in Wetland R are primarily mucky with surface saturation; they become more dominated by sand and gravel as the wetland edge approaches the stream channel. Vegetation in Wetland R consists of Douglas fir and big leaf maple in the canopy layer with salmonberry and wax currant as the dominant shrubs and water parsley, youth-on-age, lady fern, skunk cabbage, and slough sedge in the herbaceous layer. Red huckleberry (*Vaccinium parvifolium*), salal (*Gaultheria shallon*), cascara (*Rhamnus purshiana*), and western red cedar sprigs are rooted in downed wood throughout the wetland.

Wetland S is a 0.08-acre depressional sloped wetland along Tributary 1. A former access road used to cross the tributary at the head of Wetland S; the stream crossing is no longer established but a culvert is still in place. The culvert is approximately 30 feet long; about 20 feet is buried at stream level but the majority of the stream flows around the culvert to the east. The primary source of hydrology for Wetland S is Tributary 1; additional hydrology is contributed by two seeps, one (Seep 1) is located near the wetland's headwaters and another (Seep 2) enters from the east stream bank in the tail waters. Seep 1 begins in a collapsed bank formation that has developed a distinct drainage channel, deep mucky soils, and a low-gradient flow pattern. The seep's boundaries support skunk cabbage, water parsley, and salmonberry. Seep 2 emerges from underneath an old cedar stump and flows overland for approximately 2 feet before intersecting Wetland S. Vegetation includes red alder in the canopy cover, salmonberry as the dominant shrub, with youth-on-age, water parsley, lady fern, and sword fern in the herbaceous layer. Tributary 1 flows as a braided channel in the southern portion of the wetland and as a single channel at the wetland's outlet.

Wetlands associated with Tributaries 2, 3, 4, 5, and 6:

Wetland A is referred to locally as "Hart's Lake" and is a 33.51-acre wetland located in Area A of the project. Wetland A is classified as a depressional outflow wetland according to the HGM classification system (Brinson, 1993) and as a palustrine forested, scrub-shrub, emergent, aquatic bed (PFO/SS/EM/AB) wetland according to the Cowardin classification system (Cowardin et al, 1979). Wetland A and the surrounding uplands are actively grazed and therefore reflect disturbed conditions as a result. A detailed characterization of the vegetation assemblages found in Wetland A is located in the Addendum to the Existing Conditions Report (ELS, 2014) located in the Resource Folder and is summarized later in Appendix A.

As summarized in Table 3 above, Wetland A is a Category I wetland having received a total score of 70 points using the *Washington State Wetland Rating System for Western Washington, Revised* (Hruby2004). This total score includes a moderate score (18 points) for water quality

functions having an intermittently flowing outlet, some areas of grazed vegetation and a large area of seasonal ponding, a moderate score (18 points) for hydrologic functions with an intermittently flowing outlet, 3 feet or more of ponding, and a very large contributing basin; and very high score (34 points) for habitat functions as it contains multiple water regimes, Cowardin classes, and special habitat features as well as high functioning buffer. It is important to note that 70 points is the lowest score a Category I wetland can receive based on functions provided by the wetland. The lower scoring hydrologic and water quality function scores combined with a very high habitat score despite areas of degradation from cattle allow the Category 1 rating. Completed wetland data forms and rating forms for Wetland A are included in the project Resource Folder.

The hydroperiods for Wetland A include seasonally flooded, occasionally flooded, and saturated only. Hydrologic sources supporting Wetland A and these hydroperiods include perennial surface flow from Tributaries 2 and 5, seasonal surface flow from Tributaries 3 and 4, hillside seeps, groundwater, precipitation, and periodic overbank flooding from the Coweeman River. Water surface elevation data collected from May 2013 to April 2014 indicates that the water surface of Wetland A is perched above the water surface of the Coweeman River and occasionally connected at high river flow conditions. The existing-conditions HEC-RAS model for the Coweeman River and Wetland A (Shannon Wilson, 2014) indicates that flood connectivity into Wetland A currently occurs mostly as backwater through the Wetland A outflow channel on an annual basis and overbank flooding of the Coweeman River into Wetland A would occur at the 10-year flood elevation.

Surface water level measurements were recorded throughout parts of 2013-2014 within Wetland A at three Level Loggers: H1 through H3. H1 was installed in Wetland A, north of Tributaries 3 and 4, which is seasonally flooded and dominated by aquatic bed vegetation and at a ground elevation of approximately 13 feet. H2 is located within a seasonally flooded area of Wetland A dominated by emergent vegetation near the Wetland A Outlet Channel and at a ground elevation of approximately 14 feet. H3 was installed within a seasonally flooded area of wetland dominated by emergent vegetation at the north end of Wetland A and at a ground elevation of approximately 14 feet.

Based on data from the Level Loggers, wetland hydrology within Wetland A ranges from saturated only to seasonally flooded with approximately 3 feet of seasonal inundation and 5 feet of occasional inundation at the lowest elevation areas of the wetland. The highest level of seasonal flooding within Wetland A occurs during seasonal high flood events within the Coweeman River, when surface water backs up through the Wetland A Outlet Channel and inundates Wetland A, as was recorded during parts of February and March 2014. Furthermore, seasonal flooding within Wetland A appears to occur for approximately 9 months, between the months of October to July.

The Wetland A Outlet Channel, which has been manipulated and deepened to improve drainage for grazing and agricultural activities onsite, is flowing much of the year. Both Tributaries 2 and 5 flow through Wetland A and have created pockets of defined channel where a bed and bank are clearly visible. In other parts of the wetland, these tributary channels become less discernible.

Given the varying depths of inundation that occur within Wetland A, those areas which are seasonally flooded or occasionally flooded have fewer grazing impacts and are comprised of a variety of Cowardin vegetation communities, including emergent (native and disturbed), forested/scrub-shrub, forested-emergent, and aquatic bed. Vegetation communities within Wetland A are further described in Section A.4.6 below.

Soils observed within Wetland A were silt loams and silty clay loams meeting either the Depleted Matrix (F3) or Redox Dark Surface (F6) hydric soil indicators.

Wetland T is a 0.05-acre riverine wetland formed on fluvial sediment deposits. Soils are mucky near the toe slope and become increasingly gravel-filled as the wetland edge approaches the stream channel. Drainage from the side channel, overflow from Tributary 2, surface runoff from the adjacent side-slope, and topography-driven subsurface drainage patterns are the primary sources of wetland hydrology. Vegetation in Wetland T consists of beaked hazelnut and salmonberry with an herbaceous layer of youth-on-age, lady fern, skunk cabbage, maiden hair fern, and sword fern. Soils are mucky near the toe slope and become increasingly gravelly as the wetland edge approaches the stream channel.

Wetland U is a 0.44-acre sloped wetland formed on a terrace near the head of Tributary 2. A defined drainage continues upslope from Wetland U and exits the site's south boundary line. Wetland U contains a series of braided channels, interspersed with low-lying upland hummocks formed by an accumulation of organic debris and by soil uplift around root crowns of larger trees. The wetland supports areas of shallow inundation near the center and along the fringe, particularly north and south. Vegetation in Wetland U includes Western red cedar, Douglas fir, and red alder as the dominant canopy layer, salmonberry and vine maple in the shrub layer, and sword fern, skunk cabbage, youth-on-age, water parsley, and lady fern in the herbaceous layer. Small diameter wood material is present throughout the wetland ranging from 8 to 10 inches diameter and 5 to 12 feet long. There are two standing snags. Hydrology in Wetland U exits in a defined channel and proceeds downslope in Tributary 2.

Wetland D is a 0.36-acre depressional forested and emergent wetland located within a shallow depression abutting the steep hillside southeast of Wetland C. Tributary 6 flows down the hillside and terminates in the wetland, providing the main source of hydrology. The wetland contained areas of standing water up to 4 inches deep and areas of surface saturation during the May 2014 site visit. Inundated areas are shaded by the hillside most of the day. The majority of Wetland D is dominated by emergent vegetation consisting of Reed canarygrass with skunk cabbage and lady fern in the shaded areas along the base of the hillside.

Wetlands within the Floodplain Not Associated with a Tributary Stream:

Wetland B is a 0.44-acre depressional emergent wetland located within an actively grazed pasture on the north (right) bank of the Coweeman River, in Area B of the Bank site. The hydroperiods within Wetland B include both occasionally flooded and saturated only. Eight inches of surface water inundation was observed within Wetland B in February 2014 during a large precipitation and high water event in the river. Hydrologic sources to Wetland B are predominantly limited to direct precipitation, groundwater, and periodic overbank flooding.

Vegetation within Wetland B is limited to grazed, emergent pasture grasses. Soils observed within Wetland B were predominantly silt loams satisfying the Depleted Matrix (F3) hydric soil indicator.

As summarized in Table 3 above, Wetland B is a Category III wetland having received a total score of 30 points using the *Washington State Wetland Rating System for Western Washington, Revised* (Hruby, 2004). This total score includes a low score (6 points) for water quality functions, moderate score (14 points) for hydrologic functions, and low score (10 points) for habitat functions. Completed wetland data forms and rating forms for Wetland B are included in the project Resource Folder.

Wetland C is a 1.02-acre forested, scrub-shrub, emergent wetland located within Area C of the Bank site, along the Coweeman River floodplain at the toe of the southwest project boundary and hillside area. Wetland C includes areas classified as slope under the HGM classification system (Brinson, 1993) along its southern end which transitions to areas classified as depressional as it extends northward. Given the dual HGM classification, Wetland C was rated as a depressional wetland under Ecology's *Wetland Rating System for Western Washington, Revised* (Hruby, 2004).

The hydroperiods within Wetland C include saturated only along the portion of wetland that is sloped and seasonally flooded in surface depressions to the north. Hydrologic sources to Wetland C include hillside seeps along the southern perimeter, direct precipitation, groundwater, and periodic overbank flooding. Vegetation within Wetland C is dominated by grazed, emergent Reed canarygrass with shrub and forested species present on the south perimeter. Soils observed within Wetland C were silty clay loam satisfying the Depleted Matrix hydric (F3) soil indicator.

As summarized in Table 3 above, Wetland C is a Category III wetland having received a total score of 45 points (Hruby, 2004). This total score includes a low-moderate score (12 points) for water quality functions, moderate score (14 points) for hydrologic functions, and moderate-high score (19 points) for habitat functions. Completed wetland data forms and rating forms for Wetland C are included in the project Resource Folder.

A.4.6.2 Streams

DNR Stream Mapping depicts three fish bearing (Type F) primary streams, four non-fish bearing (Type Ns) primary streams, and multiple Type N side channels (**Figures A-3 through A-5**). ELS located and verified three Type F tributaries and four Type Ns tributaries onsite, and documented the presence, location, and extent of each side channel. These streams are identified in this report as Tributaries 1, 2, 3, 4, 5, and 6. Table 4 below is a summary of the existing streams onsite.

Table 4. Stream Summary

Stream	DNR Stream Type	Stream Length	Stream Width
Coweeman River	Type S (fish bearing/perennial/shoreline of the state)	1.5 miles (onsite)	60-80 ft.
Tributary 1	Type F ¹ (fish bearing/perennial)	0.92 miles (total)	6-8 ft.

Stream	DNR Stream Type	Stream Length	Stream Width
Tributary 2	Type F ² (fish bearing/perennial)	1.06 miles (total)	2-5 ft.
Tributary 3	Type Ns (non-fish bearing/seasonal)	0.19 miles (total)	2 ft.
Tributary 4	Type Ns (non-fish bearing/seasonal)	0.29 miles (total)	2 ft.
Tributary 5	Type Ns (non-fish bearing/seasonal)	0.26 miles (onsite)	3-4 ft.
Tributary 6	Type Ns (non-fish bearing/seasonal)	0.03 miles (total)	2 ft.
¹ Tributary 1 may not be fish bearing upstream of the Bank boundary. ² 0.09 miles of Tributary 2 are fish bearing. The remaining length is non-fish bearing. See break on Figure A-4a.			

Below is a summary of the existing or baseline conditions for each stream within the project boundary.

Tributary 1 originates in a geologically unstable area due to high amounts of water infiltrating poorly consolidated soils. Landscape instability has given variation to the stream channel, as have modifications to flow patterns from an active beaver population. For these reasons Tributary 1 had the greatest variance from DNR mapping. Tributary 1 supports numerous pools, sediment-rich substrate, gravel bars, organic debris, and a year-round water source, that together form suitable fish habitat. During tributary mapping ELS observed small fish in some of the pools, verifying DNR's Type F designation.

Tributary 2 flows on bed rock between steep, incised banks for much of the distance that it is present onsite, leading to low variability in the channel. In certain sections water has flowed in one place long enough to have formed a grooved channel in the bedrock, reflecting landscape stability; topographic mapping provides a faithful depiction of the stream channel. Much of the upper stream is unable to provide adequate fish habitat due to consolidated substrate, low organic content, and an infrequent occurrence of pools. However, the lower sections of Tributary 2 contain pools formed by fragments of fallen trees and these pools have developed unconsolidated stream beds with nutrient-rich organic sediment deposits. During tributary mapping ELS observed small fish in the lower section of Tributary 2, verifying DNR's Type F designation.

In the lower section of the stream gradient, sediment accumulation is at the highest level. Large amounts of sediment have been deposited in an alluvial fan where Tributary 2 meets Wetland A in the floodplain. This material has cut off the surface water connection of Tributary 2 to Wetland A during low flows in the summer and early fall. It is assumed that human actions to lower the water levels of Wetland A through deepening the outlet channel have created or exposed the large amount of sediment. Prior to human alteration, Tributary 2 most likely maintained a surface water connection to Wetland A. Actions to restore the surface water connection of Wetland A and Tributary 2 to improve fish habitat conditions are detailed in Appendix B of the MBI.

Tributary 3 and 4 flow somewhat parallel to one another for a short distance before entering Wetland A, after which point they briefly converge into one channel prior to becoming indistinguishable from the wetland. DNR has designated Tributary 3 and 4 as Type N streams. These two channels flow over exceptionally steep terrain that range from 60 to 80 percent slopes. Portions of the stream appear to be saturated overland flow rather than channelized flow; these sections likely provide an effective barrier for fish travelling any distance upstream. Due to the topography ELS was not able to walk in the stream channel but made observations from the nearby side-slope. Tributaries 3 and 4 are largely rocky, debris-filled gullies that support occasional shallow pools. It is unlikely that either stream supports fish, and no fish were observed.

Tributary 5 is among the three largest of the five drainages but flows for only short distances onsite. Those sections consist of a delta prior to entering Wetland A and a portion of one side channel. There are no wetlands associated with Tributary 5, probably due to soil structure. Similar to the western boundary of the site, soils are unconsolidated in this location. Unlike the western edge, transitional soil structure has allowed an incised channel to develop with bank heights of 3-to-5 feet, toed into sideslopes of 40 to 50 percent grade. There is a high density of woody material in the channel, probably again due to unstable soils. The lower section of Tributary 5 which enters into Wetland A has a large alluvial fan that is largely rock and debris filled. This connection of Tributary 5 to Wetland A has been significantly altered by the lowering of water levels in Wetland A, causing it to lose its surface water connection to Wetland A for a long segment over significant periods of time causing it to be classified as non-fish bearing.

Tributary 6 is a small seasonal type Ns stream that originates south of Area C and flows through a culvert into the Area C floodplain, providing seasonal hydrology to Wetlands C and D. The tributary is a collection of small seeps off of the hillside and runs for approximately .03 miles until its end point into wetland C. These wetland areas are not connected to the Coweeman River and the tributary itself is too steep to provide any kind of fish habitat or access.

Coweeman River

There is currently limited riparian habitat along the Coweeman River within the Bank site boundary. Additionally, there are several areas of localized bank erosion where cattle access the river. Old cars and farm equipment were dumped in the river at the meander bend area in an apparent effort to stabilize the banks and prevent erosion. Several of these pieces are visible protruding from the bank and river bottom. In general, the river bank is a nearly vertical drop that averages approximately 5 feet to the water surface. There are a few areas where the bank has natural benches that step up gradually to the floodplain. The width of the river ranges between 60 and 80 feet wide with depths between 2 and 10 feet deep throughout the Bank site. Substrate is either mucky, or the bedrock is exposed.

There is little habitat complexity in this reach of the Coweeman River and within the floodplain. A large woody material (LWM) survey of root wads, logs, and large branches in the Coweeman River within the Bank boundaries was completed by ELS in the summer of 2014. In total 154 pieces of LWM were documented within the Coweeman River with an average DBH of 9.5 inches and an average length of 11.1 feet. The full results of the LWM survey can be found in

the project Resource Folder. The majority of LWM pieces present in the river, however, appear to be imbedded in the riverbed, parallel to stream flow which likely occurred during splash dam logging. Very few pieces extend from the river bank into the water and few pieces have rootwads and/or branches attached. Because the LWM pieces are parallel with the stream flow and do not have rootwads and branches retained, they are not creating pools, channel complexity/roughness, or areas of sediment deposition, and therefore, are not providing areas of refuge, forage, or habitat diversity in general for fish and aquatic species.

A stream gauge at RM 7.5 was destroyed in the 1990s by a major flood and reinstalled in 2006 but gauge data dating back to 2007 shows that the Coweeman River typically discharges its peak flows from November to January with lowest flows between August and September. Shannon & Wilson conducted a flow-duration analysis of the mean daily flow values over the combined period of record, segregated by month. This modeling indicates on average the mean daily flow of the Coweeman ranged from a low of approximately 50 cubic feet per second (CFS) in August and September to a high of over 600 CFS in December and January. Mean daily flows greater than 1,000 CFS occur 15 to 20 percent of the time between November and March, and mean daily flows of 1,500 CFS occur between 5 and 15 percent of the time during the same time period. Annual flood frequency analysis indicates that a two-year flood event is approximately 5,090 CFS (S&W 2014).

The ordinary high water mark (OHWM) was delineated on the Bank site on May 2, 2014 following standard methodology as described in the Washington State Department of Ecology manual: “*Determining the Ordinary High Water Mark on Streams in Washington State*” (Publication # 08-06-001). Preliminary modeling of river gauge data for the approximate elevation of the 2-year flooding event combined with ground truthing was used to determine the location of the OHWM. Based on preliminary modeling of the 2-year flood event on the Coweeman River provided by the project engineer, Shannon and Wilson, the flood flow of approximately 5,090 CFS corresponds to an approximate elevation of 16.9 feet NAVD88. Shannon and Wilson also provided recent data from an Ecology gauge that indicates an elevation 14.04 feet NAVD88 for the approximate 2-year event, which is also based on modeling. The 16.9-foot elevation contour was uploaded onto a hand-held GPS unit and verified location in the field. This elevation was too high in the field, and the OHWM most closely followed the 14-foot elevation contour modeled by Ecology. The river bank is nearly vertical over the majority of the Bank property, therefore the OHWM was drawn along the top of the bank for most of the site. However, in the southwestern portion of the Bank site in the vicinity of Wetland C, there is a low bench along the river’s edge. In this area, the OHWM delineated was based on a slight change in vegetation and a change in elevation. The river bank is dominated almost exclusively by Reed canarygrass. The OHWM was delineated where additional grass species and Canada thistle (*Cirsium arvense*) were establishing, which generally corresponded with the rise in elevation.

A.4.7 Existing Vegetation Communities Onsite

Vegetation communities at test plot locations were recorded by ELS in the existing conditions report which is contained in the project Resource Folder. Existing wetland habitat communities are mapped and shown in **Figure A-6 Hydroperiods and Cowardin Vegetation Classes**. Vegetation communities present onsite are described below and are separated into riparian floodplain area and forested hillside preservation area. The riparian floodplain area is further

broken down into three subareas; Area A, Area B, and Area C, which is where the construction activities of the Bank site design will focus to provide the greatest functional lift. The Bank site design elements are detailed in Appendix B of the MBI and are likewise grouped into Areas A, B, and C. Area D within Phase 2 will be discussed in an addendum if Phase 2 of the Bank project moves forward.

A.4.7.1 Riparian Floodplain Vegetation

Cattle are able to access nearly all of the floodplain areas within the Bank site including all of Wetlands B, C, and D and the majority of Wetland A resulting in degradation. Cattle grazing along with regular mowing for hay production and invasive species presence has slowed or prevented the establishment of woody plant species and the natural recruitment of additional native herbaceous species. If left ungrazed and unmowed, the higher elevation emergent wetland areas would likely see a dominance of Reed canarygrass and Himalayan blackberry combined with some woody species recruitment. Lower elevations of emergent wetland and aquatic bed would likely have an increase in invasive species presence. Upland riparian areas would likely also transition to areas dominated by invasive species, mixed with some recruited woody species such as cottonwood and alder.

A.4.7.2 Area A Floodplain Vegetation

The Area A floodplain totals 67.46 acres and is located east of Tributary 1 and north of the hillside within portions of parcels WI3605002, WI3601001, and WE3101003 (Phase 2). Area A is similar in nature to the other upland floodplain areas in the Bank site being predominantly grazed pasture with only scattered deciduous trees and patches of low shrubs along the Coweeman river bank. A small stand of Oregon ash is present in the northwest corner within the cultural resources area. Beneath the Oregon ash, the understory consists mainly of Reed canarygrass and red fescue with scattered patches of snowberry.

Wetland A (33.51 acres) is located along the base of the hillside along the south end of Area A. The majority of vegetation and habitat diversity within the floodplain portion of the Bank site is located within Wetland A. Wetland A contains forested, scrub-shrub, emergent, and aquatic bed components, as well as three seasonal tributaries (Tributaries 3, 4, and 5, and one perennial tributary, Tributary 2). Tributary 1 is perennial and flows directly into the Coweeman River. Overall, habitat in Wetland A is compromised by cattle that are able to access the majority of the wetland, severely degrading the emergent and aquatic bed areas. Grazing has slowed establishment of shrubs outward from the core scrub-shrub areas. If left ungrazed, the higher elevation emergent areas will likely transition to an area dominated by invasive species with some shrub species and some tree species scattered throughout.

Wetland A also contains a variety of hydroperiods including seasonally inundated, occasionally flooded, saturated only, and includes perennial and seasonal streams. The aquatic bed area is flooded the majority of the year but dries out in some years in late summer/early fall. Seasonally flooded areas may be up to 5 feet deep. During heavy rain events, the entire wetland and the surrounding upland becomes inundated as evidenced by wrack deposits landward of the wetland boundary in 2013. The wetland's varying hydroperiods also directly affect the vegetation communities present within the wetland. A characterization of the vegetation communities found

in Wetland A was conducted on October 17, 2014 by walking throughout the wetland and identifying species assemblages present. The majority of the assemblages were mapped using an aerial photo along with ground-truthing. The Aquatic Bed-1 area was mapped using a hand-held GPS unit with sub-meter accuracy. Eleven different vegetation assemblages were found within the wetland. Plant species comprising these assemblages are detailed in Table 5 below and their locations are shown on **Figure A-6**. These vegetation assemblages were also described in a memorandum prepared by ELS in November 2014 discussing the Addendum to the Existing Conditions Report and were accompanied by pictures of each vegetation assemblages. This memorandum is located in the Resource Folder.

Table 5. Wetland A Vegetation Assemblages

Emergent Community 1 (EM 1)			
Species	Scientific Name	Percentage	Indicator
Soft rush	<i>Juncus effusus</i>	70	FACW
Reed canarygrass	<i>Phalaris arundinacea</i>	20	FACW
Slough sedge	<i>Carex obnupta</i>	10	OBL
Notes: Very heavily grazed area generally at highest elevation on north side of wetland. Occasional, heavily grazed Sitka willow.			
Emergent Community 2 (EM 2)			
Species	Scientific Name	Percentage	Indicator
Pacific willow	<i>Salix lasiandra</i>	20	OBL
Sitka willow	<i>Salix sitchensis</i>	10	FACW
Soft rush	<i>Juncus effusus</i>	50	FACW
Reed canarygrass	<i>Phalaris arundinacea</i>	30	FACW
Small-fruited bulrush	<i>Scirpus microcarpus</i>	20	OBL
Notes: Heavily grazed. Some willow are establishing. Area slightly lower in elevation than EM 1. Main difference between EM1 and EM2 is establishing willow and the presence of small-fruited bulrush. This assemblage is present along southern edge of EM1 and at similar elevations in the willow-dominated forested /scrub-shrub interior of wetland.			
Emergent Community 3 (EM 3)			
Species	Scientific Name	Percentage	Indicator
Reed canarygrass	<i>Phalaris arundinacea</i>	30	FACW
Jewelweed	<i>Impatiens capensis</i>	30	FACW
Agrostis sp.	<i>Agrostis sp.</i>	20	FAC
Canada thistle	<i>Cirsium arvense</i>	20	FAC
Creeping buttercup	<i>Ranunculus repens</i>	5	FAC
Tansy ragwort	<i>Tanacetum vulgare</i>	5	FACU
Notes: Moderately grazed. Lots of LWM from flooding. Appears that possibly LWM was pushed in this area with heavy equipment disturbing soils, which allowing the prevalence of invasive species. This community is in the upper elevation at eastern edge of the wetland only.			
Forested/Scrub-shrub 1(FO/SS 1)			

Species	Scientific Name	Percentage	Indicator
Pacific willow	<i>Salix lasiandra</i>	90	OBL
Oregon ash	<i>Fraxinus latifolia</i>	10	FACW
Reed canarygrass	<i>Phalaris arundinacea</i>	45	FACW
Agrostis sp.	<i>Agrostis</i> sp.	45	FAC
Soft rush	<i>Juncus effusus</i>	5	FACW
Jewelweed	<i>Impatiens capensis</i>	5	FACW
Slough sedge	<i>Carex obnupta</i>	Trace	OBL

Notes: Heavily grazed. Upper elevation FO/SS area, more open in mostly narrow bands with little to no low shrub understory. Pacific willow is present as both a tree and shrub. Oregon ash generally appears stressed.

Forested/Scrub-shrub 2 (FO/SS 2)

Species	Scientific Name	Percentage	Indicator
Pacific willow	<i>Salix lasiandra</i>	90	OBL
Oregon ash	<i>Fraxinus latifolia</i>	10	FACW
Spiraea	<i>Spiraea douglasii</i>	40	FACW
Red-osier dogwood	<i>Cornus sericea</i>	40	FACW
Douglas hawthorn	<i>Crataegus douglasii</i>	10	FAC
Himalayan blackberry	<i>Rubus armeniacus</i>	10	FACU
Reed canarygrass	<i>Phalaris arundinacea</i>	30	FACW
Jewelweed	<i>Impatiens capensis</i>	10	FACW
Skunk cabbage	<i>Lysichiton americanus</i>	5	OBL

Notes: Upper elevation FO/SS areas with only grazing at edges. Pacific willow is present as both a tree and shrub. Oregon ash generally appears stressed. Blackberry and jewelweed present at perimeter. Low shrub layer very dense.

Forested/Scrub-shrub 3 (FO/SS 3)

Species	Scientific Name	Percentage	Indicator
Pacific willow	<i>Salix lasiandra</i>	80-100	OBL
Smartweed	<i>Polygonum lapathifolium</i>	35	FACW
Creeping jenny	<i>Lysimachia nummularia</i>	35	FACW
Reed canarygrass	<i>Phalaris arundinacea</i>	20	FACW
Soft rush	<i>Juncus effusus</i>	10	FACW
Forget-me-not	<i>Myosotis</i> sp.	Trace	FACW

Notes: Pacific willow is present as both a tree and a shrub. Where willow is most dense, ground cover is mainly leaf litter. Where the canopy is not as dense, smartweed and creeping jenny are present and in the most open areas, Reed canarygrass and soft rush are present.

Forested/Scrub-shrub 4 (FO/SS 4)

Species	Scientific Name	Percentage	Indicator
Pacific willow	<i>Salix lasiandra</i>	70	OBL
Sitka willow	<i>Salix sitchensis</i>	30	FACW
Spiraea	<i>Spiraea douglasii</i>	20	FACW

Red-osier dogwood	<i>Cornus sericea</i>	20	FACW
Reed canarygrass	<i>Phalaris arundinacea</i>	10	FACW
Notes: Pacific willow is present as both a tree and a shrub. Red-osier dogwood and spiraea are not intermixed in most areas, but are present in mono-specific patches.			
Scrub-shrub 1 (SS 1)			
Species	Scientific Name	Percentage	Indicator
Salmonberry	<i>Rubus spectabilis</i>	40	FAC
Red-osier dogwood	<i>Cornus sericea</i>	30	FACW
Piggyback plant	<i>Tolmiea menziesii</i>	40	FAC
Lady fern	<i>Athyrium filix-femina</i>	20	FAC
Jewelweed	<i>Impatiens capensis</i>	10	FACW
Skunk cabbage	<i>Lysichiton americanus</i>	5	OBL
Notes: This assemblage is along the hillside at the southern fringe of the wetland and near the mouth of Tributary 2, and has relatively little disturbance from cattle.			
Forested 1 (FO 1)			
Species	Scientific Name	Percentage	Indicator
Red alder	<i>Alnus rubra</i>	50	FAC
Western red cedar	<i>Thuja plicata</i>	20	FAC
Salmonberry	<i>Rubus spectabilis</i>	40	FAC
Red-osier dogwood	<i>Cornus sericea</i>	10	FACW
Himalayan blackberry	<i>Rubus armeniacus</i>	10	FACU
Piggyback plant	<i>Tolmiea menziesii</i>	30	FAC
Stinging nettle	<i>Urtica dioica</i>	30	FAC
Slough sedge	<i>Carex obnupta</i>	10	OBL
Horsetail	<i>Equisetum arvense</i>	10	FAC
Jewelweed	<i>Impatiens capensis</i>	10	FACW
Notes: This assemblage surrounds Tributary 2.			
Aquatic Bed 1 (AQ 1)			
Species	Scientific Name	Percentage	Indicator
Creeping jenny	<i>Lysimachia nummularia</i>	40	FACW
Smartweed	<i>Polygonum lapathifolium</i>	40	FACW
Reed canarygrass	<i>Phalaris arundinacea</i>	10	FACW
Forget-me-not	<i>Myosotis</i> sp.	10	FACW
Notes: Micro topography is present throughout this area. The lower elevations do not contain Reed canarygrass and the higher elevations have scattered Pacific willow saplings.			
Aquatic Bed 2 (AQ 2)			
Species	Scientific Name	Percentage	Indicator
Reed canarygrass	<i>Phalaris arundinacea</i>	40	FACW
Pond lily	<i>Nuphar polysepala</i>	40	OBL
Smartweed	<i>Polygonum lapathifolium</i>	10	FACW
Creeping jenny	<i>Lysimachia nummularia</i>	10	FACW
Forget-me-not	<i>Myosotis</i> sp.	Trace	FACW

<p>Notes: Micro topography is present throughout this area. The lower elevations generally do not contain Reed canarygrass. In some areas however, pond lily and Reed canarygrass dominate together.</p>

In general, the vegetation communities least impacted by cattle grazing are the fenced FO/SS 2 and forested vegetation communities located in southwestern portion of Wetland A, as well as the fringe of SS1 along the southern perimeter of Wetland A at the base of the hillside. A small area of FO/SS 2 is also located in the southeastern portion of Wetland A. The FO/SS 2 vegetation assemblage is a good overall representation of what similar elevations of the wetland may transition to if grazing was eliminated and wetland restoration occurred.

A.4.7.3 Area B Vegetation

Area B of the Bank site totals 11.38 acres (not including the Coweeman River) and is located on the north side of the River within parcels WI3608001 and WI3605001. Area B generally consists of flat pasture with an emergent wetland (Wetland B which is 0.44 acres) located in a shallow depression in the center. There are several scattered deciduous trees around the property and patches of low shrubs along the river banks providing very limited habitat value. Dominant vegetation in both the uplands and wetland consists of Reed canarygrass and red fescue. Tree species include red alder and Oregon ash and shrub patches with a mix of snowberry, Nootka rose, and spiraea.

A.4.7.4 Area C Vegetation

Area C totals 6.71 acres and is located in the northwestern portion of Bank site on a portion of parcel WI3602008. Area C extends between 100 and 300 feet to the river from the base of a steep, forested hillside and contains Wetlands C and D. This area is slightly lower in elevation than Area B and is dominated almost exclusively by Reed canarygrass. Small percentages of Kentucky bluegrass and Canada thistle are intermixed with the Reed canarygrass in the drier areas, and there is a large patch of Himalayan blackberry at the base of the hillside between Wetlands C and D. Small scattered red alder and patches of low shrubs, including snowberry and Nootka rose are located along the river bank in the southern portion of this area.

Wetland C (1.02 acres) is dominated by Reed canarygrass with a small percentage of Kentucky bluegrass near the wetland margins. The southwestern portion of the wetland sloping from the hillside contains red alder and Western red cedar, which transitions to a thicket of salmonberry and vine maple.

Wetland D (0.36 acres) is partially shaded by the hillside and Tributary 6 disperses in the wetland providing a deeper water regime than Wetland C. The shaded portion of the wetland is dominated by lady fern and skunk cabbage with a small percentage of bedstraw, and much lower percentage of Reed canarygrass. Vegetation within the shaded area transitions to 100 percent Reed canarygrass in the open area. Red alder and Western red cedar are established at the foot of the hillside along the margin of the wetland. Salmonberry is interspersed with the skunk cabbage and lady fern beneath the forested canopy.

A.4.7.5 Forest Hillside Preservation Area

The hillside preservation area totals 208.70 acres and includes 174.01 acres of old growth forest (as defined by the Washington Department of Fish and Wildlife Priority Habitat Definition), 32.37 acres of second growth forest and 2.32 acres of wetland. Tree species meeting old growth criteria include Douglas fir, western red cedar, big leaf maple, Western hemlock, red alder, and black cottonwood. The well-developed shrub understory of the hillside preservation area contains multiple strata and includes salmonberry, wax currant, devil’s club, vine maple, Oregon grape, salal, beaked hazelnut, and snowberry. The herbaceous stratum is dominated by swordfern. The second growth forest includes the same tree and shrub species, although tree species composition is different. Individual tree species, DBH, and onsite location are recorded in the existing conditions report and are summarized in Table 6 below.

Table 6. Forested Hillside Tree Species

Old Growth Area -174.01Acres	
<i>Overall Summary</i>	<i>Species Composition</i>
6 tree species present	73% Douglas fir (<i>Pseudotsuga menziesii</i>)
11 trees/acre >32” dbh	14% Western red cedar (<i>Thuja plicata</i>)
2 snags/acre >20” dbh and >15’ tall	9% Big leaf maple (<i>Acer macrophyllum</i>)
2 downed logs/acre >24” diameter and >50’ long	2% Western hemlock (<i>Tsuga heterophylla</i>)
	1% Red alder (<i>Alnus rubra</i>)
	1% Black cottonwood (<i>Populus balsamifera</i>)
Second Growth Area -32.37Acres	
<i>Species Composition</i>	
36% Douglas-fir (<i>Pseudotsuga menziesii</i>)	
32% Red alder (<i>Alnus rubra</i>)	
28% Big leaf maple (<i>Acer macrophyllum</i>)	
4% Western red cedar (<i>Thuja plicata</i>)	

Figure A-3 shows mapped old growth habitat and second growth forest within the hillside area in combination with existing riparian corridors per DNR forest practice protections for fish bearing and non-fish bearing streams.

A.4.7.6 Riparian Corridors

Riparian corridors along the Tributaries are generally comprised of the coniferous old growth forested habitat with a portion of Tributary 2 being located within the second growth forest. The forested canopy and north facing slopes of the hillside provide ample shade to the tributaries. Devil’s club, salmonberry, vine maple, sword fern, and piggy back plant are the dominant stream side species providing an abundance of overhanging vegetation, leaf litter, and small woody material to the riparian systems. Tributary 2 flows through a stretch of alder and maple dominated canopy allowing more light penetration. Table 7 shows the acreage of riparian corridors associated with each tributary within the hillside and the amount of classified Priority Old Growth Forest habitat and second growth forested habitat within the riparian corridors.

Table 7. Stream and Wetland Riparian Corridor Calculations

Stream Riparian Corridor Calculations				
Tributary	Length (Linear Feet)	Riparian Corridor Width (Feet)	Riparian Corridor Old Growth(Acres)	Riparian Corridor Second Growth (Acres)
1	4,192	150		
2	5,584	150/50 ¹		
3	1,006	50		
4	1,539	50		
5	1,382	50		
6	150	50		
Total	13,853	--	46.74	5.52

¹Riparian corridor is 50 feet wide upstream of the break between fish bearing and non-fish bearing.

A.4.7.7 Invasive Species on the Bank Site

Reed canarygrass dominates the wetter floodplain areas of the Bank site that aren't heavily shaded, particularly in the wetlands of Area A and Area C. Reed canarygrass is also interspersed with aquatic bed species in the deeper parts of Wetland A and is the dominant species along the banks of the Coweeman River. There are several areas of localized Himalayan blackberry infestations within the Bank site as well. A large patch of Himalayan blackberry is located between Wetlands C and D in Area C and patches of blackberry are present in Area A along the upland fringes surrounding the northern portion of Wetland A, particularly along the fence lines and within the forested component in the southwest portion of the wetland. Scattered patches of blackberry are present along the river banks in Area A, as well as along the upland fringes at the southeast edge of Wetland A near the mouth of Tributary 5. Wetland E in the Hillside Preservation area also contains blackberries.

Jewelweed is present in the understory of the forested component of Wetland A, as well as along the eastern side of Wetland A in the EM 3 plant community. Species composition within the EM3 vegetation community appears to be disturbed as evidenced by a high percentage of invasive species, which also includes tansy ragwort (*Tanacetum vulgare*) and Canada thistle. Tansy ragwort and Canada thistle are also present throughout all of the pasture areas of the Bank site. A localized infestation of English ivy (*Hedera helix*) is also present in northwestern corner of the hillside preservation area. Occasional English holly trees (*Ilex aquifolium*) are scattered in the hillside preservation area as well.

A.4.8 Fish and Wildlife Habitat Overview

The Bank site provides a diverse collective of different habitats utilized by fish and wildlife including in-stream (Coweeman River and six tributaries), riparian, floodplain, open pasture, wetland (forested, scrub-shrub, emergent, and aquatic bed), old growth forest, and well-developed second growth forest. The entire Bank site includes 1.5 river miles of the Coweeman River, three complete tributary systems from the headwaters to the mouth, portions of three additional tributary systems, 20 wetlands totaling 37.65 acres, 104.45 acres of floodplain (which includes 35.33 acres of wetland), 174.01 acres of old growth forest, and 32.37 acres of well-developed second growth forest. The southeastern portion of the Bank site also connects to offsite, rural forested areas that encompass thousands of acres. Together these elements provide significant macro and micro habitat opportunities for many birds, amphibians, reptiles, mammals, and fish. The proximity of all these diverse and interconnected habitat types allows for species to utilize them for multiple life stage requirements and/or life cycles.

In the forested hillside area there is an abundance of snags, downed logs, and other large woody material in various states of decay that litter the understory throughout the old growth, second growth and wetland areas. The forest floor has a well-developed duff layer used for overwintering and refuge habitat for small species of wildlife (especially amphibians) and nutrient cycling for overall forest health. There is also an ample amount of large woody material within and spanning the tributaries on the hillside, creating pools, perching areas, and channel complexity. The large and well established canopy also provides shading for Tributaries 1 through 5 which in turn create cold water inputs into Wetland A and the Coweeman River.

Tributaries 1 and 2 within the forested hillside provide cold, year-round, freshwater habitat flowing within old growth and well-developed second growth forest, which is extremely rare in the region and the greater western Washington lowland areas. Tributaries 1 and 2 are fish bearing, and Tributary 5 has the potential to provide seasonal fish habitat. Tributaries 3 and 4 provide seasonal cold water inputs to Wetland A and are not fish bearing. All the tributaries are on north facing slopes and are well shaded by the surrounding forest.

The riparian areas along the Coweeman River on the Bank site are currently in a highly degraded state from cattle grazing and historic agricultural activities and mainly consist of pasture and scattered trees and shrubs providing minimal habitat functions. Wetlands A through D are located within the 100-year floodplain of the Coweeman River. These wetlands receive overbank flooding from the Coweeman during large flood events; however, Wetland A also receives floodwaters more frequently from smaller events that back flood into the wetland from its direct connection to the Coweeman River. Salmonids and other fish may utilize this channel and inundated portions of Wetland A as refuge during flood events but may become trapped as a result of an undersized culvert that prevents ingress and egress at the outlet of Wetland A. Fish that may enter Wetlands B through D during flood events will likely become stranded as there is no direct outlet back to the Coweeman River. Wetlands C and D are heavily shaded by the adjacent hillside, however, Wetland B is an open pasture and receives no shade.

The combination of habitat types found within Wetland A, the adjacent old growth forest, and the cold water perennial streams provide ideal habitat for native amphibians. Wetland A is used

for amphibian breeding and egg laying, as was evidenced by the presence of many egg masses found during existing conditions data collection on site. Because of the well-established forested upland areas adjacent to existing aquatic areas, amphibians requiring terrestrial habitat can overwinter and seek shade and cover within the thick duff layer of the hillside forest.

A.4.8.1 Fish Habitat

Although degraded in many areas, fish habitat exists within the Bank site and there is the potential to provide additional habitat and function and multiple life stage improvements for anadromous and resident fish in the Bank site design. Within the Bank site area along the Coweeman River, degraded riparian habitat features include: 1) areas of localized bank erosion where cattle access the river and walk along the banks during low flows, 2) loss of channel sinuosity, complexity and connection to other floodplain habitats due to incised banks and lack of roughened structure (wood), 3) a lack of habitat complexity as most riparian vegetation has been cleared for farming 4) a lack of shade due to clearing the riparian corridor and poor water quality in existing wetlands due to cattle grazing. Throughout the Bank site area, the Coweeman River is severely incised with steep, near-vertical banks. The incised river and over steepened banks provide little vegetation for shade, bank stability or escapement during high flows.

The Coweeman River system supports a number of anadromous and resident fish species including resident cutthroat trout, sea run coastal cutthroat trout, Lower Columbia River (LCR) Chinook, LCR steelhead, LCR coho, Columbia River chum, and Pacific eulachon. The Coweeman River also provides suitable habitat for Pacific lamprey and river lamprey, which are federally listed as Species of Concern. The WDFW Salmonscape website identifies the lower 0.3 and 0.34 miles of Tributaries 1 and 2 respectively, as accessible to coho and steelhead. Based on observations by WDFW, resident fish are likely present farther upstream on Tributary 1, and only the lower 0.09 miles of Tributary 2 should be considered fish bearing. Tributary 5 is not considered fish bearing but is accessible to fish during high flows and high water levels in Wetland A. Tributary 2 and 5 are both accessible to fish from Wetland A during higher water levels but lose their surface water connection with Wetland A (and the Coweeman River) during low flows due to the buildup of sediment in the tributaries as they enter the floodplain, blocking and limiting access for fish to cold water late in the summer.

Within the Coweeman system, populations for Coweeman River fall Chinook have declined from an estimated historic adult population of 4,000 – 7,000 down to 100 – 2,100 adult fish, representing a 70 – 97.5 percent decline. The winter steelhead population in the Coweeman River is believed to have declined from an estimated historic adult population of 3,000 – 7,000 to 100 – 1,100 adult fish, representing an 84 – 97 percent decline. The chum that utilize the Coweeman River are part of the Cowlitz River population, which had a historic population of 300,000 – 500,000 but now have a return of approximately 150 fish. While cutthroat trout are not one of the focal fish species addressed in Watershed Recovery Plans, the abundance of cutthroat trout is also considered depressed in the watershed. Table 8 shows the federal and state listed fish species that may be present on the Bank site or within the Coweeman River:

Table 8. Federal and State Listed Species That May be Present on the Bank Site

Species, ESU, or DPS	State Status	Federal Status	Presence onsite
<i>Fish</i>			
Chinook Salmon (<i>Onchorhynchus tshawytscha</i>)			
Lower Columbia River Chinook ESU	Candidate	Threatened	Documented
Chum Salmon (<i>Onchorhynchus keta</i>)			
Columbia River Chum Salmon ESU	Candidate	Threatened	Documented
Coho Salmon (<i>Onchorhynchus kisutch</i>)			
Lower Columbia River Coho Salmon ESU	Not Listed	Threatened	Documented
Steelhead (<i>Onchorhynchus mykiss</i>)			
Lower Columbia River Steelhead DPS	PHS Listed	Threatened	Documented
Cutthroat (<i>Onchorhynchus clarki</i>)	PHS Listed	Not Listed	Documented
Columbia River Smelt (<i>Eulachon</i>) Southern DPS (<i>Thaleichthys pacificus</i>)	Candidate	Threatened	Suitable Habitat Present
Pacific Lamprey (<i>Lampetra tridentate</i>)	Monitored	Species of Concern	Suitable Habitat Present
River Lamprey (<i>Lampetra ayresii</i>)	Candidate	Species of Concern	Suitable Habitat Present

A.4.8.2 Birds, Amphibians, and Mammals

A wide variety of migratory waterfowl, song birds, raptors, small and large mammals and amphibians have been observed (or heard) utilizing the wetlands, forests, streams, river, and pasture areas of the Bank site. Because of the diversity of habitat types and corridor connectivity for wildlife, the Bank site is utilized by many species that are dependent on the aquatic environment. Beavers are present in Tributary 1 and have created dams that have formed wetlands within the hillside area. Evidence of beaver browse (although not recent) is also present along the Coweeman River and nutria have been observed on site in past reconnaissance. River otters, and muskrats are also likely present near the Coweeman River. Wetland A is utilized by migratory waterfowl, including wood ducks and a variety of native amphibian species because of the wetland's close proximity to forest habitat which is critical for both species. Within the forested hillside area, larger mammals such as deer, elk, and bear are present and come into the floodplain areas to find food.

The Priority Habitat and Species Report from WDFW for the project site (WDFW 2014) shows two bald eagle nests are mapped along the eastern Bank site boundary within the forested hillside area. A spotted owl management circle also appears to graze the edge of the eastern Bank boundary. The western most extent of the circle encompasses the eagle nests. The report also indicates the presence of wetlands and regular concentrations of Roosevelt elk. Table 9 below lists state and federally listed species and species of interest on the WDFW Priority Habitat and Species (PHS) list that may, or do occur on site:

Table 9. Federal and State Listed Species That May be Present on the Bank Site

Species, ESU, or DPS	State Status	Federal Status	Presence onsite
Birds			
Band-tailed Pigeon (<i>Clumba fasciata</i>)	PHS Listed	Not Listed	Suitable Habitat Present
Bald eagle (<i>Haliaeetus leucocephalus</i>)	Sensitive	Species of Concern	Observed
Fox Sparrow (<i>Passerella liaca</i>)	Not Listed	BCC ¹	Suitable Habitat Present
Marbled Murrelet (<i>Brachyramphus marmoratus</i>)	Threatened	Threatened	Suitable Habitat Present
Northern Goshawk (<i>Accipiter gentilis</i>)	Candidate	Not Listed	Suitable Habitat Present
Northern Spotted Owl (<i>Strix occidentalis caurina</i>)	Endangered	Threatened	Suitable Habitat Present
Olive-sided Flycatcher (<i>Contopus cooperi</i>)	Not Listed	BCC ¹	Suitable Habitat Present
Peregrine Falcon (<i>Falco peregrinus</i>)	Sensitive	Not Listed	Suitable Habitat Present
Pileated Woodpecker (<i>Dryocopus pileatus</i>)	Candidate	Not Listed	Heard
Purple Finch (<i>Carpodacus purpureus</i>)	Not Listed	BCC ¹	Suitable Habitat Present
Purple Martin (<i>Progne subis</i>)	Candidate	Not Listed	Suitable Habitat Present
Red-tail Hawk (<i>Buteo jamaicensis</i>)	PHS Listed	Not Listed	Observed (multiple)
Rufus Hummingbird (<i>Selasphorus rufus</i>)	Not Listed	BCC ¹	Suitable Habitat Present
Sandhill Crane (<i>Grus canadensis</i>)	Endangered	Not Listed	Suitable Habitat Present
Vaux's Swift (<i>Chaetura vauxi</i>)	Candidate	Not Listed	Suitable Habitat Present
Amphibians			
Cascade torrent salamander (<i>Rhyacotriton cascadae</i>)	Candidate	Not Listed	Suitable Habitat Present
Columbia torrent salamander (<i>Rhyacotriton kezeri</i>)	Monitored	Not Listed	Observed
Dunn's salamander (<i>Plethodo dumni</i>)	Candidate	Not Listed	Potential Habitat
Oregon spotted frog (<i>Rana pretiosa</i>)	Endangered	Threatened	Potential Habitat
Red-Legged Frog (<i>Rana aurora</i>)	Not Listed	Not Listed	Observed
Rough-skinned Newt (<i>Taricha granulosa</i>)	Not Listed	Not Listed	Observed
Western Toad (<i>Anaxyrus boreas</i>)	Candidate	Not Listed	Suitable Habitat Present
Mammals			
Columbian black-tailed Deer	PHS Listed	Not Listed	Suitable Habitat

Species, ESU, or DPS	State Status	Federal Status	Presence onsite
<i>(Odocoileus hemionus columbianus)</i>			Present
Elk (<i>Cervus elaphus</i>)	PHS Listed	Not Listed	Suitable Habitat Present
Reptiles			
Western Pond Turtle (<i>Clemmys marmorata</i>)	Endangered	Under Review	Suitable Habitat Present

¹Bird of Conservation Concern

A.5 Post-Construction Conditions and Anticipated Functional Lift of Wetlands and other Aquatic Areas in the Floodplain

To understand the baseline conditions of the wetlands and aquatic areas on site, different function assessment methods and rating systems were utilized. This included running Washington Department of Ecology’s Wetland Rating System, the “Credit-Debit Method” and the Wetland Functional Assessment Method (WFAM). The results of each of these assessments can be found in the project Resource Folder. While these assessment methods helped to establish existing baseline conditions for aquatic areas and understand the functions currently being provided by the aquatic areas, they were incapable of measuring the totality of functional lift, post-construction, within a large and diverse area such as Wetland A. While Wetland A is considered a Category I wetland under Ecology’s wetland rating system, the Credit-Debit tool and WFAM, there are multiple restoration actions proposed in Wetland A that cannot be measured under the available function assessment tools. In Ecology’s guidance document “*Calculating Credits and Debits for Compensatory Mitigation in Wetlands of Western Washington*” there is confirmation of the limit of function assessments:

“None of the rapid assessment methods developed by Ecology (the rating systems and function assessment methods) are rigorous enough to adequately assess the functions of only a small area within a wetland unit” (Hruby, 2012).

For this reason it is assumed that rehabilitation, enhancement and preservation actions (such as removing cattle grazing, restoring floodplain connections, improving water quality, restoring native vegetation, removing invasive species, reconnecting hydrologic processes and providing fish access) will have a greater influence within Wetland A than what is actually captured in post construction functional assessment calculations.

Additionally, protecting the forested hillside within the Bank site is an integral part of maintaining and creating highly functioning aquatic habitat in the floodplain, especially in Wetland A. The floodplain aquatic areas are dependent on the forested hillside area to provide a significant benefit to the restored, created, and enhanced wetlands and streams that fish and wildlife will utilize. Lowland old growth forest is rare in this region and if logged in the future, cannot be replaced in this lifetime. The 208.7 acres of forested area within the Bank site provides a large, un-fragmented habitat corridor connecting the Coweeman River to the top of the hillside and also connecting to other offsite forested corridors. The proximity of all the diverse and interconnected habitat types within the old growth and well-developed second growth forested area including in-stream (Tributaries 1 through 6), riparian, and forested, scrub-shrub, and

emergent wetland (Wetlands E through U totaling 2.32 acres) to the adjoining wetlands in the floodplain and Coweeman River provides the unique opportunity for fish and wildlife species to utilize the Bank site for multiple life stages or life cycles. Furthermore, addressing the recovery actions listed in the Lower Columbia Salmon Recovery and Fish and Wildlife Sub-basin Plan can only be accomplished in conjunction with preserving the forested hillside, protecting existing stream corridor structure and function, protecting hillslope processes, and restoring degraded water quality with emphasis on temperature impairments, which are several of the actions outlined in the plan.

A.5.1 Wetland A

Through the proposed wetland creation and enhancement activities documented in Appendix B, it is expected that Wetland A will remain a Category I wetland with an increased total score of 75 points under the Wetland Rating System. This represents a 5 point lift, which is due to the following activities:

- **Water Quality Functions:** Removal of the cattle grazing in the wetland and improved connection of the wetland with the Coweeman River to trap and filter sediment and pollutants. Additional native plantings within the wetland creation, rehabilitation and enhancement areas would improve water quality and percent vegetation cover helping to trap and reduce nutrient loads.
- **Hydrologic Functions:** Improved floodplain connectivity will help regulate peak flows and provide flood attenuation in order to reduce erosive flood flows downstream and within the diked portions of Coweeman River in the City of Kelso.
- **Habitat Functions:** Eliminating disturbances (e.g., grazing) within the wetland unit while improving habitat diversity, structure, and interspersions creates an increase in potential and opportunity for improved wildlife habitat. Improving the connection of the wetland to the main stem of the Coweeman River and tributaries will provide a significant increase in fish habitat.

A.5.2 Wetland B

We expect the new Wetland B creation design to replace the existing Category III wetland with a Category II wetland with an increased total score of 64 points under the wetland rating system. This represents a 34 point lift due to the following activities:

- **Water Quality Functions:** Removal of the cattle grazing in the wetland and native woody plantings throughout the wetland creation area will improve water quality and the ability of the wetland unit to trap and retain sediment and pollutants.
- **Hydrologic Functions:** New overbank storage and woody vegetation within the wetland unit increases the hydrologic functions provided by the wetland unit.
- **Habitat Functions:** Eliminating disturbances (e.g., grazing) within the wetland unit and buffer while improving the habitat diversity, structure, and interspersions creates increase

potential and opportunity for improved wildlife habitat. Conversion of this depressional wetland which traps fish to a riverine wetland that drains into the Coweeman River will greatly improve the fish access and increase the habitat function of this wetland.

A.5.3 Wetland C

Through the proposed wetland creation and enhancement measures described below, we expect Wetland C to increase from a Category III wetland to a Category II wetland with a total score of 59 points under the wetland rating system. This represents a 14 point lift for the following reasons:

- **Water Quality Functions:** Removing cattle grazing will have a major impact to water quality. While the newly created wetland would be considered a riparian wetland, the rated wetland unit includes the existing slope and depression HGM classes. When rated as a depressional wetland, the proposed water quality functions would increase because of an increased percentage of persistent, ungrazed vegetation and percentage of seasonal ponding.
- **Hydrologic Functions:** When rating the multiple HGM class wetland unit as a depression, the unconstructed outlet associated with the wetland creation results in a minor decrease in hydrologic functions despite increasing the depth of storage during wetland periods.
- **Habitat Functions:** Eliminating disturbances (e.g., grazing) within the wetland unit and buffer while improving the habitat diversity, structure, and interspersions significantly increases the potential and opportunity for improved wildlife habitat.

A.5.4 Wetland D

Additionally, the proposed wetland enhancement measures for Wetland D are expected to increase the rating for this wetland, following construction, from a Category III wetland to a Category II wetland with a total score of 60 points under the wetland rating system. This represents an 18 point lift for the following reasons:

- **Water Quality Functions:** Removal of the cattle grazing will improve the water quality. The installation of native woody and emergent plants species throughout the unit will increase the percentage of persistent, ungrazed vegetation.
- **Hydrologic Functions:** No changes to hydrologic functions are expected from the proposed wetland enhancement measures.
- **Habitat Functions:** Eliminating disturbances (e.g., grazing) within the wetland unit and buffer while improving the habitat diversity, structure and interspersions significantly increases the potential and opportunity for improved wildlife habitat.

A.6 Ecological Values of the Forested Hillside Area: Compliance with the Federal Rule on Using Preservation as Compensatory Mitigation (33 CFR 332.3(h))

According to the 2008 Federal Rule on Compensatory Mitigation of Aquatic Resources (Corps 2008) and Title 33 of the *Code of Federal Regulations*, Section 332.3 (33 CFR 332.3(h)) preservation actions can be used as compensatory mitigation when certain criteria are met. These criteria, according to the *Code of Federal Regulations* are listed below in italics with the rationale of how the Bank site preservation areas meet the requirements of the criterion in regular font.

1. *Resources to be preserved provide important physical, chemical, or biological functions for the watershed and,*
2. *Resources to be preserved contribute significantly to the ecological sustainability of the Watershed.*

The hillside preservation area provides a diverse collective of different habitats types utilized by fish and wildlife including in-stream (Tributaries 1 through 6, three of which are complete systems from the headwaters to the mouth), riparian, and forested, scrub-shrub, and emergent wetland (Wetlands E through U totaling 2.32 acres) which are encompassed within old growth forest and well-developed second growth forest. The southeastern portion of the Bank site connects to offsite, rural forested areas that encompass thousands of undeveloped acres and the northern portion abuts Wetland A, a Category 1 wetland that outlets to the Coweeman River. Together these elements provide significant, diverse and interconnected macro and micro habitat opportunities for many birds, amphibians, reptiles, mammals, and fish, and the proximity of all these habitat types allows species to utilize them for multiple life stages and/or life cycles. The close association of a large floodplain wetland and the old growth forest provides an important ecological linkage. For instance, many species feed and/or breed in wetlands, then reside in adjacent upland habitats (or vice versa) such as red-legged frogs that require wetlands and open water for reproduction and early life cycle stages then reside in the forest. Wetland A is used for amphibian breeding and egg laying, as was evidenced by the presence of many egg masses found during existing conditions data collection on site. Additionally, Columbia torrent salamanders were identified within Tributary 2. This species typically lives and breeds in cold water streams or wetlands within mature forests, but during rainy and wet periods may be found in the upland areas of the forest. Amphibians are integral to food chain support as they are often top predators in aquatic systems but can also be important prey in terrestrial systems.

In the forest hillside area there is an abundance of snags, downed logs, and other large woody material in various states of decay that litter the understory throughout the old growth, second growth, and wetland areas. The forest floor has a well-developed duff layer used for overwintering and refuge habitat for small species of wildlife (especially amphibians) and nutrient cycling for overall forest health. There is also an ample amount of large woody material within and spanning the tributaries on the hillside, creating pools, perching areas, and channel complexity. LWM contributes to the food web through decomposition and by providing habitat for insects, thus increasing the food web for birds, amphibians, reptiles, and mammals. LWM also provides cover and shelter for amphibians, reptiles, and small mammals, hunting perches for great blue heron, and nesting for waterfowl, muskrats, and beaver, in addition to providing a food substrate for fungi and invertebrates, which are in

turn, consumed by vertebrates. The large trees also provide shading for Tributaries 1 through 6 which then contribute cold water inputs into Wetlands A and D and the Coweeman River. The forested vegetation also significantly benefits the production, storage, and export of organic matter within the adjacent wetlands. In its current state, Wetland A would not be rated as a Category 1 wetland without the size and quality of forested upland habitat the hillside preservation area provides the wetland. If logged, or partially logged, the effects to this ecosystem would be highly detrimental. Even if riparian corridors and wetland buffers were avoided, there would be significant loss of irreplaceable habitat and the remaining corridors/buffers would be more susceptible to wind throw, impacts from heavy rain events, erosion and overall lower aquatic function. Stream temperatures would likely warm which in turn would affect Wetland A and the aquatic dependent species that may use the wetlands and streams in the floodplain. A large habitat corridor would become fragmented and invasive vegetation would have a greater opportunity to establish and the stability of the steep hillside would become compromised.

The Bank project will preserve 174.01 acres of old growth forest and 32.37 acres of well-developed second growth forest that will eventually meet old growth criteria. Lowland old growth forest is rare in this region and if logged, cannot be replaced in this lifetime. The 208.7 acres of forested area within the Bank site provides a large, unfragmented habitat corridor connecting the Coweeman River to the top of the hillside and also connect to adjacent forested habitat areas. Preserving the forested hillside in the Bank project will fully protect three small sub-basins within the larger Coweeman and Cowlitz Watershed which in turn helps maintain the physical, biological, and chemical processes associated with the overall health of the ecosystem, as well as the surrounding ecosystem as a whole.

3. Preservation is determined to be appropriate and practicable.

As described above, preserving the forested hillside is essential to the goals of the Bank site and to the watershed as a whole. The 2010 Lower Columbia Salmon Recovery and Fish and Wildlife Subbasin Plan: Vol. 2 Chapter H Coweeman Subbasin Plan (LCFRB 2010) prioritizes actions for fish recovery in the Coweeman Subbasin. The top ten restoration and preservation activities represent a complete picture of actions that are necessary for recovery of the subbasin. These activities include: #1) Protect existing stream corridor structure and function #2) Protect hillslope processes in the system; #3) Restore degraded hillslope processes on forest, agricultural, and developed lands; #4) Restore floodplain function and channel migration processes in the mainstem and major tributaries; #5) Restore riparian conditions throughout the basin; #6) Restore access to habitat blocked by artificial barriers; #7) Restore channel structure and stability; #8) Restore degraded water quality with emphasis on temperature impairments; #9) Provide for adequate instream flows during critical periods; #10) Create/restore off-channel and side channel habitat. Of the ten action categories in the subbasin plan, the Bank project has the ability to address every one of the action items because of the location, size and diversity of habitat within the project area. Addressing all 10 recovery actions can only be accomplished in conjunction with preserving the forested hillside. Additionally, by preserving the forested hillside, the Bank site will also be preserving existing and future spotted owl and marbled murrelet nesting habitat by allowing the forest to continue maturing to meet these species' nesting requirements.

4. Resources are under threat of destruction or adverse modifications.

Clear cut timber harvesting or selective helicopter logging for high end and specialty timber resources is a demonstrable threat within portions of the old growth/mature forested habitat in the hillside preservation area. There is high commercial value of performing logging, even selective logging within the old growth footprint and is a risk because doing so would present a particularly financially attractive means of income. Old growth and mature forested habitat within the Bank area are equally at-risk for impacts and cumulative losses in the same way as cumulative losses to wetlands. The hillside preservation area is considered Timber Land of Long Term Commercial Significance and requires a Special Use Permit through Cowlitz County to prevent logging (which the Bank project is seeking).

Under the Department of Natural Resources Forest Practices laws, there are buffers associated with streams and logging on steep/unstable slopes; however, these rules and regulations allow logging access roads and stream crossings regardless of the presence of wetland and stream buffers. Steep but stable slopes can also be helicopter logged if the resources are of economic significance, which is the case with large, mature trees.

5. The preserved site will be permanently protected through an appropriate real estate or other legal instrument.

A conservation easement, which will permanently protect the Bank site, will be approved, initiated, and recorded pursuant to Article III.D of this Instrument, and Section G.1 of Appendix G.

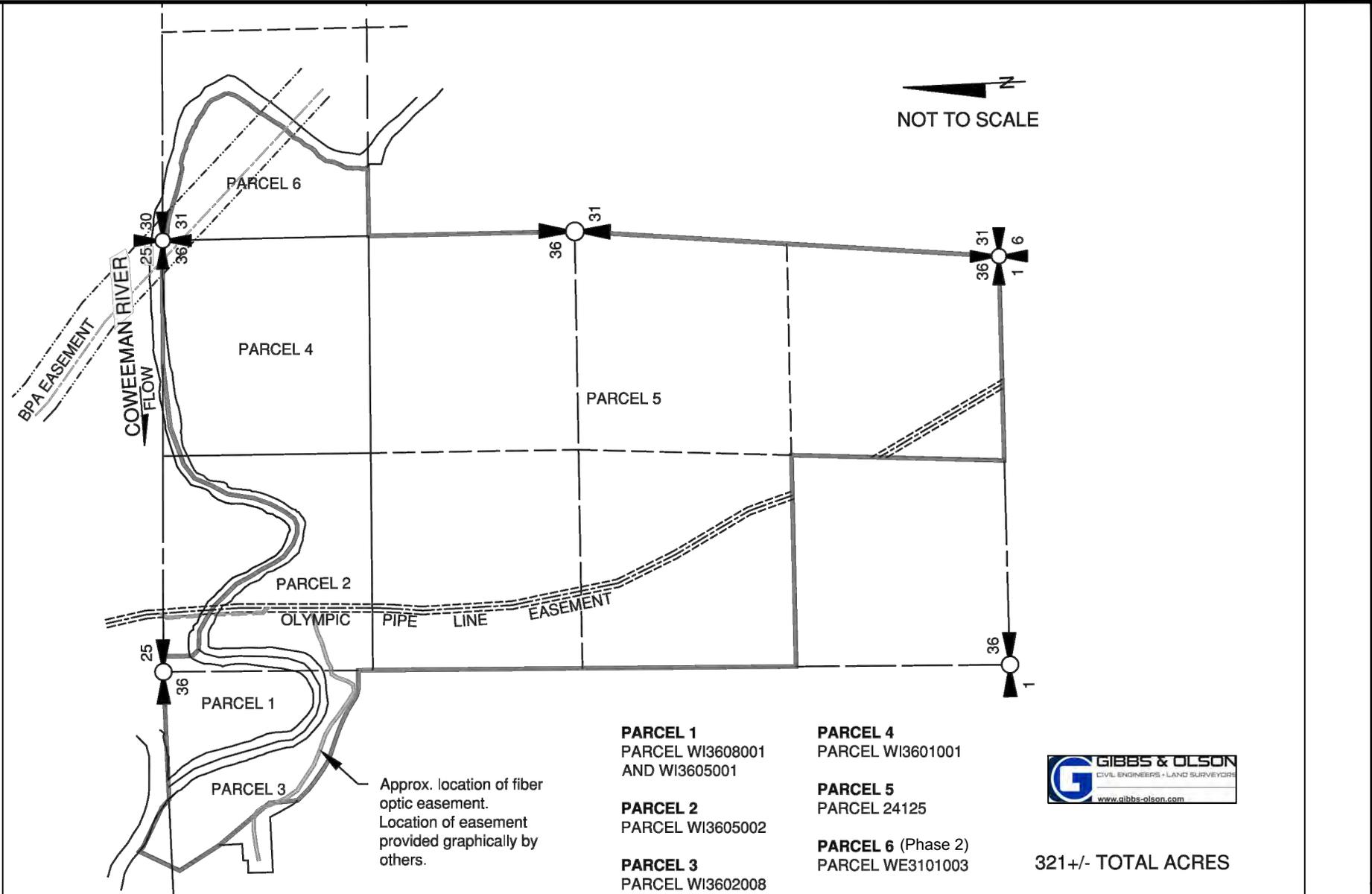
A.7 Summary

In summary, restoration actions which are detailed in Appendix B have the potential to greatly improve the existing conditions of wetland and fish habitat within the Bank site. Preservation of the forested hillside area will further add value to this area and to the aquatic resource improvements planned in the floodplain. Restoration actions will rehabilitate, enhance and preserve the existing wetlands within the project area while adding approximately 21 acres of new wetlands in Phase 1 and up to 10 acres in Phase 2 if developed. Habitat improvements within the main stem of the Coweeman River such as creating riparian wetland bench habitat, off-channel alcoves and embayments and installing LWM and plantings in the riparian areas will greatly improve fish habitat within this reach, addressing limiting factors for anadromous fish in the watershed. Restoration work to reconnect Tributaries 2 and 5 will improve in-stream habitat and create additional access for anadromous and resident fish to aquatic areas. Given the diversity of habitat types and the Bank site's position within the watershed, the project will provide a significant ecological benefit over current baseline conditions, not only to the immediate surrounding area, but contributing to a large portion of the basin. The Bank project post-construction will consist of a mosaic of forested, scrub-shrub, emergent and aquatic bed wetlands, as well as protected old growth forest, fish bearing streams, and a significantly improved section of the Coweeman River. Benefits to multiple fish and wildlife species will occur based upon improvements to the existing aquatic areas, creation of new aquatic habitat and the improved connection of those habitats to each other.

References

- Archeological Investigations Northwest, Inc. (AINW). 2013. *Archeological survey for the Coweeman River Mitigation Bank Project, Cowlitz County, Washington, Draft: Report prepared by Archeological Investigations Northwest, Inc., Portland, Oreg., no. 3200, for Habitat Bank, LLC, Kirkland, Wash., December 23.*
- Brinson, M.M., 1993. *A Hydrogeomorphic Classification for Wetlands*, prepared for U.S. Army Corps of Engineers, Waterways Experiment Station, Technical Report WRP-DE-4, 101 p.
- Cowardin, L.M., Carter, V., Golet, F.C., and LaRoe, E.T. 1979. *Classification of Wetlands and Deepwater Habitats of the United States: Washington, D.C., U.S. Dept. of the Interior, Fish and Wildlife Service, Report FWS/OBS-79/31, 131 p.*
- Department of Natural Resources. 2002. *Forest Practices Board Manual, Section 13 Guidelines for determining fish use for the purpose of typing waters under WAC 222-16-031.* February. Available: http://www.dnr.wa.gov/Publications/fp_board_manual_section13.pdf
- Ecological Land Services, Inc. (ELS). 2014a. *Baseline Conditions Report for the Coweeman Mitigation Bank, Kelso, Washington: Report prepared by ELS, Longview, Washington for Habitat Bank, LLC, Kirkland, Washington. September.*
- Ecological Land Services, Inc. (ELS), 2014b, *Addendum to the Existing Conditions Report for the Coweeman Mitigation Bank.* Memorandum prepared by ELS, Longview, Washington for Habitat Bank, LLC, Kirkland, Washington. November.
- Federal Register. 2005. *Endangered and Threatened Species; Designation of Critical Habitat for 12 Evolutionarily Significant Units of West Coast Salmon and Steelhead in Washington, Oregon, and Idaho; Final Rule.* Volume 70. Number 170. 50 CFR Part 226. September 2.
- Federal Register. 2008. *Compensatory Mitigation for Losses of Aquatic Resources.* Volume 73. Number 70. 33 CFR Part 332. April 10.
- Habitat Bank, LLC, 2013, *Coweeman River Wetland and Conservation Bank Prospectus, Cowlitz County, Washington: Kirkland, Wash., Habitat Bank, LLC, July.*

- Hruby, Thomas, 2004, *Washington State Wetland rating System for Western Washington-Revised*: Olympia, Wash., Washington State Department of Ecology, Publication no. 04-06-25, 126 p., available: <http://www.ecy.wa.gov/biblio/0406025.html>.
- Lower Columbia Fish Recovery Board (LCFRB), 2010, *Washington Lower Columbia salmon recovery and fish and wildlife subbasin plan, chapter H – Coweeman Subbasin: Longview, Washington*. Lower Columbia Fish Recovery Board, May, Accessed online at: http://media.wix.com/ugd/810197_9fd7123ad9094af9a3b37ebdc656f789.pdf
- Shannon & Wilson, Inc. (S&W), 2014, *Geologic Assessment of Coweeman Mitigation Bank, Kelso, Washington: for Habitat Bank, LLC*.
- Shannon & Wilson, Inc. (S&W), 2014, *Revised Coweeman River Mitigation Bank Basis of Design Report, Cowlitz County Washington*. November 31.
- USDA/NRCS Soil Conservation Service, online database: accessed December 2013. <http://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx>
- USDA Natural Resources Conservation Service (NRCS). 2013. *Hydric Soils for Washington*. Online document. <http://soils.usda.gov/use/hydric/lists/state.html>
- Washington State Department of Ecology (Ecology). 2012. *Calculating Credits and Debits for Compensatory Mitigation in Wetlands of Western Washington*.
- Washington State Department of Ecology (Ecology). 2013. *Water Quality Assessment for Washington 303(d)/305(b) Integrated Report Viewer*. <http://www.ecy.wa.gov/programs/wq/303d/currentassessmt.html>. Website accessed June 2013.
- Washington Department of Fish and Wildlife (WDFW). 2014. *Priority Habitats and Species Mapping*. Accessed October 2014. http://wdfw.wa.gov/publications/00165/2012_distribution_by_county.xls.
- Washington Department of Fish and Wildlife (WDFW). 2013 *SalmonScape*. <http://www.wdfw.wa.gov/mapping/salmonscape.index.html>. Website accessed June 2013
- Weyerhaeuser, 1995, *Upper Coweeman watershed analysis, part 1 – section A, synthesis of watershed analysis*: Weyerhaeuser, February



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PRJ. MGR: ST
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PROJECT NO:
1209.14

Figure A-2
SITE SURVEY - INDEX
Coweeman Mitigation Bank
Habitat Bank LLC
City of Kelso, Cowlitz County, Washington
Section 31, Township 8N, Range 1W, W.M.

LINE TABLE

LINE	BEARING	LENGTH
L1	S43°32'13"E	57.66'
L2	S56°18'21"W	44.15'
L3	S14°02'48"W	92.95'
L4	S02°09'47"W	119.57'
L5	S02°31'42"W	153.44'
L6	S09°36'02"W	162.33'
L7	S21°14'30"W	150.74'
L8	S50°16'30"W	59.24'
L9	S66°21'03"W	64.58'
L10	S79°37'48"W	56.98'
L11	N80°10'19"W	50.24'
L12	N86°12'49"W	61.44'
L13	N60°32'38"W	63.46'
L14	N46°38'24"W	104.67'
L15	N37°57'44"W	48.86'
L16	N23°52'26"W	45.26'
L17	N04°11'40"W	118.51'
L18	N15°54'16"W	55.23'
L19	N20°06'41"W	44.48'
L20	N18°32'48"W	60.56'
L21	N14°06'34"W	74.52'
L22	N13°02'47"W	57.93'
L23	N12°47'29"W	83.12'
L24	N16°00'53"W	60.19'
L25	N18°24'03"W	18.14'
L26	N24°57'21"W	72.21'
L27	N18°36'23"W	7.30'
L28	N33°06'17"W	106.12'
L29	N35°05'41"W	102.68'

S89°44'03"E
743.78'

S87°14'21"E
100'

NE1/4, NW1/4

PARCEL W13608001
AND W13605001
WETLAND MITIGATION BANK
PARCEL 1
13.40± ACRES

N
SCALE: 1" = 200'



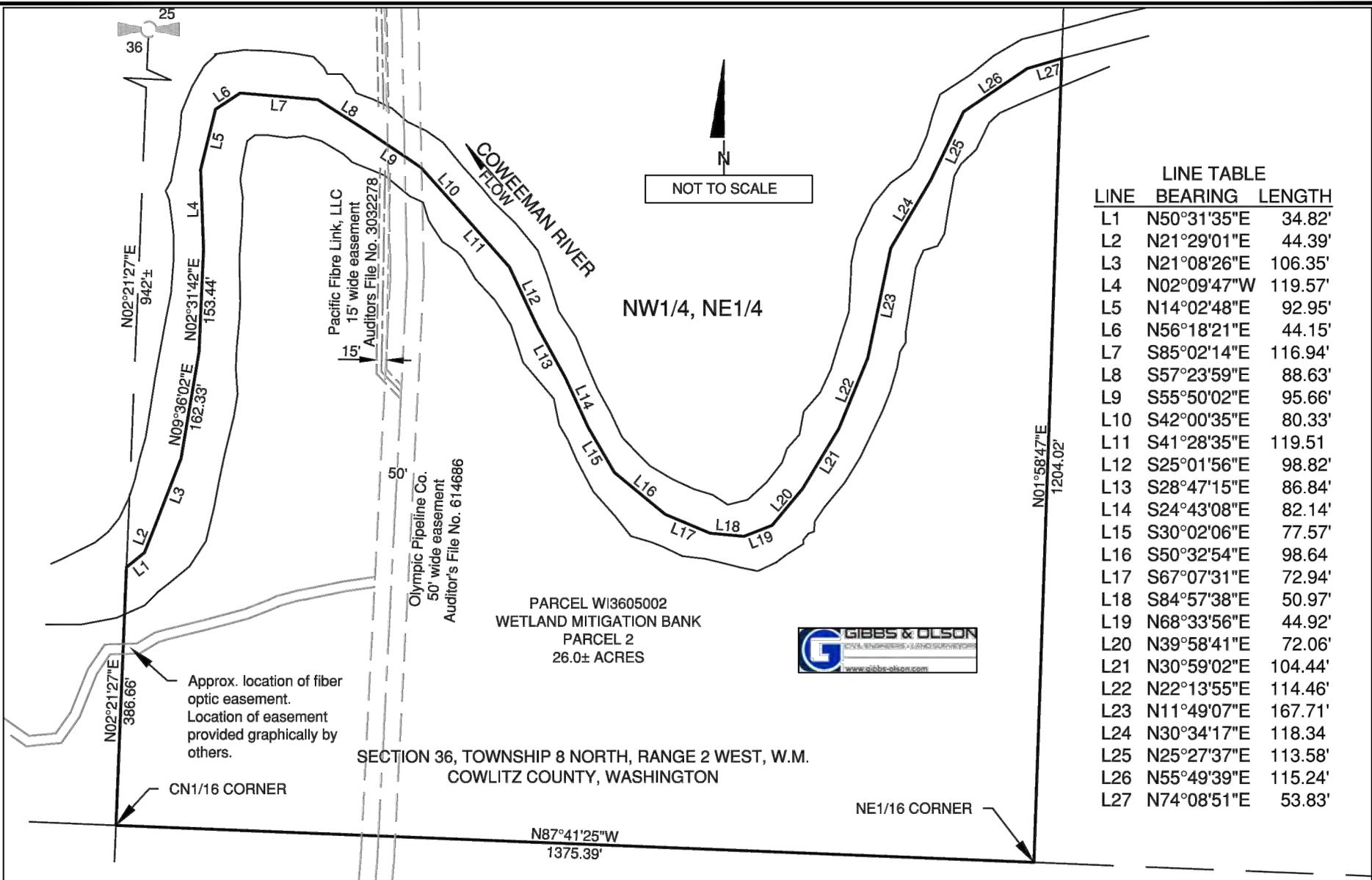
SECTION 36, TOWNSHIP 8 NORTH, RANGE 2 WEST, W.M.
COWLITZ COUNTY, WASHINGTON

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Figure A-2a
 SITE SURVEY - PARCEL 1
 Coweeman Mitigation Bank
 Habitat Bank LLC
 City of Kelso, Cowlitz County, Washington
 Section 31, Township 8N, Range 1W, W.M.



LINE TABLE

LINE	BEARING	LENGTH
L1	N50°31'35"E	34.82'
L2	N21°29'01"E	44.39'
L3	N21°08'26"E	106.35'
L4	N02°09'47"W	119.57'
L5	N14°02'48"E	92.95'
L6	N56°18'21"E	44.15'
L7	S85°02'14"E	116.94'
L8	S57°23'59"E	88.63'
L9	S55°50'02"E	95.66'
L10	S42°00'35"E	80.33'
L11	S41°28'35"E	119.51'
L12	S25°01'56"E	98.82'
L13	S28°47'15"E	86.84'
L14	S24°43'08"E	82.14'
L15	S30°02'06"E	77.57'
L16	S50°32'54"E	98.64'
L17	S67°07'31"E	72.94'
L18	S84°57'38"E	50.97'
L19	N68°33'56"E	44.92'
L20	N39°58'41"E	72.06'
L21	N30°59'02"E	104.44'
L22	N22°13'55"E	114.46'
L23	N11°49'07"E	167.71'
L24	N30°34'17"E	118.34'
L25	N25°27'37"E	113.58'
L26	N55°49'39"E	115.24'
L27	N74°08'51"E	53.83'

PARCEL W\3605002
WETLAND MITIGATION BANK
PARCEL 2
26.0± ACRES



SECTION 36, TOWNSHIP 8 NORTH, RANGE 2 WEST, W.M.
COWLITZ COUNTY, WASHINGTON

Approx. location of fiber optic easement.
Location of easement provided graphically by others.

CN1/16 CORNER

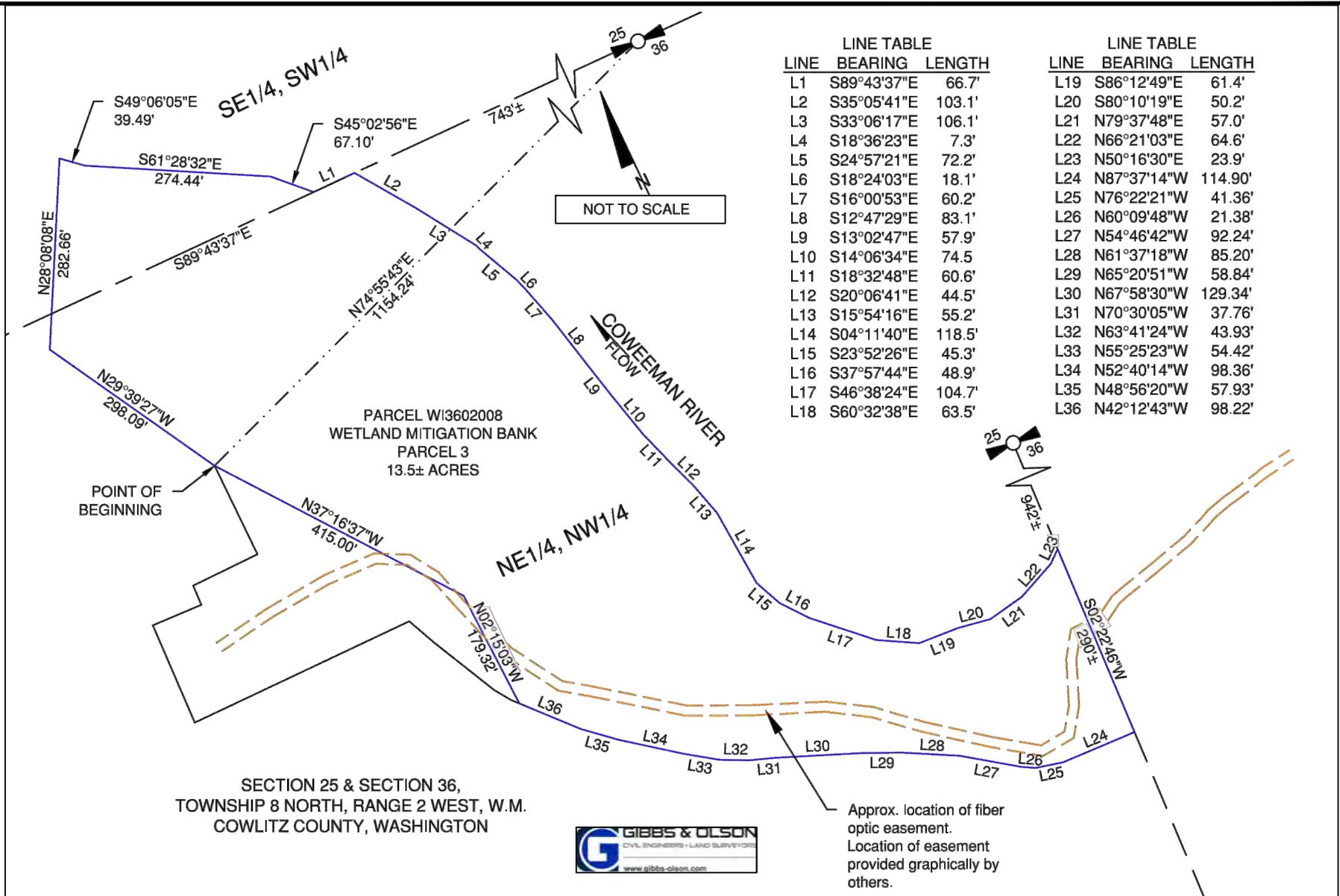
NE1/16 CORNER

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Figure A-2b
SITE SURVEY - PARCEL 2
Coweeman Mitigation Bank
Habitat Bank LLC
City of Kelso, Cowlitz County, Washington
Section 31, Township 8N, Range 1W, W.M.

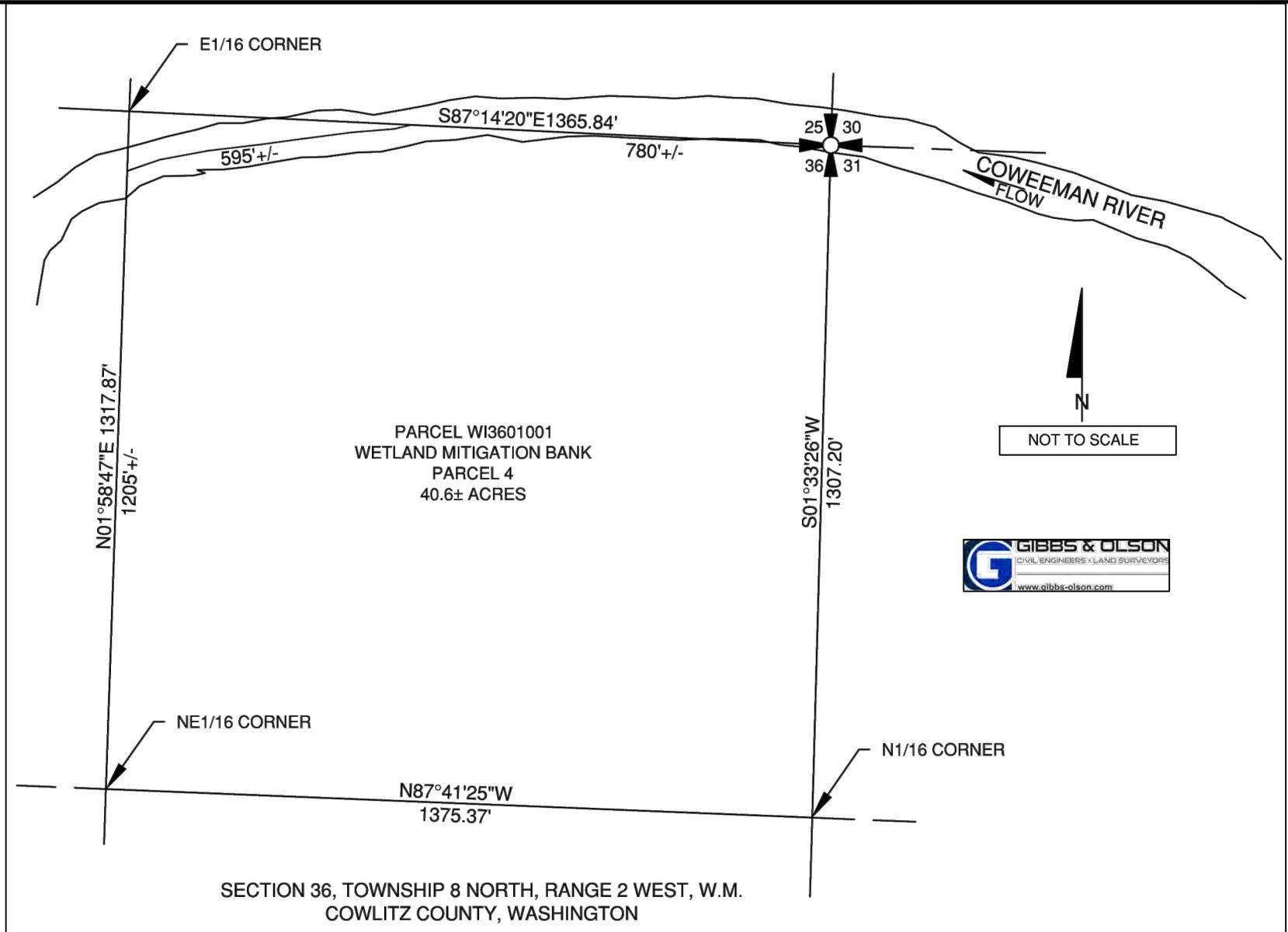


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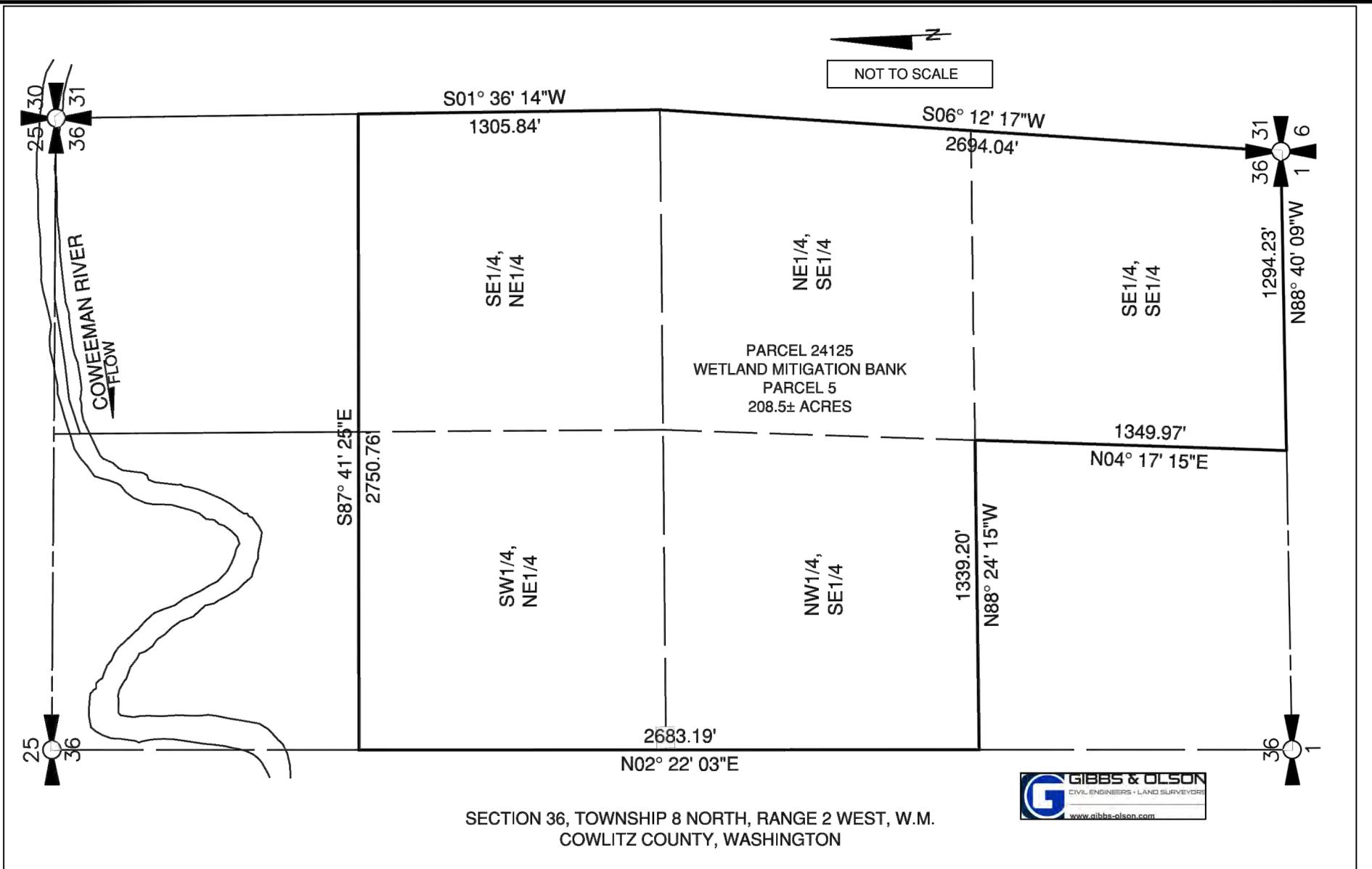
Figure A-2c
SITE SURVEY - PARCEL 3
Coweeman Mitigation Bank
Habitat Bank LLC
City of Kelso, Cowlitz County, Washington
Section 31, Township 8N, Range 1W, W.M.



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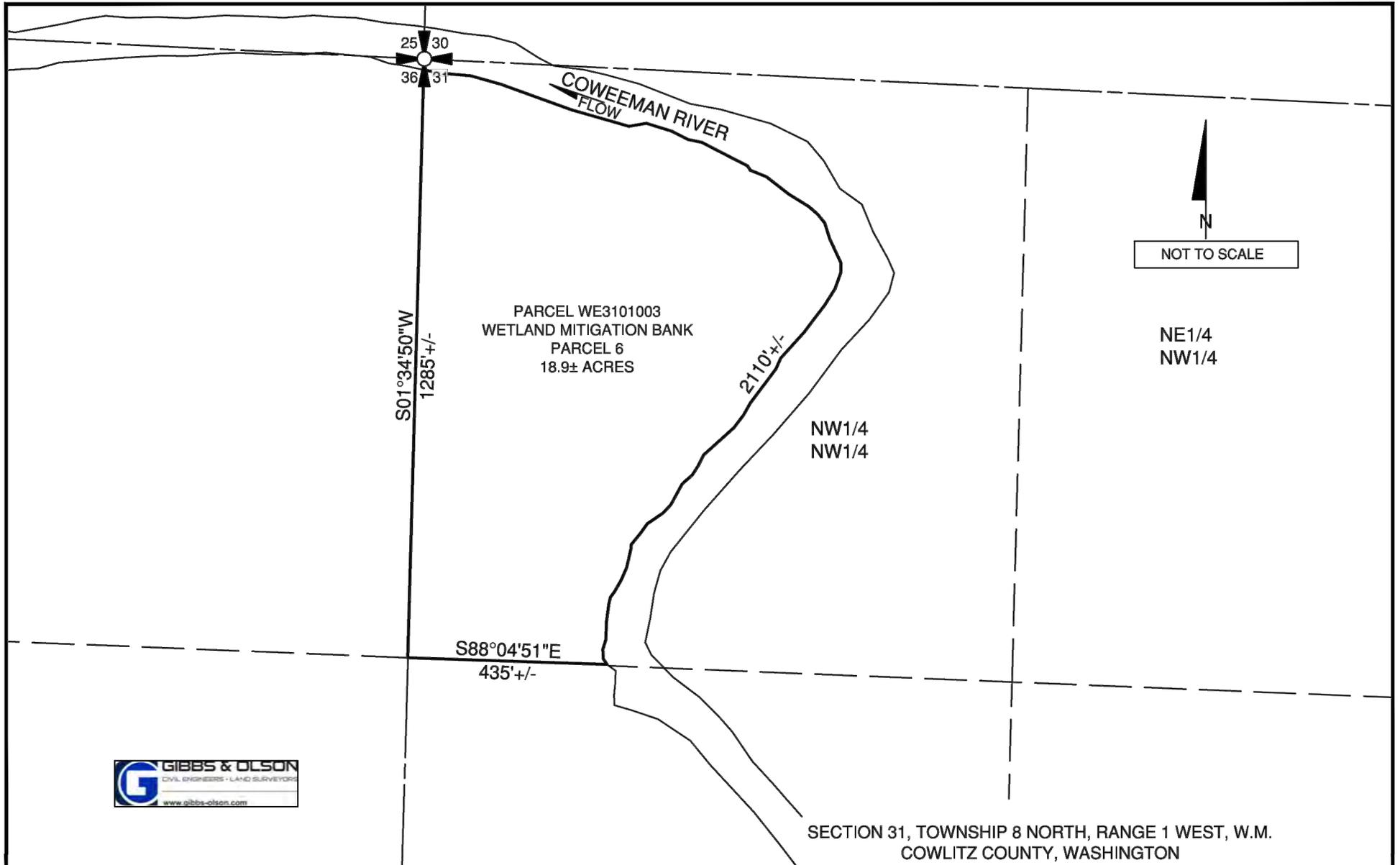
Figure A-2d
SITE SURVEY - PARCEL 4
Coweeman Mitigation Bank
Habitat Bank LLC
City of Kelso, Cowlitz County, Washington
Section 31, Township 8N, Range 1W, W.M.




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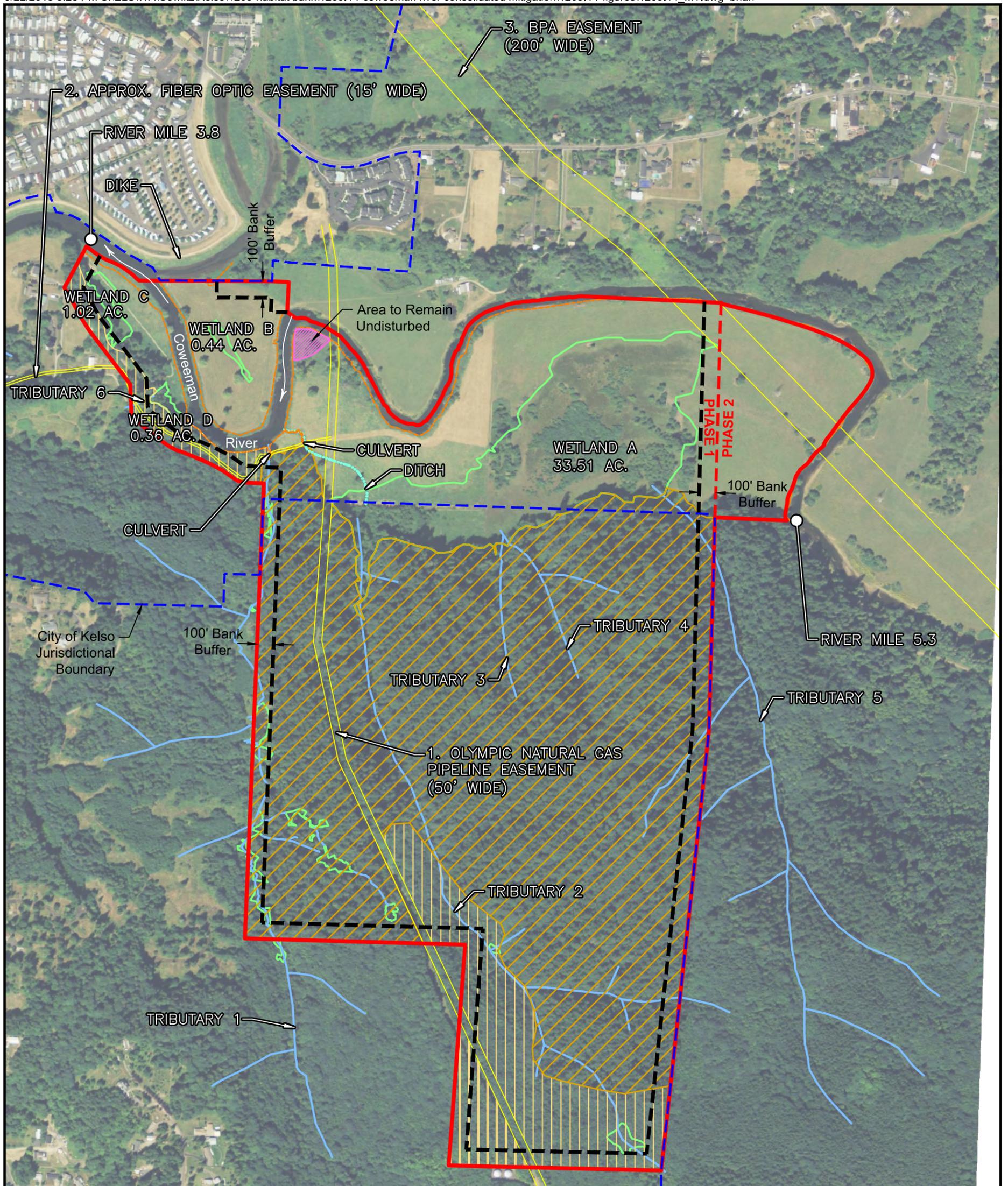
Figure A-2e
 SITE SURVEY - PARCEL 5
 Coweeman Mitigation Bank
 Habitat Bank LLC
 City of Kelso, Cowlitz County, Washington
 Section 31, Township 8N, Range 1W, W.M.



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Figure A-2f
SITE SURVEY - PARCEL 6 (PHASE 2)
Coweeman Mitigation Bank
Habitat Bank LLC
City of Kelso, Cowlitz County, Washington
Section 31, Township 8N, Range 1W, W.M.



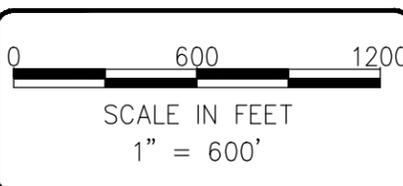
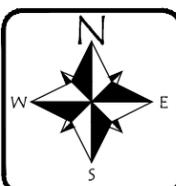
LEGEND

- **BANK SITE BOUNDARY**
(PHASE 1 = 302 AC.; PHASE 2 = 18.9 AC.)
- EXISTING WETLAND (37.65 ACRES)**
- **STREAM**
- **DITCH**
- **OLD GROWTH (174.01 ACRES)**
- **SECOND GROWTH (32.37 ACRES)**
- **ORDINARY HIGH WATER MARK**
- 100' BANK BUFFER**

Old Growth Area - 174.01 Acres
 6 tree species present
 11 trees/acre >32" dbh
 2 snags/acre >20" dbh and >15'tall
 2 downed logs/acre >24" diameter and >50' long

Composition of Species Meeting Old Growth Criteria
 73% Douglas-Fir (*Pseudotsuga menziesii*)
 14% Western Red-Cedar (*Thuja plicata*)
 9% Big-Leaf Maple (*Acer macrophyllum*)
 2% Western Hemlock (*Tsuga heterophylla*)
 1% Red Alder (*Alnus rubra*)
 1% Black Cottonwood (*Populus balsamifera*)

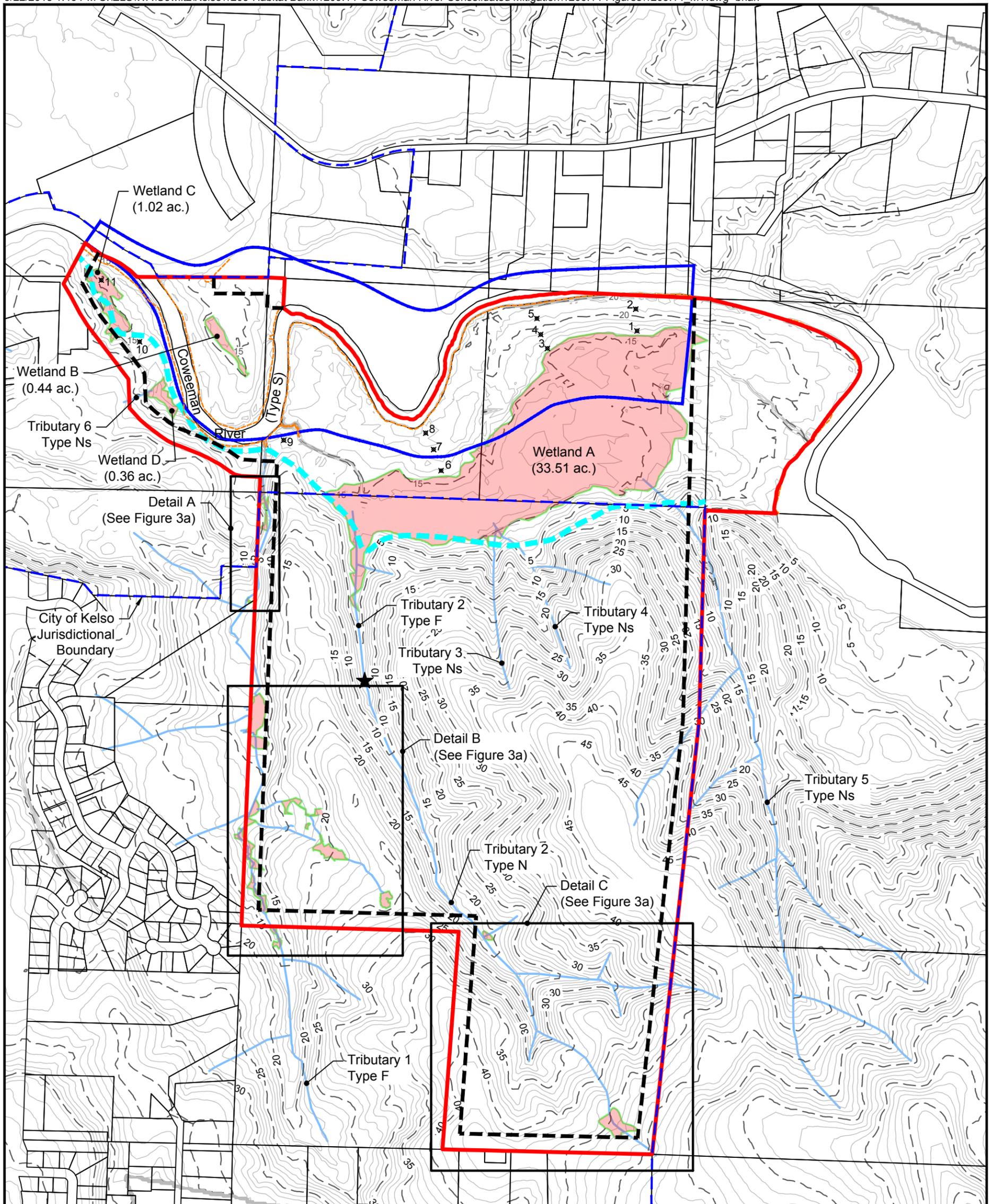
Second Growth Area Species Composition - 32.37 Acres
 36% Douglas-Fir (*Pseudotsuga menziesii*)
 32% Red Alder (*Alnus rubra*)
 28% Big-Leaf Maple (*Acer macrophyllum*)
 4% Western Red Cedar (*Thuja plicata*)



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Figure A-3
EXISTING CONDITIONS AERIAL VIEW
 Coweeman Mitigation Bank
 Habitat Bank LLC
 City of Kelso, Cowlitz County, Washington
 Section 31, Township 8N, Range 1W, W.M.
 Section 36, Township 8N, Range 2W, W.M.

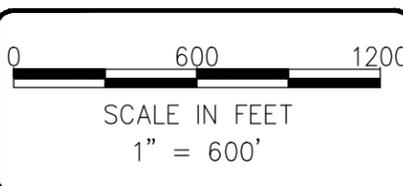


LEGEND:

- Site Boundary
- Existing Wetland
- Stream
- FEMA Floodway
- - - FEMA 100 Year Floodplain
- Taxlot
- 1' Contour
- 5' Contour
- - - Ordinary High Water Mark
- ★ Water Type Change
- 1 ✖ Hydro Pit Location

NOTES:

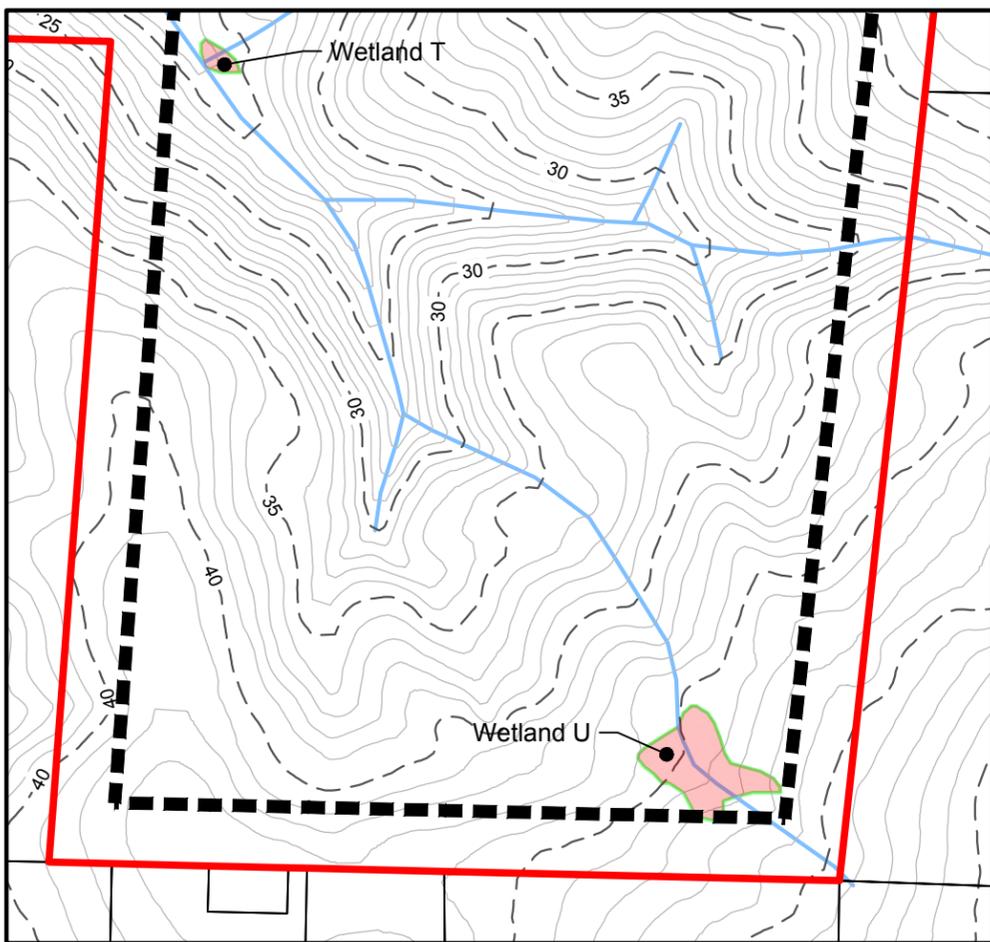
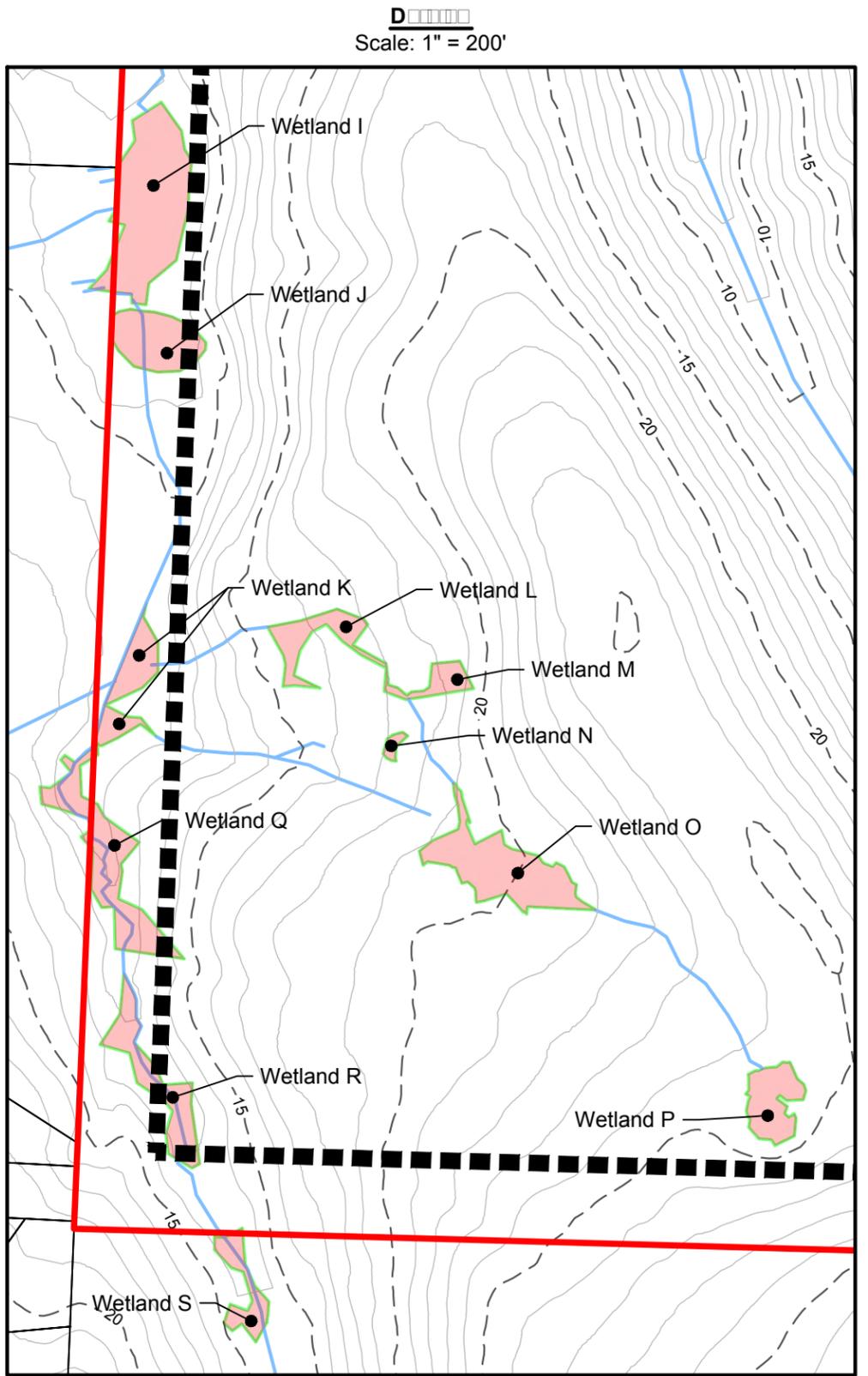
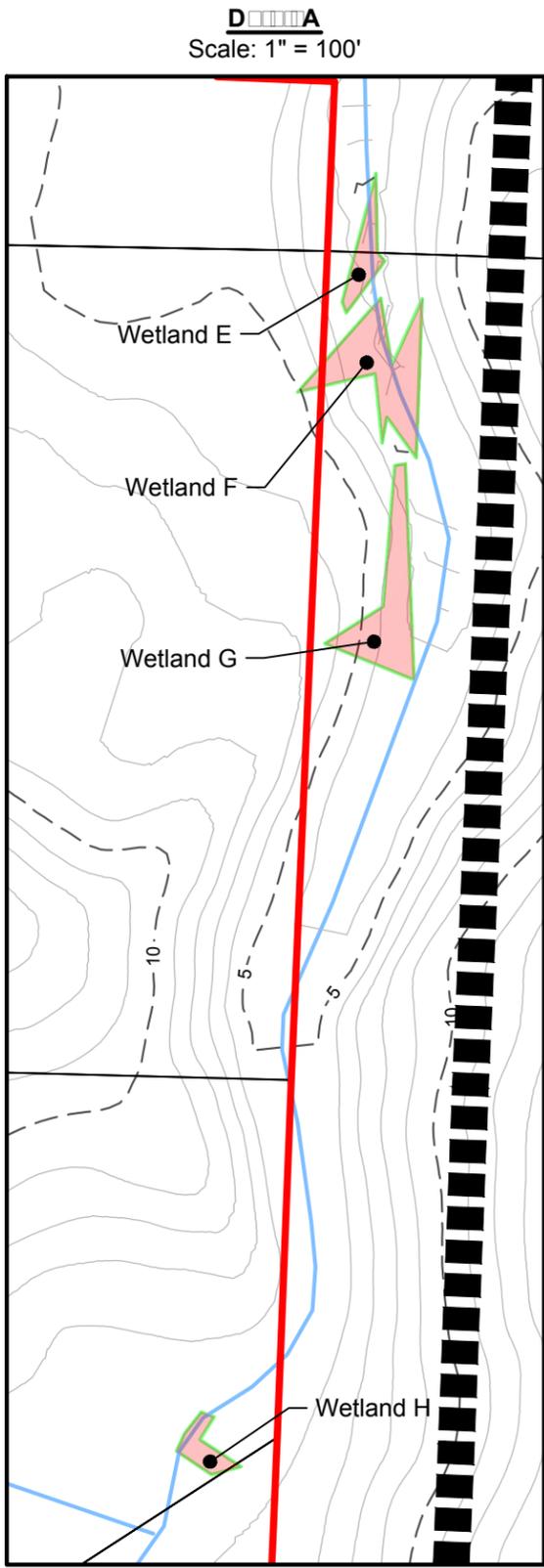
1. See Figure A-5 for wetland acreage, class and rating.



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Figure A-4
 TOPOGRAPHY AND AQUATIC AREA OVERVIEW
 Coweeman Mitigation Bank
 Habitat Bank LLC
 City of Kelso, Cowlitz County, Washington
 Section 31, Township 8N, Range 1W, W.M.
 Section 36, Township 8N, Range 2W, W.M.



Wetland	Size (ac. onsite)	Cowardin Class	HGM Classification	Ecology Rating	Total Functional Assessment Score	Habitat Functions Score
A	33.51	FO/SS/EM	Depressional	I	70	34
B	0.44	EM	Depressional	III	30	10
C	1.02	FO/SS/EM	Depressional	III	45	19
D	0.36	FO/EM	Depressional	III	42	16
E	0.01	FO/SS/EM	Riverine	II	55	23
F	0.05		Depressional	III	32	21
G	0.05	EM	Riverine	II	54	24
I	0.41		Riverine	II	63	29
J	0.17	FO/SS/EM	Riverine	II	60	20
K	0.12		Riverine	II	52	30
L	0.10	FO/SS/EM	Depressional	III	38	27
M	0.06		Depressional	III	37	26
N	0.01	FO/SS/EM	Depressional	III	35	20
O	0.28		Depressional	III	44	27
P	0.13	FO/SS/EM	Depressional	III	45	28
Q	0.19		Riverine	II	51	28
R	0.17	FO/SS/EM	Riverine	II	51	28
S	0.08		Riverine	III	47	26
T	0.05	FO/SS/EM	Riverine	III	48	24
U	0.44		Slope	III	44	28
Total	37.65					

Stream	DNR Stream Type	Stream Length	Stream Width
Coweeman River	Type S (fish bearing/perennial/shoreline of the state)	1.5 miles (onsite)	60-80 ft.
Tributary 1	Type F ¹ (fish bearing/perennial)	0.92 miles (total)	6-8 ft.
Tributary 2	Type F ² (fish bearing/perennial)	1.06 miles (total)	2-5 ft.
Tributary 3	Type Ns (non-fish bearing/seasonal)	0.19 miles (total)	2 ft.
Tributary 4	Type Ns (non-fish bearing/seasonal)	0.29 miles (total)	2 ft.
Tributary 5	Type Ns (non-fish bearing/seasonal)	0.26 miles (onsite)	3-4 ft.
Tributary 6	Type Ns (non-fish bearing/seasonal)	0.03 miles (total)	2 ft.

¹ Tributary 1 may not be fish bearing upstream of the Bank boundary.
² 0.09 miles of Tributary 2 are fish bearing. The remaining length is non-fish bearing. See break on Figure A-4.



SCALE VARIES

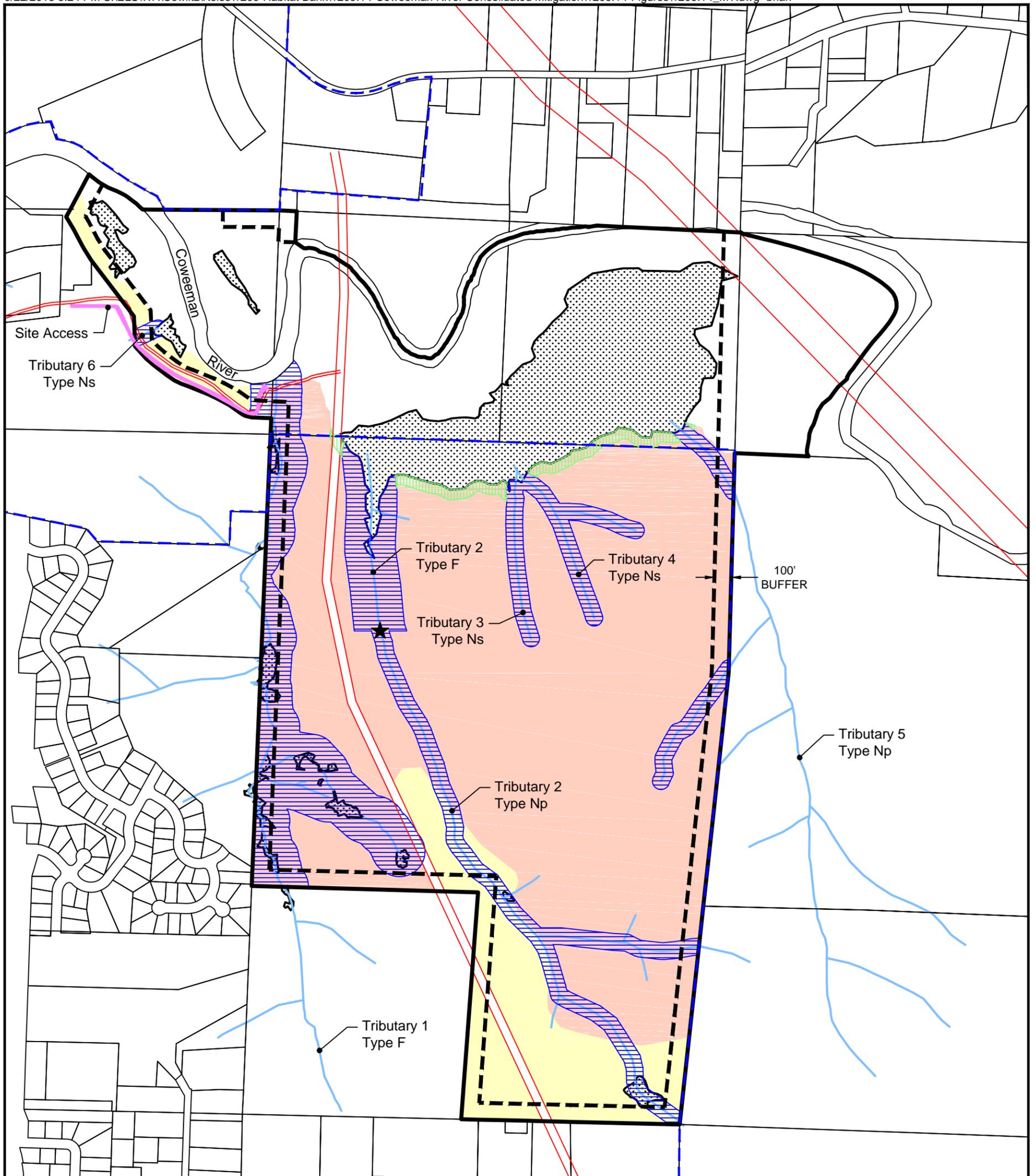


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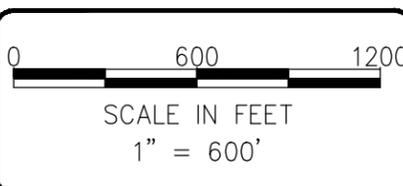
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Figure A-4a
 HILLSIDE WETLAND DETAIL
 Coweeman Mitigation Bank
 Habitat Bank LLC
 City of Kelso, Cowlitz County, Washington
 Section 31, Township 8N, Range 1W, W.M.
 Section 36, Township 8N, Range 2W, W.M.



LEGEND:

- Site Boundary
- Existing Wetland
- Taxlot
- WDFW Mapped Old Growth Forest
- Second Growth Forest
- Stream
- Riparian Corridor
- Water Type Change
- Wetland Buffer
- Existing Easement
- 100' Bank Buffer
- City of Kelso Jurisdictional Boundary

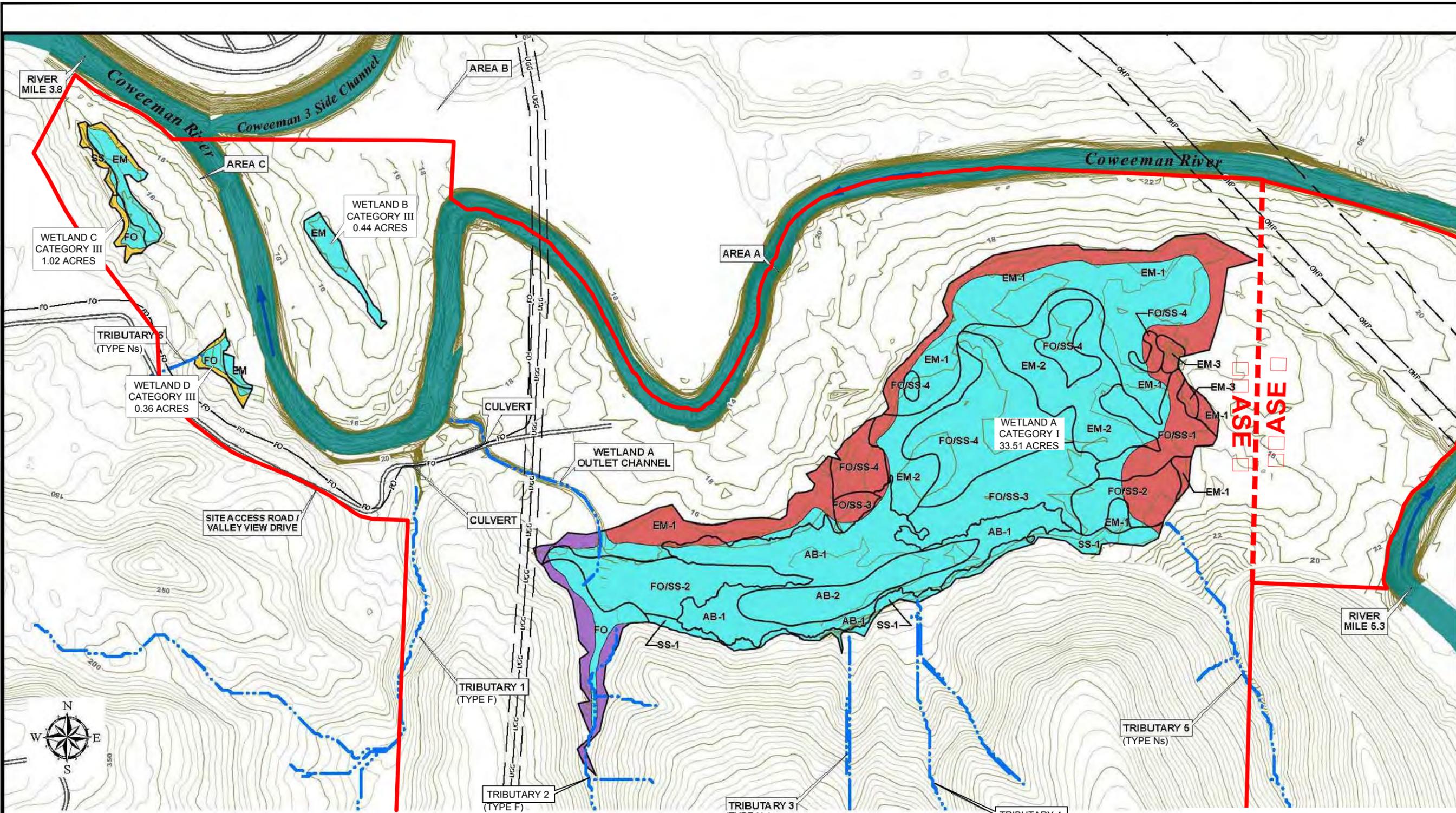


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Figure A-5
BANK SITE HILLSIDE PRESERVATION AREAS
 Coweeman Mitigation Bank
 Habitat Bank LLC
 City of Kelso, Cowlitz County, Washington
 Section 31, Township 8N, Range 1W, W.M.
 Section 36, Township 8N, Range 2W, W.M.

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LEGEND

- Bank Site Boundary
- - - Streams
- Roads

Wetland Hydroperiods

- Saturated Only
- Occasionally Flooded/Saturated Only
- Occasionally Flooded
- Seasonally Flooded

Cowardin Classification

- AB Aquatic Bed
- EM Emergent
- SS Scrub-Shrub
- FO Forested

Utilities

- - - Utility Easement
- UGG — Underground Gas Pipeline
- OHP — Overhead Power
- FO — Fiber Optic

Base map from: **SANNON** **ILSON** **INC.**
Geotechnical and Environmental Consultants

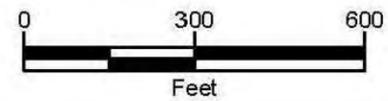


Figure A-6
EXISTING HYDROPERIODS & COWARDIN VEGETATION COMMUNITIES IN THE FLOODPLAIN
Coweeman Mitigation Bank
Habitat Bank LLC
City of Kelso, Cowitz County, Washington
Section 31, Township 8N, Range 1W, W.M.

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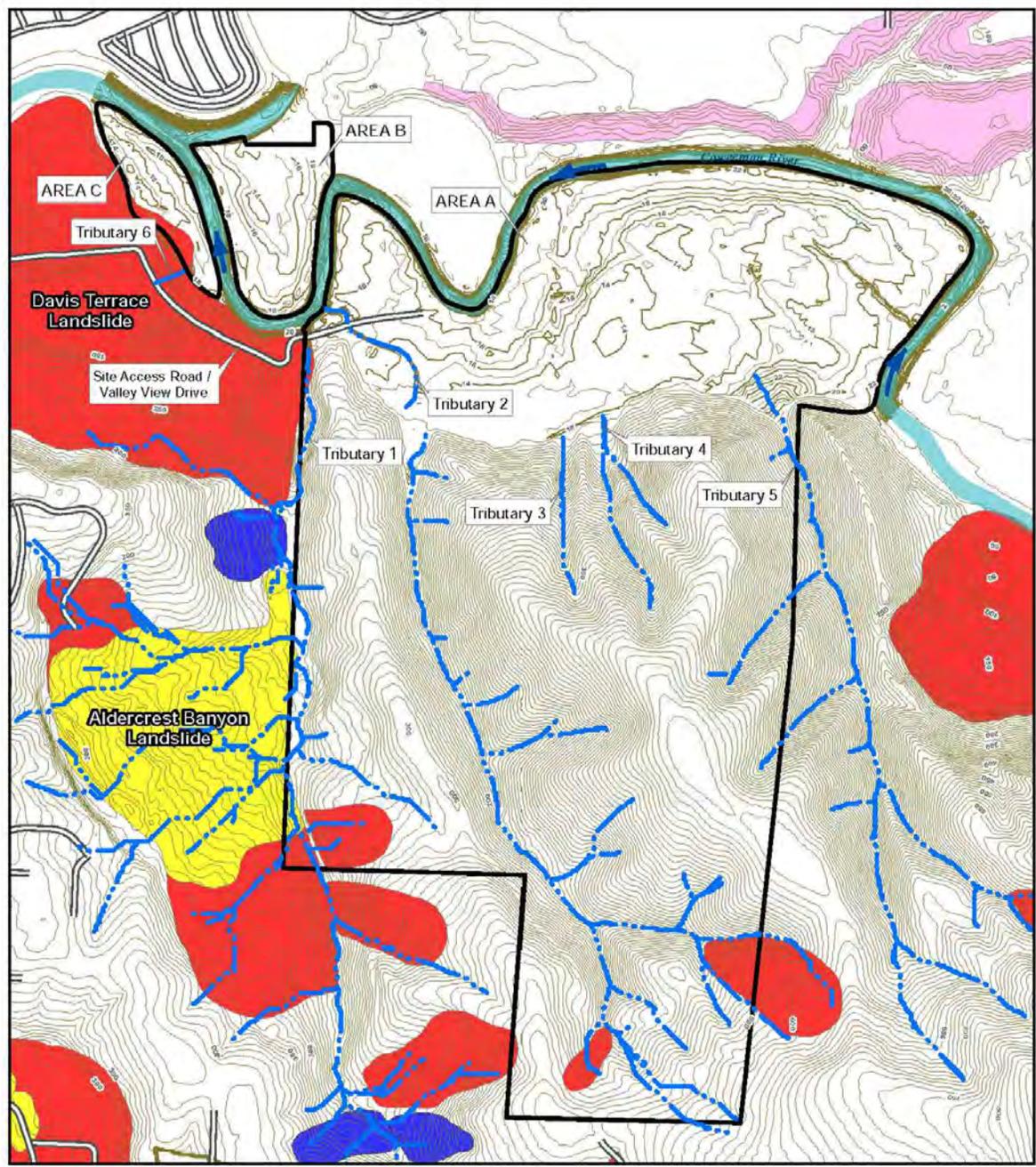


Figure A-8
LANDSLIDE MAP
 Coweeman Mitigation Bank
 Habitat Bank LLC
 City of Kelso, Cowlitz County, Washington
 Section 31, Township 8N, Range 1W, W.M.

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LEGEND

-  Project Boundary
-  Potentially Unstable Slope
-  Active deep-seated landslide; field verified by Wegman, 2006.
-  Inactive deep-seated landslide; field verified by Wegman, 2006.
-  Inactive deep-seated landslide; not field verified by Wegman, 2006.



Base map from: **S ANNON & I LSON INC**
 Geotechnical and Environmental Consultants

Note: Landslide areas are based on Cowlitz County Digital Landslide Inventory, by Karl Wegman, 2006, obtained from the Washington State Department of Natural Resources. These areas have not been field verified by Shannon & Wilson, Inc.

0 800
 Feet 

EXHIBIT A TO APPENDIX A
BANK SITE LEGAL DESCRIPTIONS

Legal Descriptions for Coweeman River Mitigation Bank

Sari/Lopes Parcel (WI3605002)

A PARCEL OF PROPERTY IN SECTION 36, TOWNSHIP 8 NORTH, RANGE 2 WEST OF THE WILLAMETTE MERIDIAN, COWLITZ COUNTY, WASHINGTON, DESCRIBED AS FOLLOWS:

BEGINNING SOUTH 0° 33' WEST 950.0 FEET FROM THE NORTH QUARTER CORNER TO SECTION 36, TOWNSHIP 8 NORTH, RANGE 2 WEST OF THE WILLAMETTE MERIDIAN, SAID POINT BEING IN THE CENTER OF THE COWEEMAN RIVER; THENCE SOUTH 0° 33' WEST 420.21 FEET TO THE STAKE; THEN NORTH 89° 20' EAST 1354.7 FEET TO A STAKE; THEN NORTH 0° 59' EAST 1270 FEET TO THE CENTER OF THE COWEEMAN RIVER; THENCE WITH THE CENTER OF THE COWEEMAN RIVER DOWNSTREAM TO THE PLACE OF BEGINNING.

SITUATE IN COWLITZ COUNTY, STATE OF WASHINGTON.

Wharton Parcels (WI3608001 and WI3605001)

THAT PORTION OF THE FOLLOWING DESCRIBED TRACT OF LAND THAT LIES IN THE NORTH HALF OF SECTION 36, TOWNSHIP 8 NORTH, RANGE 2 WEST OF THE WILLAMETTE MERIDIAN IN COWLITZ COUNTY, WASHINGTON, DESCRIBED AS FOLLOWS:

BEGINNING AT THE QUARTER CORNER COMMON TO SECTIONS 36 AND 25 OF SAID TOWNSHIP AND RANGE AND RUNNING THENCE NORTH 01° 04' 54" EAST 126 FEET TO THE END OF A FENCE LINE AGREEMENT RECORDED UNDER AUDITOR'S FILE NO. 776521; THENCE SOUTH 87° 23' 13" EAST 100.0 FEET; THENCE SOUTH 01° 03' 54" WEST 287 FEET TO A POINT ON THE RIGHT BANK OF THE COWEEMAN RIVER; THENCE SOUTH 45° 00' EAST 65 FEET TO THE CENTER OF SAID RIVER; THENCE SOUTHWESTERLY AND NORTHWESTERLY ALONG SAID RIVER CENTER TO THE NORTH BOUNDARY OF SAID SECTION 36; THENCE NORTH 88° 31' 51" EAST 755 FEET TO THE PLACE OF BEGINNING.

Lopes Parcel (Portion of WI3602008)

That certain tract of land located in the Southwest Quarter of Section 25 and the Northwest Quarter of Section 36, Township 8 North, Range 2 West, Willamette Meridian, Cowlitz County, Washington, as recorded under Auditor's File No.'s (AFN) 3426988 and 3446147, over and across all of said AFN 3426988 and 3446147, excepting therefrom that portion described as follows:

BEGINNING at a 5/8-inch rebar with a survey cap, marked "Morgan 12334" and shown on that certain survey recorded June 24, 1991, Volume 10 of Surveys, at Page 212, records of Cowlitz County, which bears South 66°19'40" East 1,472.13 feet from the Northwest corner of said Section 36 and South 61°55'49" West 1,447.35 feet from the North Quarter corner of said Section 36; thence North 01°44'04" East a distance of 156.35 feet (N00°28'03"W, 156.41 feet, said survey) to the most Southwesterly corner of that certain tract of land conveyed to James E. and Barbara G. Fernandez, husband and wife, by Statutory Warranty Deed recorded May 11,

1992 under Cowlitz County AFN 920511054; thence South 87°50'18" East a distance of 77.79 feet (N89°59'47"E, 77.90 feet, said survey) to a 5/8-inch rebar with a survey cap, marked "Morgan 12334"; thence North 02°23'05" East a distance of 30.94 feet (N00°00'03"W, 31.00 feet, said survey) to a 5/8-inch rebar with a survey cap, marked "Morgan 12334"; thence North 89°18'55" East a distance of 105.62 feet (N87°11'47"E, 105.40 feet, said survey) to a 5/8-inch rebar with a survey cap, marked "Morgan 12334"; thence North 00°39'37" West a distance of 145.41 feet (N02°44'02"W, 145.71 feet, said survey) to a 5/8-inch rebar with survey cap, marked "Morgan 12334"; thence South 37°16'37" East a distance of 415.00 feet to the North line of said AFN 3446147; thence South 02°15'03" East a distance of 179.32 feet to the Westerly line of said AFN 3446147; thence North 42°12'43" West along said Westerly line a distance of 13.30 feet (N44°27'08"W, said AFN 3446147); thence North 34°28'55" West a distance of 28.91 feet (N36°43'17"W, 28.9 feet, said AFN 3446147); thence North 26°28'17" West a distance of 112.75 feet (N28°42'39"W, 112.8 feet, said AFN 3446147); thence North 24°27'08" West a distance of 48.87 feet, (N26°41'30"W, 48.9 feet, said AFN 3446147) to the Northwest corner of said AFN 3446147 and a point on the Southerly line of said AFN 3426988; thence South 89°59'36" West along said Southerly line a distance of 350.75 feet (S87°42'14"W, 350.75 feet, said AFN 3426988) to the POINT OF BEGINNING.

City of Kelso Parcels: WI36-01-001; 24125

The E ½ of the E ½, the SW ¼ of the NE ¼, and the NW ¼ of the SE ¼ of Section 36, Township 8 North, Range 2 West, Willamette Meridian, Cowlitz County, Washington, according to U.S. Government subdivision procedures.

APPENDIX B BANK DEVELOPMENT PLAN AND DESIGN

B.1 Development Plan – Overview

The general goals of the Bank project are to restore site hydrology and floodplain connectivity to existing and created aquatic areas, increase habitat function and complexity for anadromous fish and other aquatic dependent wildlife, and reestablish wetland and riparian vegetation communities typically found in the Lower Columbia River floodplain environment. The bank development plan will restore site conditions to a pre-agricultural, pre-logging state while operating within the confines of existing site constraints.

The project grading, planting, and habitat feature development plans propose to reconstruct a mosaic of habitat types within the floodplain environment, consistent with what would have historically been found in this dynamic riverine environment, prior to human alteration during the late 19th and early 20th centuries. Before the Coweeman River was cleared of woody material and diked in the Kelso area, aquatic areas and floodplain uplands within the bank site would have had a more consistent and sustained hydrologic connection to the Coweeman River. The lowering and incising of the Coweeman River as a result of these activities has drained wetlands and lowered tributary elevations, creating points of hydrologic disconnect and incisement throughout this floodplain environment. Additionally, historical aerial photographs and topographic mapping shows a mixture of trees and shrubs in the floodplain that are no longer present because of the last 100 years of clearing and agricultural activities on the bank site.

The bank project design proposes to create, rehabilitate, enhance, and preserve wetlands, as well as enhance and preserve tributary streams, forested uplands and riparian corridors. Existing wetlands will be planted to create or enhance Palustrine Forested, Scrub-Shrub, and Emergent vegetation communities and preserve Palustrine Aquatic Bed habitat as defined by Cowardin (1979). In most areas these habitat types will be interspersed to create a mosaic of different Cowardin classes, which would most likely be present in the unaltered floodplain environment of the Coweeman River, where differences in hydrologic regime, sedimentation, large woody material (LWM) transport and beaver activity created clustered and varied vegetation communities. This is documented by historical aerial photography, surveys and the existing conditions in and around Wetland A. In addition to the work within the floodplain, the Bank includes the preservation of old growth and second growth forest which include six hillside tributaries to the Coweeman River and associated wetland areas (**Figures B-1 through B-2b**).

The project's bank development plan, including grading and planting plans, were created after numerous site visits and recommendations by professionals and experts in their respective fields, as well as information from a variety of studies of the site and hydraulic modeling completed for the project's aquatic areas. Bank project studies include:

- Topographic Survey of the Bank site Area and Cross Sections of the Coweeman River (Gibbs and Olson 2014)

- Baseline Conditions Report for the Coweeman Mitigation Bank (ELS September 2014)
- Addendum to the Existing Conditions Report for the Coweeman Mitigation Bank (ELS November 2014)
- Geologic Assessment of Coweeman Mitigation Bank (S&W 2014)
- Geotechnical Report for Coweeman Mitigation Bank (S&W October 21, 2014)
- Revised Coweeman River Mitigation Bank Basis of Design Report (S&W November 2014)
- Archeological survey for the Coweeman River Mitigation Bank Project, Cowlitz County, Washington (AINW, December 23, 2014)

B.2 Summary of Design Elements

The development of the Bank is planned in two phases. Phase 1 includes Bank Site Areas A, B and C and totals 302.00 acres as shown in **Figure B-2**. Phase 2 is Bank site Area D and includes the Murray Parcel which is 18.90 acres and considered an optional final phase of the project. The Bank site development areas are broken down in the following ways:

- **Area A Includes:**
 - 67.46 acres of habitat restoration in the floodplain, comprised of: rehabilitation, enhancement and preservation of Wetland A , wetland creation around Wetland A, riparian wetland bench habitat creation, tributary outflow and river alcove creation, flood overflow notch creation, and the restoration of riparian uplands.
 - 208.70 acres of hillside preservation area including hillside tributaries, wetlands, old growth forest, and second growth forest.
- **Area B Includes:**
 - 11.38 acres comprised of Wetland B rehabilitation and wetland creation areas, riparian wetland bench creation and surrounding riparian upland enhancement areas located north of the Coweeman River.
- **Area C Includes:**
 - 6.71 acres comprised of Wetland C rehabilitation, Wetland D enhancement, and wetland creation areas, as well as surrounding riparian upland enhancement areas.
- **Area D Includes:**
 - 18.90 acres considered Phase 2 of the project, comprised of wetlands and associated riparian upland areas to the east of Wetland A.

In Phase 1, the Bank project will create 21.33 acres of new wetland area, rehabilitate 14.68 acres of wetland area, enhance 14.53 acres of wetland area, preserve 8.44 acres of wetland area, enhance 28.82 acres of riparian upland area and preserve 206.38 acres of old growth and second growth forested hillside. Phase 2 will create approximately 8.90 acres of additional wetland area and enhance approximately 10 acres of riparian uplands. Cowardin habitat acreage totals for each

area are summarized in Table 1 below and are further broken down into creditable and non-creditable acreages:

Table 1. Proposed Cowardin Habitat Types and Acreages

Activity By Area and Cowardin Class	Creditable Acres	Non-Creditable Acres	Total Acres ¹
PHASE 1			
Area A in the Floodplain	62.86	4.60	67.46
Wetland Creation: PFO/PSS/PEM Mosaic	12.21	0.10	12.31
Riparian Wetland Bench Creation: PSS/PEM Mosaic	1.68	--	1.68
Wetland A Preservation: Existing PAB	6.12	--	6.12
Wetland A Enhancement: Existing PFO/PSS	14.17	--	14.17
Wetland A Rehabilitation: Existing PEM	13.15	0.07	13.22
Riparian Upland Enhancement PFO/PSS	15.53	4.43	19.96
Area A Hillside Preservation	179.02	29.68	208.70
Riparian Upland Preservation: Old Growth Forest Corridor	33.65	8.11	41.76
Riparian Upland Preservation: 2 nd Growth Forest Stream Corridor	3.55	1.01	4.56
Upland Preservation: Non Riparian Old Growth Forest	123.06	9.19	132.25
Upland Preservation: Non Riparian 2 nd Growth Forest	17.59	10.22	27.81
Upland Enhancement: Invasive Species Removal	N/A	N/A	N/A
Wetland Preservation: Existing PFO/PSS/PEM&PEM Wetlands	1.17	1.15	2.32
Area B	10.21	1.17	11.38
Wetland Creation: PFO/PSS/PEM Mosaic	5.28	--	5.28
Riparian Wetland Bench Creation: PSS/PEM Mosaic	0.32	--	0.32
Wetland B Rehabilitation: Existing PEM	0.44	--	0.44
Riparian Upland Enhancement PFO/PSS	4.17	1.17	5.34
Area C	6.18	0.53	6.71
Wetland Creation: PFO/PSS/PEM Mosaic	1.59	0.15	1.74
Wetland C Rehabilitation: Existing PSS/PEM	0.95	0.07	1.02
Wetland D Enhancement: Existing PSS/PEM	0.36	--	0.36
Riparian Upland Enhancement PFO/PSS	3.28	0.31	3.59
Floodplain Area Summary (A, B, C)			
Wetland Creation (not including riparian wetland bench)	19.08	0.25	19.33

Activity By Area and Cowardin Class	Creditable Acres	Non-Creditable Acres	Total Acres ¹
Riparian Wetland Bench Creation	2.00	--	2.00
Wetland Enhancement	14.53	--	14.53
Wetland Rehabilitation	14.54	0.14	14.68
Wetland Preservation	6.12	--	6.12
Riparian Upland Enhancement	22.98	5.91	28.89
Phase 1 Overall Totals	258.27	35.98	294.25
Coweeman River Total			7.75
PHASE 2			
Area D			18.90
Wetland Creation			8.90
Riparian Upland Enhancement			10.00

¹ Total acres includes areas within bank buffer and easements which are non-creditable

B.2.1 Summary of Project Grading Actions

The project grading plans are found in **Figures B-4 through B-4K**. Site grading is intended to:

- Create additional wetland hydrology in Areas A, B, and C (and Area D if developed).
- Re-contour and reconnect tributaries to wetlands and other aquatic areas in Area A.
- Create in-stream and off-channel alcoves and riparian bench habitat for salmonids and other anadromous and resident fish species.
- Place and secure large woody material in the alcoves, on the riparian benches and where the car bodies have been removed for stream bank protection and habitat complexity.
- Reconnect the Coweeman River with floodplain habitat areas through the Wetland A overflow notch to improve wetland functions and aquatic habitat functions for salmonids.

The majority of cut material generated from these grading activities will be kept onsite and spread out along existing upland areas in naturally shaped, low profile hummocks in Areas A, B, and C. These areas will also be enhanced by native plantings and clean cut material will be beneficial in creating a suitable planting surface for installing native woody species and reducing the propagation of invasive species.

Excess cut material generated from grading activities that is not placed in riparian upland areas will be placed in the stockpile area outside of the Coweeman River floodway in Area B (**Figure B-4**) or taken offsite to an approved disposal site. The Area B stockpile will flank the northeast riparian upland enhancement area and will be graded to blend with the natural landscape to the greatest extent possible. Once grading is complete, it will be seeded and planted to develop into upland riparian forested following the plant specifications in Table 5 below. Table 2 shows a summary of cut and fill volumes on the site for each area of the Bank project:

Table 2. Project Grading Volumes by Area

Area	Cut	Fill	Balance	
A	59,129	59,129	(0)	Fill to remain onsite within riparian upland planting mounds
B	41,844	7,032	34,812	Fill to remain onsite within upland areas and any additional material will be exported offsite
C	4,991	3,182	1,809	Material to be exported offsite
D	TBD	TBD	TBD	Material to be exported offsite
Totals	105,964	69,343	36,620	

B.2.2 Summary of Large Woody Material Placement

Coniferous LWM consisting of downed logs, downed logs with rootwads, rootwads, perch poles, and brush piles will be placed in each habitat area across the site. Specific LWM features include: large wood clusters within the riparian bench wetlands and alcove areas to improve fish habitat, a bar-apex log jam to create in-stream fish habitat, protect uplands and deflect flood flows above the 2-year flood event into Wetland A, large wood clusters installed in place of the removed car bodies to improve fish habitat, and downed logs, perch poles and brush piles within the wetland and upland areas to improve both fish and wildlife habitat across the site. The LWM structures will be anchored with wood piling or by using helical pile anchors (**Figures B-9 and B-10**). Cottonwood and Pacific willow stakes and stumps will be used for some LWM features to act as “living snags” or “living brush piles”. This will be accomplished by burying parts of the snag or debris clusters in the ground to promote re-growth of the assembled stakes and cut pieces.

The amount of large woody material installed across the project is based on guidance found in “*Making Endangered Species Act Determinations of Effect for Individual or Grouped Actions at the Watershed Scale*” (NMFS, 1996) which sets criteria for a “fully functioning system” for LWM within a floodplain-watershed context. The criteria to meet fully functioning conditions is 80 LWM pieces per mile with a diameter of >24 inches DBH and a length >50 feet. While the amount of LWM can be achieved on the site it may be difficult to find and transport the diameter and length of LWM needed to meet fully functioning criteria. LWM of this size is not easily found in the Coweeman system but efforts will be made to find the largest LWM pieces that can be successfully transported to the site. For LWM installation along the Coweeman River, the project will use large and medium sized logs with rootwads attached per the specifications below. Small logs with rootwads and material generated onsite may be used for brush piles and LWM in the wetland areas. The standard industry specifications for LWM in the Coweeman are as follows:

Logs with Rootwads attached

- Any conifer species. No hardwood allowed.
- Must be cut within 1 year of delivery.
- Length specified includes only the bole of the tree, the rootwad is excluded.
- Diameters of the bole (DBH) are to be taken 4 1/2 feet above the base of the rootwad.

- Diameters are taken outside bark.
- Root wad fan size must be 5 feet in diameter.
- Branches will be removed from the bole unless otherwise specified.
- Rootwads will be reasonably clean from dirt and debris.

Large Rootwad

- 20”+ DBH
- 26 feet in length minimum (maximum length of 30 feet due to constraints in getting logs in end dumps).

Medium Rootwad

- 16-19” DBH
- 26 feet in length minimum

Small Rootwad

- 12-15” DBH
- 26 feet in length minimum

Logs without rootwads

- Shall be the same specifications as above, less the rootwad.

Pilings(anchoring for LWM structures)

- Pilings shall be Douglas-fir or cedar only.
- Cut within 1 year of delivery
- Diameter specified shall be the top diameter of the log taken inside bark
- Pilings shall be reasonably straight and free of defects including splits, cracks and rot.
- Branches shall be removed flush with the bole.
- Specified length shall be the minimum length from cut end to cut end.

Baseline conditions for LWM across the site are documented in the project’s baseline conditions report. The required amount of LWM needed to reach “fully functioning” conditions on the site will be added to the project within the floodplain, predominately within the riparian wetland bench areas.

The following table lists the amount of LWM that will be installed in each area. **Figures B-2 and B-3** show the approximate location of LWM placement on the project although final conditions will be documented in as-built reports submitted to the IRT.

Table 3. Coweeman Bank Habitat Feature Installation¹

Large Woody Material					
Feature	Area A ²	Area B	Area C	Riparian Wetlands/ Alcove	Total Pieces
Downed Logs and/or Rootwads	10	3	2	40	55
Perch Poles/Cavity Trees	2	1	1	--	4
Brush Piles (2+ pieces each)	8	6	4	--	36
Bar Apex Jam (12 pieces)	1	--	--	--	12
Total Items (minimum)	21	10	7	40	107
Nest Boxes					
Wood Duck Box	4	1	1	--	6
Standard Nest Box	5	2	2	--	9
Total Items (minimum)	9	3	3	--	15

¹Habitat feature locations and amounts may be modified in the field. This table supersedes the amount of LWM pieces shown on the figure(s) and lists the minimum amount of required pieces. Final amounts and locations will be provided in the as-built report.

²Not including riparian wetlands and alcove.

B.2.3 Summary of Plantings and Habitat Communities

All areas in the floodplain will be planted with either native woody species or seeded with herbaceous species to increase structural diversity across the site and increase native species diversity on the site. A list of plant species that will be planted within the various habitat communities on the bank site can be found in **Tables 4** and **5** below. The planting objectives for each habitat area are as follows:

B.2.3.1 Plantings in the Riparian Upland Areas

The primary objective for the Riparian Upland Habitat area is to create vegetated corridors between the wetlands and the riparian areas along the Coweeman River in order to provide shade to the aquatic areas, provide an increase in food web support functions, provide bank stabilization and create usable and valuable terrestrial habitat for wildlife. Plantings in this area will be a mixture of trees and shrubs and include faster growing deciduous trees such as Cottonwood, Alder, Oregon ash, and willow that will provide quick shading and bank stabilization to the aquatic areas. Climax conifer species such as Douglas fir, Western Red cedar and hemlock will also be planted in this area to begin to develop long term canopy cover. The understory will be planted with a variety of shrubs to provide additional structure and cover for birds, small mammals, and amphibians. Trees and shrubs will be planted at a density of between

600 to 800 stems per acre to achieve full cover and density requirements as measured in the Appendix C performance standards.

B.2.3.2 Plantings in the Riparian Wetland Creation Areas

Vegetation in the created riparian wetland bench areas will include a mixture of native herbaceous wetland species, mixed with willow species that can tolerate regular and annual flooding conditions. Vegetation in this area will provide refuge habitat for fish during high water events, shading for fish during low water periods, provide native allochthonous inputs and create bank stabilization for the Coweeman River. Willows will also help collect LWM during high flows. Native herbaceous species will be seeded into final grades as well as planted using plugs. Willows will be planted using willow cuttings at an average density between 600 and 800 stems per acre.

B.2.3.3 Plantings in the Wetland Creation Areas

Wetland creation areas will be planted in a mosaic of palustrine forested, shrub, and emergent wetland plant communities, mimicking the interspersion of habitat types found in the existing wetland areas on site. Rather than evenly spacing out individual shrub and tree plantings across a largely flat wetland creation zone, shrub or forested vegetation communities will be clustered through this area to create dense patches or clumps of plantings. The planting areas will be based off of slight differences in elevation and hydrology within the wetland creation zones, although it is assumed that some tree and shrub species will be able to tolerate hydrologic conditions in both the upper and lower elevations of this part of the site and any natural recruitment and establishment of native woody species will be encouraged.

Woody habitat planting clusters will be the dominant habitat type in the upper elevations of the wetland creation zone and a subordinate amount of palustrine emergent wetland habitat will be interspersed throughout the wetland creation area. In the lowest elevations of the wetland creation area, palustrine emergent wetland habitat will be more prevalent given a higher level of inundation during the growing season. For example in the new Wetland B creation area, the lowest elevations within the lower outlet channel (between 10 and 12 feet of elevation), will support rooted emergent wetland plants and then transition into a mosaic of shrub and forested wetland habitat at an elevation of 12-13 feet. This area will be seeded and plugs will be installed after final grades for wetland hydrology have been established. Plant species for the wetland creation areas are listed in Tables 4 and 5 below. In order to inform the planting and performance objectives, the target acreage amounts for each habitat type within the created wetland areas are found in Table 6. Woody species in this area will be planted at an average density between 600 and 800 stems per acre, although the plantings will be concentrated in clumps and patches rather than equally spread out across the site.

B.2.3.4 Plantings in the Existing Wetland Areas

The biggest impact to the existing wetland vegetation communities on site has been cattle grazing which has created highly disturbed and compacted soils, invasive species establishment, a lack of woody vegetation and a lack of overall vegetation diversity in the existing wetland

areas. Additional plantings in the existing wetland areas to increase native species diversity and percent cover of woody species in Wetlands A, B, C, and D will improve habitat structure for fish and wildlife and reduce invasive species establishment which consists primarily of reed canarygrass and Himalayan blackberry. Invasive species including Himalayan blackberry and reed canarygrass that are currently growing within the existing PFO and PSS habitat and the reed canarygrass growing in the existing PEM areas, will grow vigorously after cattle removal without proper management. Therefore, invasive species control is imperative in the existing wetland areas for the short term and establishment period of the Bank Project. Long term goals will be to establish a native vegetation composition that shades out or, out-competes invasive species. Site preparation activities to prep the existing wetland areas for new plantings and planting actions in the existing wetland habitat areas are detailed below. The list of plant species to be installed in the existing wetland areas is found in Tables 4 and 5 below.

Planting in the existing Palustrine Forested and Scrub-shrub Wetland Areas:

- Remove cattle from the existing wetlands, eliminating impacts to existing vegetation and soils.
- Remove invasive Himalayan blackberry patches and reed canarygrass within the understory of existing Palustrine Forested and Scrub-Shrub wetland areas using small equipment (mechanical) and/or herbicide application.
- Install shade tolerant species in place of invasive species in the understory to increase species diversity (**Table 5**) and help develop a native understory in the existing wetland areas.
- Where woody vegetation is sparse and cover is low, increase cover of trees and shrubs through new native plantings.

Planting in the existing Palustrine Emergent Wetland Areas:

- Scrape the top 6 to 8 inches of soil which is comprised of reed canarygrass rhizomes in order to create a clean planting surface for new herbaceous and woody species.
- Seed and install native herbaceous plug species to create PEM habitat and install native woody species to increase PSS and PFO habitat.
- Plant PSS and PFO areas in interspersed clusters within the existing emergent wetland areas in accordance with the approximate acreage amounts in **Table 6**.

B.2.3.5 Plant and Seed Specifications

Bareroot Stock:

- Bareroot species will be grown by a native plant nursery.
- Bareroot stock will be 2-0 stock or similar, depending on availability from grower.
- The bareroot stock will have well-developed roots and sturdy stems, with an appropriate root-to-shoot ratio.
- Bareroot stock will be kept cool and moist prior to being planted.
- No damaged or desiccated roots or diseased plants will be accepted.
- Unplanted bareroot stock will be properly stored at the end of each planting day to prevent drying out.

Willow Cuttings:

- Cuttings will be purchased from a local native plant nursery or contract cut from local sources.
- Cuttings will be a minimum of 3-feet long and greater than ¼-inch diameter.
- Cuttings will be kept cool and moist prior to being planted.
- Cutting stock should be installed within approximately 1 week of cutting.
- Unplanted cutting stock will be properly stored at the end of each planting day to prevent desiccation.

Upland and Wetland Seeding:

Seed mixes will either be broadcast, hydro-seeded, or drilled in on site following final grading and construction. Rates of broadcast vary depending on seed size, seeding method, and habitat type. Roughly 5,000,000 seeds per acre are anticipated to be seeded. Variations from this estimate will be noted in the as-built report.

Wetland Plugs:

Plugs will be planted by hand using handheld planting tools specialized for installing plugs in wetland areas, following final grading and construction. Plugs may be added to the emergent areas after initial plantings to increase the diversity in a specific area if observations and monitoring shows that specific areas of the site are more conducive to certain species, and the increase in density and cover would be beneficial to the habitat area.

Table 4. Herbaceous Species List (Seeds or Plugs)

Community Type		Plant Species			
		Common Name	Scientific Name	Common Name	Scientific Name
Palustrine Emergent Wetlands	Shallow Emergent Areas	Tufted hairgrass	<i>Deschampsia cespitosa</i>	Woolly sedge	<i>Scirpus atrocinctus</i>
		Western mannagrass	<i>Glyceria occidentalis</i>	Shortawn foxtail	<i>Alopecurus aequalis</i>
		Bur-reed	<i>Sparganium emersum</i>	Rice cut-grass	<i>Leersia oryzoides</i>
		Softstem bulrush	<i>Scirpus tabernaemontanii</i>	American water plantain	<i>Alisma subcordatum</i>
		Creeping spike-rush	<i>Eleocharis palustris</i>	American sloughgrass	<i>Beckmannia syzigachne</i>
		Slough Sedge	<i>Carex obnupta</i>	Small fruited bulrush	<i>Scirpus Microcarpus</i>
	Deeper Emergent Areas	Softstem bulrush	<i>Scirpus tabernaemontanii</i>	American water plantain	<i>Alisma subcordatum</i>
		Creeping spike-rush	<i>Eleocharis palustris</i>	American sloughgrass	<i>Beckmannia syzigachne</i>
		Western mannagrass	<i>Glyceria occidentalis</i>	Shortawn foxtail	<i>Alopecurus aequalis</i>
		Wapato	<i>Sagittaria latifolia</i>	Skunk cabbage	<i>Lysichiton americanum</i>

Community Type	Plant Species			
	Common Name	Scientific Name	Common Name	Scientific Name
Riparian Upland Areas	Perennial ryegrass	<i>Lolium perenne</i>	Kentucky bluegrass	<i>Poa pretensis</i>
	Red fescue	<i>Festuca rubra</i>	Tall fescue	<i>Schedonorus phoenix</i>

After site grading is complete, the Bank Sponsor will seed all disturbed upland and wetland areas with a seed mix from the species listed in Table 4, in order to stabilize soils and prevent the establishment of invasive species. Additional native species may be added to the list to increase diversity or substitute for other species per consultation with native seed suppliers and the IRT.

Native trees and shrubs will be planted on the site at an approximate density between 600 and 800 stems per acre, after site grading is completed. Tree and shrub species will follow the species list detailed in Table 5 below. Trees and most shrubs will be protected with tree tubes. Individual plant species contained in the planting list were selected based on their suitability to the hydrologic regime and wetland indicator status as well as their presence in the existing floodplain environment either on the site or adjacent to the site. Undisturbed Wetlands on site or adjacent to the project were used as reference sites for species selections. These species will provide cover, forage, screening, and structure for all types of fish and wildlife utilizing the site.

Table 5. Tree and Shrub Species List and Planting Quantities by Habitat Type

Habitat Types and Planting Quantities	Plant Species			
	Common Name	Scientific Name	Common Name	Scientific Name
Created Forested Wetland (700 stems per acre)	Black cottonwood	<i>Populus balsamifera</i>	Scouler willow	<i>Salix scouleriana</i>
	Oregon ash	<i>Fraxinus latifolia</i>	Pacific willow	<i>Salix lucida</i>
	Western red cedar	<i>Thuja plicata</i>	Red alder	<i>Alnus rubra</i>
	Sitka Spruce	<i>Picea sitchensis</i>	Cascara	<i>Rhamnus purshiana</i>
Existing Forested Wetland (500 stems per acre)	Western red cedar	<i>Thuja plicata</i>	Oregon Ash	<i>Fraxinus latifolia</i>
	Cascara	<i>Rhamnus Purshiana</i>	Black Cottonwood	<i>Populus balsamifera</i>
	Pacific Willow	<i>Salix lucida</i>		
Riparian Upland (Trees) (350 (tree) stems per acre)	Black cottonwood	<i>Populus balsamifera</i>	Red alder	<i>Alnus rubra</i>
	Bitter cherry	<i>Prunus emarginata</i>	Oregon ash	<i>Fraxinus latifolia</i>
	Scouler willow	<i>Salix scouleriana</i>	Western red cedar	<i>Thuja plicata</i>

Habitat Types and Planting Quantities	Plant Species			
	Common Name	Scientific Name	Common Name	Scientific Name
	Douglas-fir	<i>Pseudotsuga menziesii</i>	Pacific willow	<i>Salix lucida</i>
	Big leaf maple	<i>Acer macrophyllum</i>	Western hemlock	<i>Tsuga heterophylla</i>
Created Scrub-shrub Wetland (650 stems per acre)	Nootka rose	<i>Rosa nutkana</i>	Pacific crabapple	<i>Malus fusca</i>
	Var. Willow Species	<i>Salix sp.</i>	Red-osier dogwood	<i>Cornus sericea</i>
	Douglas hawthorn	<i>Crataegus douglasii</i>	Salmonberry	<i>Rubus spectabilis</i>
	Ninebark	<i>Physocarpus capitatus</i>	Spiraea	<i>Spiraea douglasii</i>
Existing Scrub-shrub Wetland (500 stems per acre)	Nootka rose	<i>Rosa nutkana</i>	Red-osier dogwood	<i>Cornus sericea</i>
	Devil's Club	<i>Oplopanax horridus</i>	Salmonberry	<i>Rubus spectabilis</i>
	Spiraea	<i>Spiraea douglasii</i>		
Riparian Wetland Bench (800 stems per acre)	Sitka willow	<i>Salix sitchensis</i>	Pacific willow	<i>Salix lucida</i>
	Sandbar willow	<i>Salix exigua</i>	Columbia river willow	<i>Salix fluviatilis</i>
Riparian Upland (Shrubs) (300 shrub stems per acre)	Nootka rose	<i>Rosa nutkana</i>	Salmonberry	<i>Rubus spectabilis</i>
	Sitka willow	<i>Salix sitchensis</i>	Douglas hawthorn	<i>Crataegus douglasii</i>
	Ninebark	<i>Physocarpus capitatus</i>	Snowberry	<i>Symphoricarpos albus</i>
	Red-osier dogwood	<i>Cornus sericea</i>	Red elderberry	<i>Sambucus racemosa</i>
	Serviceberry	<i>Amelanchier alnifolia</i>	Indian plum	<i>Oemleria cerasiforis</i>
	Vine maple	<i>Acer circinatum</i>	Beaked hazelnut	<i>Corylus cornuta</i>
	Oregon grape	<i>Mahonia nervosa</i>	Salal	<i>Gautheria shallon</i>
	Sword fern	<i>Polystichum munitum</i>		

The plant communities for each area within the project (Areas A, B, C, and D) are based on the different hydroperiods expected for each wetland area and the relative site topography expected in each area post construction. The expected acreage amounts and elevation ranges for each Cowardin habitat community on the Bank site is summarized below in Table 6:

Table 6. Post-Construction Targeted Floodplain Habitat Acreages and Elevations*

Habitat Type		Target Acreage for Cowardin Class	Approximate Ground Elevation Range (feet) NAVD88
Area A	Riparian Upland Enhancement Total	19.96	---
	UPL Mosaic (Trees and Shrubs)	19.96	>17
	Wetland A (Creation + Rehab.) Mosaic	25.53	---
	PFO	13.00	14-17
	PSS	7.00	14-17
	PEM	5.53	13-16
	Wetland A (Enhancement) Total	14.17	---
	PFO/PSS Mosaic	14.17	14-16
	Riparian Wetland Creation Total	1.68	---
	PEM/PSS Mosaic	1.68	10-13
Wetland A (Preservation) Total	6.12	---	
PAB	6.12	< 13	
Area B	Riparian Upland	5.34	---
	UPL Mosaic (Trees and Shrubs)	5.34	>13
	Wetland B (Creation + Rehab.)	5.72	---
	PFO/PSS Mosaic	4.00	12-13
	PEM	1.72	10-13
Riparian Wetland Creation	0.32	---	
PEM/PSS Mosaic	0.32	10-13	
Area C	Riparian Upland	3.59	---
	UPL Mosaic (Trees and Shrubs)	3.59	>16
	Wetland C (Creation + Rehab.)	2.76	---
	Wetland D (Enhancement)	0.36	---
PFO/PSS/PEM Mosaic	3.12	13-16	

*Acreage includes both creditable and non creditable areas.

Notes:

NAVD88 = North American Vertical Datum of 1988

B.3 Bank Design Objectives and Post Construction Conditions for Each Area

B.3.1 Design Objectives for Area A

Because Area A is the largest and most diverse section of the bank project, the project design objectives for this area are broken up by individual sections and described individually below. Design objectives for Areas B and C are described under separate headings further in the Appendix.

B.3.1.1 Wetland Creation Design Objectives in Area A

Grading in Area A to create additional wetlands around Wetland A will result in 12.31 acres of additional wetland area. Grades will be lowered 2 to 3 feet below the ground surface around the fringes of Wetland A to extend soil surface inundation and saturation, creating hydric soils at elevations that support wetland hydrology. The created wetland areas will have hydroperiods ranging from “seasonally inundated” in the lower elevations to “seasonally saturated” in the higher elevation areas. A mosaic of habitat types including palustrine emergent, scrub-shrub and forested wetland vegetation communities will be interspersed throughout this area in the same way that existing habitat types are interspersed in Wetland A. Habitat types will generally follow elevation contours and the corresponding hydrologic regime with a dominance of tree and shrub species planted in the created wetland areas. It is expected that the majority of the created wetland areas will transform over time to become a floodplain wetland forest with stratified vegetation classes and a varied list of species similar to the more undisturbed portions of Wetland A along the edge of the hillside area. Large woody material such as downed logs, perch poles and brush piles will be placed in the wetland creation areas to improve habitat structure for small mammals, amphibians, reptiles, and juvenile salmonids.

Reconnecting existing aquatic areas and creating additional wetland hydrology in Wetland A is a primary goal for the project and will greatly improve anadromous fish habitat in Wetland A. It is expected that Wetland A and the associated tributaries will provide rearing and refuge habitat for out-migrating Juvenile Coho, Chinook, Steelhead and resident trout during high water conditions in the winter and spring. Much of the created wetlands in Area A will be inundated during these times and allow foraging opportunities and food chain support functions for juvenile fish as they move down the Coweeman River to the Columbia River Estuary.

B.3.1.2 Wetland Rehabilitation and Enhancement Design Objectives in Area A

The wetland rehabilitation and enhancement objectives for Wetland A can be grouped into two different categories; actions that provide functional lift to the entirety of Wetland A and actions that provide functional lift to specific Cowardin vegetation communities within Wetland A. The restoration actions described below are separated by those two distinctions and further classified as a “wetland rehabilitation” action or a “wetland enhancement” action:

Restoration Actions Providing Functional Lift to All Areas of Wetland A:

- **Wetland Rehabilitation Action:** Increase the frequency of overbank flooding into Wetland A and restore floodplain connectivity with the wetland through the construction of a flood overflow notch along the left (south) bank of the Coweeman River (**Figure B-4B**). This action will increase the potential to improve water quality functions by capturing and retaining more nutrients sediments, as well as improve water quantity functions by capturing and reducing peak flows and downstream erosion processes. The notch, graded down to an elevation of 17 feet (NAVD88), will be slightly higher than the elevation of the Wetland A creation area and will be fully engaged at approximately the two-year flood event as compared to overbank flooding which would occur at the 10-year flood event under the current conditions. A bar-apex log jam structure, constructed of

multiple LWM pieces, will be installed on the downstream end of this notch to protect the bank of the river and create variable in-river habitat and velocity conditions for fish during flood events.

- **Wetland Rehabilitation Action:** Perform minor grading within areas of seasonal flooding along the southern perimeter of Wetland A to reestablish defined channels for Tributaries 2 and 5 by excavating out approximately 225 cubic yards of alluvial deposits where these streams enter Wetland A (**Figures B-4A, B-4D, and B-4E**). These actions will improve fish habitat for the entirety of Wetland A as it reduces the potential for fish stranding. Re-contouring will be completed using small equipment (e.g., bobcat) to provide defined, low-flow channels and improve fish escapement into the permanently flowing tributaries or out of Wetland A when surface water levels in Wetland A drop to seasonal lows. The clean, well-rounded gravels removed from Wetland A and Tributaries 2 and 5 will be used within the realigned Wetland A Outflow Channel and its outlet into the alcove area of the Coweeman River.
- **Wetland Rehabilitation Action:** Remove an undersized culvert and install a WDFW approved fish passable crossing over the Wetland A outflow tributary. The new Wetland A outflow crossing will allow increased backflows (flushing) into Wetland A during high tides and high flows from the Coweeman River and greatly increase habitat connectivity for fish into all areas of Wetland A.
- **Wetland Enhancement Action:** Eliminate cattle grazing from all areas of the project including Wetland A. Cattle graze all habitat areas within Wetland A, compact and turn up soils in the emergent and aquatic bed wetland areas and contribute to nutrient and pollutant loading in Wetland A.
- **Wetland Enhancement Action:** Perform invasive species management to control undesirable vegetation, including reed canarygrass, tansy, English ivy, Himalayan blackberry, English holly, and other non-native species. Reed canarygrass and Himalayan blackberry are prevalent within the understory of existing PSS and PFO habitat, while reed canarygrass is the dominant species within the existing PEM habitat and the outer portions of the PAB habitat within Wetland A.
- **Wetland Enhancement Action:** Install and secure large woody material and other habitat features such as perch poles, root wads and nest boxes within existing Wetland A habitat Areas.

Restoration Actions Providing Functional Lift to a Specific Cowardin Habitat Type in Wetland A:

- Existing Palustrine Scrub-Shrub and Forested Wetland Habitat:
 - **Wetland Enhancement Action:** Remove invasive species in the understory (including Reed canarygrass, Himalayan blackberry and jewelweed) of existing PFO and PSS habitat. Invasive species will first be mechanically removed or killed with herbicide during construction and managed for further reduction and spread throughout the bank establishment period.
 - **Wetland Enhancement Action:** Native and shade tolerant emergent, shrub and tree plantings will be installed to replace the invasive species that will be removed in the understory. Additionally, sparsely vegetated areas that lack species diversity within

the PFO and PSS habitat areas will be planted to improve the diversity of species and the percent cover of woody species in these areas.

- Existing Palustrine Emergent Wetland Habitat:
 - **Wetland Rehabilitation Action:** Mechanically remove reed canarygrass rhizomes through shallow grading and scalping of sod materials and replant with native herbaceous, shrub or tree species depending on the intended final habitat type. Removed material will be buried beneath riparian planting mounds and stockpile areas.
 - **Wetland Enhancement Action:** Install native woody species in a mosaic of grouped clusters within PEM areas of Wetland A that have been suppressed by cattle grazing. PEM areas are currently dominated by reed canarygrass which has historically limited any natural recruitment or expansion of existing palustrine scrub-shrub or forested species.
 - **Wetland Enhancement Action:** Install habitat features including downed logs, brush piles, standing snags, and rootwads to increase habitat complexity, especially for amphibians and anadromous fish.
- Existing Palustrine Aquatic Bed Wetland Habitat (Preservation):
 - Manage and reduce reed canarygrass in and around existing PAB Habitat.
 - Install large woody material including downed logs and rootwads to improve cover and refuge for juvenile anadromous fish and native amphibians.

B.3.1.3 Wetland A Outflow and Tributary 1 Design Objectives in Area A

One of the main objectives of the Bank site design is to improve access to created or restored aquatic areas for federally listed fish species and other anadromous and resident fish species. Wetland A has the potential to provide forage and rearing habitat for anadromous fish during their juvenile life stage, however, the outlet tributary from Wetland A and the Tributary 1 crossing does not meet juvenile fish passage requirements because of the existence of undersized culverts. The objective in the Wetland A Outflow Tributary will be to remove the culvert, realign the Wetland A Outflow Tributary and add spawning gravels and large wood to create pool and riffle habitat and a lower channel gradient suitable for juvenile fish passage into Wetland A (**Figure B-4C**). The Tributary 1 Culvert will also be replaced to meet fish passage criteria. Water will be able to backwater into Wetland A during high flows and high tides in the Coweeman River. These events which occur on an annual basis, multiple times during the year, allow fish greater ingress and egress as the channel becomes flooded and Wetland A and its tributaries become more easily accessible.

An existing 18-inch CMP culvert within the Wetland A Outflow Channel will be replaced with a new fish passable crossing based on the WDFW Water Crossing Design Guidelines (Barnard and others, 2013) to improve connectivity for fish during low flows and backwatering events. The new crossing will be a three sided box culvert-bridge that is fish passable under all conditions and will provide access to the site during the Bank establishment phase and subsequent

maintenance and monitoring visits. The Tributary 1 Culvert replacement will meet the same design criteria and fish passage requirements. The culvert designs for both the Wetland A Outflow Channel and Tributary 1 were based on a combination of stream simulation and hydraulic modeling of the 2-year and 5-year flood events.

The current Wetland A Outflow Channel alignment crosses over both a gas pipeline and fiber optic utility. The realigned channel configuration has been designed to maintain the existing clearance over the gas pipeline and avoid adversely affecting this utility. As fiber optic lines are more flexible, coordination will occur with the fiber optic utility to determine the most appropriate means for relocating the fiber optic line at the new crossing.

The outlet of the realigned Wetland A Outflow Channel into the Coweeman River will be relocated towards the confluence of Tributary 1 and graded out to create a low-flow, in-river alcove area that will act as an attraction point for juvenile fish and spawning adults using the reduction in river flows as refuge and potential spawning habitat.

B.3.1.4 Riparian Wetland Bench Creation Design Objectives in Area A

As described above, site grading will pull back parts of the left (south) bank of the Coweeman River in Area A from their over-steepened existing conditions to achieve a 3 horizontal to 1 vertical (3H:1V) slope, north of Wetland A and north of the outlet of the Wetland A and the alcove area. Through the excavation and shaping of these more gradual banks, it is expected that 1.68 acres of riverine wetlands will be created, below the Coweeman River ordinary high water mark (OHWM).

Sections of the left (south) bank of the Coweeman River will be graded at a 5H:1V slope from a lower elevation of 10 feet to enhance the riparian environment, create wetland hydrology and provide increased channel width and space during high-flow events. Water surface elevations for the Coweeman River were modeled to predict wetland hydrology and post-construction hydroperiods where the banks of the Coweeman River are pulled back. The modeling indicates that the Coweeman River stage height at Area A, north of Wetland A, and near the outlet of the Wetland A Outflow Channel, rises above an elevation of 10 feet NADV88 when flow within the river reaches approximately 1,500 cubic feet per second (cfs). Flow-duration analyses for the Coweeman River presented in the basis of design report indicates that this flow occurs between 5 to 15 percent of the time between November through March and less than 1 percent of the time from April through October.

Given the post-construction hydrologic modeling contained in the basis of design report, the Riparian Wetland Bench Habitat is expected to be inundated or have saturated soils sufficient for establishing wetland hydrology, to those sections of graded river bank between a low elevation of 10 feet to an upper elevation 13 feet. Expected wetland hydroperiods for these riparian wetlands include four water regimes: seasonal flooding, occasional flooding, saturation only, and the permanent flowing stream (Coweeman River) adjacent to the wetland.

The riparian wetlands within Area A will be revegetated with native woody and emergent plantings (Tables 4 and 5) to create palustrine emergent and scrub-shrub wetland communities.

Habitat features comprised of wood pieces with rootwads will be installed along the bank and held in place using earth anchoring, buried wood abutments and wood pilings (see grading details) as recommended in the Corps' 2008 *Programmatic Biological Assessment Restoration Actions in Washington State*. Installed wood features will provide roughness to the interior channel and cover and refuge for anadromous fish during high flows.

B.3.1.5 Riparian Upland Design Objectives in Area A

Additional modifications to the Coweeman River riparian corridor in Area A include approximately 19.96 acres of riparian upland enhancement through the following activities:

- Perform invasive species management to control undesirable vegetation including: Reed canarygrass, English ivy, Himalayan blackberry, and English holly.
- Install habitat features, including large wood clusters, brush piles, large wood pieces, and snags throughout the riparian upland areas.
- Excavate a flood overflow notch, shallow swale, and low-flow channel along the left (south) bank of the Coweeman River to direct floodwaters and provide fish access to the floodplain and suitable forage and rearing habitat within Wetland A. As noted above, this notch will be graded down to an elevation of 17 feet NADV88, which will be slightly higher elevation of the Wetland A creation area. Given the lowered bank elevation at this flood overflow notch, hydrologic modeling indicates that overbank flooding into Wetland A will occur more frequently, at approximately the 2-year flood event.
- Riparian Uplands will be re-vegetated with native trees, shrubs, and herbaceous species found in Tables 4 and 5. Excavated material from the wetland creation areas will be placed 1 to 3 feet above the existing grade throughout the riparian uplands to create low planting mounds that provide additional topographic variety and bury existing invasive species.
- New Plantings will help develop multiple canopy classes in the floodplain, provide a riparian forest corridor for wildlife, shade the Coweeman River and Wetland A, create bank stability and eventually contribute large woody material to the system.

B.3.2 Post Construction Conditions in Area A

In accordance with the stated restoration objectives for Area A, the expected post-construction conditions (as depicted in **Figures B2, B-2A and B-3 through B-4E**) are as follows:

- **Area A Wetland Creation, Rehabilitation and Enhancement:** New wetland habitat will be created in a band around Wetland A through site grading and native plantings. Wetlands will be created by grading down approximately 1 to 3 feet below ground surface to establish wetland hydrology and extend the seasonally saturated and seasonally inundated wetland hydroperiod. Post-construction modeling indicates that this activity will result in wetland hydrology extending up to an elevation of 17 feet (NAVD88). Grading and revegetation will limit the reestablishment of reed canarygrass within the existing and newly created wetland areas. Habitat features, such as perch poles, brush piles, downed logs, and rootwads will be installed throughout the newly created wetland areas and existing wetland areas. Portions of Wetland A will either be rehabilitated or

enhanced through the removal of cattle, removal of invasive species through grading and other control methods, installation of native plantings, and the aforementioned installation of habitat structures. The lower reaches of Tributaries 2 and 5, near the southern boundary of Wetland A will be enhanced by channel re-contouring to improve fish access into the tributaries during seasonally low surface water levels within Wetland A.

- **Area A Flood Overflow Notch:** A large wood bar apex jam, anchored by timber pilings, is incorporated into the Bank design and will be constructed at the downstream (west) side of the flood overflow notch. The log jam at the entrance will deflect flood flows into the floodplain and Wetland A area and promote long-term stability and connectivity of the floodplain overflow notch, as well as provide habitat and refuge for fish. It is expected that the bar apex jam will recruit additional LWM from the river during high flows. The overflow notch will also flush flood flows into seasonally flooded areas within the Wetland A palustrine emergent and aquatic bed habitat to minimize the chance of fish stranding.
- **Wetland A Outflow Tributary Realignment:** Realignment and rehabilitation of the existing Wetland A Outflow Tributary will provide improved off-channel habitat and habitat connectivity to Wetland A. The slope and current alignment of this ditch will be realigned to improve channel complexity and fish access to Wetland A. The Wetland A Outflow Channel realignment will avoid impacts to the Olympic natural gas pipeline and fiber optic lines which cross the channel. The confluence of the Wetland A Outlet Tributary with the Coweeman River will be relocated closer to the Tributary 1 confluence with the Coweeman River. Convergence of the two tributaries is intended to create more attraction flow to encourage fish use. Fish access will be improved through the installation of a fish passable crossing over the existing Wetland A Outlet Tributary and Tributary 1 crossing. Off-channel floodplain habitat will be significantly improved within the outflow tributary through riparian plantings, the addition of gravel at the mouth, and gravel and cobble riffles throughout the channel realignment, and the placement of large wood features to provide complexity, pools, and cover.
- **Area A Riparian Wetland Creation:** Site grading will create riparian wetlands along the left (south) bank of the Coweeman River. The grading will start at an elevation of 10 feet NAVD88 and lay back the river bank up to the upland riparian elevations. The 10-foot elevation corresponds to a flow of approximately 1,000 to 1,300 cfs in this reach of the Coweeman River. Based on the monthly flow duration information flows greater than or equal to this magnitude would be expected to occur between approximately 5 to 15 percent of the time during November through March and typically less than 1 percent of the time in April through October resulting in sustained wetland inundation or saturation sufficient to meet wetland hydrology criteria. Car bodies will be removed from the outside of the meander bend along the left (south) bank of the Coweeman River during the creation of the riparian bench habitat.
- **Tributary 1 Crossing:** The current culvert crossing on Tributary 1 while functionally fish passable, does not meet WDFW fish passage criteria. This culvert will be replaced

with a three sided box culvert or bridge structure that meets WDFW fish passage criteria for the stream.

- **Area A Riparian Upland Enhancement:** Site grading will create variable topography throughout the Area A uplands and riparian corridor, adjacent to the Coweeman River and Wetland A. These areas will be re-vegetated with trees and shrubs to establish riparian upland shrub and forest habitat. Invasive species will first be killed and then existing seed sources and rhizomes will be buried under clean native material. Habitat features such as large woody material, perch poles and bird nest boxes will be installed throughout the uplands to increase habitat diversity.

Through the proposed wetland creation, rehabilitation and enhancement activities in Area A, Wetland A will increase significantly in size and is expected to remain a Category I wetland with an increased total score of 75 points as summarized in Appendix G of the Revised Basis of Design Report (S&W 2014). This represents a 5 point lift, which is due to the following activities:

- **Water quality functions:** Cattle will be removed from the property which are currently degrading Wetland A Water Quality functions. The Wetland A overflow notch will increase the potential for Wetland A to filter nutrients and sediments from the Coweeman River Watershed. Native plantings within the wetland creation area, rehabilitation area and enhancement area will increase total vegetation cover and the wetland's ability to filter out and trap nutrients and pollutants such as toxics and heavy metals.
- **Hydrologic functions:** An increase in overbank flooding into Wetland A increases the potential of the wetland to trap sediment and slow flood flows, reducing erosive forces lower in the system.
- **Habitat Functions:** Eliminating disturbances (e.g., grazing) within the wetland unit and buffer while improving habitat diversity, interspersions and connectivity, creates an increase in potential and opportunity for improved wildlife habitat, especially for anadromous fish.

B.3.3 Design Objectives for Area B

Area B includes a 0.44-acre Category III depressional wetland (Wetland B) and an actively grazed pasture. The Coweeman River wraps around the south side of Area B and along the north side with an off-channel, backwater slough extending off the Coweeman River. Historic land uses and grazing have largely eliminated any riparian habitat that would have been present within Area B. An incised Coweeman River has resulted in localized stream bank erosion and a lack of floodplain connectivity to Wetland B which can potentially strand any fish that get caught in high flows within the wetland.

Given the baseline conditions present within Area B, as well as the Cowlitz watershed's limiting factors for off-channel and side-channel habitat accessible to anadromous fish, the following design objectives for Area B were developed:

- Create new wetland habitat areas composed of a PEM, PSS, and PFO wetland mosaic to improve structural diversity in the floodplain and increase food chain support functions for resident fish species.
- Create off-channel habitat along the Coweeman River within the new wetland areas that will be used for high flow refuge, off-channel rearing, forage, and cover for juvenile salmonids.
- Enhance riparian upland habitat along the banks of the Coweeman River to increase structural diversity and large woody material recruitment in the floodplain.
- Enhance bank stability along the Coweeman River mainstem through site grading and planting.
- Increase shading and reduce temperature along the Coweeman River through riparian upland plantings.

B.3.4 Post Construction Conditions in Area B

B.3.4.1 Area B Wetland Creation Area

The proposed site grading within Area B includes excavating a broad, gradual slope, approximately 2 to 5 feet below existing grade, towards a newly constructed interior channel that connects to the Coweeman River. The new Wetland B will be a 5.72 acre riverine wetland directly connected to the Coweeman River. The sloping connection to the river will allow fish escapement during high water whereas the existing Wetland B may trap fish because it has no outlet.

The new wetland will replace the existing low-functioning depressional Wetland B that is currently at the center of Area B. The hydroperiods associated with the existing depressional Wetland B include two water regimes: seasonally flooded and saturated only. Current hydrologic sources to Wetland B are predominantly limited to direct precipitation, groundwater, and periodic overbank flooding.

Water surface elevations and flow transfers between the new Wetland B and Coweeman River were modeled to determine the site grading elevations and Wetland B outlet design to predict wetland hydrology and post-construction hydroperiods while providing ingress and egress opportunities for fish. As shown in **Figure B-12**, the modeling indicates that the Coweeman River stage height at Area B rises above an elevation of 10 feet NADV88 when flow within the river reaches approximately 1,500 cfs. Flow-duration analyses for the Coweeman River presented in **Figure B-14** indicate that this flow occurs between 5 to 15 percent of the time between November – March and less than 1 percent of the time from April – October. The Wetland B outlet will be at an elevation of 10 feet to allow surface flow from the Coweeman River into Wetland B during these months (**Figure B-4G**). The wetland boundary will extend up to an elevation of 13 feet, which modeling indicates will provide inundation or saturation sufficient to meet wetland hydrology criteria. The side slopes of Wetland B will be a minimum of 2 percent to direct fish into the channel and out of Wetland B when floodwaters recede. Given the new hydrologic sources to Wetland B, the post-construction wetland hydroperiods will include three water regimes within the newly created Wetland B: seasonal flooding, saturation only, and the permanently inundated channel within Wetland B.

Wetland B will be re-vegetated with native woody and emergent plantings (Tables 4 and 5) to create palustrine scrub-shrub and forested communities over time. Habitat features, including LWM, standing snags, and brush piles within the wetland and LWM including downed logs and rootwads within the interior channel will provide cover and refuge for juvenile salmonids, amphibians and bird species which are expected to utilize the new habitat.

The new Wetland B creation design will replace the existing Category III wetland with a Category II wetland with an increased total score of 64 points as summarized in Appendix G of the *Revised Basis of Design Report* (S&W 2014). This represents a 34 point lift due to the following activities:

- **Water Quality Functions:** The size of the wetland and native woody plantings throughout the wetland creation area will improve the ability of the wetland unit to trap and retain fine sediments and pollutants.
- **Hydrologic Functions:** Excavated areas will create additional overbank storage and woody vegetation within the wetland unit will increase the hydrologic functions by slowing flood flows.
- **Habitat Functions:** Eliminating disturbances (e.g., grazing) within the wetland unit and buffer while improving the wetland's connectivity to the Coweeman River and increasing habitat structure, interspersion and diversity in the wetland area, greatly improves the value of habitat for priority fish species and other wetland dependant wildlife.

B.3.4.2 Area B Riparian Wetland Creation Area

Similar to Area A, site grading will pull back parts of the bank of the Coweeman River in Area B from its over-steepened condition to a 6H:1V slope, south of Wetland B and where the Coweeman River bends around Area B. Through the excavation and shaping of more gradual banks, it is expected that 0.32 acres of new riverine wetland will be created below the Coweeman River ordinary high water mark. Wetland hydrology will occur along these newly constructed riparian wetlands beginning from an elevation of 12 feet up to 13 feet and result in the following water regimes: seasonal flooding, occasional flooding, and saturation only. The riparian wetlands within Area B will be vegetated with native shrub and emergent plantings (Tables 4 and 5) to create palustrine scrub-shrub and emergent wetlands.

B.3.4.3 Area B Riparian Upland Enhancement Area

Additional modifications to the Coweeman River riparian corridor in Area B include approximately 5.34 acres of riparian upland enhancement through the following activities:

- Remove invasive species by tilling and spraying to control undesirable vegetation including reed canarygrass, tansy, Himalayan blackberry, English holly. Bury invasive seed sources and rhizomes with clean cut material from wetland creation activities.
- Install habitat features for amphibians and small mammals including brush piles, downed logs and bird nesting boxes throughout banks and snags within higher elevations along the riparian uplands.

- Re-vegetate the banks of the Coweeman River within Area B and riparian uplands, including upland mounds, with native trees and shrubs, as described in Table 4.

B.3.5 Design Objectives for Area C

Given the baseline conditions present within Area C, the following design objectives for Area C were developed:

- Enhance the existing wetland habitats within Wetlands C and D by removing invasive species and providing additional habitat structure including LWM and additional woody species plantings.
- Create off-channel habitat on the Coweeman River for anadromous fish species by grading down 1 to 4 feet to create a side channel that is inundated during high water flows.
- Create new wetland area composed of PEM habitat in the lower elevations and a PSS and PFO wetland mosaic in the upper elevations of the created wetland area.
- Create forested riparian upland habitat along the banks of the Coweeman River to increase shading in order to reduce temperatures along the Coweeman River.

B.3.6 Post Construction Conditions in Area C

B.3.6.1 Area C Wetland Creation

The Area C design includes 1.74 acres of wetland creation, 1.02 acres of rehabilitation, and 0.36 of wetland enhancement within Wetlands C and D (**Figures B-4J and B-4K**). Wetland creation will occur by grading down the south bank of the Coweeman River, north of Wetland C, to construct a shallow, seasonally flooded backwater channel that extends south towards Wetland D. The grading design for this new wetland preserves the existing hydroperiods for Wetlands C and D; however, it will effectively expand the Wetland C unit by approximately 173 percent and provide an outlet for fish since the current wetland will strand fish that enter during high flow events.

Water surface elevations and flow transfers between the Area C wetland creation and Coweeman River were modeled to determine the site grading elevations and new Wetland C outlet design to predict wetland hydrology and post-construction hydroperiods while preventing fish stranding. Modeling indicates that the Coweeman River stage height for Area C rises above an elevation of 10 feet NADV88 when flow within the river reaches approximately 1,500 cubic feet per second. Flow-duration analyses for the Coweeman River indicates that this flow occurs between 5 to 15 percent of the time between November to March and less than 1 percent of the time from April to October (**Figures B-14 through B-15**). The new Wetland C outlet will be at an elevation of 10 feet to allow surface flow from the Coweeman River into the newly created Wetland C during these months. The wetland boundary will extend up to an elevation of 13 feet, which modeling indicates will provide inundation or saturation sufficient to meet wetland hydrology standards. The post-construction Wetland C hydroperiod will include three water regimes within the

expanded Wetland C unit: saturated only, seasonally flooded, and the permanent flowing stream adjacent to the wetland.

The wetland creation area will be re-vegetated with native woody and emergent plantings (Table 4 and 5) to create palustrine emergent, scrub-shrub and forested vegetation communities over time. Habitat features, such as LWM and brush piles within the wetland area and LWM within the interior channel will provide cover and refuge for juvenile salmonids which will use this habitat area for foraging as well as flood refuge and refuge during periods of juvenile outmigration.

B.3.6.2 Area C Wetland Enhancement and Rehabilitation

The existing 1.39 acres constituting Wetland C and D will be enhanced and rehabilitated through a combination of activities, including:

- Eliminate cattle from the wetland areas which are currently browsing the emergent species within the wetland and contributing to nutrient and pollutant loading.
- Install native woody plantings (Table 5) within the existing emergent areas of Wetland C and D, which currently are dominated by reed canarygrass, in order to expand the existing palustrine scrub-shrub and forested wetland communities over time.
- Perform invasive species management along the perimeter of Wetlands C and D to control undesirable invasive species, including reed canarygrass, English ivy, Himalayan blackberry, and English holly.
- Increase the frequency of overbank flooding into Area C and restore floodplain wetland dynamics through the construction of a seasonal channel within the Area C wetland creation area.

Through the proposed wetland creation, rehabilitation, and enhancement measures described above, we expect Wetland C to increase from a Category III wetland to a Category II wetland with a total wetland rating score of 59 points. This represents a 14 point lift in function. Wetland enhancement measures for Wetland D are expected to increase the rating for this wetland, following construction, from a Category III wetland to a Category II wetland with a total score of 60 points. This represents an 18 point lift in wetland functions.

B.3.6.3 Area C Riparian Upland Enhancement

Soil removed from the site during grading to construct the Area C wetland creation area will be placed in uplands along the south bank of the Coweeman River in Area C, north of Wetland D (**Figure B-4J**). Additional modifications to the Coweeman River riparian corridor in Area C include approximately 3.59 acres of riparian upland enhancement through the following activities:

- Perform invasive species management to control undesirable vegetation, including reed canarygrass, English ivy, Himalayan blackberry, and English holly.
- Install habitat features, including LWM and bird nest boxes throughout the interior side slopes of the upland enhancement areas where it meets the wetland creation area.

- Revegetate the south bank of the Coweeman River within Area C with native trees and shrubs to create an upland riparian forest that provides shading to the Coweeman River as well as the created wetland habitat.

B.4 Bank Site Design Summary

The Bank site design accomplishes many of the restoration objectives for wetland and fish habitat within the Cowlitz and Coweeman River Watersheds as well as the broader Lower Columbia River Watershed, as defined in local watershed management plans and put forth in the project's basis of design report. A summary of the projects expected conditions post-construction is as follows:

- The Bank design addresses specific elements within the Salmon Recovery Plan (LCFRB 2010) such as protecting and restoring habitat types critical and beneficial to anadromous fish including the 208.70 acres of lowland forest preservation, of which 174.01 acres is priority old growth forest providing shading and food chain support to 5 tributaries to the Coweeman River. The bank project also addresses the limiting factors within the Cowlitz and Coweeman Watersheds as identified by the Salmon Recovery Plan which include the loss of floodplain habitat and connectivity of wetlands and other aquatic habitats used by anadromous fish, and the increase of river temperatures as a result of clearing the floodplain, riparian corridors and headwaters of the river systems.
- With the completion of Phase 1 of the Bank, the project will have created 21.33 acres of new wetland area, rehabilitated 14.68 acres of existing wetland area, enhanced 14.53 acres of existing wetland area and preserved 8.44 acres of existing wetland area. The wetlands are located within a 14-digit HUC characterized within the Lower Columbia River Recovery Plan's Integrated Watershed Assessment as being locally impaired for hydrology, locally impaired for sediment conditions, and fully impaired for riparian functions (LCFRB 2010).
- The project's restoration activities will result in improvements to the following priority attributes that benefit Coweeman River Chinook, chum, and coho salmon, as defined within the Recovery Plan:
 - Flow: Minor grading to improve surface water connectivity between Wetland A and the tributaries will provide access to cool, permanent flow within the hillside area for forage and rearing of juvenile fish within Area A during low-water periods.
 - Habitat Diversity: The Bank includes in-river attraction points and refuge points with habitat features to provide a variety of in stream habitat improvements for juvenile and adult salmonids. Newly created off-channel habitat in Areas B and C provide additional off-channel habitat to the system for juvenile salmonids. Improvements to the Wetland A outlet channel and creation of the Area A alcove will provide additional refuge, rearing and potential spawning habitat and increase fish passage for juvenile salmonids into Wetland A.

- Sediment Loading: Re-grading the banks along the Coweeman River and the installation of native woody vegetation and LWM will provide improved channel stability.
 - Temperature: The Bank will preserve cold water tributary sources to Wetland A and the Coweeman River. Additionally, through the wetland and riparian upland plantings, a forested riparian corridor will establish over time and provide increased shading to the existing and created wetland areas and the outlet tributary to maintain cold water temperatures in those aquatic areas.
- In addition to addressing limiting factors for salmonids, the Bank site activities will also provide numerous benefits to terrestrial species including amphibians, reptiles, birds, and both small and large mammals. The Bank will provide a diverse collective of different habitats types utilized by terrestrial species including in-stream, riparian, forested, scrub-shrub, and emergent wetland, and old growth forest and well-developed second growth forest which connects to offsite, rural forested areas that encompass thousands of undeveloped acres. Together these elements provide significant, diverse and interconnected macro and micro habitat opportunities not only for fish, but other wildlife, and the proximity of all these habitat types allows species to utilize them for multiple life stages and/or life cycles providing an important ecological linkage lacking in the watershed.

B.5 Site Construction Details

B.5.1 Construction Timing

The construction of the Bank project is being planned in two stages and will occur as follows:

1. The first stage will take place in the late summer and fall of the project development year and will include vegetation management to control invasive species and all grading activities across the site for Areas A, B and C, including rerouting of the Wetland A outlet, alcove creation, wetland creation, riparian bench habitat creation, overflow notch creation and installation of new crossings and large woody material in wetlands and along the Coweeman River. The site will be seeded with native grasses and erosion control measures put in place for the winter.
2. The second stage will take place the following spring after completion of the first stage and include the planting of all trees and shrubs and emergent plug plantings as well as the installation of any remaining habitat features.

All aspects of the development process will be documented in as-built reports submitted to the IRT after construction activities are completed.

B.5.2 Implementation Schedule

The following schedule will be implemented for the Bank site construction activities. Seasonal restrictions, and the in-water work window for the Coweeman River (August 1-

September 30) will be observed. Some activities may overlap or be performed concurrently with other activities:

Stage 1:

- Remove livestock from the property
- Mobilize and store all erosion control and soil stabilization products onsite
- Mow areas if necessary and spray/scalp reed canarygrass. Spray all blackberry patches.
- Survey and stake construction grading areas and planting areas. Clearly designate easements and cultural resource areas to be avoided.
- Install silt fencing, wattles or other erosion control measures in designated areas
- Strip all vegetation from wetland creation areas. Bury any fill left on site containing reed canarygrass rhizomes under up to two feet of clean fill material.
- Pull back portions of the Coweeman River bank per the plan to create riparian wetlands. Place material in the riparian upland areas and bury any material with reed canarygrass rhizomes.
- Grade Wetland A overflow Notch in conjunction with riparian bench habitat creation in Area A
- Excavate material at mouth of Tributary 1 and Wetland A outlet to create the alcove on the Coweeman River.
- Create new Wetland A outlet stream including new crossing for utility and access. Install LWM and stream gravels to create fish passable stream channel per specifications. Isolate stream flows from work area if present.
- Place gravel in Wetland A outlet and alcove along Coweeman River. Excavate material at mouths of Tributaries 2 and 5 in Wetland A to reconnect tributaries to wetland, place stream gravels in new stream channels. Isolate stream flows from work areas if present.
- Remove old Wetland A culvert, direct outlet into new channel and re-contour old outlet.
- Remove and replace Tributary 1 crossing culvert with WDFW approved culvert.
- Remove car bodies and other material from Coweeman River and dispose of offsite.
- Place and anchor LWM including downed logs, perch poles, apex bar jam and anchored wood and root wads across site.
- Grade and smooth all fill areas. Plant with native seed mix and erosion control mix according to specifications.
- Seed soil disposal areas
- Remove erosion control features including silt fencing once ground cover has been established per the NPDES permit.

Stage 2:

- Install all emergent, shrub and tree plantings in areas A, B and C.
- Install vole protection on all trees and shrubs.
- Install remaining habitat features such as bird nest boxes.
- Clean site and remove any remaining erosion control or unnecessary staking or marking material.

B.5.3 Erosion Control

Temporary erosion and sediment control (TESC) best management practices (BMPs) will be implemented prior to construction in accordance with the National Pollutant Discharge Elimination System permit to be obtained for the project and the site-specific Stormwater Pollution Prevention Plan developed for the project. TESC BMPs implemented during construction of the Bank site will include brightly marking all grading limits and stabilizing the construction site access roads, which includes the existing access road from the west to Areas A and C, as well as a second temporary access road from the north through an easement on the Wharton property to Area B. Silt fencing or straw wattles will be installed along the downstream, waterward edge of construction where site grading approaches the river and stream.

A combination of floating sediment curtains, temporary hay bales dams, and timing restrictions (e.g., grading to occur during periods of low water during the approved in-water work window) will be implemented to minimize and control any sediment from entering the river or erosion during site grading along the banks of the Coweeman River. The relocation of excavated material from wetland creation areas is minimized by locating naturally shaped fill areas within riparian upland enhancement areas and naturally shaped stockpiles placed adjacent to the Areas A and B. A temporary stream bypass may be installed during the realignment and restoration of the Wetland A outlet ditch. Sand bags, aboveground pipes, and pumps may be necessary to isolate this work area during construction. Flows will be diverted around the work area if present in the stream channel re-contouring locations by constructing temporary sand bag dams. Other TESC BMPs include maintaining a supply of straw/hay bales, extra silt fencing, straw wattles, erosion control blankets, and keeping a spill control kit onsite in case of an emergency.

B.5.4 Culvert Replacement

An existing 36-inch CMP culvert for Tributary 1 and an 18-inch CMP culvert for the Wetland A Outlet Channel will be replaced with new crossings based on the WDFW Water Crossing Design Guidelines (Barnard and others 2013). The final crossings will meet WDFW fish passage requirements and will provide access to the site during the Bank establishment phase and subsequent maintenance and monitoring visits during the life of the project. Both crossings are in the fiber optic right-of-way and also protect the fiber conduit. The crossing on the Wetland A Outlet is also within a natural gas pipeline and the culvert replacement will take in to account the buried pipeline. Culvert removal and replacement construction techniques will follow the guidance detailed in the 2008 Corps *Programmatic Biological Assessment for Restoration Actions in Washington State*.

B.5.5 Signage

Signage stating ‘protected area’ or similar wording will be added to all potential Bank site access points such as where abandoned logging roads enter the property. Sign locations and wording will be coordinated with the City of Kelso and the IRT and will be provided in the as-built report.

B.5.6 Site Maintenance

General site maintenance will be performed throughout the Bank project to address conditions that may limit the success of the Bank and attainment of the performance standards and objectives described in Appendix C. Anticipated maintenance activities fall into two main categories and include, but are not limited to, vegetative maintenance and general maintenance. Vegetative maintenance includes such activities as watering, replanting failed plants to meet performance standards, repairing any areas subject to erosion, controlling invasive plants, mowing, and deterring herbivores such as voles, beaver, elk, and deer. Spraying weeds at the base of trees and shrubs to discourage voles and root competition may occur for up to two years following planting. General maintenance activities include: re-installing signage, maintaining nest boxes, and removing garbage and maintaining fencing. All maintenance activities will be documented in project monitoring reports.

B.5.7 Invasive Species Control

Weed control will occur as needed, throughout the growing season, and will target Reed canarygrass (*Phalaris arundinacea*), Himalayan blackberry (*Rubus armeniacus*), any invasive knotweed, and any other non-native invasive species that attempt to colonize the site. Japanese knotweed (*Polygonum cuspidatum*), English ivy (*Hedera helix*), and purple loosestrife (*Lythrum salicaria*) will be immediately eradicated if found on the site. Invasive control will follow methods recommended by the Cowlitz County Noxious Weed Board. Invasive plants will be controlled by repeated spraying of a Washington State Department of Agriculture approved herbicide. Weed control will occur prior to planting, and will continue throughout the Bank Establishment Period and into the Long Term Management and Maintenance Phase of the Bank. Weed control methods will include hand pulling and spot spraying and weed wiping with appropriate herbicides according to the species and Washington Department of Agriculture regulations.

B.5.8 Construction Inspection and Monitoring

All BMPs shall be inspected, maintained, and repaired as needed to assure continued performance of their intended function. Site inspections shall be conducted by a person who is knowledgeable in the principles and practices of erosion and sediment control. This person has the necessary skills to assess the site conditions and construction activities that could impact the quality of stormwater, and assess the effectiveness of erosion and sediment control measures used to control the quality of stormwater discharges.

- A Certified Erosion and Sediment Control Lead shall be onsite or on-call at all times.
- Whenever inspection and/or monitoring reveals that the BMPs identified in the SWPPP are inadequate, due to the actual discharge of or potential to discharge a significant amount of any pollutant, appropriate BMPs or design changes shall be implemented as soon as possible.

B.5.9 Maintaining an Updated Construction SWPPP

- The Storm Water Pollution Prevention Plan (SWPPP) shall be retained onsite or within reasonable access to the site.
- The SWPPP shall be modified whenever there is a change in the design, construction, operation or maintenance at the construction site that has, or could have, a significant effect on the discharge of pollutants to waters of the state.
- The SWPPP shall be modified if, during inspections or investigations conducted by the owner/operator, or the applicable local or state regulatory authority, it is determined that the SWPPP is ineffective in eliminating or significantly minimizing pollutants in stormwater discharges from the site. The SWPPP shall be modified as necessary to include additional or modified BMPs designed to correct problems identified. Revisions to the SWPPP shall be completed within seven (7) days following the inspection.

References

Archeological Investigations Northwest, Inc. (AINW). 2013. *Archeological survey for the Coweeman River Mitigation Bank Project, Cowlitz County, Washington, Draft: Report prepared by Archeological Investigations Northwest, Inc., Portland, Oreg., no. 3200, for Habitat Bank, LLC, Kirkland, Wash., December 23.*

Barnard, R.J., Johnson, J., Brooks, P., Bates, K.M., Heiner, B., Klavas, J. P., Ponder, D.C., Smith, P.D., and Powers, P.D. 2013. *Water Crossings Design Guidelines*. Washington Department of Fish and Wildlife. Olympia, Washington, available: <http://wdfw.wa.gov/hab/ahg/culverts.htm>.

Brinson, M.M., 1993. *A Hydrogeomorphic Classification for Wetlands*, prepared for U.S. Army Corps of Engineers, Waterways Experiment Station, Technical Report WRP-DE-4, 101 p.

Cowardin, L.M., Carter, V., Golet, F.C., and LaRoe, E.T. 1979. *Classification of Wetlands and Deepwater Habitats of the United States*: Washington, D.C., U.S. Dept. of the Interior, Fish and Wildlife Service, Report FWS/OBS-79/31, 131 p.

- Department of Natural Resources. 2002. *Forest Practices Board Manual*, Section 13 Guidelines for determining fish use for the purpose of typing waters under WAC 222-16-031. February. Available: http://www.dnr.wa.gov/Publications/fp_board_manual_section13.pdf
- Ecological Land Services, Inc. (ELS). 2014a. *Baseline Conditions Report for the Coweeman Mitigation Bank, Kelso, Washington*: Report prepared by ELS, Longview, Washington for Habitat Bank, LLC, Kirkland, Washington. September.
- Ecological Land Services, Inc. (ELS), 2014b, *Addendum to the Existing Conditions Report for the Coweeman Mitigation Bank*. Memorandum prepared by ELS, Longview, Washington for Habitat Bank, LLC, Kirkland, Washington. November.
- Hruby, Thomas, 2004, *Washington State Wetland rating System for Western Washington-Revised*: Olympia, Wash., Washington State Department of Ecology, Publication no. 04-06-25, 126 p., available: <http://www.ecy.wa.gov/biblio/0406025.html>.
- Lower Columbia Fish Recovery Board (LCFRB), 2010, *Washington Lower Columbia salmon recovery and fish and wildlife subbasin plan, chapter H – Coweeman Subbasin*: Longview, Washington. Lower Columbia Fish Recovery Board, May, Accessed online at: http://media.wix.com/ugd/810197_9fd7123ad9094af9a3b37ebdc656f789.pdf
- Shannon & Wilson, Inc. (S&W), 2014, *Geologic Assessment of Coweeman Mitigation Bank, Kelso, Washington: for Habitat Bank, LLC*.
- Shannon & Wilson, Inc. (S&W), 2014, *Revised Coweeman River Mitigation Bank Basis of Design Report, Cowlitz County Washington*. November 31.
- U.S. Army Corps of Engineers. 2008. *Programmatic Biological Assessment Restoration Actions in Washington State*. Revised July 29.
- Washington Department of Fish and Wildlife (WDFW). 2014. *Priority Habitats and Species Mapping*. Accessed October 2014.
http://wdfw.wa.gov/publications/00165/2012_distribution_by_county.xls.

WASHINGTON



SITE

46.136060° Latitude
-122.870817° Longitude

LOCATION MAP

	R 2 W		R 1 W		
T 8 N	6		1	6	
31					36

PROJECT VICINITY MAP

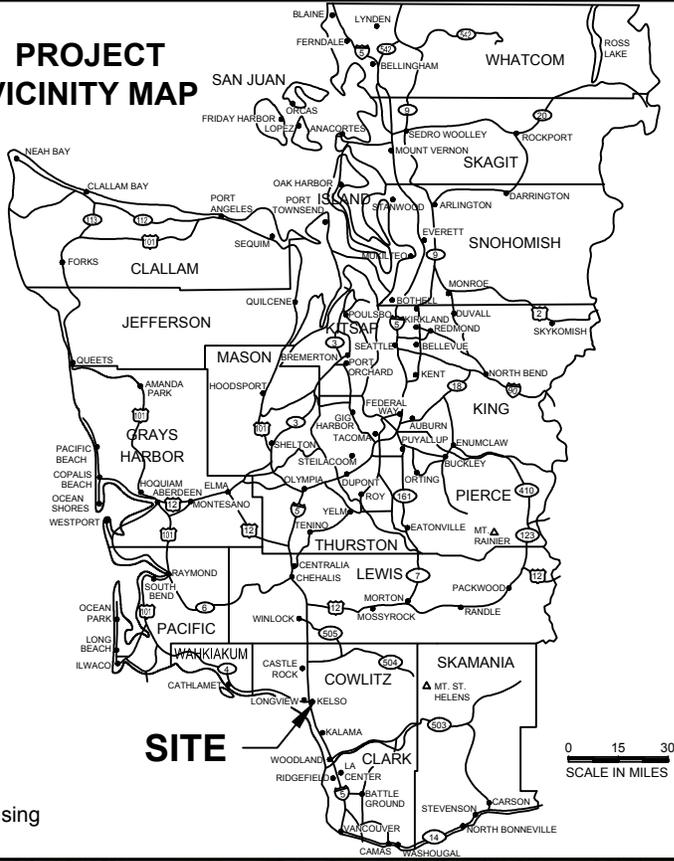
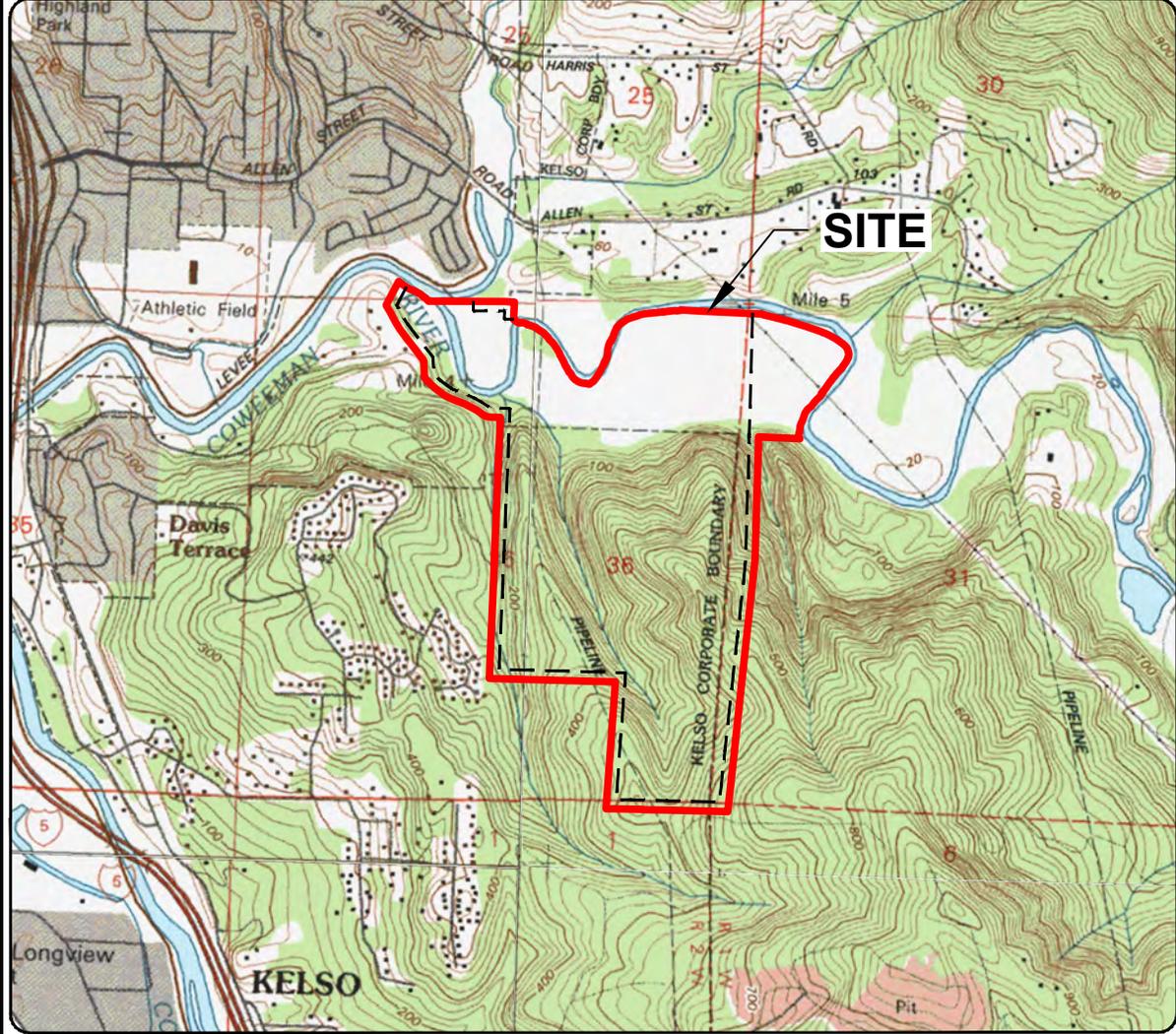


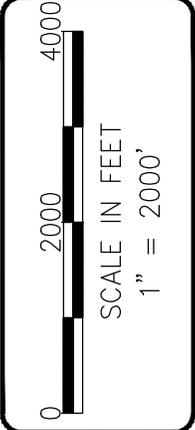
Figure B-1
VICINITY MAP
Coweman Mitigation Bank
Habitat Bank LLC
City of Kelso, Cowlitz County, Washington
Section 31, Township 8N, Range 1W, W.M.
Section 36, Township 8N, Range 2W, W.M.

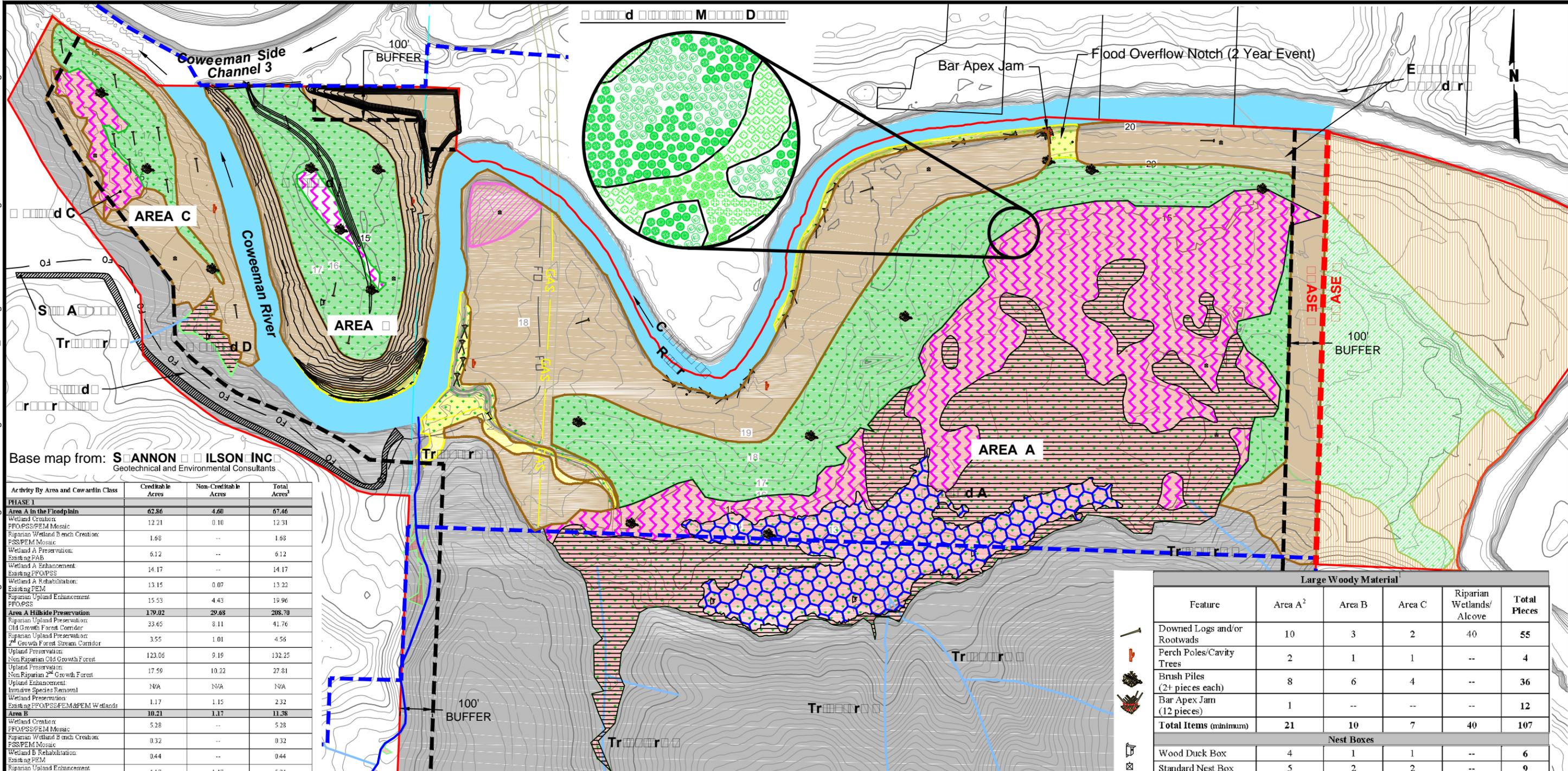
DATE: 9/22/15
DWN: BCB
REQ. BY: ST
PRJ, MGR: ST
CHK:
PROJECT NO:
1209.14

NOTE:
USGS topographic quadrangle map reproduced using
MAPTECH Inc., Terrain Navigator Pro software.



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Base map from: S ANNON I LSON INC
Geotechnical and Environmental Consultants

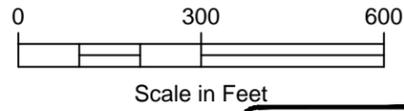
Activity By Area and Cowardin Class	Creditable Acres	Non-Creditable Acres	Total Acres
PHASE 1			
Area A in the Floodplain	62.86	4.60	67.46
Wetland Creation (PFO/PSS/PEM Mosaic)	12.21	0.10	12.31
Riparian Wetland Branch Creation (PSS/PEM Mosaic)	1.68	--	1.68
Wetland A Preservation (Existing PAB)	6.12	--	6.12
Wetland A Enhancement (Existing PFO/PSS)	14.17	--	14.17
Wetland A Rehabilitation (Existing PEM)	13.15	0.07	13.22
Riparian Upland Enhancement (PFO/PSS)	15.53	4.43	19.96
Area A Hillside Preservation	179.02	29.68	208.70
Riparian Upland Preservation (Old Growth Forest Corridor)	33.65	8.11	41.76
Riparian Upland Preservation (2nd Growth Forest Stream Corridor)	3.55	1.01	4.56
Upland Preservation (Non-Riparian Old Growth Forest)	123.06	9.19	132.25
Upland Preservation (Non-Riparian 2nd Growth Forest)	17.59	10.22	27.81
Upland Enhancement (Invasive Species Removal)	N/A	N/A	N/A
Wetland Preservation (Existing PFO/PSS/PEM Wetlands)	1.17	1.15	2.32
Area B	10.21	1.17	11.38
Wetland Creation (PFO/PSS/PEM Mosaic)	5.28	--	5.28
Riparian Wetland Branch Creation (PSS/PEM Mosaic)	0.32	--	0.32
Wetland B Rehabilitation (Existing PEM)	0.44	--	0.44
Riparian Upland Enhancement (PFO/PSS)	4.17	1.17	5.34
Area C	6.18	0.53	6.71
Wetland Creation (PFO/PSS/PEM Mosaic)	1.59	0.15	1.74
Wetland C Rehabilitation (Existing PFO/PSS)	0.95	0.07	1.02
Wetland D Enhancement (Existing PFO/PSS)	0.36	--	0.36
Riparian Upland Enhancement (PFO/PSS)	3.28	0.31	3.59
Floodplain Area Summary (A, B, C)			
Wetland Creation (not including riparian wetland branch)	19.08	0.25	19.33
Riparian Wetland Branch Creation	2.00	--	2.00
Wetland Enhancement	14.53	--	14.53
Wetland Rehabilitation	14.54	0.14	14.68
Wetland Preservation	6.12	--	6.12
Riparian Upland Enhancement	22.98	5.91	28.89
Phase 1 Overall Totals	258.27	35.98	294.25
Coweeman River Total			7.75
PHASE 2			
Area D			18.90
Wetland Creation			8.90
Riparian Upland Enhancement			10.00

¹Total acres includes areas within bank buffer and easements which are non-creditable

LEGEND

	Existing Contour 1'
	Existing Contour 5'
	Bank Site Boundary
	Underground Gas
	Fiber Optic
	Easement
	Existing Wetland
	Stream
	100' Bank Buffer
	Area to Remain Undisturbed

	Riparian Upland Enhancement
	Wetland Creation (PFO/PSS/PEM Mosaic)
	Riparian Wetland Creation (PSS/PEM)
	Existing Wetland/Wetland Enhancement Area
	Hillside Preservation
	Existing PAB Preservation
	Existing PFO/PSS/PEM Enhancement
	Existing PEM Rehabilitation
	City of Kelso Jurisdictional Boundary



DATE: 9/25/15
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Feature	Large Woody Material ¹				Total Pieces
	Area A ²	Area B	Area C	Riparian Wetlands/ Alcove	
Downed Logs and/or Rootwads	10	3	2	40	55
Perch Poles/Cavity Trees	2	1	1	--	4
Brush Piles (2+ pieces each)	8	6	4	--	36
Bar Apex Jam (12 pieces)	1	--	--	--	12
Total Items (minimum)	21	10	7	40	107
Nest Boxes					
Wood Duck Box	4	1	1	--	6
Standard Nest Box	5	2	2	--	9
Total Items (minimum)	9	3	3	--	15

¹Habitat feature locations and amounts may be modified in the field. This table supersedes the amount of LWM pieces shown on the figure(s) and lists the minimum amount of required pieces. Final amounts and locations will be provided in the as-built report.
²Not including riparian wetlands and alcove.

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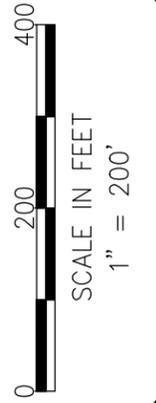
Figure B-2
BANK SITE DESIGN FLOODPLAIN WETLANDS
Coweeman Mitigation Bank
Habitat Bank LLC
City of Kelso, Cowlitz County, Washington
Section 31, Township 8N, Range 1W, W.M.
Section 36, Township 8N, Range 2W, W.M.

Overall Wetland A Restoration Actions	
Action	Results
Remove Livestock	General habitat improvement throughout Wetland A including, soil stabilization, improved water quality in wetland and tributaries, reduced river bank degradation (where livestock access river), and increased vegetation species diversity in Wetland A by allowing grazed species to recover.
Notch Creation and Floodplain Reconnection	Restored hydrologic functions by improving flood storage. Improved water quality in river by trapping sediment and reducing downstream transfer. Improved flood refuge for fish.
Tributary 2 and 5 Reconnection to Wetland A	Improved fish access for refuge and rearing as well as access to cold water inputs during low flows. Improved nutrient and food transport.
Wetland A Outlet Restoration and Relocation	Improved fish access and habitat value to Wetland A, reduce fish stranding in Wetland A, provide flood refuge, rearing habitat and potential spawning habitat for fish.
Addition of Large Woody Material	Added large woody material including downed logs, rootwads, snags, and brush piles creates improved habitat value for amphibians and fish in Wetland A.
Wetland A Restoration Actions Specific to Individual Cowardin Classes	
Action	Results
Enhance Existing PFO Wetland	Invasive species removal in understory and replanting to improve species diversity and increase cover.
Enhance Existing PSS Wetland	Invasive species removal in understory and replanting to improve species diversity and increase cover.
Rehabilitate Existing PEM Wetland	Grade to remove reed canarygrass rhizomes to improve herbaceous species richness. Replant PEM and add PSS and PFO habitat to increase native structural diversity.
Preserve Existing PAB Wetland	Manage and reduce reed canarygrass in and around PAB habitat. Install large woody material including down logs and rootwads for improved fish and amphibian habitat.



 Existing PAB Preservation
 Existing PFO/PSS/PEM Enhancement
 Existing PEM Rehabilitation

NOTE(S):
 1. Outer boundary of Aquatic Bed mapped with hand-held GPS unit. All other boundaries are based on aerial photography and field verification.

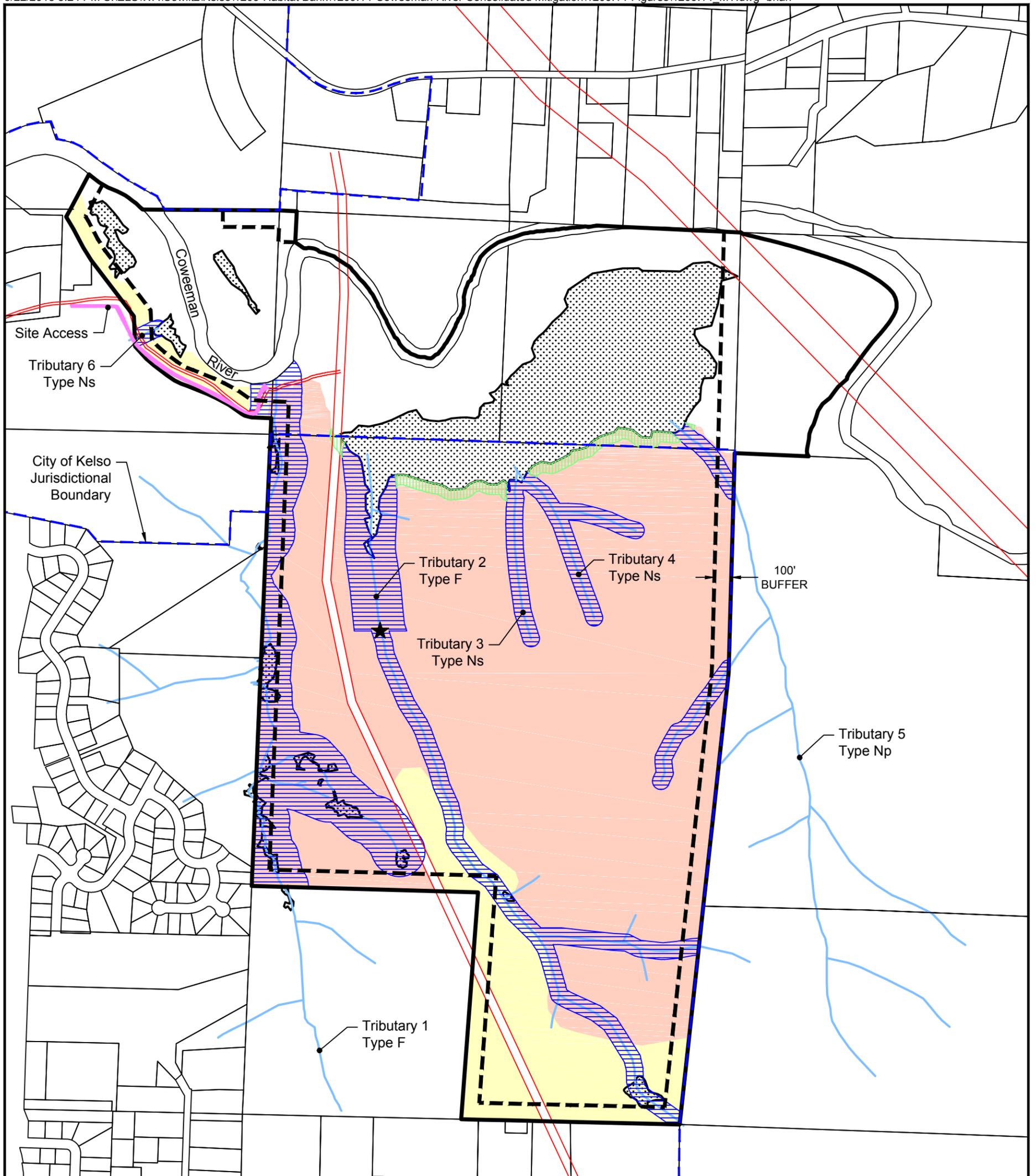


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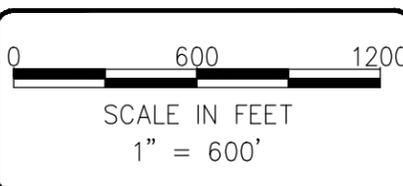
Figure B-2a
WETLAND A RESTORATION DETAILS
 Coweeman Mitigation Bank
 Habitat Bank LLC
 City of Kelso, Cowlitz County, Washington
 Section 31, Township 8N, Range 1W, W.M.



LEGEND:

- Site Boundary
- Existing Wetland
- Taxlot
- WDFW Mapped Old Growth Forest
- Second Growth Forest
- Stream
- Riparian Corridor
- Water Type Change
- Wetland Buffer
- Existing Easement
- 100' Bank Buffer

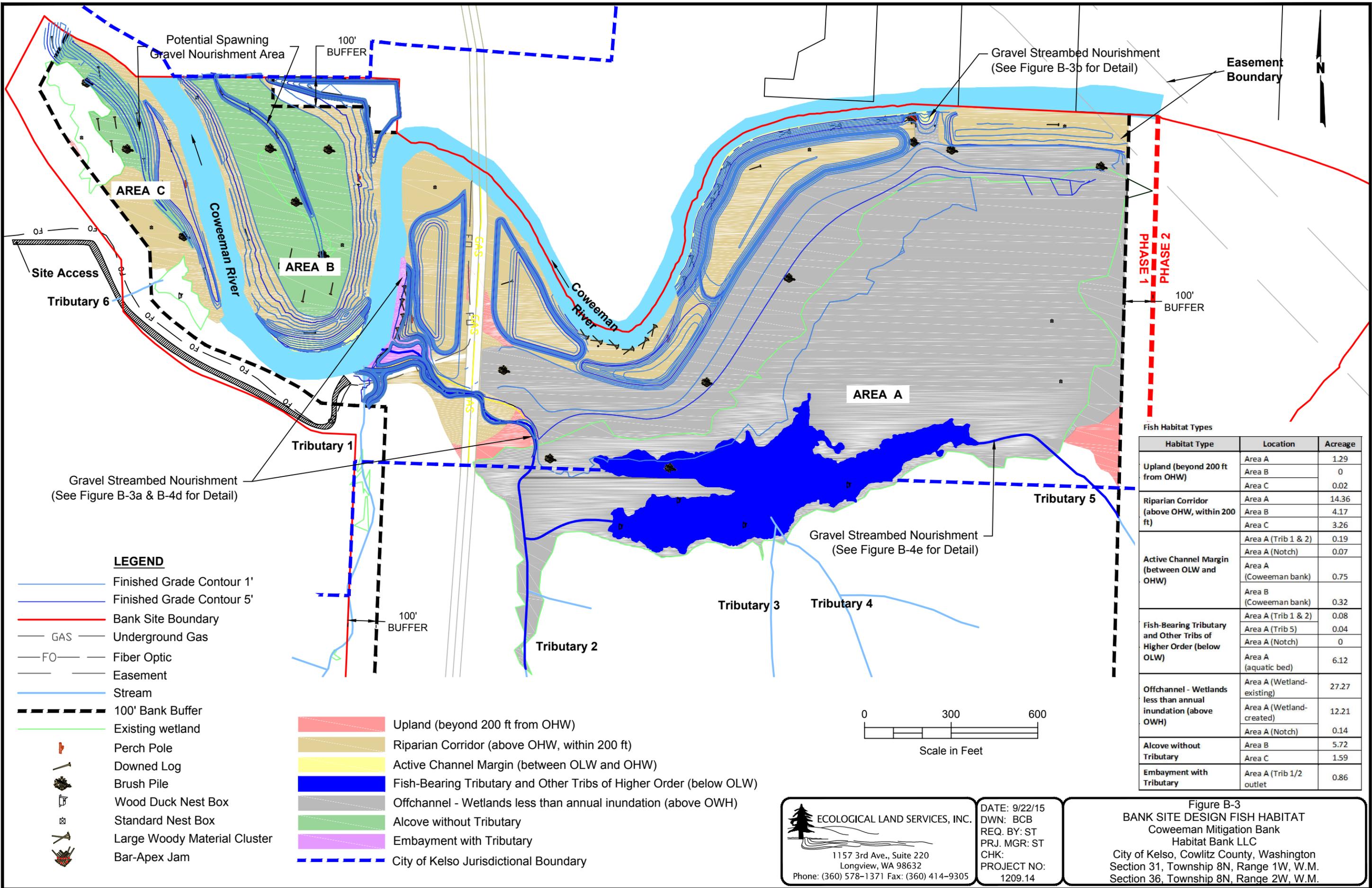
Activity By Area and Cowardin Class	Creditable Acres	Non-Creditable Acres	Total Acres ¹
Area A Hillside Preservation	179.02	29.68	208.70
Riparian Upland Preservation: Old Growth Forest Corridor ²	33.65	8.11	41.76
Riparian Upland Preservation: 2 nd Growth Forest Stream Corridor	3.55	1.01	4.56
Upland Preservation: Non Riparian Old Growth Forest	123.06	9.19	132.25
Upland Preservation: Non Riparian 2 nd Growth Forest	17.59	10.22	27.81
Upland Enhancement: Invasive Species Removal	N/A	N/A	N/A
Wetland Preservation: Existing PFO/PSS/PEM&PEM Wetlands	1.17	1.15	2.32



ECOLOGICAL LAND SERVICES, INC.
 1157 3rd Ave., Suite 220
 Longview, WA 98632
 Phone: (360) 578-1371 Fax: (360) 414-9305

DATE: 9/22/15
 DWN: BCB
 REQ. BY: ST
 PRJ. MGR: ST
 CHK:
 PROJECT NO:
 1209.14

Figure B-2b
BANK SITE HILLSIDE PRESERVATION AREAS
 Coweeman Mitigation Bank
 Habitat Bank LLC
 City of Kelso, Cowlitz County, Washington
 Section 31, Township 8N, Range 1W, W.M.
 Section 36, Township 8N, Range 2W, W.M.

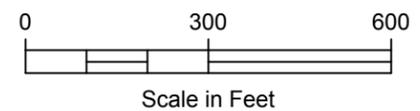


Fish Habitat Types

Habitat Type	Location	Acreage
Upland (beyond 200 ft from OHW)	Area A	1.29
	Area B	0
	Area C	0.02
Riparian Corridor (above OHW, within 200 ft)	Area A	14.36
	Area B	4.17
	Area C	3.26
Active Channel Margin (between OLW and OHW)	Area A (Trib 1 & 2)	0.19
	Area A (Notch)	0.07
	Area A (Coweeman bank)	0.75
	Area B (Coweeman bank)	0.32
Fish-Bearing Tributary and Other Tribs of Higher Order (below OLW)	Area A (Trib 1 & 2)	0.08
	Area A (Trib 5)	0.04
	Area A (Notch)	0
	Area A (aquatic bed)	6.12
Offchannel - Wetlands less than annual inundation (above OWH)	Area A (Wetland-existing)	27.27
	Area A (Wetland-created)	12.21
	Area A (Notch)	0.14
Alcove without Tributary	Area B	5.72
	Area C	1.59
Embayment with Tributary	Area A (Trib 1/2 outlet)	0.86

LEGEND

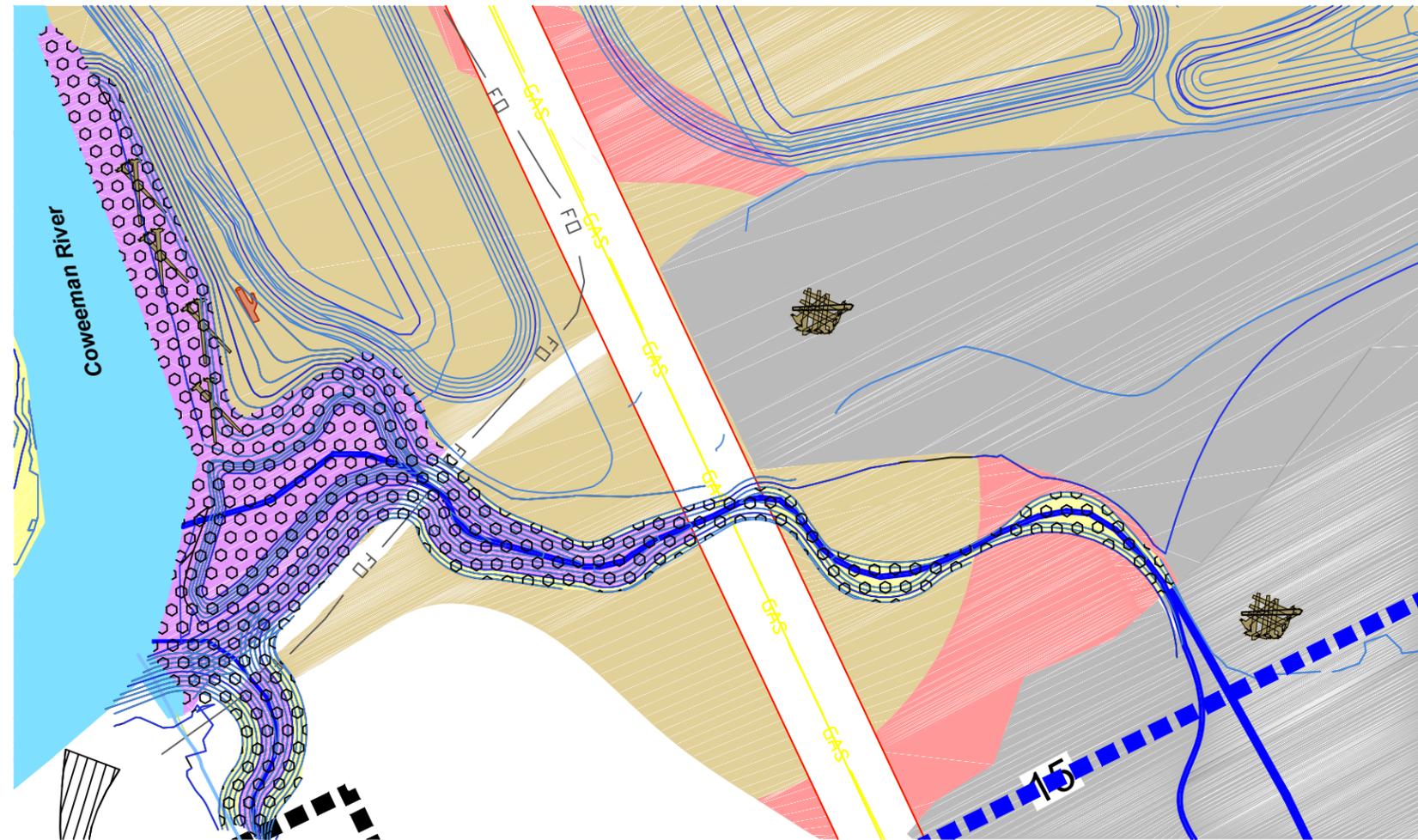
- Finished Grade Contour 1'
- Finished Grade Contour 5'
- Bank Site Boundary
- Underground Gas
- Fiber Optic
- Easement
- Stream
- 100' Bank Buffer
- Existing wetland
- Upland (beyond 200 ft from OHW)
- Riparian Corridor (above OHW, within 200 ft)
- Active Channel Margin (between OLW and OHW)
- Fish-Bearing Tributary and Other Tribs of Higher Order (below OLW)
- Offchannel - Wetlands less than annual inundation (above OWH)
- Alcove without Tributary
- Embayment with Tributary
- City of Kelso Jurisdictional Boundary
- Perch Pole
- Downed Log
- Brush Pile
- Wood Duck Nest Box
- Standard Nest Box
- Large Woody Material Cluster
- Bar-Apex Jam



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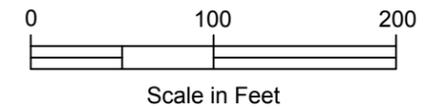
DATE: 9/22/15
 DWN: BCB
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 PRJ. MGR: ST
 CHK:
 PROJECT NO:
 1209.14

Figure B-3
BANK SITE DESIGN FISH HABITAT
 Coweeman Mitigation Bank
 Habitat Bank LLC
 City of Kelso, Cowlitz County, Washington
 Section 31, Township 8N, Range 1W, W.M.
 Section 36, Township 8N, Range 2W, W.M.



LEGEND

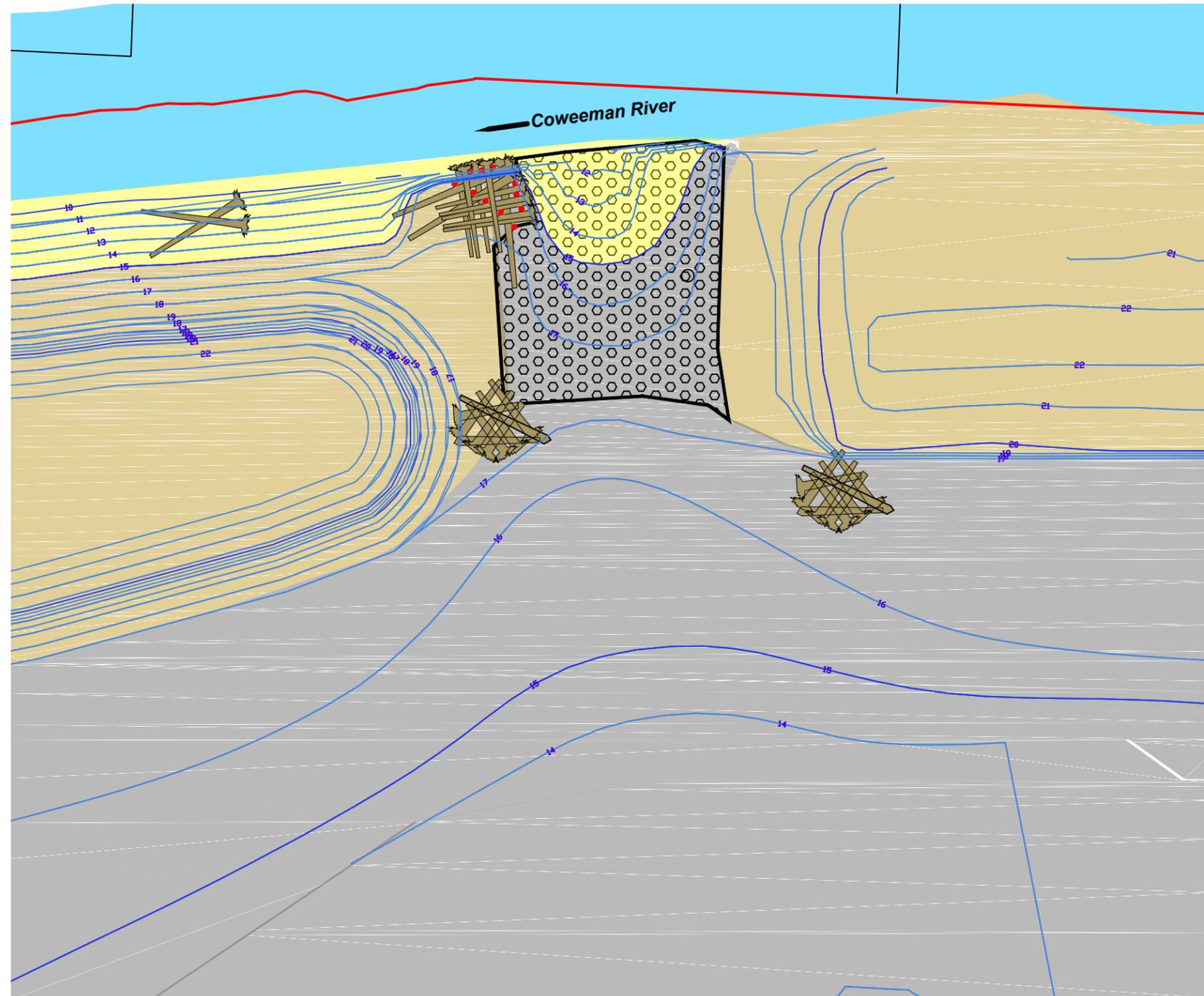
- Finished Grade Contour 1'
- Finished Grade Contour 5'
- Bank Site Boundary
- GAS — Underground Gas
- FO — Fiber Optic
- Easement
- Stream
- 100' Bank Buffer
- Perch Pole
- Downed Log
- Brush Pile
- Wood Duck Nest Box
- Standard Nest Box
- Large Woody Material Cluster
- Bar-Apex Jam
- City of Kelso Jurisdictional Boundary
- Upland (beyond 200 ft from OHW)
- Riparian Corridor (above OHW, within 200 ft)
- Active Channel Margin (between OLW and OHW)
- Fish-Bearing Tributary and Other Tribs of Higher Order (below OLW)
- Offchannel - Wetlands less than annual inundation (above OHW)
- Alcove without Tributary
- Embayment with Tributary
- Gravel Streambed Nourishment



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 PRJ. MGR: ST
 CHK:
 PROJECT NO:
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Figure B-3a
FISH HABITAT EMBAYMENT DETAIL
 Coweeman Mitigation Bank
 Habitat Bank LLC
 City of Kelso, Cowlitz County, Washington
 Section 31, Township 8N, Range 1W, W.M.
 Section 36, Township 8N, Range 2W, W.M.



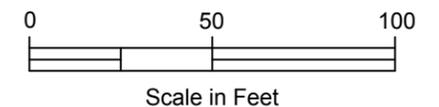
LEGEND

- Finished Grade Contour 1'
- Finished Grade Contour 5'
- Bank Site Boundary
- GAS — Underground Gas
- FO — Fiber Optic
- Easement
- Stream
- 100' Bank Buffer
- Perch Pole
- Downed Log
- Brush Pile
- Wood Duck Nest Box
- Standard Nest Box
- Large Woody Material Cluster
- Bar-Apex Jam

- Upland (beyond 200 ft from OHW)
- Riparian Corridor (above OHW, within 200 ft)
- Active Channel Margin (between OLW and OHW)
- Fish-Bearing Tributary and Other Tribs of Higher Order (below OLW)
- Offchannel - Wetlands less than annual inundation (above OHW)
- Alcove without Tributary
- Embayment with Tributary
- Gravel Streambed Nourishment

NOTE

Excavate low flow channel into seasonally flooded area in Wetland A per direction in the field.

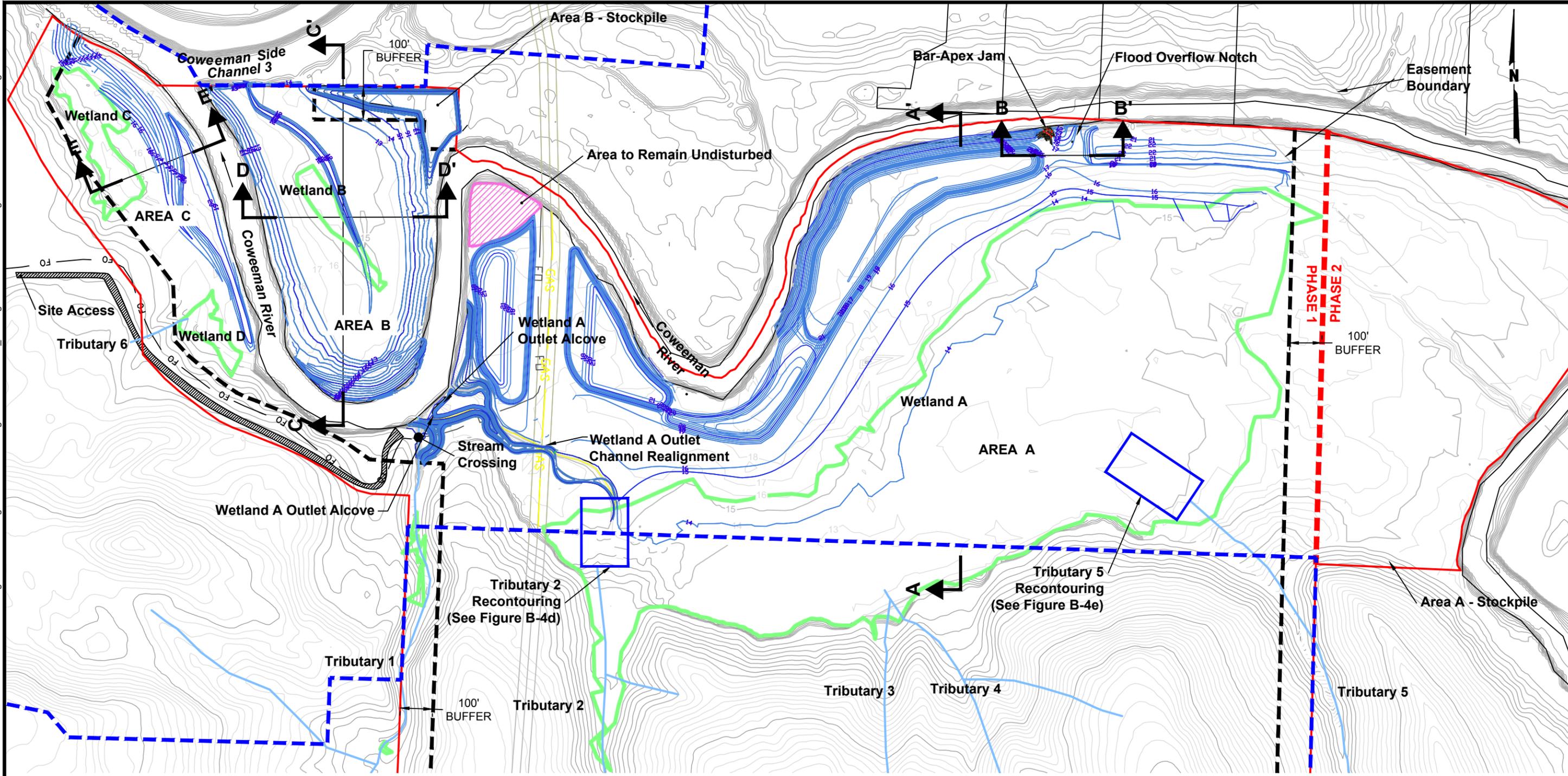


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 DWN: BCB
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 PROJECT NO:
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Figure B-3b
 FISH HABITAT NOTCH DETAIL
 Coweeman Mitigation Bank
 Habitat Bank LLC
 City of Kelso, Cowlitz County, Washington
 Section 31, Township 8N, Range 1W, W.M.
 Section 36, Township 8N, Range 2W, W.M.

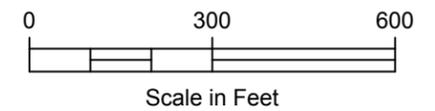
Filename: S:\ELSWA\Cowlitz\Kelso\Habitat Bank\1209_14-Coweeman River Consolidated Mitigation\1209_14-Figures\SW Final Design\21-1-12444-003_Grading & Habitat Site Plan.dwg
 Date: 09-22-2015
 Login: brian



LEGEND

- Existing Contour 1'
- Existing Contour 5'
- Bank Site Boundary
- 100' Bank Buffer
- Stream
- Finished Grade Contour 1'
- Finished Grade Contour 5'
- Underground Gas
- Fiber Optic
- Easement
- Existing Wetland
- Area to Remain Undisturbed
- City of Kelso Jurisdictional Boundary

Area	Cut	Fill	Balance	
A	59,129	59,129	(0)	Fill to remain onsite within riparian upland planting mounds
B	41,844	7,032	34,812	Fill to remain onsite within upland areas and any additional material will be exported offsite
C	4,991	3,182	1,809	Material to be exported offsite
D	TBD	TBD	TBD	Material to be exported offsite
Totals	105,964	69,343	36,620	

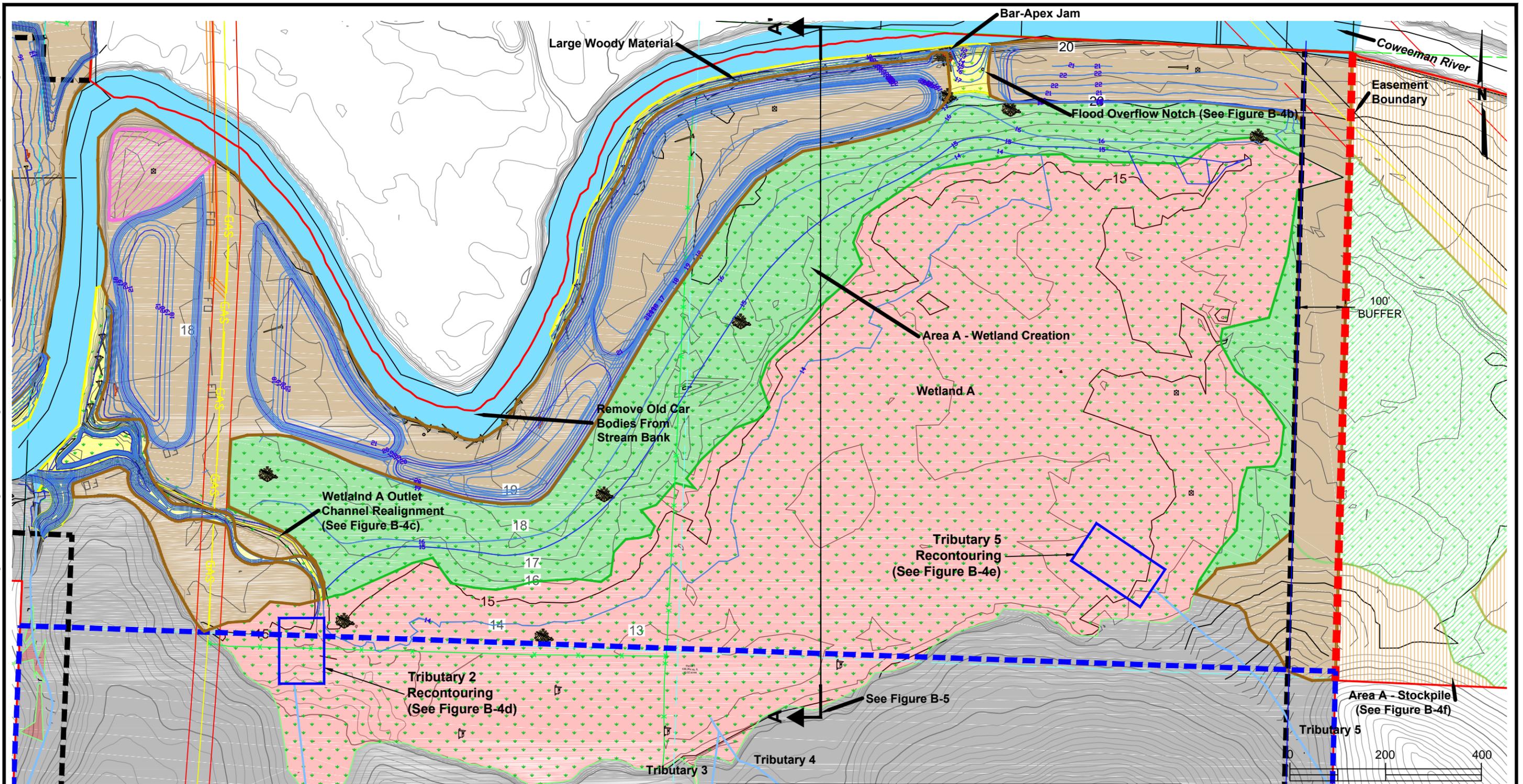


Coweeman Mitigation Bank
 Habitat Bank, LLC
 Kelso, Washington

**BANK SITE DESIGN
 GRADING OVERVIEW**

November 2014
21-1-12444-004

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants
FIG. B-4



LEGEND

- Existing Contour 1'
- Existing Contour 5'
- Finished Grade Contour 1'
- Finished Grade Contour 5'
- Wetland
- Stream
- 100' Bank Buffer
- Area to Remain Undisturbed
- Bar-Apex Jam
- Riparian Upland Enhancement
- Wetland Creation
- Riparian Wetland Creation
- Existing Wetland/Wetland Enhancement Area
- Preservation
- City of Kelso Jurisdictional Boundary

Activity By Area and Cowardin Class	Creditable Acres	Non-Creditable Acres	Total Acres ¹
Area A in the Floodplain	62.86	4.60	67.46
Wetland Creation:			
PFO/PSS/PEM Mosaic	12.21	0.10	12.31
Riparian Wetland Bench Creation:			
PSS/PEM Mosaic	1.68	--	1.68
Wetland A Preservation:			
Existing PAB	6.12	--	6.12
Wetland A Enhancement:			
Existing PFO/PSS	14.17	--	14.17
Wetland A Rehabilitation:			
Existing PEM	13.15	0.07	13.22
Riparian Upland Enhancement:			
PFO/PSS	15.53	4.43	19.96

Scale in Feet

Coweeman Mitigation Bank
Habitat Bank, LLC
Cowlitz County, WA

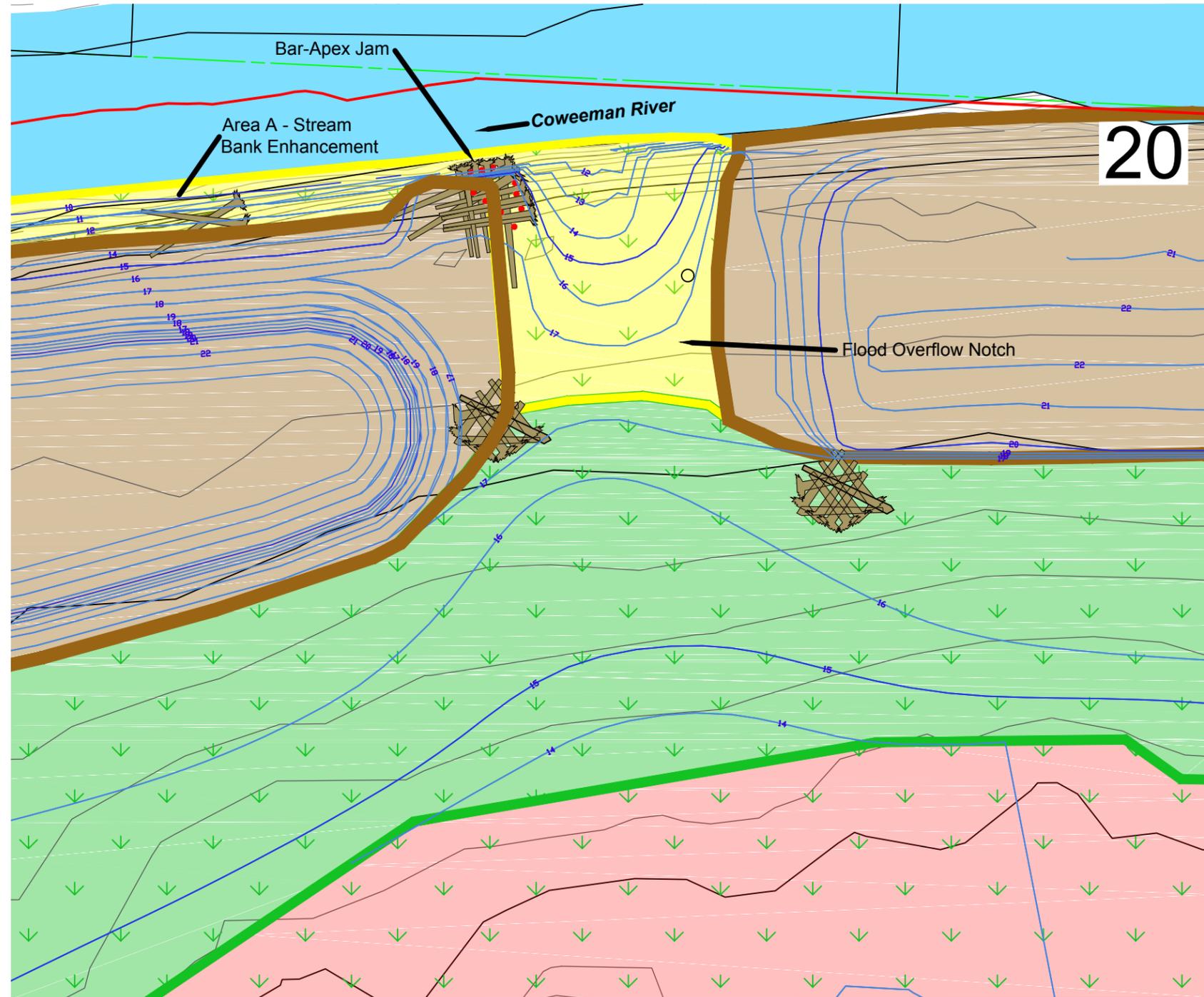
AREA A SITE PLAN

November 2014

21-1-12444-004

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. B-4A

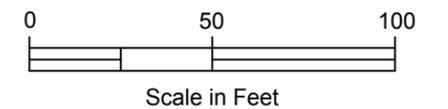


LEGEND

- Existing Contour 1'
- Existing Contour 5'
- Finished Grade Contour 1'
- Finished Grade Contour 5'
- Wetland
- Stream
- 100' Bank Buffer
- Bar-Apex Jam
- Riparian Upland Enhancement
- Wetland Creation
- Riparian Wetland Creation
- Existing Wetland/Wetland Enhancement Area
- City of Kelso Jurisdictional Boundary

NOTE

Excavate low flow channel into seasonally flooded area in Wetland A per direction in the field.



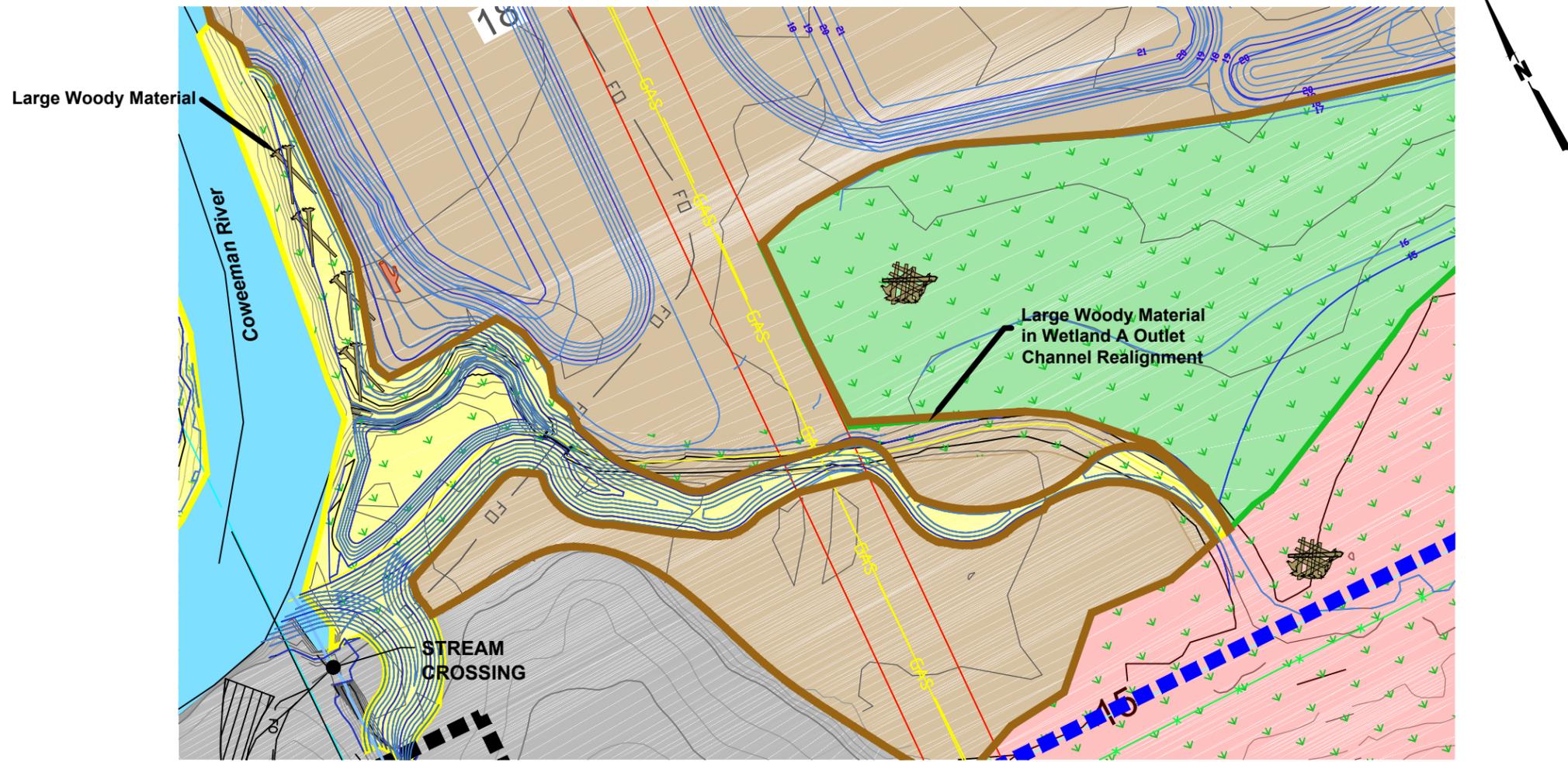
Coweeman Mitigation Bank
Habitat Bank, LLC
Cowlitz County, WA

FLOOD OVERFLOW NOTCH DETAIL

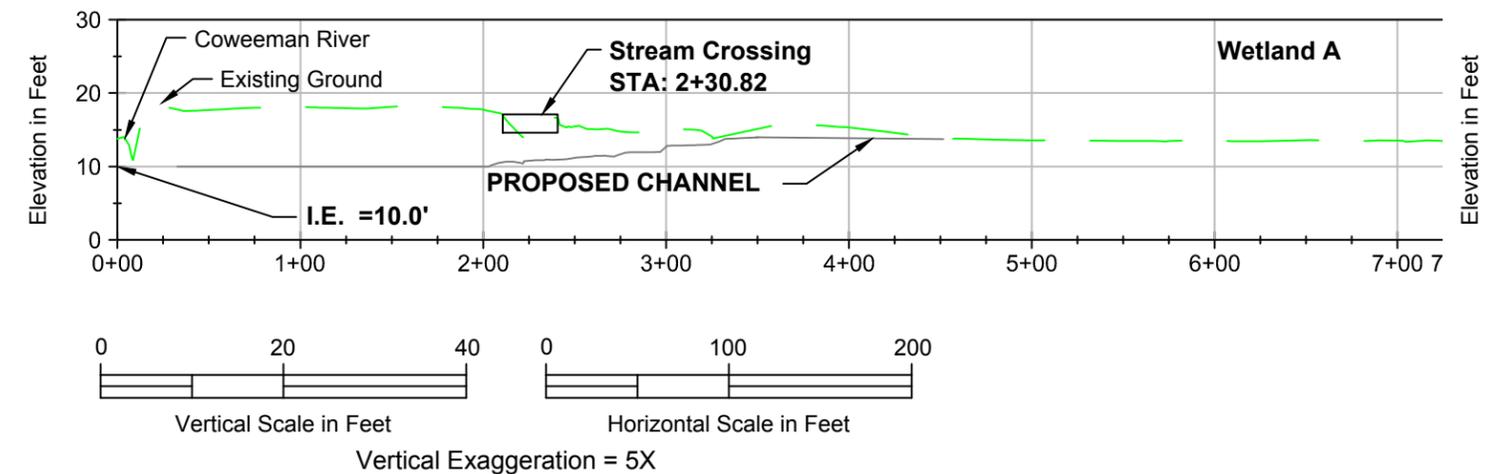
November 2014 21-1-12444-004

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FIG. B-4B



PLAN



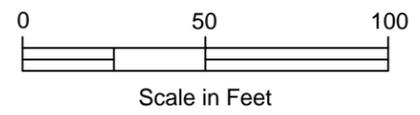
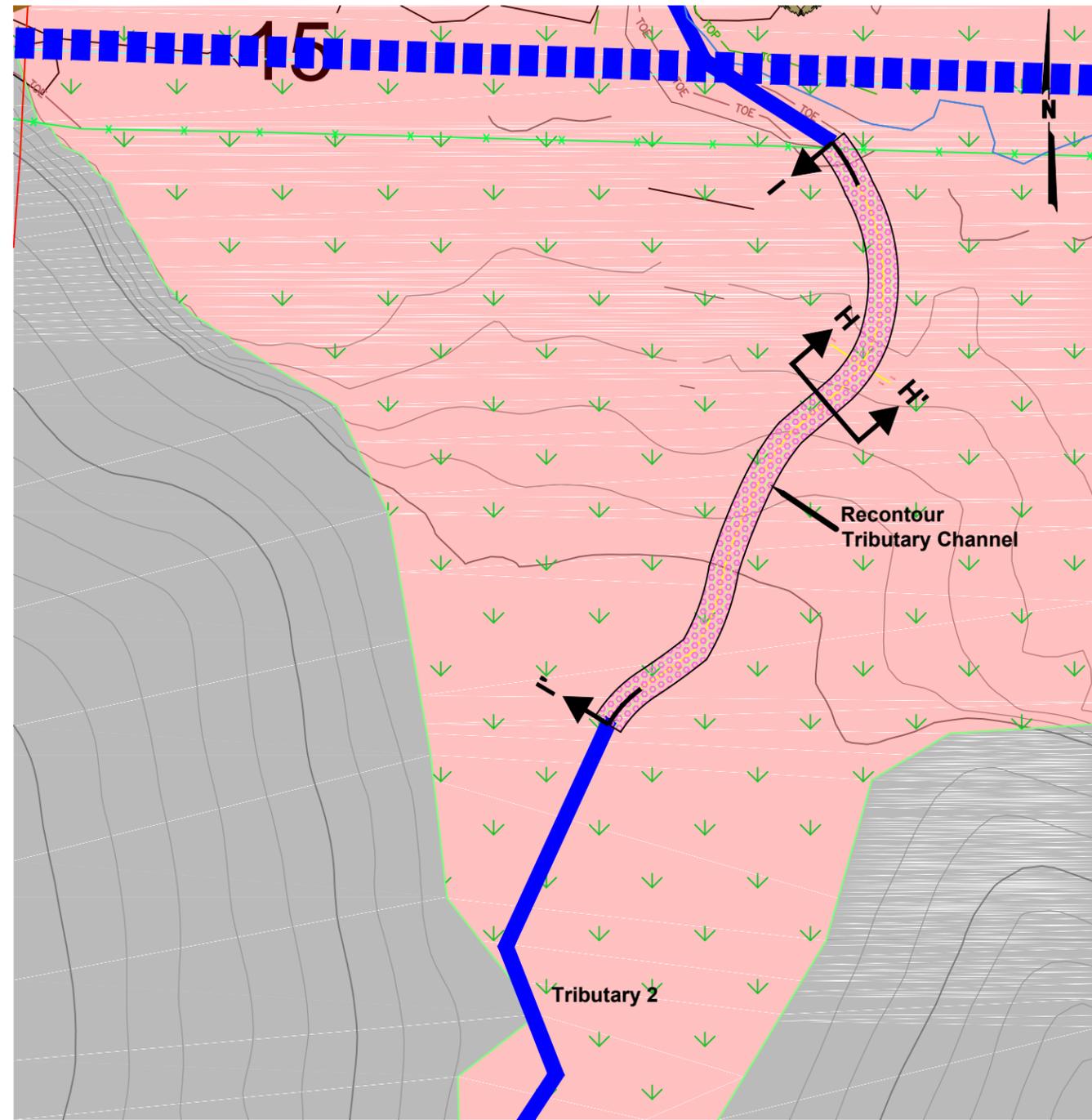
LEGEND

- Existing Contour 1'
- Existing Contour 5'
- Finished Grade Contour 1'
- Finished Grade Contour 5'
- Wetland
- Stream
- 100' Bank Buffer
- City of Kelso Jurisdictional Boundary
- Riparian Upland Enhancement
- Wetland Creation
- Riparian Wetland Creation
- Existing Wetland/Wetland Enhancement Area
- Preservation

NOTE(S):

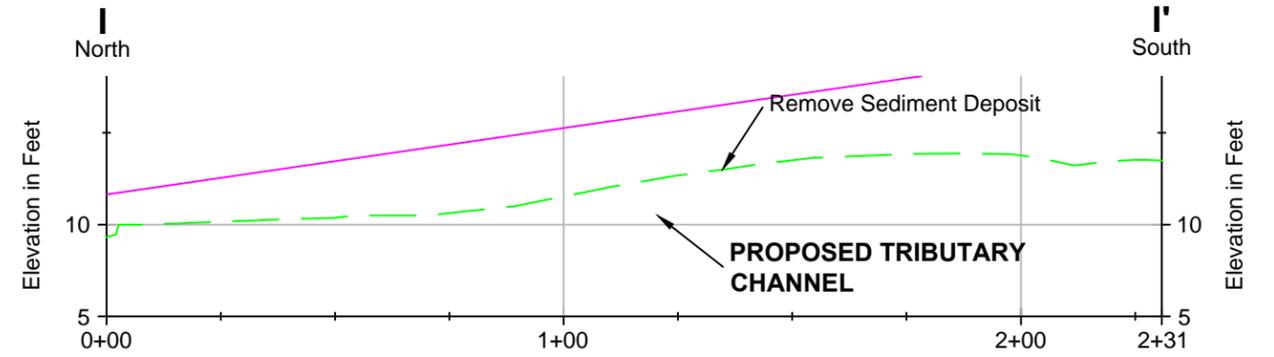
1. Gravel streambed nourishment to occur through channel and alcove.

Coweeman Mitigation Bank Habitat Bank, LLC Cowlitz County, WA	
WETLAND A OUTLET CHANNEL PLAN AND PROFILE	
November 2014	21-1-12444-004
SHANNON & WILSON, INC. Geotechnical and Environmental Consultants	FIG. B-4C

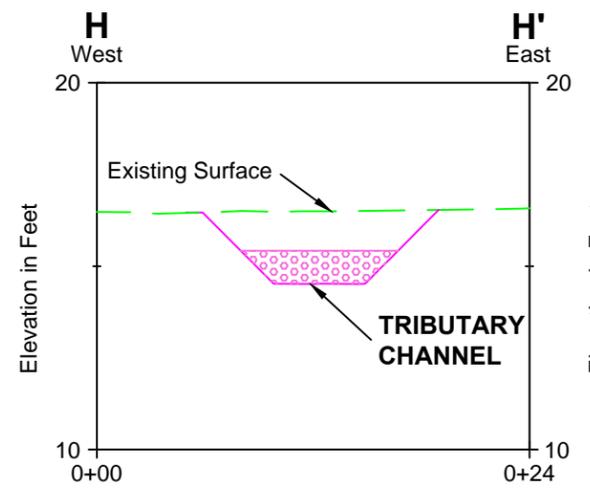
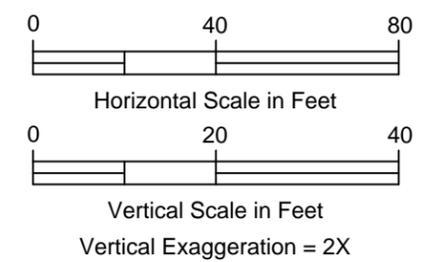


LEGEND

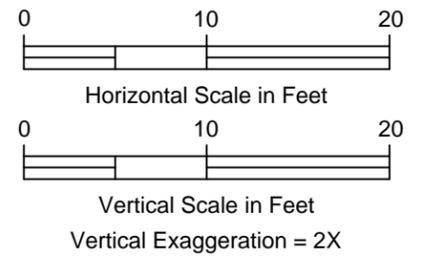
- Riparian Upland Enhancement
- Existing Wetland/Wetland Enhancement Area
- Preservation
- City of Kelso Jurisdictional Boundary
- Existing Survey Contour
- Existing Lidar Contour
- Finished Grade Contour
- Wetland
- Streambed Gravel Nourishment
- Profile Designation and Approximate Location



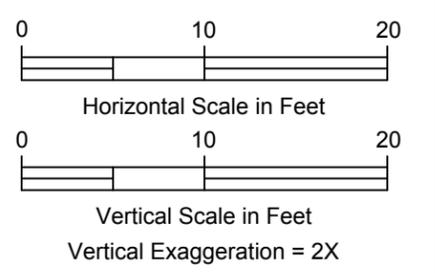
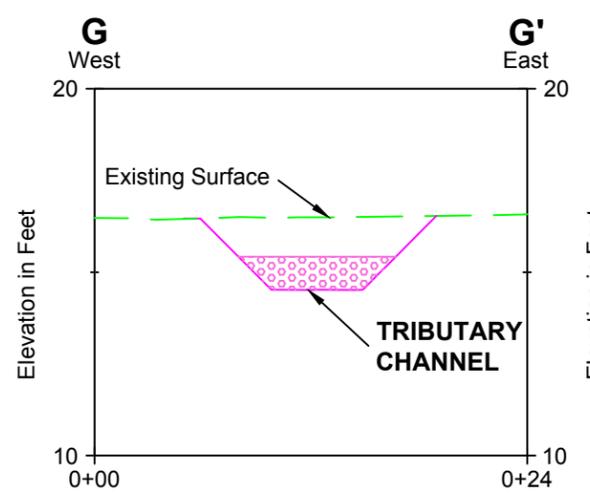
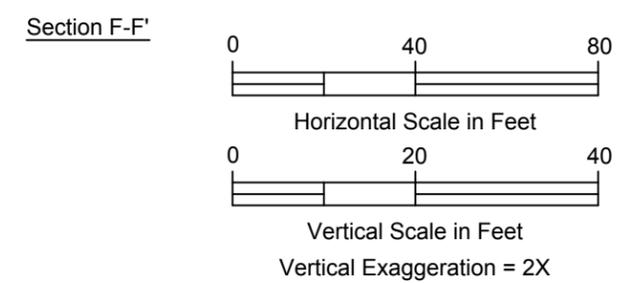
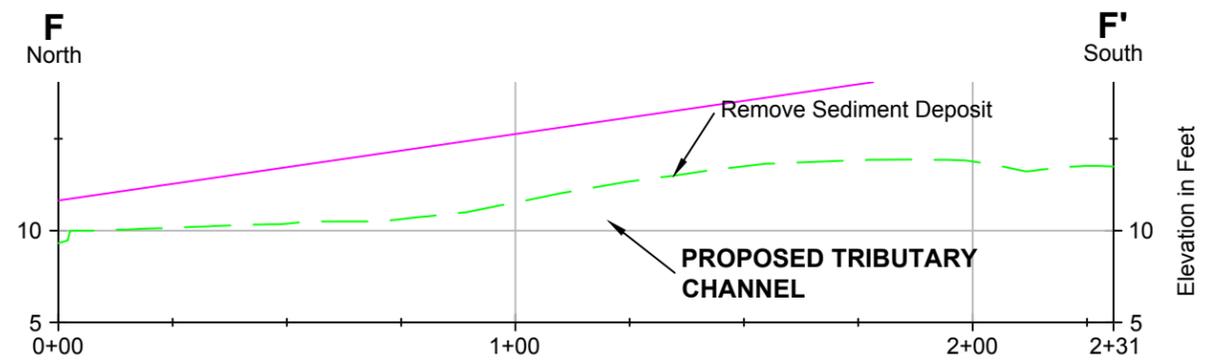
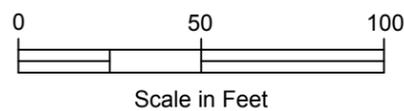
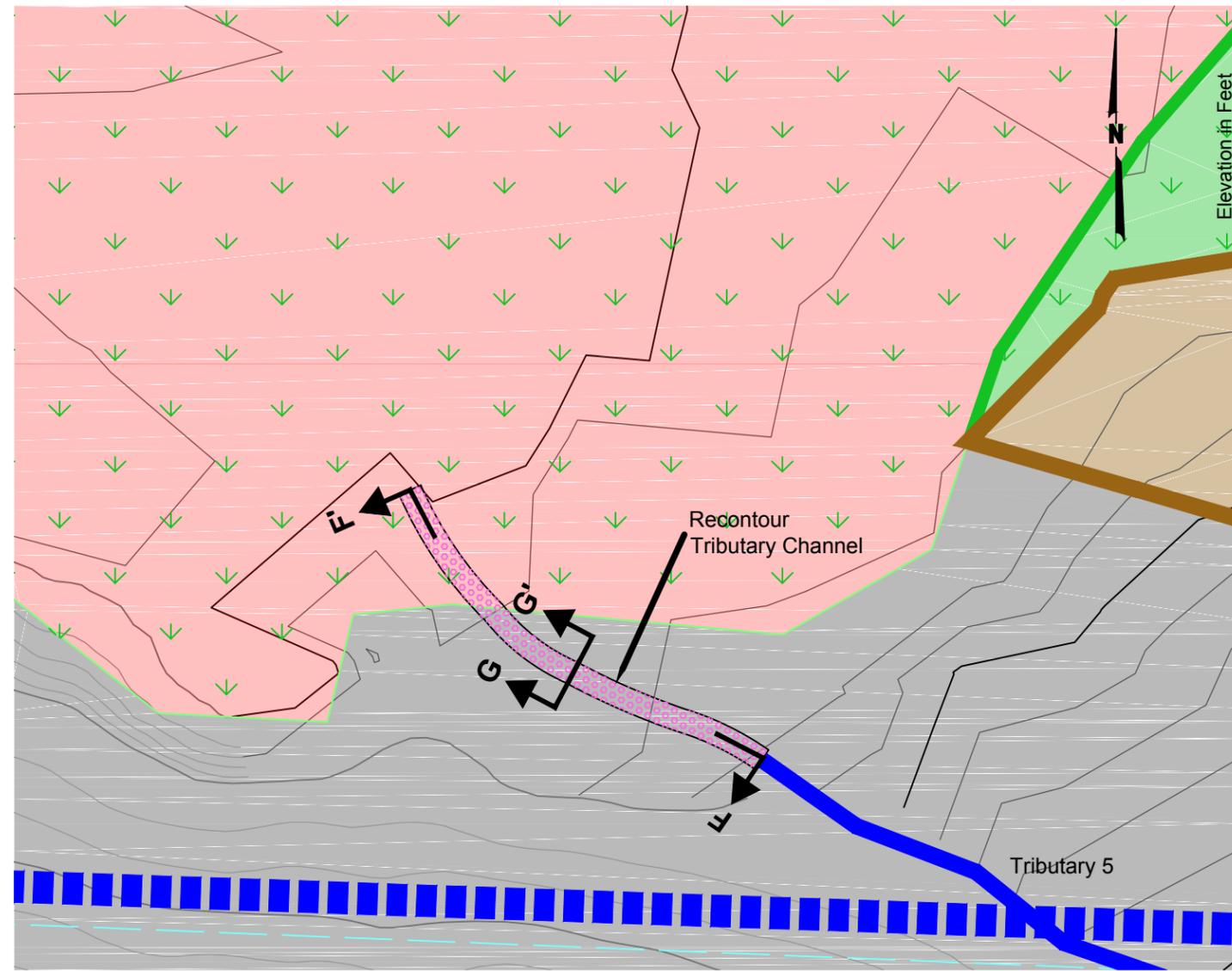
Section I-I'



Section H-H'



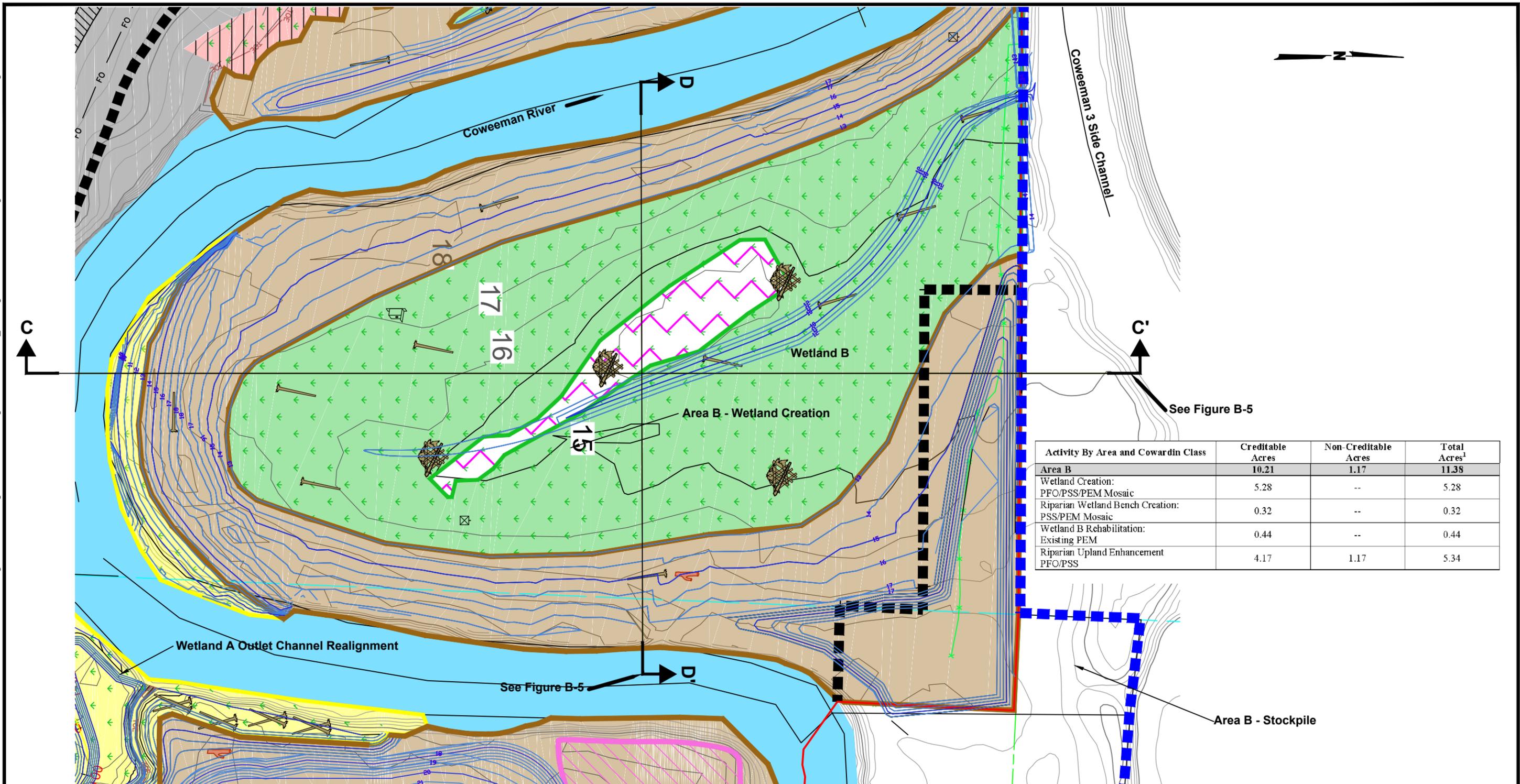
Coweeman Mitigation Bank Habitat Bank, LLC Cowlitz County, WA	
TRIBUTARY 2 RECONTOURING AND SECTIONS I-I' & H-H'	
November 2014	21-1-12444-004
SHANNON & WILSON, INC. Geotechnical and Environmental Consultants	FIG. B-4D



LEGEND

- | | | | |
|--|---------------------------------------|--|---|
| | Existing Survey Contour | | Riparian Upland Enhancement |
| | Existing Lidar Contour | | Wetland Creation |
| | Finished Grade Contour | | Existing Wetland/Wetland Enhancement Area |
| | Wetland | | Preservation |
| | Streambed Gravel Nourishment | | |
| | City of Kelso Jurisdictional Boundary | | |

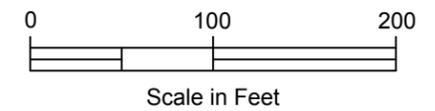
Coweeman Mitigation Bank Habitat Bank, LLC Cowlitz County, WA	
TRIBUTARY 5 RECONTOURING AND SECTIONS F-F' & G-G'	
November 2014	21-1-12444-004
SHANNON & WILSON, INC. Geotechnical and Environmental Consultants	FIG. B-4E



Activity By Area and Cowardin Class	Creditable Acres	Non-Creditable Acres	Total Acres ¹
Area B	10.21	1.17	11.38
Wetland Creation:			
PFO/PSS/PEM Mosaic	5.28	--	5.28
Riparian Wetland Bench Creation: PSS/PEM Mosaic	0.32	--	0.32
Wetland B Rehabilitation: Existing PEM	0.44	--	0.44
Riparian Upland Enhancement PFO/PSS	4.17	1.17	5.34

LEGEND

- Existing Contour 1'
- Existing Contour 5'
- Finished Grade Contour 1'
- Finished Grade Contour 5'
- Wetland
- Stream
- Bank Site Boundary
- 100' Bank Buffer
- Area to Remain Undisturbed
- Perch Pole
- Downed Log
- Brush Pile
- Wood Duck Nest Box
- Standard Nest Box
- Large Woody Material Cluster
- Bar-Apex Jam
- Riparian Upland Enhancement
- Wetland Creation
- Riparian Wetland Creation
- Existing Wetland/Wetland Enhancement Area
- Preservation
- Existing PFO/PSS/PEM Enhancement
- Existing PEM Rehabilitation
- City of Kelso Jurisdictional Boundary

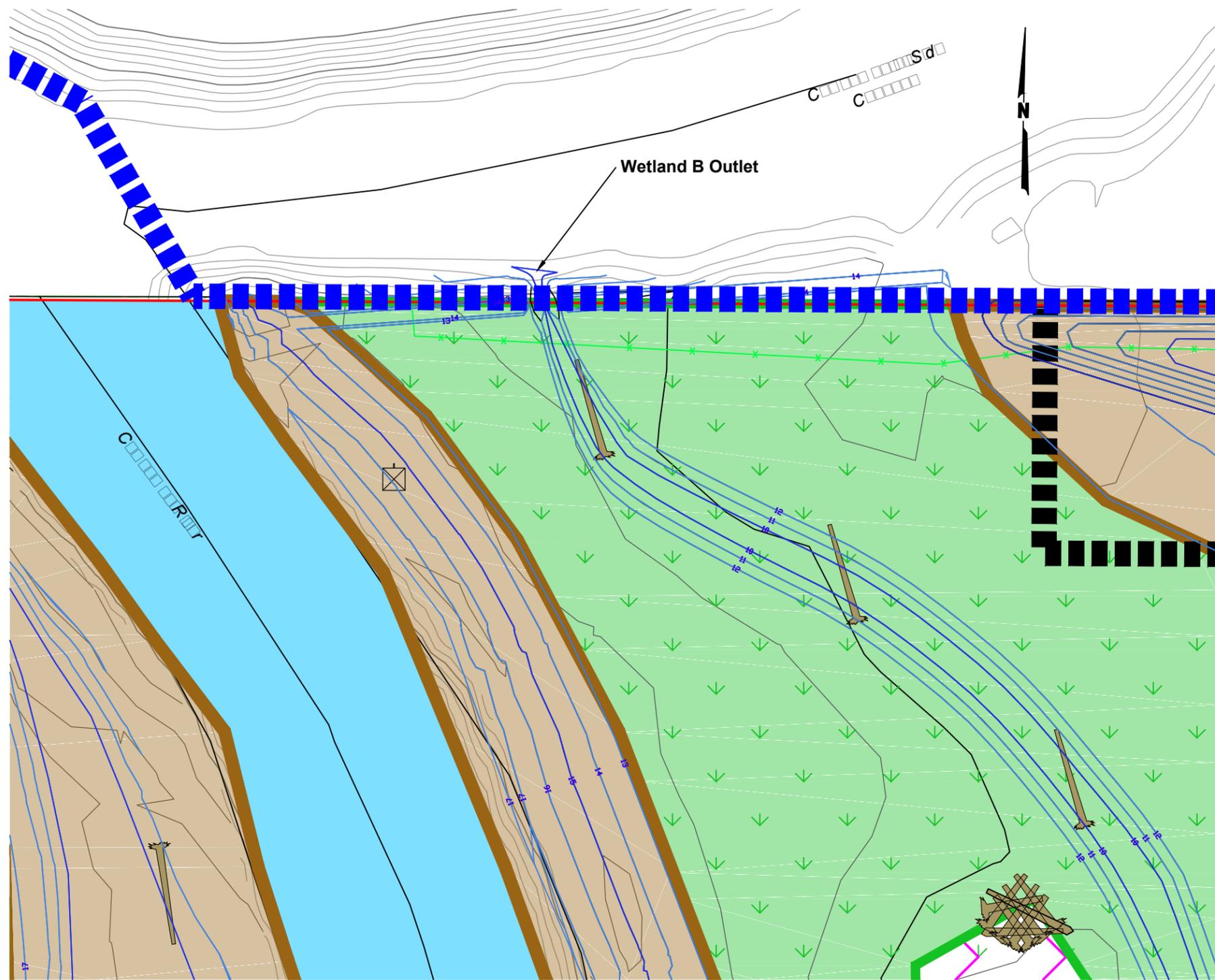


Coweeman Mitigation Bank
 Habitat Bank, LLC
 Cowlitz County, WA

AREA B SITE PLAN

November 2014 21-1-12444-004

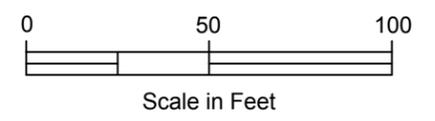
SHANNON & WILSON, INC. **FIG. B-4F**
Geotechnical and Environmental Consultants



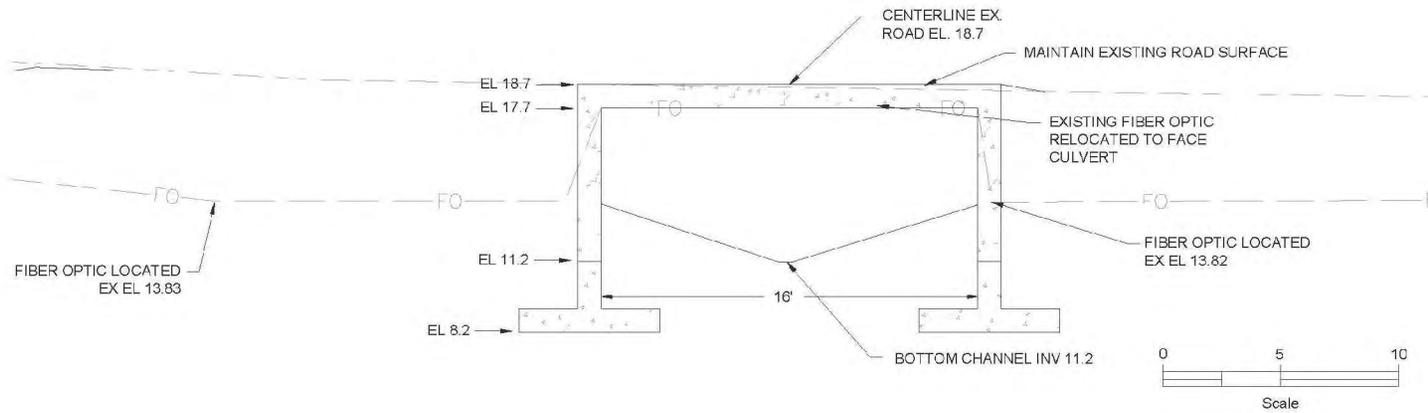
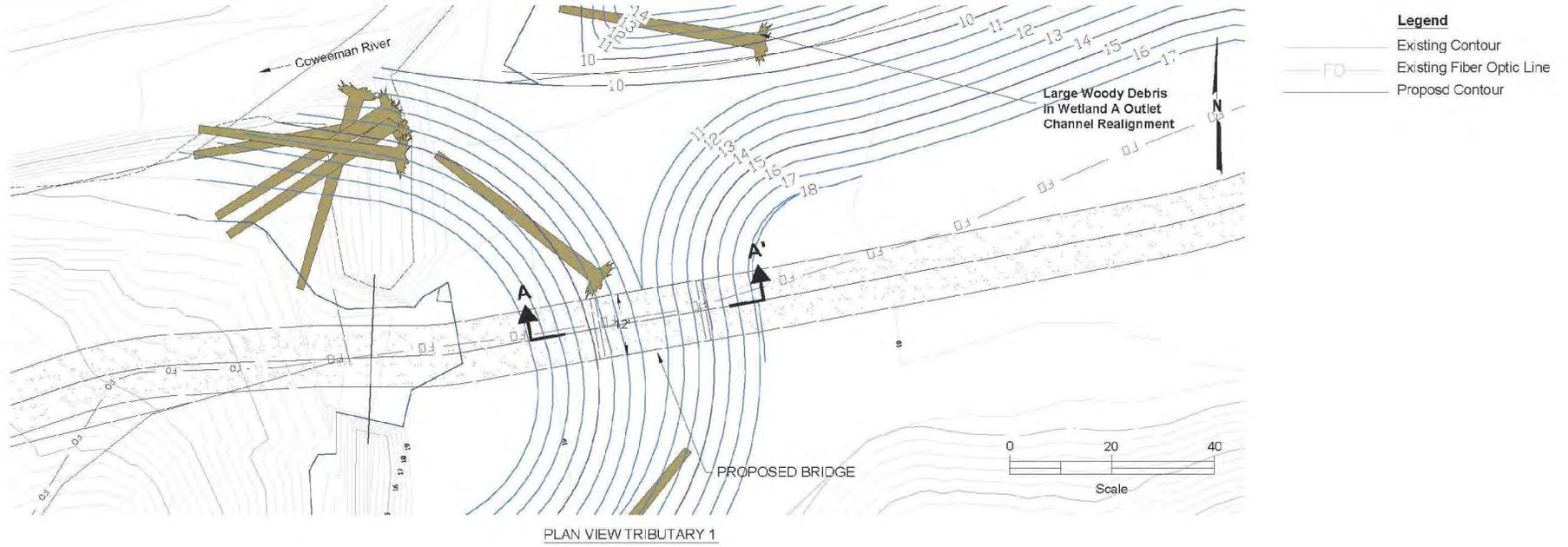
LEGEND

- Existing Contour 1'
- Existing Contour 5'
- Finished Grade Contour 1'
- Finished Grade Contour 5'
- 100' Bank Buffer
- City of Kelso Jurisdictional Boundary
- Perch Pole
- Downed Log
- Brush Pile
- Wood Duck Nest Box
- Standard Nest Box
- Large Woody Material Cluster
- Bar-Apex Jam

- Riparian Upland Enhancement
- Wetland Creation
- Wetland Rehabilitation



Coweeman Mitigation Bank Habitat Bank, LLC Cowlitz County, WA	
WETLAND B OUTLET DETAIL	
November 2014	21-1-12444-004
SHANNON & WILSON, INC. <small>Geotechnical and Environmental Consultants</small>	FIG. B-4G



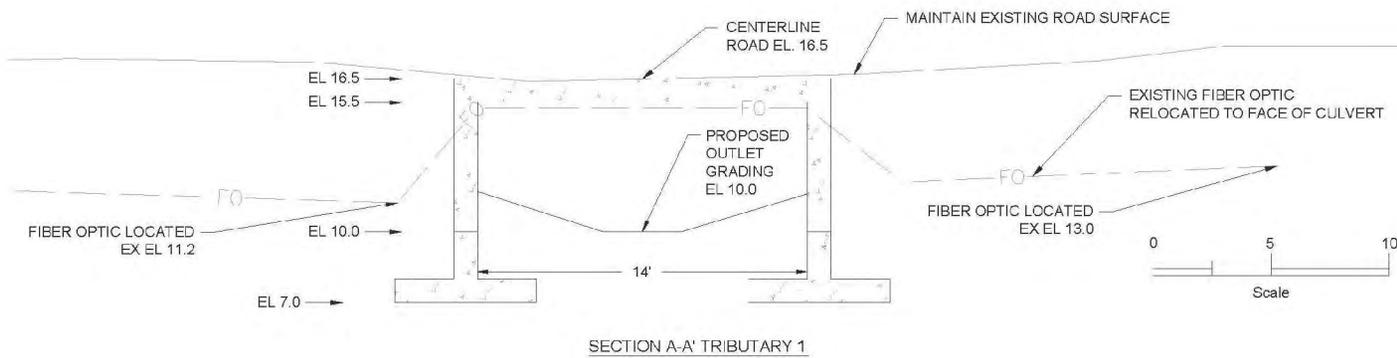
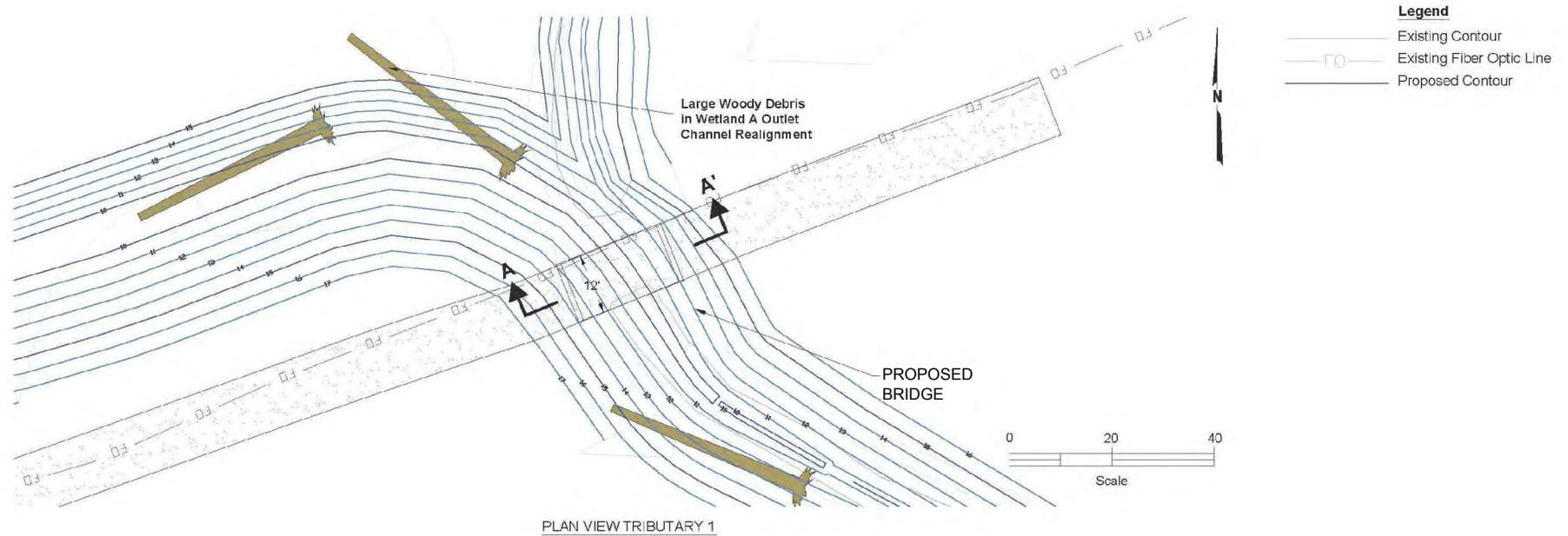
Base map from: **SHANNON & WILSON, INC.**
Geotechnical and Environmental Consultants

ECOLOGICAL LAND SERVICES, INC.

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Longview, WA 98632
Phone: (360) 578-1371 Fax: (360) 414-9305

DATE: 8/25/15
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PRJ. MGR: ST
CHK:
PROJECT NO:
1209.14

Figure B-4h
TRIBUTARY 1 CROSSING BRIDGE PLAN & PROFILE
Coweeman Mitigation Bank
Habitat Bank LLC
City of Kelso, Cowlitz County, Washington
Section 31, Township 8N, Range 1W, W.M.



Base map from: **SHANNON & WILSON, INC.**
Geotechnical and Environmental Consultants

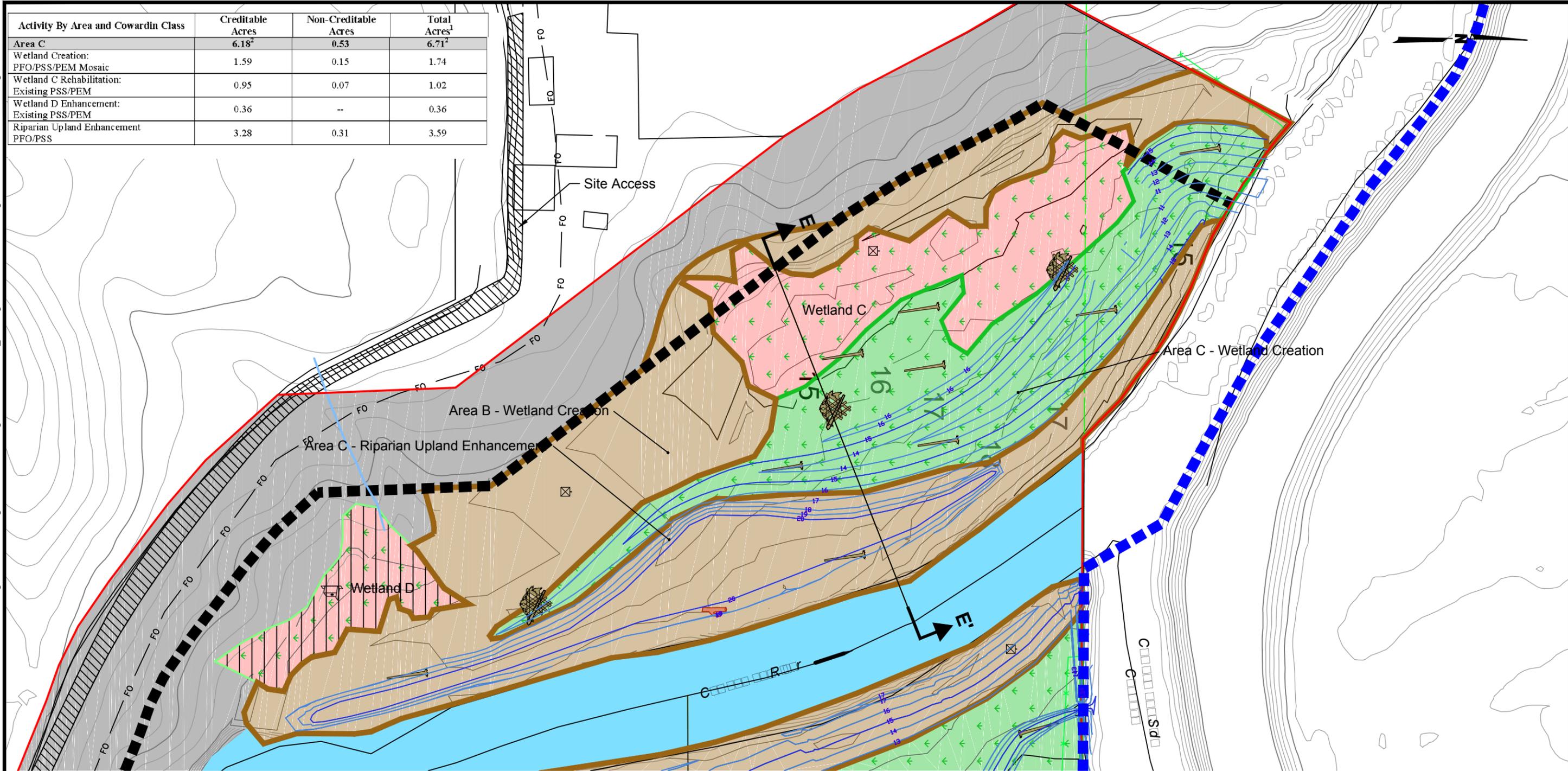
ECOLOGICAL LAND SERVICES, INC.

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Longview, WA 98632
Phone: (360) 578-1371 Fax: (360) 414-9305

DATE: 8/25/15
DWN: BCB
REQ. BY: ST
PRJ. MGR: ST
CHK:
PROJECT NO:
1209.14

Figure B-4i
WETLAND A OUTLET CROSSING BRIDGE PLAN & PROFILE
Coweeman Mitigation Bank
Habitat Bank LLC
City of Kelso, Cowlitz County, Washington
Section 31, Township 8N, Range 1W, W.M.

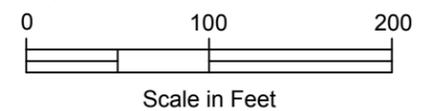
Filename: S:\EL\SWA\Cowlitz\Kelso\1209-14-Coweeman River Consolidated Mitigation\1209-14-Figures\SW Final Design\21-1-12444-003_Grading & Habitat Site Plan.dwg
 Date: 09-22-2015
 Login: brian



Activity By Area and Cowardin Class	Creditable Acres	Non-Creditable Acres	Total Acres ¹
Area C	6.18²	0.53	6.71²
Wetland Creation: PFO/PSS/PEM Mosaic	1.59	0.15	1.74
Wetland C Rehabilitation: Existing PSS/PEM	0.95	0.07	1.02
Wetland D Enhancement: Existing PSS/PEM	0.36	--	0.36
Riparian Upland Enhancement PFO/PSS	3.28	0.31	3.59

LEGEND

- Existing Contour 1'
- Existing Contour 5'
- Finished Grade Contour 1'
- Finished Grade Contour 5'
- Wetland
- Stream
- Bank Site Boundary
- 100' Bank Buffer
- Perch Pole
- Downed Log
- Brush Pile
- Wood Duck Nest Box
- Standard Nest Box
- Large Woody Material Cluster
- Bar-Apex Jam
- Riparian Upland Enhancement
- Wetland Creation
- Riparian Wetland Creation
- Existing Wetland/Wetland Enhancement Area
- Preservation
- Existing PFO/PSS/PEM Enhancement

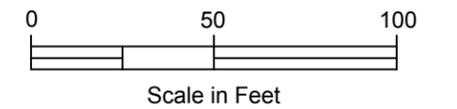
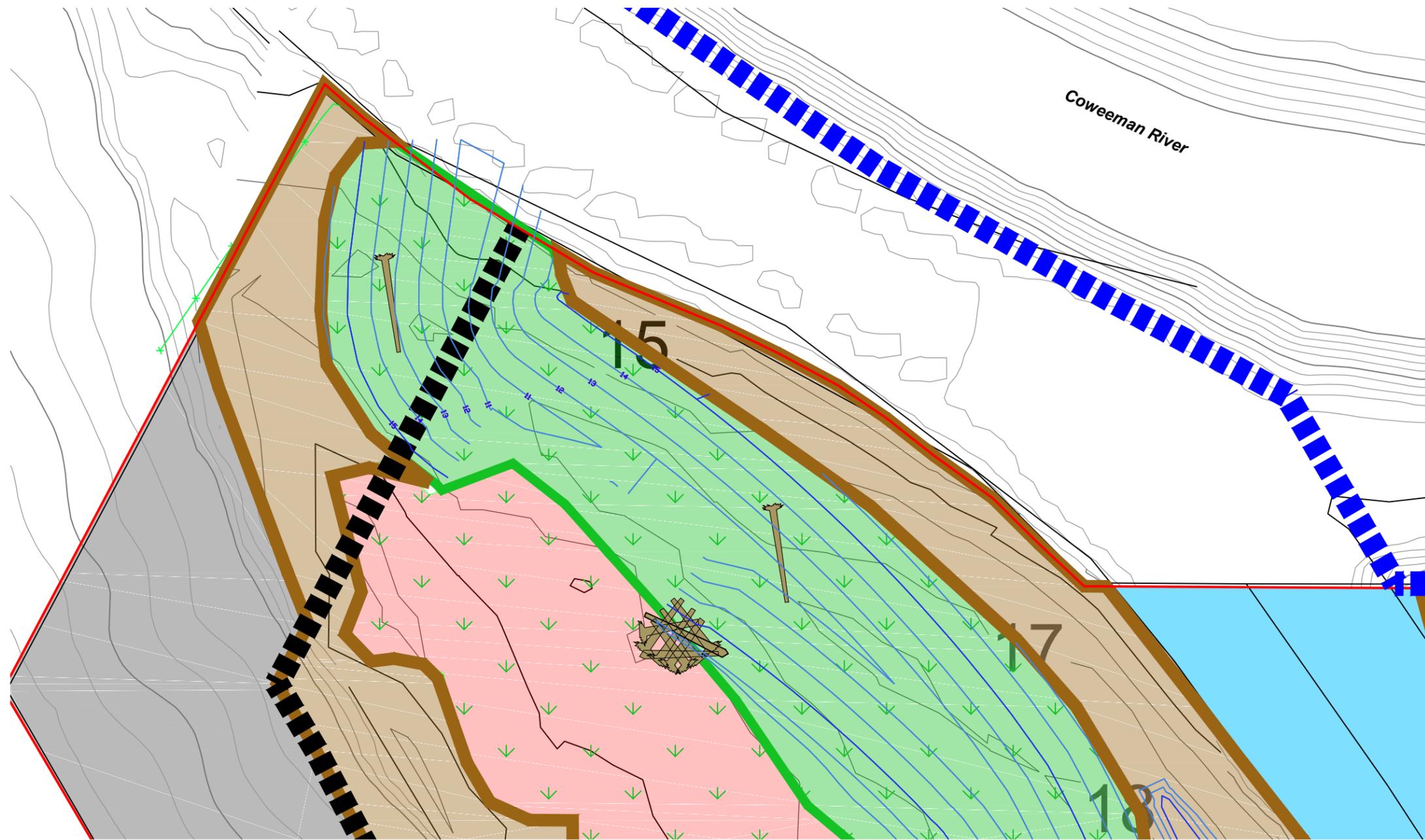


Coweeman Mitigation Bank
Habitat Bank, LLC
Cowlitz County, WA

AREA C SITE PLAN

November 2014 21-1-12444-004

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Geotechnical and Environmental Consultants **FIG. B-4J**



LEGEND

- Existing Contour 1'
- Existing Contour 5'
- Finished Grade Contour 1'
- Finished Grade Contour 5'
- Wetland
- Stream
- Bank Site Boundary

--- 100' Bank Buffer

- Perch Pole
- Downed Log
- Brush Pile
- Wood Duck Nest Box
- Standard Nest Box
- Large Woody Material Cluster
- Bar-Apex Jam

- Riparian Upland Enhancement
- Wetland Creation
- Riparian Wetland Creation
- Existing Wetland/Wetland Enhancement Area
- Preservation
- Existing PFO/PSS/PEM Enhancement

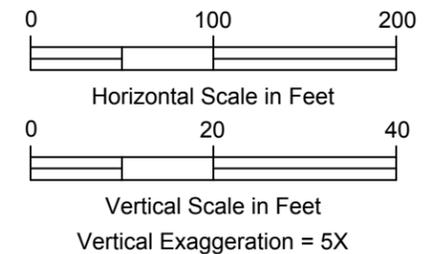
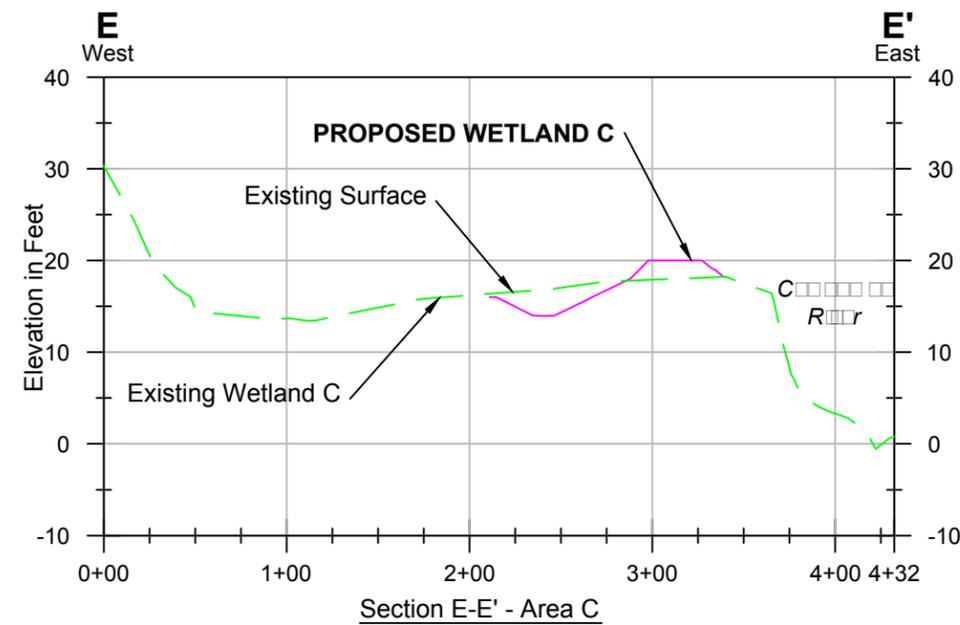
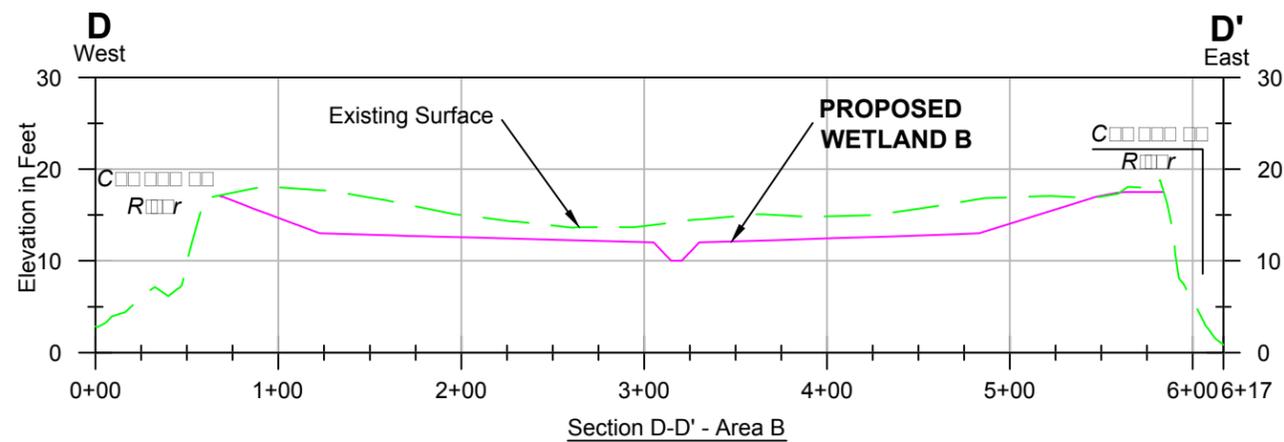
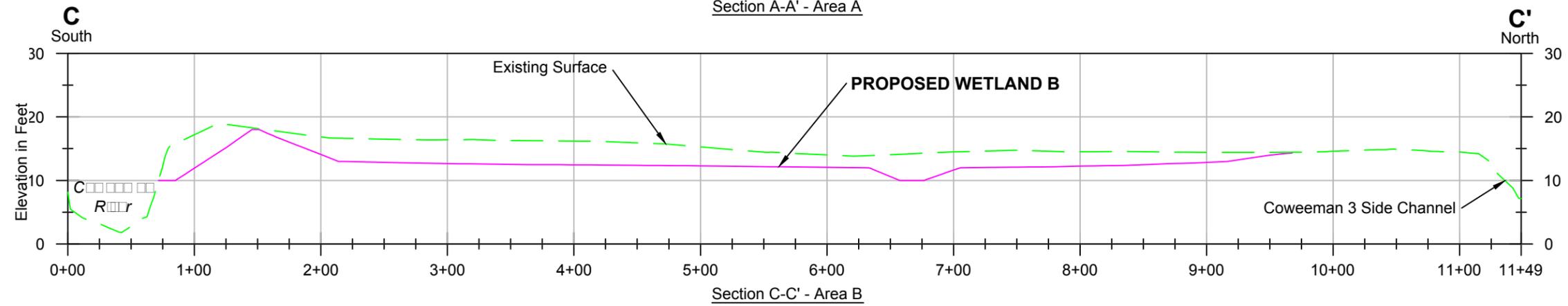
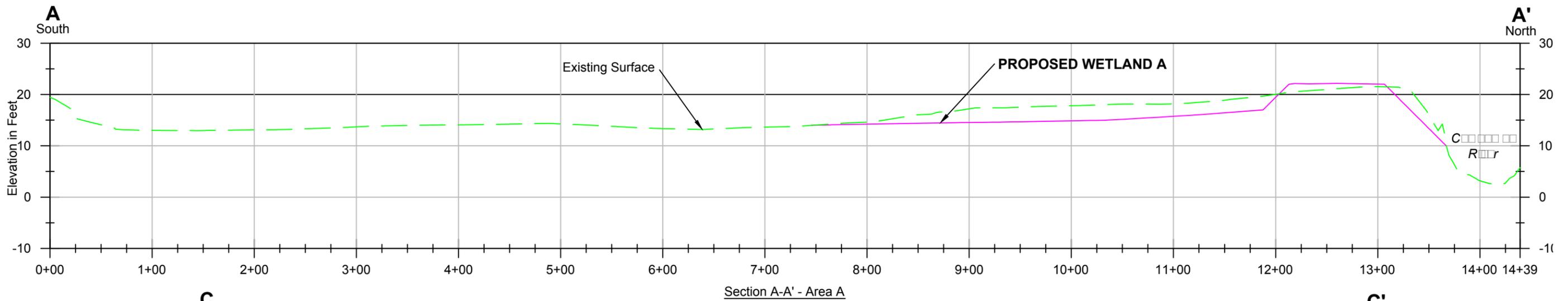
Coweeman Mitigation Bank
Habitat Bank, LLC
Cowlitz County, WA

WETLAND C OUTLET DETAIL

November 2014 21-1-12444-004

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Geotechnical and Environmental Consultants

FIG. B-4K



Coweeman Mitigation Bank
Habitat Bank, LLC
Cowlitz County, WA

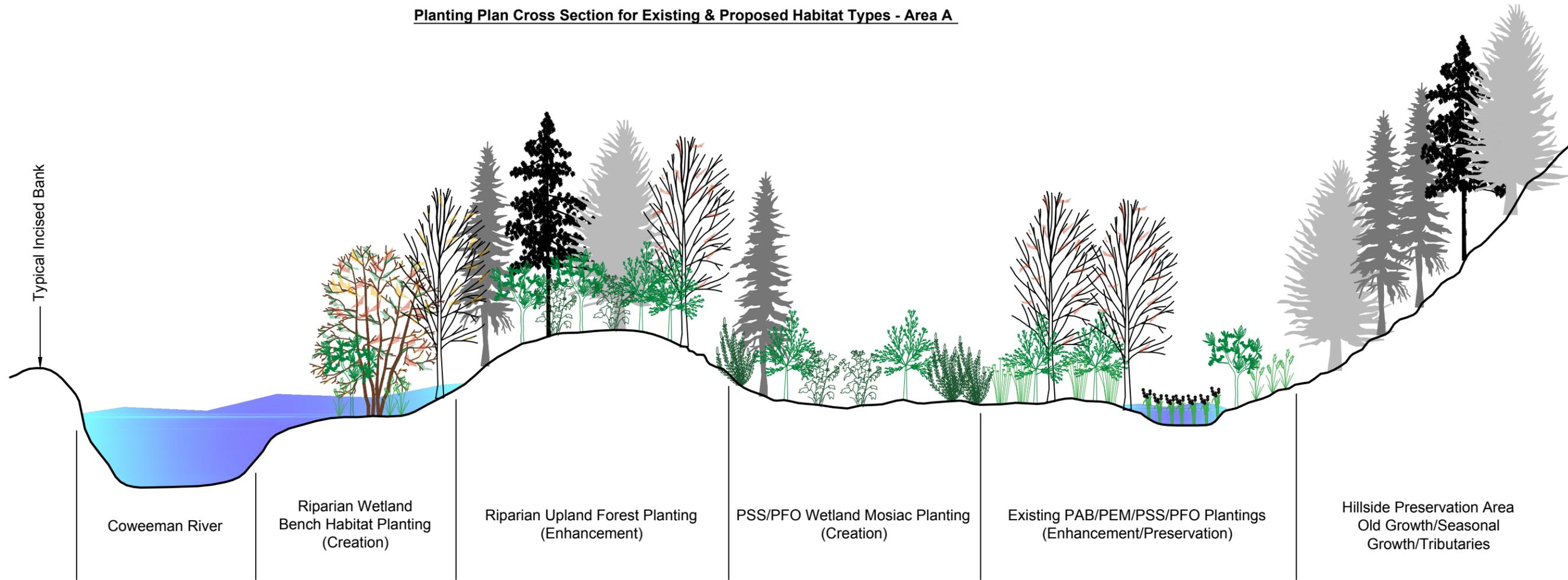
**TYPICAL SECTIONS
A-A', C-C', D-D' & E-E'**

November 2014 21-1-12444-004

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FIG. B-5

Planting Plan Cross Section for Existing & Proposed Habitat Types - Area A



Plant Species List

Plant Community	Common Name	Scientific Name	Common Name	Scientific Name
Wetland Trees	Black cottonwood	<i>Populus balsamifera</i>	Scouler willow	<i>Salix scouleriana</i>
	Oregon ash	<i>Fraxinus latifolia</i>	Pacific willow	<i>Salix Lasianдра</i>
	Western red cedar	<i>Thuja plicata</i>	Red alder	<i>Alnus rubra</i>
Riparian and Upland Trees	Black cottonwood	<i>Populus balsamifera</i>	Red alder	<i>Alnus rubra</i>
	Bitter cherry	<i>Prunus emarginata</i>	Oregon ash	<i>Fraxinus latifolia</i>
	Scouler willow	<i>Salix scouleriana</i>	Western red cedar	<i>Thuja plicata</i>
	Douglas-fir	<i>Pseudotsuga menziesii</i>	Oregon white oak	<i>Quercus garryana</i>
	Big leaf maple	<i>Acer macrophyllum</i>	Western hemlock	<i>Tsuga heterophylla</i>
Wetland Shrubs	Nootka rose	<i>Rosa nutkana</i>	Pacific crabapple	<i>Malus fusca</i>
	Sitka willow	<i>Salix sitchensis</i>	Red-osier dogwood	<i>Cornus sericea</i>
	Douglas hawthorn	<i>Crataegus douglasii</i>	Salmonberry	<i>Rubus spectabilis</i>
Riparian and Upland Shrubs	Ninebark	<i>Physocarpus capitatus</i>	Spiraea	<i>Spiraea douglasii</i>
	Nootka rose	<i>Rosa nutkana</i>	Salmonberry	<i>Rubus spectabilis</i>
	Sitka willow	<i>Salix sitchensis</i>	Douglas hawthorn	<i>Crataegus douglasii</i>
	Ninebark	<i>Physocarpus capitatus</i>	Snowberry	<i>Symphoricarpos albus</i>
	Red-osier dogwood	<i>Cornus sericea</i>	Red elderberry	<i>Sambucus racemosa</i>
	Serviceberry	<i>Amelanchier alnifolia</i>	Indian plum	<i>Oemleria cerasiforis</i>
	Vine maple	<i>Acer circinatum</i>	Beaked hazelnut	<i>Corylus cornuta</i>
Oregon grape	<i>Mahonia nervosa</i>	Salal	<i>Gautheria shallon</i>	
Cascara	<i>Rhamnus purshiana</i>	Sword fern	<i>Polystichum munitum</i>	

Seed Mixes

Plant Community	Common Name	Scientific Name	Common Name	Scientific Name
Shallow Wetland Areas	Western manna grass	<i>Glyceria occidentalis</i>	Shortawn foxtail	<i>Alopecurus aequalis</i>
	Bur-reed	<i>Sparganium emersum</i>	Rice cut-grass	<i>Leersia oryzoides</i>
	Softstem bulrush	<i>Scirpus tabernaemontanii</i>	American water plantain	<i>Alisma subcordatum</i>
	Creeping spike-rush	<i>Eleocharis palustris</i>	American sloughgrass	<i>Beckmannia syzigachne</i>
	Slough sedge	<i>Carex obnupta</i>	Woolly sedge	<i>Scirpus atrocinctus</i>
	Deeper Emergent Wetland Areas	Softstem bulrush	<i>Scirpus tabernaemontanii</i>	American water plantain
Creeping spike-rush		<i>Eleocharis palustris</i>	American sloughgrass	<i>Beckmannia syzigachne</i>
Western manna grass		<i>Glyceria occidentalis</i>	Shortawn foxtail	<i>Alopecurus aequalis</i>
Riparian Upland Areas	Wapato	<i>Sagittaria latifolia</i>	Skunk cabbage	<i>Lysichiton americanum</i>
	Perennial ryegrass	<i>Lolium perenne</i>	Kentucky bluegrass	<i>Poa pretensis</i>
	Red fescue	<i>Festuca rubra</i>	Tall fescue	<i>Schedonorus phoenix</i>

NOTES:

- Plants are not to scale and locations are approximate as shown. Actual planting locations will be determined in the field, with consideration to the listed spacing and density requirements.
- Section is not to scale. See "Section A" on Figure 24 for a to scale section of Area A.

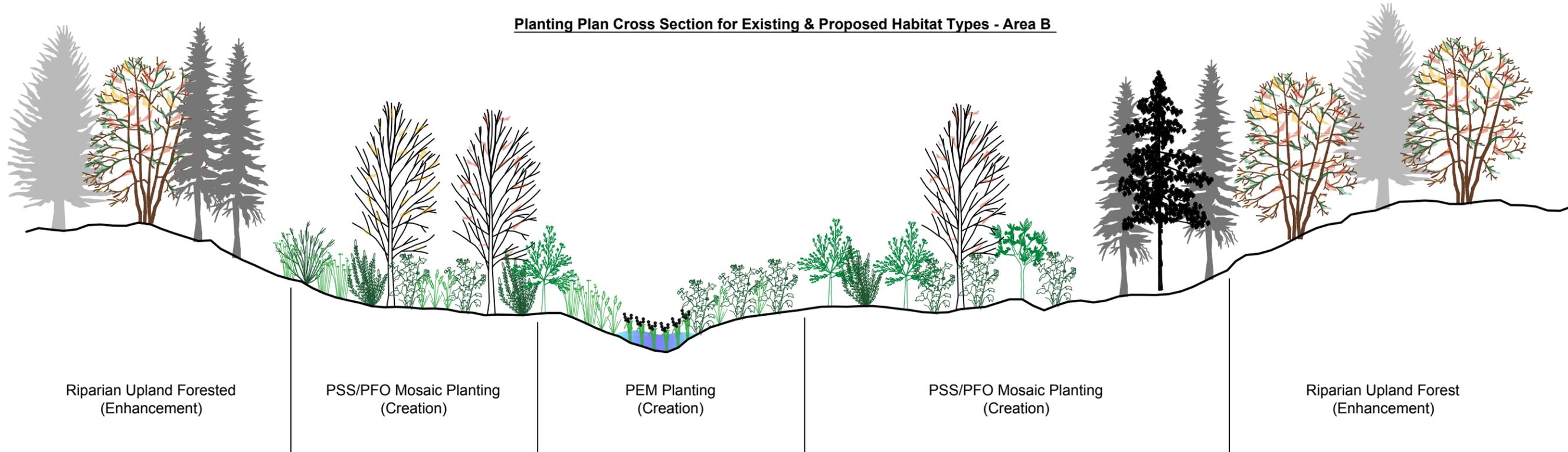
ECOLOGICAL LAND SERVICES, INC.
 1157 3rd Ave., Suite 220
 Longview, WA 98632
 Phone: (360) 578-1371 Fax: (360) 414-9305

DATE: 8/14/15
 DWN: BCB
 REQ. BY: ST
 PRJ. MGR: ST
 CHK:
 PROJECT NO:
 1209.14

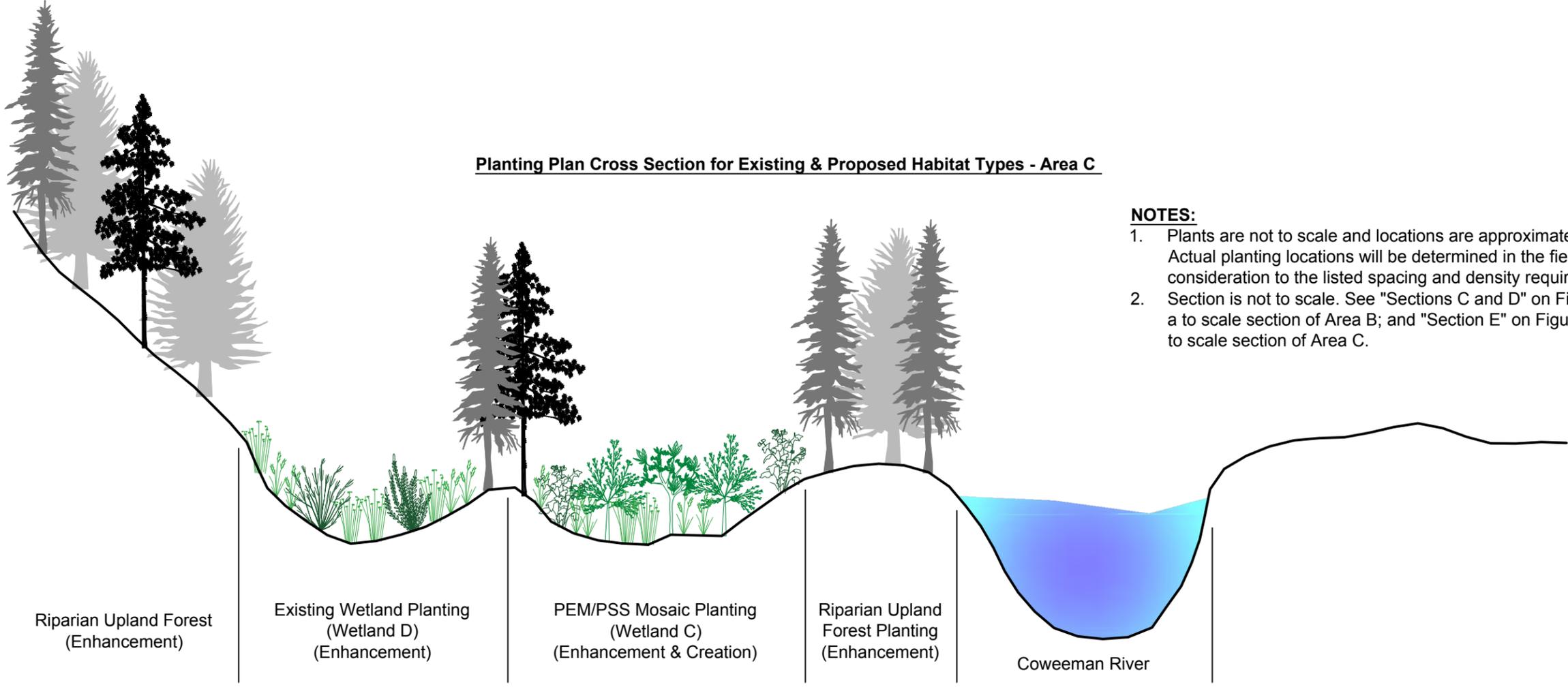
Figure B-6
 AREA A PLANTING PLAN AND CROSS SECTION
 Coweeman Mitigation Bank
 Habitat Bank LLC
 City of Kelso, Cowitz County, Washington
 Section 31, Township 8N, Range 1W, W.M.

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Planting Plan Cross Section for Existing & Proposed Habitat Types - Area B



Planting Plan Cross Section for Existing & Proposed Habitat Types - Area C



NOTES:

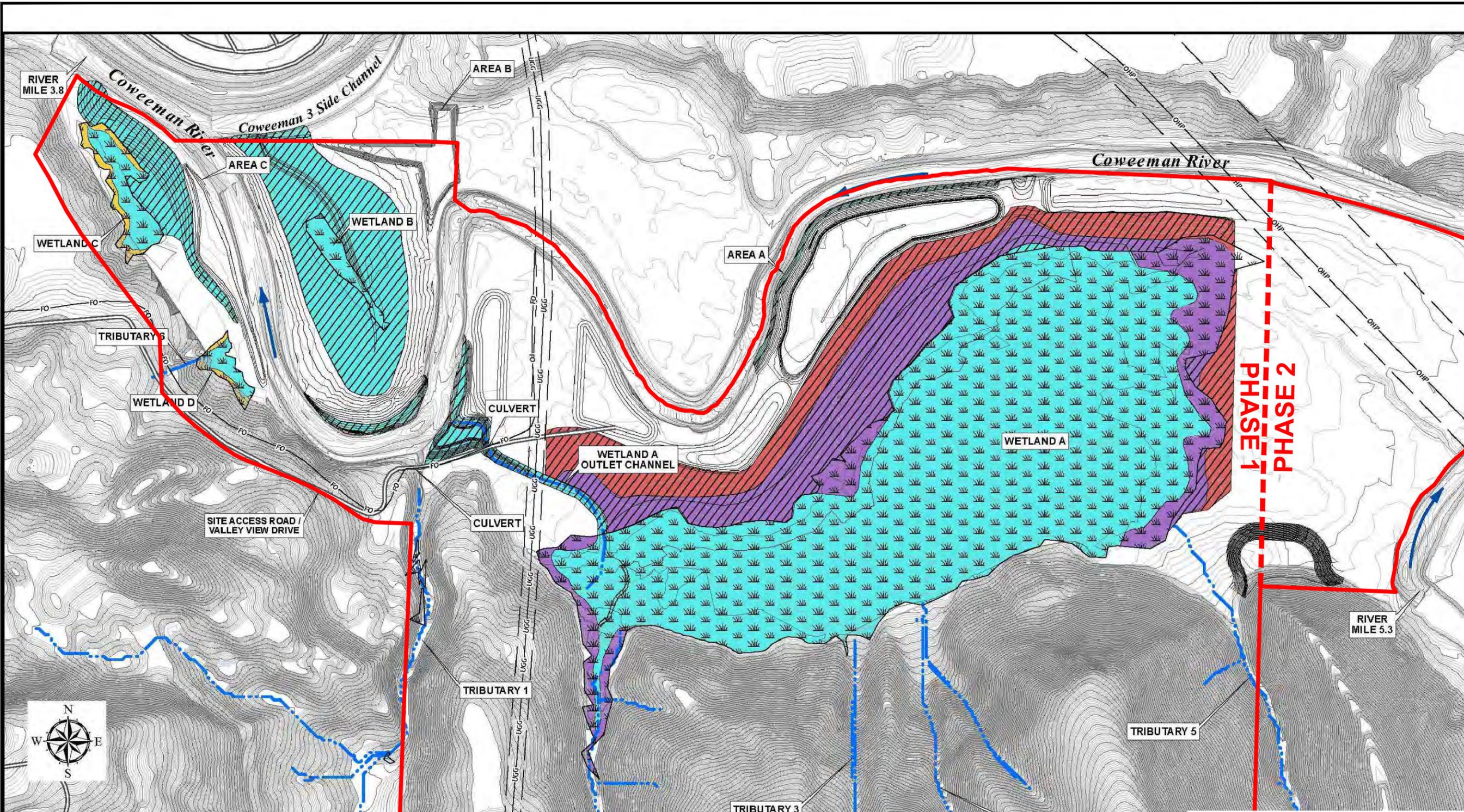
1. Plants are not to scale and locations are approximate as shown. Actual planting locations will be determined in the field, with consideration to the listed spacing and density requirements.
2. Section is not to scale. See "Sections C and D" on Figure 24 for a to scale section of Area B; and "Section E" on Figure 24 for a to scale section of Area C.

Figure B-7
 AREAS B AND C PLANTING PLAN AND CROSS SECTIONS
 Coweeman Mitigation Bank
 Habitat Bank LLC
 City of Kelso, Cowlitz County, Washington
 Section 31, Township 8N, Range 1W, W.M.

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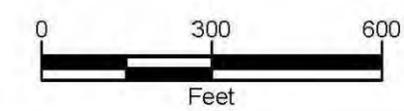
- Bank Site Boundary
- - - Streams
- Roads
- Existing Wetland
- Wetland Creation

Wetland Hydroperiods

- Saturated Only
- Occasionally Flooded/
Saturated Only
- Occasionally Flooded
- Seasonally Flooded

Utilities

- Utility Easement
- UGG Underground Gas Pipeline
- OHP Overhead Power
- FO Fiber Optic



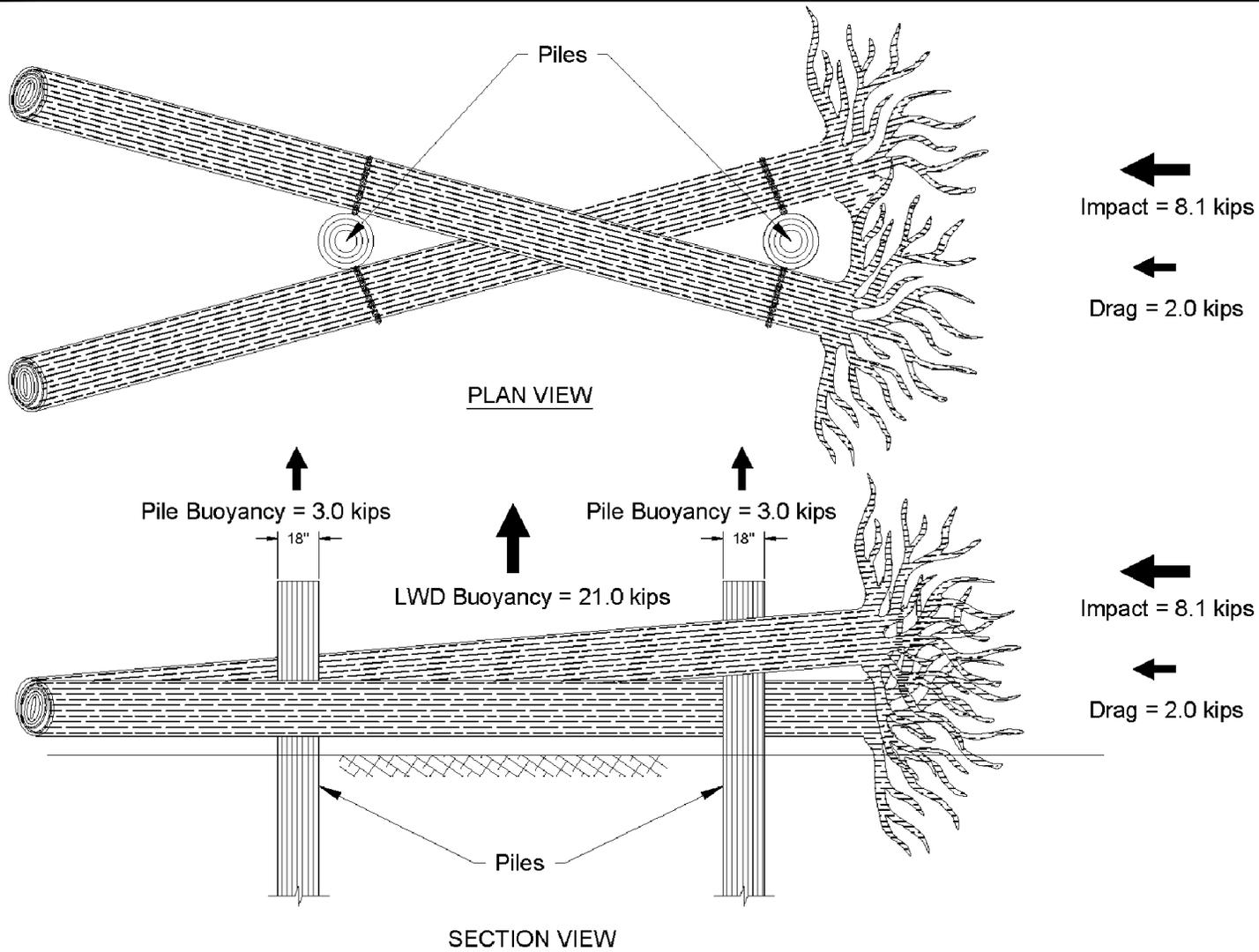
Base map from: **SHANNON & WILSON, INC.**
Geotechnical and Environmental Consultants

Figure B-8
PROPOSED WETLAND HYDROPERIODS
 Coweeman Mitigation Bank
 Habitat Bank LLC
 City of Kelso, Cowlitz County, Washington
 Section 31, Township 8N, Range 1W, W.M.

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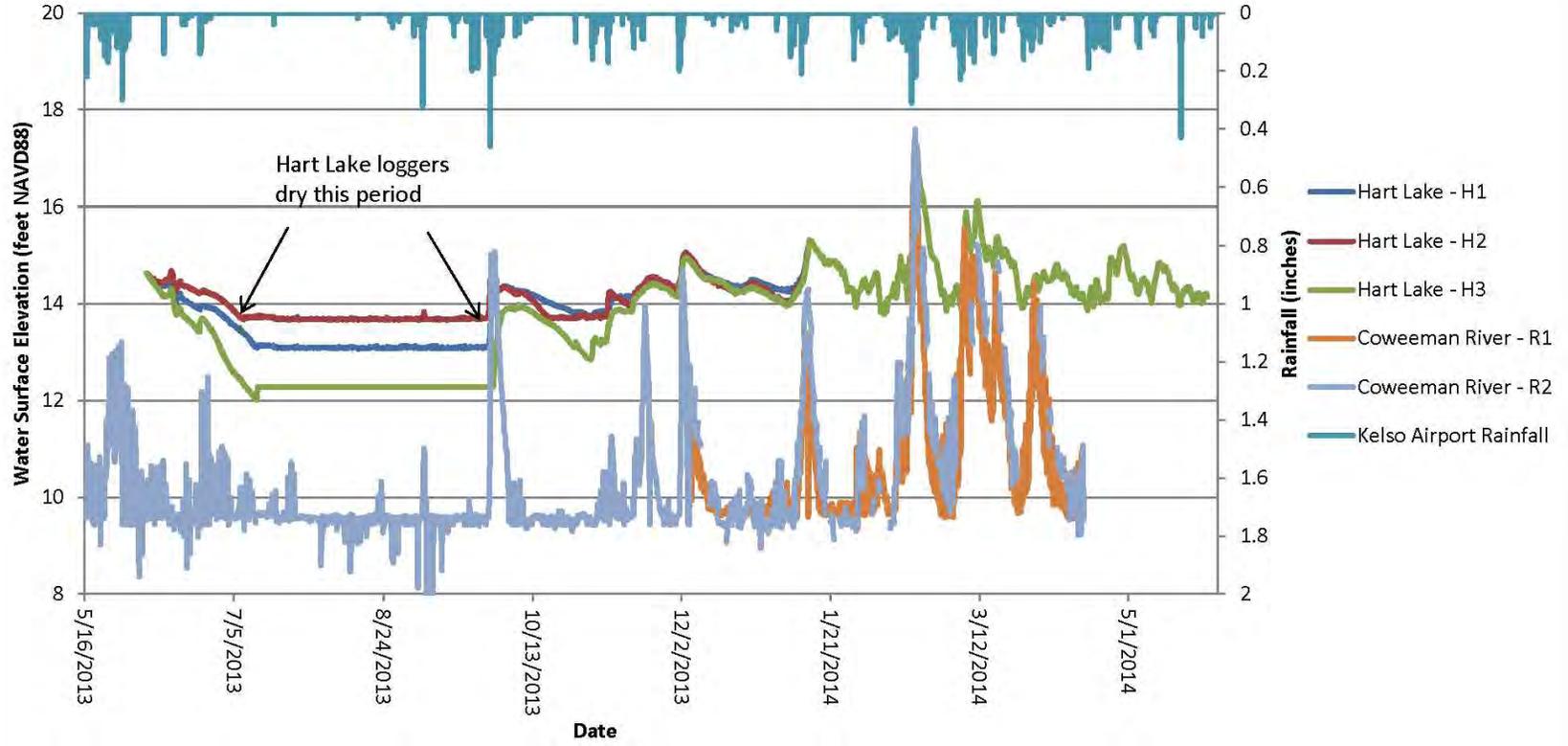
NOT TO SCALE

Base map from: **SHANNON & WILSON, INC.**
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Figure B-9
ELJ TIMBER PILE ANCHOR IN BANK AREAS
Coweeman Mitigation Bank
Habitat Bank LLC
City of Kelso, Cowlitz County, Washington
Section 31, Township 8N, Range 1W, W.M.



NOTES

1. Rainfall and barometric data obtained from Kelso Airport records
2. H1 and R1 datum estimated by comparison to other loggers

FIG. 9

Coweeman Mitigation Bank
 Habitat Bank, LLC
 Cowlitz County, Washington

**DATA LOGGER
 WATER LEVELS
 MAY 2013 - MAY 2014**

September 2014 21-1-12444-004

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GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

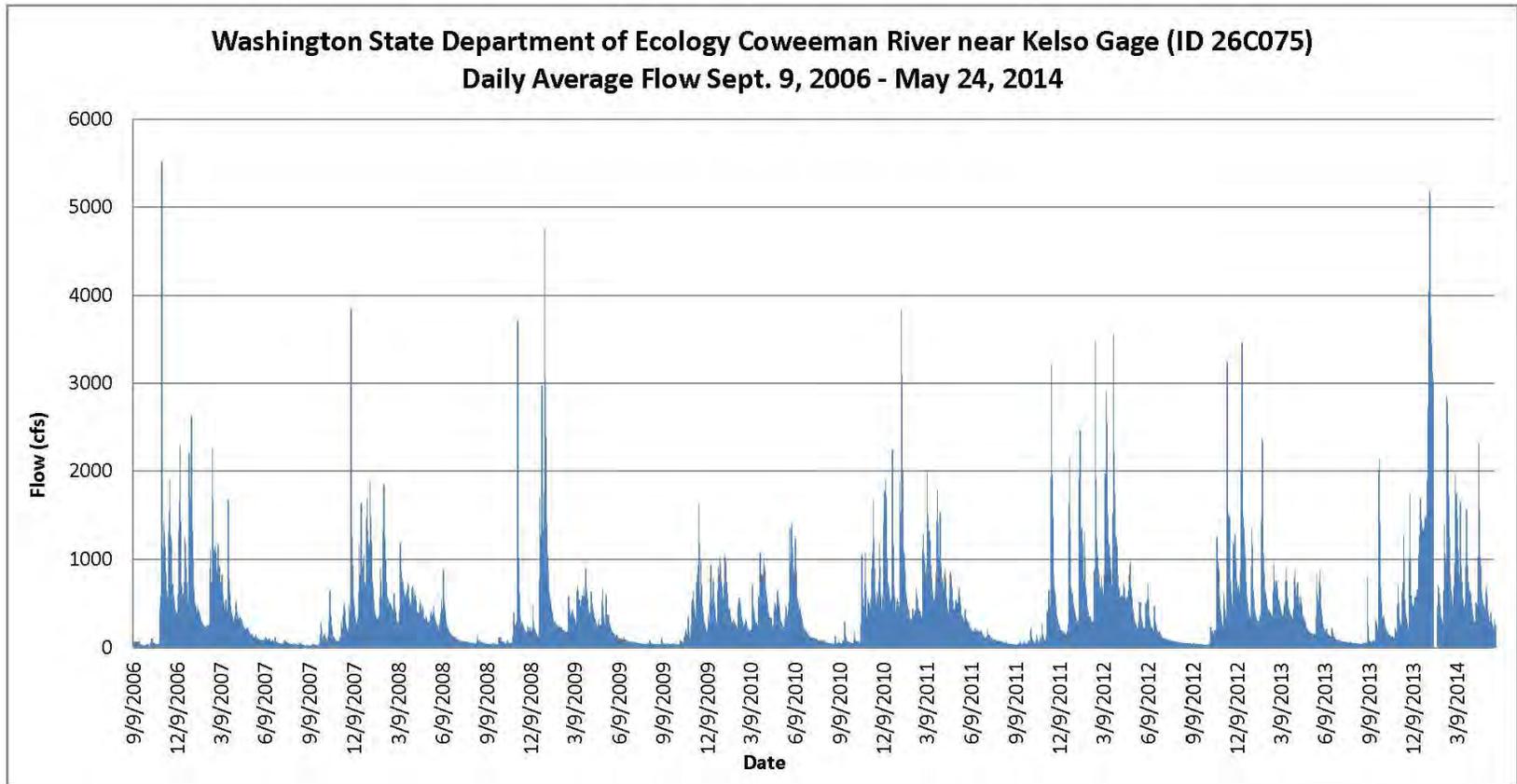
FIG. 9

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Figure B-11
DATA LOGGER WATER LEVELS (MAY 2013 - MAY 2014)
 Coweeman Mitigation Bank
 Habitat Bank LLC
 City of Kelso, Cowlitz County, Washington
 Section 31, Township 8N, Range 1W, W.M.

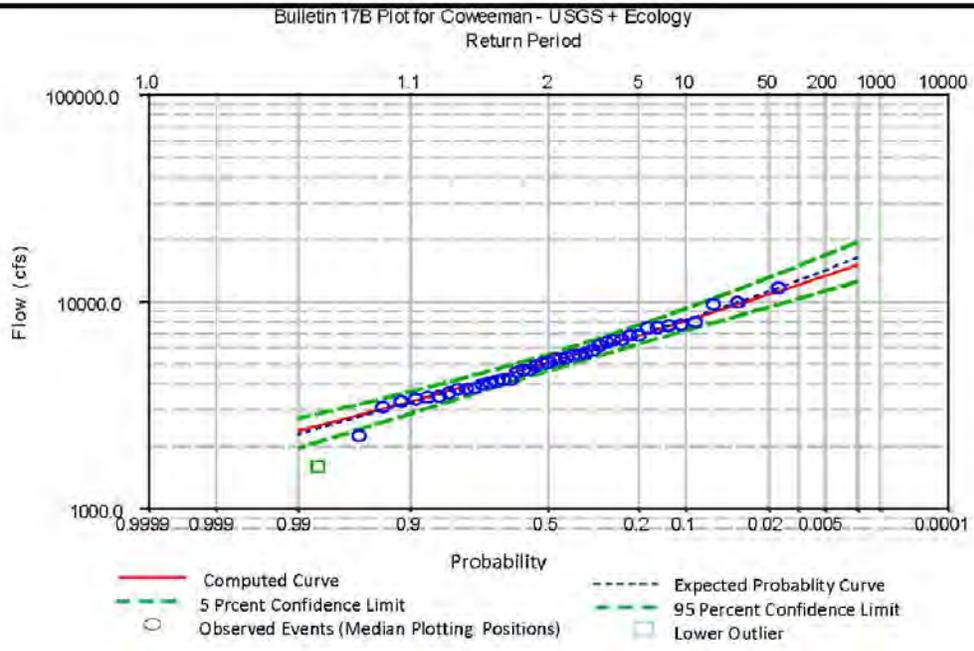


Base map from: **SHANNON & WILSON, INC.**
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PROJECT NO:
1209.14

Figure B-12
COWEEMAN RIVER DAILY AVERAGE FLOW
Coweeman Mitigation Bank
Habitat Bank LLC
City of Kelso, Cowlitz County, Washington
Section 31, Township 8N, Range 1W, W.M.



Return period (years)	Exceedance Probability	Flow (cfs)	5% Confidence Limit (cfs)	95% Confidence Limit (cfs)
500	0.2%	15,091	19,468	12,568
200	0.5%	13,359	16,816	11,309
100	1%	12,097	14,933	10,374
50	2%	10,870	13,145	9,448
20	5%	9,284	10,907	8,220
10	10%	8,093	9,289	7,268
5	20%	6,877	7,708	6,256
2	50%	5,090	5,563	4,654
1.25	80%	3,819	4,199	3,405
1.11	90%	3,304	3,675	2,884
1.05	95%	2,939	3,308	2,516
1.01	99%	2,376	2,741	1,956

NOTES
 1. Flow data obtained from Coweeman River near Kelso USGS stream gage 14245000 (1950-1982) and Washington Dept. of Ecology stream gage 26C075 (2006-present).

Base map from: **SHANNON & WILSON, INC.**
 Geotechnical and Environmental Consultants

Figure B-13
COWEEMAN RIVER FLOOD FREQUENCY ANALYSIS
 Coweeman Mitigation Bank
 Habitat Bank LLC
 City of Kelso, Cowlitz County, Washington
 Section 31, Township 8N, Range 1W, W.M.

DATE: 8/25/15
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Percent of Time Exceeded	Flow (cfs)											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.1	5,784	3,999	3,560	1,945	1,366	1,373	604	496	2,113	2,042	6,311	6,635
1	4,407	2,569	2,525	1,373	946	881	251	230	423	1,184	3,000	3,820
2	3,654	2,337	2,096	1,250	722	704	210	158	310	977	2,339	3,282
5	2,658	1,806	1,570	1,054	582	441	157	109	230	670	1,718	2,397
10	2,038	1,440	1,190	832	476	319	130	80	145	442	1,220	1,779
15	1,642	1,139	1,035	719	413	260	115	71	109	321	993	1,460
25	1,190	867	805	589	340	205	98	61	72	198	706	1,130
50	630	551	538	424	244	140	72	47	48	95	360	650
80	322	336	335	289	169	97	52	37	35	48	160	351
90	250	258	278	235	143	85	46	33	31	39	103	228
95	191	211	240	203	130	72	42	30	27	34	70	160
99	88	93	184	150	104	61	36	25	24	25	36	65

NOTES

1. Flow data obtained from USGS stream gage 14245000 (1950-1982) and Washington Dept. of Ecology stream gage 26C075 (2006-present)

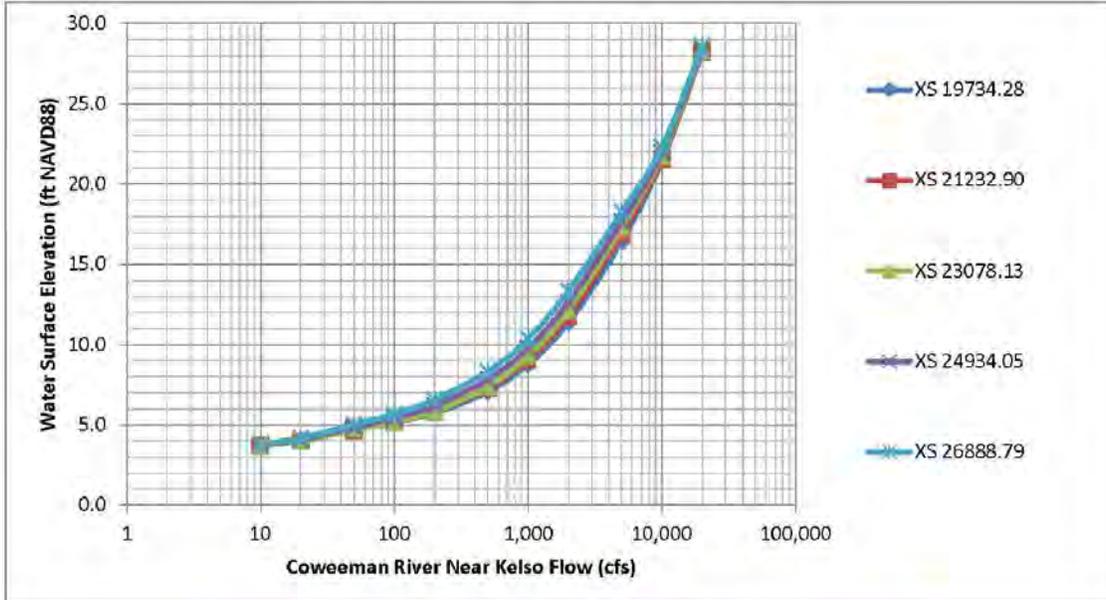
Base map from: **SHANNON & WILSON, INC.**
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Figure B-14
COWEEMAN RIVER FLOW-DURATION ANALYSIS
Coweeman Mitigation Bank
Habitat Bank LLC
City of Kelso, Cowlitz County, Washington
Section 31, Township 8N, Range 1W, W.M.



Flow (cfs)	Water Surface Elevation (ft NAVD88)				
	XS 19734.28	XS 21232.90	XS 23078.13	XS 24934.05	XS 26888.79
10	3.7	3.7	3.7	3.8	3.8
20	4.0	4.0	4.0	4.1	4.2
50	4.7	4.7	4.7	4.9	5.0
100	5.1	5.2	5.2	5.4	5.7
200	5.8	5.8	5.9	6.2	6.6
500	7.1	7.3	7.4	7.8	8.3
1,000	8.8	9.1	9.3	9.8	10.4
2,000	11.4	11.8	12.1	12.7	13.4
5,000	16.4	16.9	17.3	17.7	18.3
10,000	21.5	21.6	21.7	22.0	22.3
20,000	28.2	28.2	28.3	28.4	28.6

NOTES

1. Flow data obtained from Coweeman River near Kelso USGS stream gage 14245000 (1950-1982) and Washington Dept. of Ecology stream gage 26C075 (2006-present)

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Phone: (360) 578-1371 Fax: (360) 414-9305

APPENDIX C BANK OBJECTIVES AND PERFORMANCE STANDARDS

C.1. Requirements for Bank Objectives and Performance Standards:

A. Implementation of the Coweeman River Mitigation Bank is anticipated to result in substantial gains in aquatic ecosystem functions, as compared to those now present, or those that would likely accrue on the site if the Bank were not constructed. The Sponsor must be able to demonstrate tangible aquatic ecosystem gains before Bank credits can be awarded for sale, use or other transfer, because these functional gains will be used to offset comparable losses to other components of the aquatic environment in the Bank service area. The Bank's success will be measured by the enumerated objectives, each of which is subdivided into specific performance standards. The prescribed performance standards each provide a gauge for measuring the success of the ecological restoration, enhancement, and preservation efforts at the Bank.

B. Unless otherwise noted, all documentation required for demonstrating attainment of performance standards will be submitted to the IRT for review and approval as a condition of credit award. Documentation can typically be included in required monitoring reports. IRT award of credits will be reflected in a letter issued using a joint letterhead and signed by the Corps and Ecology.

C. Recreational, educational, and scientific activities that do not conflict with the use limitations or other provisions of the conservation easement, do not interfere with the delineated purposes and goals of the Bank, and do not adversely affect the ecological viability and functionality of the Bank may take place on the Bank site. Specifically, the site may be used by the owners and guests for walking, riding, bird watching, and other passive recreation including hunting and fishing. The City of Kelso property included in the Bank may be accessed by the public through existing hiking and equestrian trails but no additional trails are included in the Bank plan.

D. All performance standards apply to the Phase 1 of the Bank site including the buffer areas, utility corridors, and the encompassed portions of the Coweeman River.

C.2. Bank Objectives and Performance Standards

Objective 1: Protect Aquatic Ecosystem Functions

Permanently protect aquatic ecosystem functions at the Bank by instituting the Instrument and implementing conservation easements with permanent funding for site stewardship. Each of the performance standards associated with this objective must be met before any Bank credits may be awarded, and before any construction or implementation activities may be initiated pursuant to this Instrument. Any construction or implementation activities conducted on-site prior to the inception of the establishment period must cease as of the effective date of this Instrument pursuant to Article VI.B.1, until the Objective 1 performance standards 1.a through 1.e have been accomplished. The initial award of credits in recognition of accomplishment of these performance standards will serve as the IRT's notification that construction and implementation activities are authorized to commence.

Performance Standard	Documentation
1A. Complete the development of an appropriate Mitigation Banking Instrument and Appendices.	Mitigation Banking Instrument has been signed by the Sponsor and the applicable regulatory agencies. An original signed Instrument must be provided to each of the signatories.
1B. Protect ecosystem function by placing IRT-approved conservation easements on the property.	Provide the IRT copies of the signed, IRT-approved conservation easements and evidence that they have been recorded with Cowlitz County and placed on the property title.
1C. Provide financial assurance by establishing an IRT-accepted financial assurance mechanism pursuant to the requirements established in Article III.C.1. of the Instrument.	Demonstrate to the IRT that a compliant and acceptable financial assurance mechanism has been established to provide financial assurance for the establishment period.
1D. Establish a Long-Term Management and Maintenance Endowment Fund escrow account and develop an escrow agreement, all pursuant to the requirements established in Article III.C.2 of the Instrument.	Demonstrate to the IRT that a Long-Term Management and Maintenance Endowment Fund has been initiated through establishment of a compliant and acceptable escrow account. Enter into an escrow agreement with the Corps and Ecology.
1E. Obtain all appropriate environmental documentation, permits, and other authorizations needed to establish and maintain the Bank.	Provide IRT with copies of all environmental documentation, permits, and other authorizations.

Objective 2: Hydrology

Create additional wetland hydrology and fish accessible aquatic habitat in the graded portions of Areas A, B and C and maintain existing wetland hydrology on the remainder of the site. Increase floodplain connectivity and fish accessibility through the construction of an overflow notch into Wetland A. Reconnect Tributary 2 and 5 to Wetland A. Improve, and make fish passable, the Wetland A outlet tributary to the Coweeman River. Pull back the incised banks of the Coweeman River to create riparian wetland bench habitat that is also fish accessible.

Performance Standard	Documentation
2A. Grading work on the site completed according to IRT approved grading plans.	As-built drawings and photographs showing completed grading per the approved plan with key elevations and cross sections are approved by the IRT. The grading as-built report for the project can be submitted before site planting is complete.
2B. A minimum of 55.00 acres including wetlands A, B and C within the floodplain portion of the site (including the riparian	A wetland determination will be made and mapped of the wetlands in areas A, B, C and the riparian benches. To demonstrate wetland hydrology, soil

<p>wetland bench habitat) will have wetland hydrology present at Year 3 following approval of the As-built grading plan.</p>	<p>will be saturated to the surface, or there will be free water in soil pits or shallow water wells at 12 inches or less below the soil surface for at least 30* days during the growing season, where the growing season is defined as March 1 through October 31.</p> <p>A monitoring report with maps and data from Solinst Levelloggers, wells, and/or soil pits sufficient to document the extent of wetland hydrology on the site is approved by the IRT.</p> <p>*Because wetland hydrology in the riparian wetland bench area is driven by Coweeman River flows which are affected by annual variations in precipitation and tidal inundation levels, some areas of the riparian wetland may not reach 30 consecutive days of inundation in which case other factors such as soils and vegetation data will be used to determine the success of establishing wetland hydrology in the riparian wetland zone.</p>
<p>2C. In years 5 and 10, a minimum of 55.00 acres within areas A, B and C within the floodplain portion of the site (including the Riparian Wetland Bench habitat) will have wetland hydrology present. In years 5 and 10 the hydroperiod of Wetland A will be monitored and mapped in order to compare to baseline conditions and to account for any changes and impacts to wetland hydrology.</p>	<p>In years 5 and 10 wetlands in the floodplain will be delineated according to the 1987 Corps of Engineers Delineation Manual and appropriate regional supplement in effect at the time of delineation. Wetland delineation report is approved by the IRT. In years 5 and 10 the Wetland A hydroperiod will be mapped and any changes documented in that year’s monitoring report and submitted to, and approved by, the IRT.</p>
<p>2D. The Riparian Wetland Bench habitat areas as well as Wetland B and Wetland C will document surface water levels at or above the 13-foot elevation contour at least one time on an annual basis to demonstrate meeting a 1-year recurrence interval requirement for suitable fish habitat.</p>	<p>Stream flow data from data loggers collecting surface water flow elevations within the Coweeman River confirm inundation of Riparian Wetland Bench habitat and Wetlands B and C, at least one instance in each year. This data will be collected every year and reported during monitoring years 1, 3, 5, 7 and 10 and approved by the IRT.</p>
<p>2E. Wetland A outlet flows will pass through the re-contoured stream channel, with no drop in surface water elevation of more than 6” to allow juvenile fish access and egress to the wetlands, in accordance with WDFW recommendations for juvenile fish passage (Don Ponder, personal communication, June 2015).</p>	<p>Documentation of fish passable status and a properly functioning stream channel will be included in monitoring reports with photo documentation in years 1, 3, 5, 7 and 10 and approved by WDFW and/or the IRT.</p>

Objective 3: Vegetation

Remove cattle and eliminate grazing on the Bank property. Remove invasive species and establish native wetland and adjoining upland vegetation communities comparable to pre-agricultural conditions, in accordance with the MBI planting plan and the targeted hydrologic regimes across the site.

Note: “Cover” is used in this MBI to mean the actual proportion of the ground surface of the sample plot that is covered by a vertical projection of foliage (by single species or defined group of species) as viewed from above (or below for taller shrubs and trees), or by bare substrate.

Performance Standards for All Areas of the Site:

Performance Standard	Documentation
3A. Cattle permanently removed from bank site and planting completed according to IRT approved plans.	As-built planting plan showing completed planting, approved by the IRT. Include a species list, plant spacing and density measurements, seeding rate and final planted acreages of vegetative community types.
3B. Within PAB, PEM, PSS, and PFO wetlands in the floodplain including the Riparian Wetland Bench and Riparian Upland habitat: The following noxious and invasive species, Himalayan blackberry, scotch broom, tansy ragwort, Canada thistle, jewel weed, and bull thistle, do not collectively exceed 10% cover at 3, 5, 7, and 10 years following approval of as-built planting plan. Cover is not averaged for the entire site – maximum applies to each habitat type. Additional species may be added pursuant to Article VI.B.2.	Monitoring reports documenting non-native invasive species presence and percent cover approved by IRT. Document the percent cover of invasive species in each habitat type and each data plot at years 3, 5, 7 and 10.
3C. Cover of reed canary grass and meadow foxtail does not collectively exceed 30% within PEM, PSS, and PFO wetlands and Riparian Wetland Bench and Upland Habitats and 15% within the PAB habitat at 3, 5, 7, and 10 years following approval of as-built planting plan. Cover is not averaged for the entire site, maximum applies to each habitat type.	Monitoring reports documenting non-native invasive species presence and percent cover approved by IRT. Document the percent cover of invasive species in each habitat type and each data plot at years 3, 5, 7 and 10.
3D. Over the entire site there will be zero tolerance of Japanese knotweed (and related hybrids) and purple loosestrife. Holly and English ivy colonization are located and will be eliminated. Any specimens that appear will be eradicated during the growing season of the same year. Additional species may be added pursuant to Article VI.B.2.	Monitoring reports documenting identification and eradication approved by the IRT. Inventory annually and include in monitoring reports at years 1, 3, 5, 7 and 10.

Performance Standards for Existing and Proposed Palustrine Emergent Wetland Areas in the floodplain:

Performance Standard	Documentation
3E. In the PEM wetland areas, there will be at least 8 native herbaceous facultative or wetter native species present. At least 3 native facultative or wetter species will each have a minimum of 5% cover at years 3, 5, 7, and 10 following approval of the as-built planting plan.	In each of years 3, 5, 7, and 10, monitoring reports documenting species presence are approved by the IRT. Provide photos from established photo points.
3F. In the PEM wetland areas, native emergent plant species have a minimum of 30% cover at year 1, 60% cover at year 3, 70% cover at year 5, 80% cover at year 7 and 80% at year 10 following approval of the as-built planting plan.	In years 1, 3, 5, 7 and 10, monitoring reports documenting native species percent cover s are approved by the IRT.

Performance Standards for Palustrine Scrub-shrub Wetland Areas:

Performance Standard	Documentation
3G. In the created PSS habitat (including existing PEM converted to PSS), native woody species shall have a minimum stem density of at least 450 stems per acre at years 1 and 3, 60% cover at year 5, and 70% cover at year 7 and 10, following approval of the as-built planting plan.	Monitoring reports documenting stem density of native woody vegetation in years 1 and 3 and percent cover in years 5, 7 and 10 are approved by the IRT.
3H. In the existing PFO and PSS habitat enhancement areas, native woody species will have a minimum of 4 species present and 50% cover in year 1, 60% in year 3, 70% in year 5 and 80% in year 7 and 10 following approval of the as-built planting plan.	Monitoring reports documenting species of native woody vegetation and cover density in years 1, 3, 5, 7 and 10 are approved by the IRT.

Performance Standards for Palustrine Forested Wetland Areas:

Performance Standard	Documentation
3I. In the created PFO habitat (including existing PEM converted to PFO), PFO wetland areas shall have a minimum density of trees of at least 250 stems per acre at year 1, 225 stems/acre at years 3, 200 stems/acre at year 5, 180 stems/acre at year 7 and year 10 following approval of the as-built planting	Monitoring reports documenting tree stem density approved by the IRT. Stem density for trees within PFO plots will be recorded for years 1, 3, 5, 7 and 10. Trees are defined as those species that have the potential to reach greater than 20 feet in height at maturity.

plan.	
3J. In the created PFO habitat (including existing PEM converted to PFO), PFO wetland areas will have a minimum percent cover of native trees and shrubs of 25% cover at year 3, 40% cover at year 5, 60% cover at year 7, and 70% cover at year 10 following approval of the as-built planting plan.	Monitoring reports documenting cover of native trees and shrubs in years 3, 5, 7 and 10 are approved by the IRT.

Performance Standards for Riparian Upland Enhancement Areas:

Performance Standard	Documentation
3K. Native woody species in the Riparian Upland enhancement areas shall have a minimum stem density of at least 400 stems per acre at year 1, 375 stems per acre at year 3, 40% cover at year 5, 60% cover at year 7 and 70% cover at year 10 following approval of the as-built planting plan.	Monitoring reports documenting stem density and percent cover approved by the IRT in years 1, 3, 5, 7 and 10.

Objective 4: Hillside Preservation Area

Preserve and protect the forested hillside area including the wetlands, tributaries, Priority Habitat Old Growth Forest and riparian corridors that provide critical habitat values, water quality functions and water quantity functions to the aquatic areas in the floodplain. Protect the forested uplands in the hillside area, along the tributaries and surrounding Wetland A to maintain a habitat corridor for amphibians and other aquatic dependent wildlife, cool water inputs and food chain support for fish and access to beneficial rearing and refuge habitat for salmonids within the tributaries.

Performance Standard	Documentation
4A. Confirm the presence and existing baseline wetland ratings of 2.32 acres of PFO, PSS and PEM wetlands within all of the preserved hillside area in year 5. Survey and document any changes to the preserved hillside area from human activities or significant natural changes in year 10.	Perform an assessment of the hillside preservation area noting any natural or unnatural (human caused) changes to the forest, streams or wetlands from baseline conditions. Include in the Year 5 and 10 monitoring reports for submittal to and approval by the IRT. If changes occur, make changes to the management and protection plan in consultation with the City of Kelso and the IRT

Objective 5: Habitat

Create and improve habitat for fish and wildlife on the site by removing all internal fencing, installing habitat features such as large woody material, live brush piles, log jams, downed logs

and bird nest boxes. Upgrade culverts to WDFW standards and remove old farm equipment and other debris placed in the Coweeman River as rip-rap.

Performance Standard	Documentation
<p>5A. Install fish passable crossings over Tributaries 1 and 2, spawning gravel in Tributaries 2 and 5, and large woody material, perch poles, and bird nest boxes per the Bank MBI. Remove fencing and old farm equipment and other debris from the Coweeman River.</p>	<p>As-built drawings and photos showing removal of old farm equipment from river and installation of LWM, spawning gravel, log jams, downed logs and bird nest boxes and fish passable crossings installed per the MBI and grading plan and approved by the IRT.</p>
<p>5B. A minimum of 80% of the original number, as shown on the approved as-built drawings, of each type of habitat feature will be present at year 10. Habitat features include: root wads, downed logs, perch poles, and nest boxes.</p>	<p>Document location of habitat features at year 10 in monitoring report approved by the IRT. LWM recruited and secured to the site by established vegetation will qualify towards the final 80% remaining calculation.</p>
<p>5C. Perform a fish presence and habitat survey in years 1, 3, and 7 within the riparian wetland bench and alcove areas along the main stem of the Coweeman River, within Wetlands A, B and C and Tributaries 1, 2 and 5. Document the presence/absence of anadromous fish utilizing previously inaccessible aquatic areas (riparian wetland bench, alcove areas, Tributaries 1, 2, and 5 and within Wetlands A, B and C) within the bank project boundaries and around LWM installed within the riparian areas.</p> <p>Fish presence surveys will be conducted during years 1, 3, and 7 to provide information on the fish species present and their corresponding life stage, as they utilize restored habitat areas on the bank project.</p> <p>Habitat surveys will collect data on Wetland A outlet flows, annual percent inundation levels of Wetland A, B and C, amount and integrity of suitable fish habitat structure (Areas A, B, C) and water temperature in Area A aquatic habitat.</p>	<p>Fish Presence surveys will be completed per applicable NMFS/WDFW methods for surveying of anadromous fish, as further detailed in Appendix F.</p> <p>The timing of fish presence surveys for juvenile salmonids will be based on the bimodal outmigration patterns of Chinook (and Coho) salmon in the Coweeman system. The number of fry outmigrants peak in early spring, based on high flow events, and the number of outmigrating subyearling smolt peak in the summer, based on increased stream temperatures. In accordance with these events, surveys will generally occur during or after peak flows in the Spring and before Summer stream temperatures rise above 20 degrees Celsius, which generally occurs in July or August.</p> <p>Fish presence/absence surveys can be conducted through visual monitoring in the tributaries within the bank without the need for fish handling. After year 1, in coordination with NMFS and WDFW, if it is determined that electrofishing is necessary to achieve greater quantitative understanding of fish use in the tributary systems monitored, an application for a Section 10 research</p>

	<p>permit from NOAA will be submitted to provide for incidental take allowance, such that this technique can be applied in years 3, and 7 of fish monitoring.</p> <p>Wetland A outlet flows will be documented using a gauge or flowmeter in order to show proper function per the approved design.</p> <p>Annual percent inundation of wetlands will be documented with Solinst Datalogger data, and for Wetland A, compared to pre-construction data.</p> <p>Fish habitat structure enhancements (e.g., spawning gravels and LWM) installed in Wetlands A, B and C, along riparian areas, and within tributaries within the bank will be identified and photo-documented to record their structural integrity over time.</p> <p>Water temperature in Area A will be collected with Solinst dataloggers and compared with Pre-construction data for the same location.</p>
<p>5D. Survey for and document the presence of adult salmon and spawning activities including the identification of redds within the Bank site wetlands, tributaries or alcove areas along the Coweeman River. These surveys must be conducted without handling fish such that incidental take allowance is not required under the current project description from which consultation proceeded.</p>	<p>Visually document and/or photo document and report on any adult salmon presence and spawning activity within the habitat areas of the bank project as part of year 1, 3, 5, 7 and 10 monitoring reports. Visual and/or photo documentation will occur in the fall and winter of each monitoring year.</p>

APPENDIX D CREDIT GENERATION AND AWARD SCHEDULE

D.1 Definition of Credit Values

A. Universal Credits and Discounted Service Acre Year or “DSAY” Credits will be established and awarded to Phase 1 of the Bank upon the Sponsor’s demonstration that the performance standards reflected in Appendix C, Section C.2. have been met.

B. A “Universal Credit” is defined as a unit of measure representing the increase in the ecological value of the bank site. A universal credit for this Bank represents the increase in functions, values, and areal extent of the wetland systems on the project site. This increase in function results from the creation, rehabilitation, enhancement and preservation of wetlands and their associated uplands on the Bank site as detailed in Appendix B and Table D-1 below. The anticipated number of universal credits reflected in Table D-1 are determined based on the projection, if the performance standards are achieved, that the created, enhanced or preserved wetlands and associated upland areas at the Bank site will rate as a high functioning wetland, riparian and upland systems upon maturity. The value of existing old growth and second growth forests protecting wetlands and cold water tributaries to the Coweeman River and a large interconnected Category 1 wetland in the floodplain create a significant suite of resources that can sustain wetland function if adequately preserved. In addition to the existing resources there is significant opportunity to create additional wetland habitat in the floodplain that can be used by important fish and wildlife species, as well as an integral riparian upland corridor that can be significantly enhanced to provide form and function in the floodplain. The bank site includes wetland habitat that would be classified as “depressional, riverine and slope” under the HGM classification system and “palustrine and riverine” wetlands under the Cowardin classification system. A universal credit is also based on the improvement to water quality, water quantity and habitat functions within the created, enhanced or preserved wetlands on the bank site which are documented as performance standards are met.

C. A “Discounted Service Acre Year” (DSAY) Credit is a unit of measure derived from functional gains in fish habitat as measured through Habitat Equivalency Analysis or “HEA”. HEA has been used over the last two decades in NOAA’s Damage Assessment and Restoration Program to help value damages to certain near-shore habitats, in order to negotiate Natural Resource Damage Settlements with Responsible Parties in Superfund sites (CERCLA, 1980). More recently, HEA has been utilized to evaluate the benefits provided to listed species such as Chinook salmon in conservation bank projects. HEA, based on a Stated Preference economics model, has the flexibility to provide across-habitat evaluations of both habitat loss (injury) and habitat gain (compensation for loss) (i.e., a Habitat Equivalency Analysis) (Wolotira, NOAA 2008). HEA can be employed to evaluate ecological function gains from restoring habitats within areas such as riverine floodplains and estuarine habitats that have value to anadromous fish species. Ecological function gains on the Coweeman Bank project is determined by comparing habitat types and conditions in areas within the Coweeman River floodplain before and after restoration occurs.

Four components are used within HEA to generate DSAY values at the Bank: 1) a valuation of all habitat types relevant to anadromous fish within the floodplain portion of the project before and after restoration occurs; 2) estimates of the time needed for each restored habitat type to achieve its full ecological function value for anadromous fish; 3) the duration that the restored habitat will continue to fully function; and 4) A discounting factor.

The Bank project has delineated 7 distinct habitat polygons within the floodplain that are beneficial to anadromous fish, based upon the definitions in NOAA’s draft guidance “Habitat Types and Values for the Lower Columbia River Salmon and Steelhead Recovery Domain for Use with Habitat Equivalency Analysis” (Fisher 2015). Each separate habitat polygon is given an incremental value between 0 and 1 (0 denoting “not functioning” and 1 denoting “fully functioning”) and an expected time for that habitat type to reach full function and maturity. Additionally, bonus crediting factors are derived when a certain habitat type will benefit multiple species and life stage requirements of anadromous fish. A total number of DSAYs is then determined by inputting this information into the HEA calculation:

$$\text{Total Habitat Gain (loss)} = \sum_{t=t_0}^{tt} V_t A (1 + d)^{(T-t)}$$

Where:

V_t = inherent value of habitat for subject species gained (or lost) at time t per unit area of injured habitat

A = area of restored habitat

tt = year in which services are completely recouped/ duration of existence of restoration site

t_0 = time when impact occurs, usually “0”

T = base year/present time, usually “0”

d = discount rate (NOAA-NMFS uses 3%)

Total DSAYs derived from each habitat type found within the floodplain portion of the bank are documented in Table D-2 in Section D.2 below.

D. Both Universal Credits and DSAY Credits will be generated within the floodplain portions of the bank project. Only Universal Credits will be generated within the hillside preservation area of the Bank Project. Universal Credits derived from preservation actions will be tracked separately from Universal Credits generated in the floodplain portion of the project. Universal Credits and DSAY Credits will be totaled up within each section of the floodplain (A, B and C) and the conversion factor of Universal Credit to DSAY credit will be determined and averaged for the floodplain area. When either type of credit is debited from an area where both Universal and DSAY credits were generated, the equivalent and corresponding credit amount of either the DSAY or Universal Credit will also be taken off the ledger. If both Universal Credits and DSAY credits are required by an applicant for a specific impact mitigation, whichever amount of Universal Credit or DSAY credit is the greatest during the evaluation and permitting process, will be used as the correct amount of credit to debit from the Bank.

E. The precise number of both universal credits and DSAY credits actually generated by the Bank cannot be determined until the project is constructed and the success of restoration and enhancement activities is assessed by the IRT. The final number of Universal Credits and

DSAYs will be determined by the Corps and Ecology, in consultation with the IRT, and will be based on achievement of the performance standards set forth in Appendix C of this instrument. DSAY credits have a discounted present value based upon the time for the restoration activity to reach full function. In years 5 and 10 the Sponsor may request to revalue the existing habitat types to determine whether the unused DSAY credit values have reached full maturity and function more quickly than originally anticipated.

D.2 Credit Generation

A. A table showing Universal Credit generation ratios and total credit amounts for each habitat type by area within Phase 1 of the project will be calculated as shown in Table D-1 below. The total amount of Universal Credit that can be generated at the bank project is 57.15 Universal Credits. This includes 37.76 credits generated by creation, rehabilitation and enhancement activities of aquatic and riparian areas in the floodplain and 19.39 credits generated by the preservation of streams, wetlands and uplands in both the floodplain (PAB Wetland Habitat) and Hillside Preservation Area.

Table D-1: Universal Credit Generation by Bank Development Activity

Bank Activity by Area and Cowardin Class	Area (Acres) of Credit Generation	Credit Generation Ratio (Activity Area: Credit)	Anticipated Number of Credits
Area A			
Wetland A Creation: PEM/PSS/PFO Mosaic	12.21	1:1	12.21
Area A Riparian Wetland Bench Creation: PEM/PSS Mosaic	1.68	1:1	1.68
Wetland A PEM Rehabilitation to PSS/PFO Mosaic	13.15	2:1	6.58
Wetland A Enhancement Existing PSS/PFO mosaic	14.17	4:1	3.54
Wetland A Preservation of PAB	6.12	6:1	1.02
Area A: Riparian Upland Enhancement	15.53	4:1	3.88
Hillside Preservation: PSS/PFO Wetlands	1.17	6:1	0.20
Hillside Preservation: old growth riparian-wetland corridor	33.65	8:1	4.21
Hillside Preservation: second growth riparian corridor	3.55	9:1	0.39
Hillside Preservation: non riparian old growth forest	123.06	10:1	12.31
Hillside Preservation: non riparian second growth forest	17.59	14:1	1.26
Area B			
Wetland B Creation	5.28	1:1	5.28

PEM/PSS Mosaic			
Area B Riparian Bench Wetland Creation	0.32	1:1	0.32
Wetland B Rehabilitation PEM/PSS Mosaic	0.44	2:1	0.22
Area B Riparian Upland Enhancement	4.17	4:1	1.04
Area C			
Wetland C Creation: PEM/PSS/PFO Mosaic	1.59	1:1	1.59
Wetland C Rehabilitation	0.95	2:1	0.48
Wetland D Enhancement	0.36	3:1	0.12
Area C Riparian Upland Enhancement	3.28	4:1	0.82
Total Creditable Area and Credit:	258.27		57.15
Total Credit from Preservation Phase 1			19.39
Total Credit from Restoration Phase 1			37.76
Non-Creditable Buffer Phase 1	30.22		
Non-Creditable Easements Phase 1	5.76		
Non-Creditable Coweeman River	7.75		
Phase 2 Total Acreage	18.90		
Bank Site Area Total:	320.90		

B. A table showing the number of DSAYs generated at the Coweeman Bank Project by using the Lower Columbia River HEA Habitat Values will be calculated as shown in Table D-2 on the following page. The definitions of these habitat types under the Lower Columbia River HEA Model and the rationale for crediting each area at the bank site are contained in the Project Resource Folder.

Table D-2: Coweeman River Mitigation Bank Table of HEA Habitat Areas and Values

Habitat Type	Location	Acreage	Existing Functional Habitat Value	Proposed Functional Habitat Value	Years to Full Function	DSAYs per Acre	DSAY Total per Area	Crediting Factor	Total DSAYs w/ Crediting Factors
Upland (beyond 200 ft from OHW)	Area A	1.29	0.1	0.4	40	6.13	7.91	-	8.03
	Area C	0.02					0.12		
Riparian Corridor (above OHW, within 200 ft)	Area A	14.36	0.1	0.65	40	11.24	161.41	-	244.92
	Area B	4.17					46.87		
	Area C	3.26					36.64		
Active Channel Margin (between OLW and BKF)	Area A (Trib 1&2)	0.19	0.1	1.0	5	29.15	5.54	1.3 ¹	50.40
	Area A (Notch)	0.07					2.04		
	Area A (Coweeman bank)	0.75					21.86		
	Area B (Coweeman bank)	0.32					9.33		
Fish-Bearing Tributary and Other Tribs of Higher Order (below OLW)	Area A (Trib 1&2)	0.08	0.4	1.0	10	18.10	1.45	1.3 ¹	194.81
	Area A (Trib 5)	0.04	0.2				0.72		
	Area A (Wetland-perm inundated)	6.12	0.2				24.13		
Offchannel – Wetlands- flooding frequency less	Area A (Wetland-existing)	27.27	0.2	0.9	20	18.41	502.04	1.15 ²	876.17

than annually (above OWH)	Area A (Notch)	0.14	0.1			21.04	2.95		
	Area A (Wetland- created)	12.21					256.90		
Alcove without Tributary	Area B	5.72	0.1	0.8	1	24.03	137.45	1.2 ³	210.79
	Area C	1.59					38.21		
Embayment with Tributary	Area A (Trib 1/2 outlet)	0.86	0.1	1	1	30.9	26.57	1.3 ¹	34.54
Total DSAYs									1,619.66

¹ 2 additional species and one additional life history stage

² flood recurrence interval of 2 years (0.3 crediting factor divided by 2 year recurrence interval)

³ 2 additional species

C. Table D-3 below shows the total amount of Universal Credit and the total amount of DSAYs generated within the floodplain portion of the bank project. For the purposes of debiting the correct amount of equivalent and corresponding bank credits from the bank ledger, a conversion factor of 1 Universal Credit to 41.77 DSAY Credits will be used.

Table D-3: Universal Credits to DSAYs Credit Conversion factor within Floodplain

Bank Site Area	Universal Credit (Floodplain)	Total DSAYs (Floodplain)	Universal Credit to DSAY Credit conversion factor per Area	Universal Credit to DSAY Credit conversion factor (Floodplain)
Area A (Floodplain)	28.91	1,313.11	1 : 45.39	1 : 41.77
Area B	6.86	223.94	1 : 32.64	
Area C	3.01	82.61	1 : 27.45	
Total:	38.78	1619.66	1 : 41.77	

D.3 Credit Award Schedule:

A. Credits will be awarded to the Bank for sale, use, or other transfer as the performance standards associated with those credits are met, with the following exceptions: (1) no credits may be awarded prior to meeting all of the performance standards associated with Objective 1, and (2) no credits associated with the Year 10 performance standards may be awarded until at least 60% of all possible credits associated with Years 0 through 9 have been awarded. DSAYs will be awarded in proportion to the universal credits released as performance standards are achieved for universal credits from the floodplain area. If performance standards associated with the floodplain area are not achieved and universal credits are not released, the corresponding amount of DSAYs will not be released, based upon the Universal Credit to DSAY Credit conversion factor in Table D-3. DSAY Credits and Universal Credits within the floodplain area of the Bank will be debited from the bank ledger based upon the credit conversion factor contained in Table D-3 which shows the total maximum amount of DSAY and Universal Credit available for those areas within the floodplain. If the expected HEA Habitat Values in the Bank cease to be an accurate representation of current or expected conditions (positively or negatively), HEA Habitat Values can be recalculated and the Universal Credit to DSAY Credit conversion factor may be adjusted to account for those changes, with approval of the Corps and Ecology, in consultation with the other members of the IRT. This action could occur if there are adaptive management actions or unexpected changes to site conditions that effect the current and expected HEA Habitat Values at the Bank.

B. The Corps and Ecology, in consultation with the IRT, will typically approve the award of credits according to the schedule in Table D-4, below. Credits may not be awarded sooner than specified in Table D-4, except where otherwise noted or in extraordinary situations with the written approval of the Corps and Ecology, in consultation with the other members of the IRT. If the Bank is not able to meet a particular performance standard by the year indicated in Table

Table D-4 Credit Release Schedule

Universal Credits from Floodplain Area Restoration	38.78							
Universal Credits from Hillside Preservation	18.37							
Potential Universal Credits - Total	57.15							
Potential DSAYs to be Released	1619.66							
Appendix C Performance Standards								
	Pre-Construction Credits	Year 0 Credits	Year 1 Credits	Year 3 Credits	Year 5 Credits	Year 7 Credits	Year 10 Credits	Total Credits
Objective 1. Administrative Protections								
1A MBI Signed	3.84							3.84
1B CE Recorded	3.84							3.84
1C Financial Assurances Completed	3.84							3.84
1D Long-Term M & M Fund Established	3.84							3.84
1E Obtain all Authorization and Permits	3.85							3.85
Objective 2. Hydrology								
2A Grading Plan As-built Approved by IRT		1.55						1.55
2B Minimum of 55.00 acres of wetlands in floodplain				3.30				3.30
2C Delineate wetlands in floodplain					2.52		0.39	2.91
2D Document Inundation of Fish Habitat			0.78	0.39	0.19	0.39	0.19	1.94
2E Wetland A Outlet is Fish Passable			0.78	0.39	0.19	0.43	0.23	2.02
Objective 3. Vegetation								
3A Planting Plan As-built Approved by IRT		1.94						1.94
3B Maximum Invasives and noxious Weeds				0.31	0.27	0.39	0.19	1.16
3C Maximum RCG and Meadow Foxtail				0.31	0.27	0.39	0.19	1.16
3D Zero Tolerance Invasives			0.39	0.19	0.19	0.39	0.12	1.28
3E PEM 8 Native Species 3 with 5% Cover				0.23	0.23	0.39	0.31	1.16
3F PEM % Cover native species			0.31	0.19	0.19	0.37	0.16	1.22
3G Created PSS Stem Density and % Cover			0.31	0.27	0.19	0.23	0.32	1.32
3H Enhanced PFO/PSS % Cover and Diversity			0.39	0.23	0.19	0.30	0.16	1.27
3I Created PFO Stem Density			0.39	0.31	0.19	0.39	0.27	1.55
3J Created PFO Cover Density				0.31	0.31	0.39	0.16	1.17
3K Riparian Upland Stem Density and % Cover			0.47	0.39	0.31	0.74	0.43	2.34
Objective 4. Hillside Preservation Area								
4A Protect and Confirm Baseline Conditions					2.75		1.84	4.59
Objective 5. Habitat								
5A Habitat Features Plan As-built Approved by IRT		2.33						2.33
5B 80% Survival of Habitat Features				0.39		0.39		0.78
5C Survey Site for Fish Presence			0.24	0.27		0.31		0.82
5D Adult Salmon Presense and Spawning Survey			0.23	0.27	0.54	0.31	0.78	2.13
Universal Credits From Floodplain	5.43	5.82	4.29	7.75	5.78	5.81	3.90	38.78
Universal Credits From Preservation	13.78				2.75		1.84	18.37
Total Universal Credits	19.21	25.03	29.32	37.07	45.60	51.41	57.15	57.15
DSAY Credit Release Schedule	226.81	243.10	179.00	323.72	241.43	242.68	162.92	1619.66

D-4, the Sponsor may submit documentation of successful satisfaction of that performance standard during a subsequent year, and the Corps and Ecology, in consultation with the IRT, will give full consideration to the award of appropriate credits for sale, use, or transfer without reduction or other penalty.

C. The Corps and Ecology may, at their discretion following consultation with the IRT, award partial credit for partial accomplishment of a performance standard. In the event a specific performance standard is not met, but the IRT feels that the site is progressing satisfactorily, the Corps and Ecology may at their discretion following consultation with the IRT, award credits.

D. Once a credit is awarded, the Bank may sell, use, or otherwise transfer that credit at any time, subject to the provisions of this Instrument.

E. If the institution of an adaptive management or remedial action plan as described in Section F.4 of Appendix F causes delay in the achievement of a performance standard, the timeline for achievement of each subsequent milestone for that performance standard will be deferred for a like interval, unless otherwise specifically approved by the Corps and Ecology, following consultation with the IRT. The Corps and Ecology, following consultation with the IRT and with the Sponsor, will determine what remedial actions are necessary to correct the situation, pursuant to Article IV.H. and Section F.4, and direct their performance prior to the award of any additional mitigation credits.

References

United States Environmental Protection Agency. *Compensation, beyond remediation, for damages covered by the Comprehensive Environmental Response, Compensation and Liability Act of 1980, (CERCLA) (42 U.S.C. § 9601 et seq.)*

National Marine Fisheries Service. *Habitat Types and Values for the Lower Columbia River Salmon and Steelhead Recovery Domain for Use with Habitat Equivalency Analysis*. (Jeffrey P. Fisher and Stephanie Ehinger 2015)

National Marine Fisheries Service-Northwest Region. *Habitat Evaluation of the Blue Heron site for a specific type of juvenile Chinook salmon*. (Wolotria, R.J. 2008)

APPENDIX E PROCEDURES FOR USE OF MITIGATION BANK CREDITS AND DEBIT USE

E.1 Mitigation Bank Service Areas

Credits from the Coweeman River Mitigation Bank will be used within two distinct Service Areas depending on the type of credit required; one service area will define the use of the bank when an applicant uses Universal Credits for wetlands, buffers and other aquatic resource impacts and another service area will define the use of the bank when the applicant uses DSAYs for ESA listed fish and non-listed fish habitat impacts.

1) The service area for Universal Credits which includes impacts to wetlands, critical area buffers and other regulated aquatic resources is based upon the aquatic functions restored and preserved at the bank project, in conjunction with similar potential aquatic resource impacts in the Lower Columbia River Floodplain and Cowlitz River Watershed (**Figure E-1**).

2) The service area for ESA-designated and proposed critical habitat, non-listed and resident fish, and stream habitat impacts (as measured through DSAYs) is based upon the bank project's restored habitat areas and the potential use of that habitat by ESA-designated and non-listed fish species in the same ecologically significant unit (ESU), or related river system (**Figure E-2**).

E.2 Service Area Boundary for Universal Credits

E.2.1 Universal Credit Use within the Lower Columbia River Floodplain

The service area boundary for Universal Credits within the Lower Columbia River Floodplain includes portions of the 12-digit Hydrologic Unit Code (HUC) mapped sub-basins along the Columbia River within the historical floodplain of the Columbia River, at or below the 20 foot elevation contour. The upstream extent of the Service Area is the I-5 Bridge at River Mile (RM) 106 in Vancouver, Washington and the downstream extent is the western edge of the Hunt Creek Sub-Basin (HUC 17080030602) at RM 56 near Stella, west of the City of Longview in Washington. The service area also includes the small tributary basins of Coal Creek and Clark Creek that drain into the Columbia River between the City of Longview and RM 56 near Stella. The upstream reach of the service area along the Columbia River extends into the upper tidal hydrogeomorphic region of the Columbia River to the I-5 Bridge which is in the middle of the 12-digit HUC "Lake River-Frontal Columbia River Sub-Basin (HUC 170900120304).

Prior to European settlement, the Lower Columbia River floodplain and tributaries including the Sandy, Washougal, Willamette, Lewis, Kalama, Coweeman and Cowlitz Rivers, and lesser streams, were connected with tidally influenced river processes that were very similar in nature. Higher energy tributary rivers and streams entered the slower moving, but massive Columbia River, within a region of repetitious and periodic slack water and fast moving flows under the influence of Pacific Ocean tides. All the major tributaries within this segment of the Columbia

River originate in the Cascade Mountain Range and sediment deposition and periodic flood flows are common. Native human populations recognized the annual flood cycles and avoided permanent encampment in the low areas of the Columbia River during winter and spring. The bank site was historically part of a large interconnected and tidally influenced floodplain area that included wetlands, oxbows, sloughs and drainages which were heavily influenced by the Cowlitz, Coweeman and Columbia Rivers. These low lying floodplain areas (including the floodplains in the bank site), regularly receive overbank flooding during high river flows, backwatering during spring snow melts and tidal backflow due to the tidal influence in this portion of the Columbia River.

The low-lying topography at the bank site, similar composition of alluvial soils and a consistent tidal connection between the Coweeman, Cowlitz and Columbia Rivers is why the floodplain areas of the bank project are mapped as part of the larger historical Columbia River Floodplain. The bank site is within the tidally influenced portion of the Columbia River Basin and Cowlitz River which is mapped as tidally influenced to River Mile 7.5 on the Coweeman River.

Along the lower Columbia River portion of the Bank's service area from Vancouver to Willow Grove and the tributaries within the tidal reaches, the following aquatic habitat processes and characteristics are shared:

- A shared interaction of floodplain processes, annual floods and sediment deposition, influenced by tidal action.
- The presence of associated back channels, side channels, sloughs, wetlands and low lying lakes.
- Aquatic resource habitat for fish and wildlife that utilize habitat areas along the main stem Columbia River as well as the associated tributaries, including areas such as the bank site and its aquatic areas.
- Vegetation communities and specific species unique to the region that share the same overlapping climate-dependent propagation zones.
- Similar pattern of historic settlement for native cultures in the region that reflect the related natural resource processes occurring in this environment.
- Pattern of historic European settlement and economic interest and trade principally in salmon, timber and other natural resources that are unique to the region.
- Pattern of floodplain control through levees and drainage systems to support agriculture and development, largely focused next to the river and tributaries.

In summation, portions of the Lower Columbia River floodplain are included in the service area based on: 1) the similarities in riverine floodplain geomorphology at the bank site, compared with other similar areas along the lower Columbia River floodplain, 2) the similarities in wetland

processes and other aquatic functions at the bank site compared with other areas of the Columbia River Floodplain and 3) the restoration and creation of tidally influenced wetlands at the Bank site compared with similar areas with current or historical tidal influence along the Lower Columbia River.

The upper and lower river limits of the service area along the Columbia River are also based on a reasonable geographical distance of potential projects from the Bank site location as well as similar topographic features, floodplain soils composition, hydrology and habitat connectivity.

The Service area boundary along the historic lower Columbia River Floodplain has been further detailed by County based upon different watershed characterizations below:

In Clark County, the service area includes that area identified as the Columbia floodplain area by Washington Department of Ecology’s Watershed Characterization of Clark County (Ecology, 2007). Specifically, the report states “The Columbia floodplain area is dominated by the influence of the Columbia River. It is located in a rain zone, has sub-surface water flow patterns which are influenced by groundwater discharge from the adjacent upland units and recharge from the river surface waters, geologic deposits consistent primarily of relatively recent river alluvium (sand and silt), and a riverine floodplain and valley walls formed by fluvial action of the river.” (Ecology). This area was mapped by Ecology, in cooperation with Clark County.

In Cowlitz County, the service area in the Columbia River floodplain was determined using the following criteria:

1. The service area boundary includes small watersheds immediately above and which directly drain into the Columbia River. The intent is to capture areas that directly influence or are influenced by the Columbia River and are not influenced significantly by surface and subsurface movement of water in major valleys, terraces and mountains that are inland from the historical Columbia River floodplain.
2. The extent of tidal inundation or the 20 foot contour, whichever was greater, was used to determine the upstream boundaries for major rivers and streams. If information on tidal extent was unknown, then the 20 foot contour was used. The 20 foot contour line was selected based on identification of the elevation at which a distinct break between riverine floodplain geomorphology and upland topography occurred. The distinct break is associated with the Columbia River’s historical direct influence on wetlands. If the tidal extent upstream on tributaries was downstream of where the 20 foot contour intersected the historic tributary floodplain, then it was used.

E.2.2 Universal Credit Use within the Cowlitz River Watershed (WRIA 26)

The service area for Universal Credits also includes a portion of Water Resource Inventory Area (WRIA) 26 – Cowlitz River Watershed and its major tributaries (including the Coweeman River) below the Mayfield Dam.

In consideration of Ecology’s guidance on locating mitigation and restoration projects using a watershed approach, (Ecology, 2009) the inclusion of the WRIA 26 watershed into the bank’s service area matches future and potential resource impacts in the same hydrologically defined system with those similar restored ecological processes at the bank site. Impacts to the same hydrologically connected ground and surface water flows within WRIA 26 can be offset with improvements to those similarly connected ground and surface water flows within the bank project. The variation of wetland types represented at the Coweeman Mitigation Bank make it uniquely qualified to provide appropriate and in-kind mitigation for a variety of diverse aquatic habitat types in WRIA 26. As an example the Coweeman Mitigation Bank will generate universal credits from the preservation, enhancement rehabilitation and creation activities of wetland types ranging from headwater wetlands along the hillside tributaries down to depressional and riverine wetlands in the floodplain, and finally to the tidally influenced riparian wetlands along the main stem of the Coweeman River. This diverse and all-encompassing system is representative of the wide range of wetland habitat types that are found throughout the WRIA 26 watershed from headwater wetlands in the higher elevations of WRIA 26 to tidally influenced riverine floodplain wetlands in and around the Cities of Kelso and Longview.

The Mayfield Dam in Cowlitz County is the uppermost extent of the service area boundary for universal credit use as most of the land above this point in the watershed is national forestland and the Mayfield Dam is a known landmark representing a hydrologic break and a reasonable geographical distance between the bank site location, and potential projects that wish to utilize credits in the WRIA 26 watershed.

E.3 Service Area Boundary for DSAY Credit Use

The service area for offsetting permanent or temporary habitat impacts to ESA-designated and proposed critical habitat for listed fish species, as well as non-listed and resident fish species and stream habitat impacts, includes portions of the Lower Columbia River Basin and associated tributaries outside of WRIA 26 and portions of the Cowlitz River Watershed (WRIA 26). The limits of the service area for ESA designated fish habitat and non-listed fish habitat are described below and illustrated in Figure E-2.

In the Cowlitz River Watershed (WRIA 26):

The service area for fish includes all portions of the Cowlitz River Watershed with the exception of areas upstream of the North Fork Toutle River Sediment Retention Structure (SRS) as it is not feasible to offset impacts on ESA listed species and non-listed species above the SRS.

Lower Columbia River Basin and Associated Tributaries outside of WRIA 26:

The upstream extent of the service area within the Columbia River Basin extends as far as the Port of Kalama and associated properties along the mainstem of the Columbia River. The service area also includes the tidally influenced portions of the Kalama River up to RM 2.8 which is also demarcated by the “Modrow Bridge” over the Kalama River. The Kalama River is recognized as a “contributing” system for LCR coho, Chinook and chum salmon, but is recognized as a

primary system for steelhead. Therefore, impacts to steelhead habitat in the Kalama system cannot be offset with credits from the Bank. The downstream extent of the service area within the Columbia River Basin terminates at river mile 56 on the Columbia River and includes the tidally influenced portions of Germany Creek (approximately ½ mile upstream) as well as all of the other independent tributaries and sloughs between the Cowlitz watershed and Germany Creek.

The Bank service area includes the entirety of Owl Creek, the independent drainage to the Columbia River between the Kalama River and the Cowlitz River. The Owl Creek system is recognized in the LCR recovery plan as “supporting” only to recovery for LCR Chinook, coho, chum and steelhead. It is presumed that impacts in the Owl Creek drainage above the natural barrier on this system, could be offset by withdrawals from the Coweeman Bank for aquatic habitat impacts addressed through WDFW’s HPA program or for Corps and Ecology permit requirements, where mitigation is sought for non-listed fish and aquatic habitat impacts.

The Bank service area also includes the entirety of the Coal Creek and Clark Creek watersheds in Longview which are the first independent tributaries downstream of the confluence of the Cowlitz River with the mainstem Columbia River. The Bank can only be used to offset impacts to non-listed fish habitat above the fish passage barriers in both of these systems.

E.4 Use of Credits outside the Service Area

The Bank may be used to compensate for permitted impacts outside the service area if specifically approved by the appropriate agencies requiring mitigation and the Corps and Ecology, following consultation with the IRT, provided that such mitigation would be practicable and environmentally preferable to other mitigation alternatives. As such, out-of-service-area impacts will only be allowed in special circumstances, which will be evaluated on a case-by-case basis (e.g., projects that span multiple basins such as transportation and utility corridors and pipelines, and settlement of enforcement actions).

E.5 Universal Credit Ratios and DSAY Credit Use

A. Universal credits or DSAYs may be used, subject to the approval of the regulatory agencies with jurisdiction over the impact, to compensate for authorized permanent or temporary impacts, as well as to resolve enforcement or permit compliance actions such as replacing previously implemented project-specific mitigation that has partially or completely failed.

Each credit withdrawal transaction agreement that is associated with a permit must indicate the permit number of the impacting project, date of permit issuance, the number of universal credits and/or DSAYs transacted, and must expressly specify that the Sponsor, and its successors and assigns, assumes responsibility for accomplishment and maintenance of the permittee’s compensatory mitigation requirements associated with the impacting project, upon completion of the credit transfer.

B. The following table depicts the approximate number of Universal Credits typically required by the IRT agencies to compensate for each unit of permanent loss of listed aquatic resource type

and functional level. The actual number of Universal Wetland Credits required to compensate for an adverse impact to aquatic resources in any particular situation depends on many factors (e.g., whether the impact is permanent or temporary) and will be determined on a case-by-case basis by the regulatory agency(ies) authorizing the impact. The wetland functional categories are based on the Washington State Wetland Rating System for Western Washington, revised (Ecology Publication # 04-06-025). Units of loss are measured in acres for wetland and buffer impacts. Due to the typically high level of functioning of Category I wetlands, compensation for impacts to these resources by Bank credits will be determined by the regulatory agencies on a case-by-case basis.

Table E-1: Typical Debit-Credit Ratios for Wetland Impacts at the Bank

Resource Impact	Bank Credits: Impact Acreage
Wetland, Category I	Case-by-Case
Wetland, Category II	1.2 : 1
Wetland, Category III	1 : 1
Wetland, Category IV	.85 : 1

C. Impacts to streams, wetlands or other aquatic areas that permanently or temporarily impact ESA listed or threatened fish species, non-listed or resident fish species or habitat will be calculated based upon the following, which is the most current and accepted credit-debit methodology available for measuring fish habitat loss or gain for a given species. DSAYs credits at the bank have been calculated based upon HEA values for different habitat types found in the Lower Columbia River Basin that are used by anadromous fish, specifically ESA listed Chinook Salmon. In consultation with those regulatory agencies with jurisdiction over an impact, permit applicants may utilize the Lower Columbia River HEA values in order to calculate the correct amount of DSAY credits required to offset impacts to ESA listed, threatened or state species of concern. DSAY credit use will be on a case-by-case basis, and be based on the review and oversight of the regulatory agency reviewing the project with knowledge of the project impacts, including the location, amount and type of impact that is occurring to fish species or their habitat.

E.6 Use of Universal Credits for Critical Area Buffer Mitigation by Local Jurisdictions

Impacts to critical area buffers for wetlands, streams, lakes and other areas regulated by local jurisdictions within the Bank service area, including Cowlitz County and the City of Kelso can be mitigated by use of universal Bank credits with the approval of the appropriate regulatory agencies. Since one Bank credit is generated for every 4 acres of upland buffer or riparian buffer restoration, a ratio of “.25 : 1” for critical area buffer impacts results in a “1 : 1” ratio for area on the ground of permitted buffer impact to buffer restoration at the Bank. Buffer values vary in every situation so the amount of universal credit required in each permit situation can be determined on a case-by-case basis by the regulatory agency reviewing the project according to local regulations.

E.7 Procedures for Use of Mitigation Bank Credits

A. Use of Mitigation Bank Credits: Public and private proponents of activities regulated under Sections 401 and 404 of the Clean Water Act (33 U.S. Code §§ 1341, 1344), Section 10 of the Rivers and Harbors Act of 1899 (33 U.S. Code § 403), Endangered Species Act (16 USC §§ 1531 et seq.), Magnuson-Stevens Fishery Conservation and Management Act (16 USC §§ 1801 et seq.), Washington State Water Pollution Control Act (Chapter 90.48, RCW), Shoreline Management Act (RCW 90.58), Growth Management Act (RCW 36.70A), Hydraulic Code (RCW 75.20), and other Federal, State, and local authorities may be eligible to use the Bank as mitigation for unavoidable impacts. The Bank will be eligible to serve public and private end users by providing advance compensatory mitigation for authorized impacts to regulated areas that require mitigation to settle enforcement claims. The Bank is intended to provide replacement of lost functions and values including: wetlands, streams, endangered species habitat, riparian habitat, aquatic lake and open water habitat and upland/buffer habitat.

B. An applicant seeking a permit for a project with unavoidable adverse impacts to the aquatic environment within the service area must generally obtain the approval of each regulatory agency with jurisdiction over that project, in order to use the Bank as a source of compensatory mitigation. To receive approval to use the Bank, the applicant must demonstrate to the satisfaction of the pertinent regulatory agencies that the project complies with all applicable requirements pertaining to alternatives and mitigation sequencing and that purchasing credits from the Bank for compensatory mitigation would be in the best interest of the environment. Specifically, a permit applicant must generally be able to demonstrate to the satisfaction of the involved regulatory agencies that:

(1) There is no practicable less environmentally damaging alternative to adversely impacting the aquatic resource, critical area, buffer, animal species or other regulated area; and

(2) All appropriate and practicable measures to minimize adverse impacts to the aquatic ecosystem have been demonstrated and included in the project.

It is solely the determination of the agency(ies) permitting the project with adverse impacts as to whether a proposed use of Bank credits within the service area is appropriate and environmentally preferable compared to other mitigation alternatives.

C. An applicant seeking to use DSAYs from the Bank will generally follow these steps during a project review and permitting process:

1. A project applicant and the involved regulatory agency(s) determine that a proposed project will have unavoidable impacts to an ESA listed or non-listed fish species (or its habitat) or, a state species of concern¹.
2. It is determined by the regulatory agency(s) that compensatory mitigation to offset the impacts to fish and/or its habitat is required.

¹ In accordance with a project's Section 7 Consultation if necessary.

3. The applicant must request and the regulatory agency(s) must determine whether or not utilizing DSAY credits from the Bank would be appropriate compensatory mitigation and if the project is within the DSAY service area of the Bank project.
4. The applicant contacts the Bank Sponsor or Bank IRT to determine if DSAY credits are available from the Bank project.
5. The applicant or its representative, performs a Habitat Equivalency Analysis (HEA) on the pre-impact conditions of the project location and on the expected (post-impact) conditions of the project location, in order to determine the total expected impacts from the project. During this process, the applicant will utilize the most current Lower Columbia River HEA guidance for habitat definitions and their associated values for the impacting project. The Lower Columbia HEA guidance and calculation spreadsheet is available through the Bank Sponsor or Bank IRT Co-Chairs. Currently this guidance is titled: “Habitat Types and Values for the Lower Columbia River Salmon and Steelhead Recovery Domain for Use with Habitat Equivalency Analysis” (Fisher, Ehinger 2015) and is found in the Bank Project Resource Folder.
6. After HEA is completed, a total (negative) amount of DSAYS is calculated based upon the project impacts and confirmed by the regulatory agency(s) overseeing the impact project.
7. The corresponding amount of DSAYs are then proposed to be debited from the Bank project as a condition of permit issuance and in accordance with the applicant’s Bank Use Plan.
8. Proof of DSAY credit transfer will be furnished via a DSAY credit issuance letter from the Bank Sponsor, stating the total amount of DSAY credits transferred to the project permit numbers. The transfer will be recorded on the Bank’s credit ledger which is submitted to and held by the IRT co-chairs and the involved regulatory agency(s). These documents will serve as confirmation that the appropriate amount of DSAY credits have been debited from the Bank and applied to the project to compensate for the project impacts. The credit transfer process is then complete.

D. Upon receiving permission to utilize credits from the Bank the permittee must contact the Sponsor to ensure that credits are available. Upon completion of the transaction, the Sponsor will inform the permitting agencies of each completed transaction, via email or letter with an attached copy of the accounting ledger.

E. Other types of credit users may include, but are not necessarily limited to, purchases made that will not be associated with a particular project or impact (i.e., “good will” purchase), purchases made by natural resource stewards resulting from expenditures from in-lieu-fees (or similar type funds), and other conservation purposes.

F. The Sponsor may use the Bank site to provide compensatory mitigation to offset impacts to environmental elements other than aquatic resources. Such use shall result in no physical changes to the Bank site unless approved by the Corps and Ecology, acting with the concurrence of NMFS, in consultation with the IRT. The Sponsor must obtain approval from the Corps and Ecology, acting with the concurrence of NMFS, following consultation with the IRT, prior to establishing currencies other than the wetland mitigation credits or DSAYs that are established

by Appendix D of this Instrument. The agencies that regulate those specific environmental elements are responsible for establishing the value of the currency and release schedules, and determining the appropriateness of using the Bank as compensatory mitigation for impacts to those elements. The Corps and Ecology, in consultation with the IRT, will determine how withdrawal of those currencies will affect the amount of potential wetland mitigation credits and/or DSAYS remaining. The Sponsor shall record the award and use of all currencies on the Bank ledger and otherwise follow the procedures as outlined in Appendix E.8. Use of the Bank for compensatory mitigation for other environmental elements shall not conflict with the provisions of this Instrument.

E.8 Accounting Procedures

A. The Sponsor shall establish and maintain for inspection and reporting purposes a ledger of all credits that are awarded through the achievement of specified performance standards, as well as credits that are sold, used or transferred. The Sponsor will record each credit withdrawal transaction that receives a permit with the Cowlitz County Auditor, and submit a copy of the recorded transaction to the IRT within 30 days from the stamped registration date.

B. The ledger must follow the current ledger template approved by the Corps and Ecology. The following information, at a minimum, will be recorded in the ledger for each transaction:

(1) Date of transaction.

(2) Amount and type of credits transacted.

(3) For credits awarded, reference the performance standard(s) to which the awarded credits correspond.

(4) For credit sales/use/transfers, include the name, address, and telephone number of purchaser/user/transferee; and include all the following information that applies: permit number(s), permit issuance date, and name of the regulatory agency(ies) requiring permits; location of the project for which the credits are being purchased/used/transferred; the size of the impacts; and a brief description of the project impacts requiring compensatory mitigation (e.g., nature and quality of aquatic resources affected).

(5) For credits withdrawn from the ledger for reasons other than credit sale/use/transfer, include the specific reason for withdrawal.

(6) Bank balance of each credit type after the award or transaction.

C. The Sponsor will provide an updated ledger to the IRT each time credits are awarded, sold, used, or transferred. This must be provided within 30 days of any credit transaction. The Sponsor will also submit an annual ledger by February 1 of each year. The annual ledger must show a cumulative tabulation of all credit transactions at the Bank through December 31. This ledger will be submitted in conjunction with the monitoring reports until (1) all credits have been

awarded and sold, used, transferred, or otherwise withdrawn; or (2) until the Corps and Ecology, in consultation with the IRT, has approved the Sponsor's written request to permanently cease banking activity.

References

Stanley, S., J. Brown, and S. Grigsby. 2005. Protecting Aquatic Ecosystems: A Guide for Puget Sound Planners to understand Watershed Processes. Washington State Department of Ecology. Publication #05-06-027. Olympia, WA.

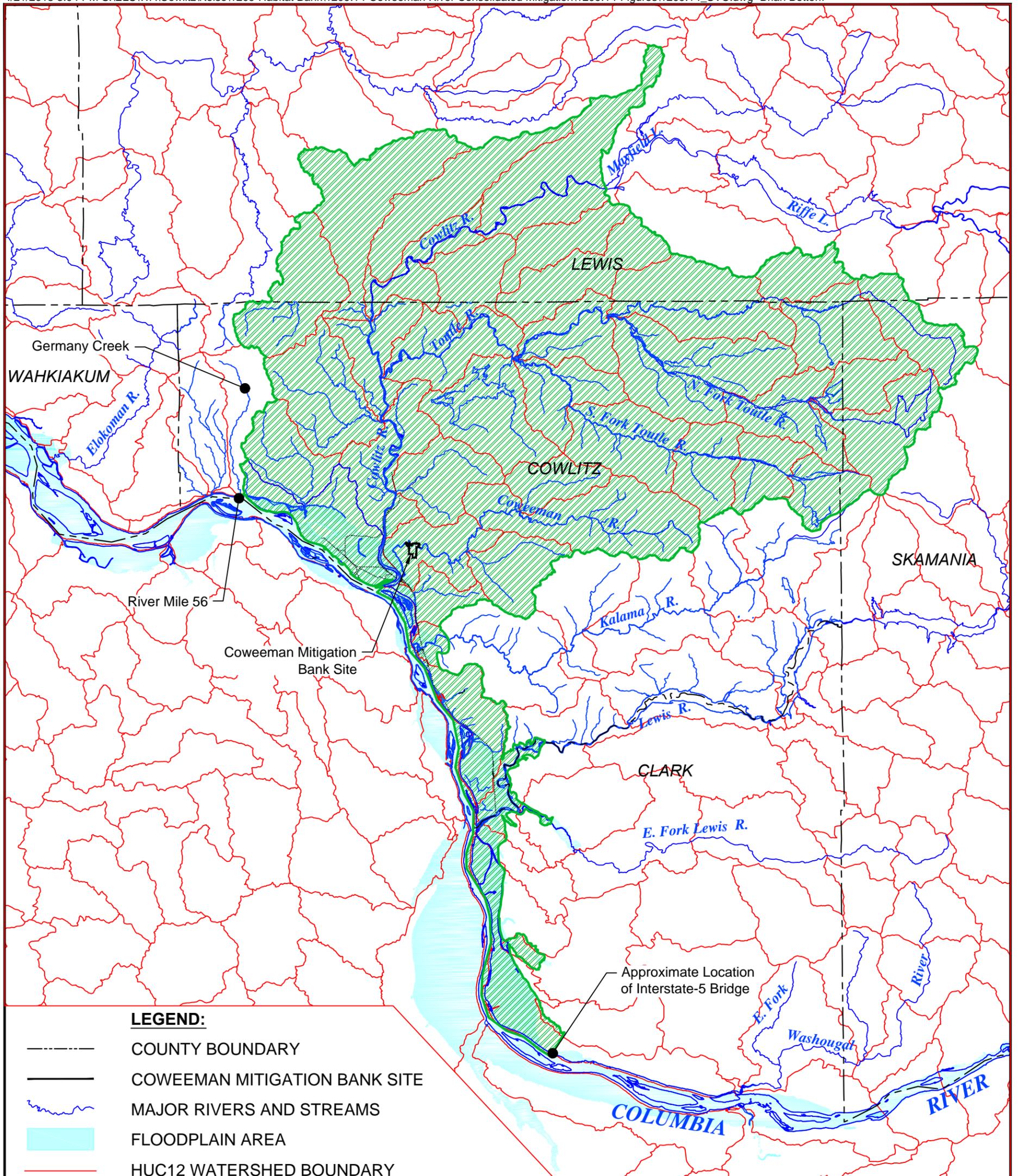
Hruby, T., K. Harper, and S. Stanley (2009). Selecting Wetland Mitigation Sites Using a Watershed Approach. Washington State Department of Ecology Publication #09-06-032.

Washington State Department of Ecology, Shorelands and Environmental Assistance Program. 2009. *Watershed Characterization and analysis of Clark County*. Washington State Department of Ecology Publication # 09-06-019. Olympia, Washington

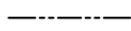
Hruby, T. 2006. *Wetland Rating System for Western Washington (Revised)*. Washington State Department of Ecology. Publication #04-06-025. Olympia, Washington

Washington State Department of Ecology and U.S. Army Corps of Engineers. 2013. *Credit Guide for Wetland Mitigation Banks*. Publication no. 12-06-014. Olympia, Washington

National Marine Fisheries Service. *Habitat Types and Values for the Lower Columbia River Salmon and Steelhead Recovery Domain for Use with Habitat Equivalency Analysis (Draft)*. (Jeffrey P. Fisher and Stephanie Ehinger 2015)



LEGEND:

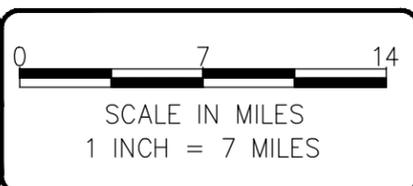
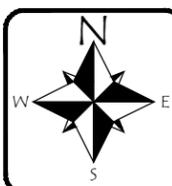
-  COUNTY BOUNDARY
-  COWEEMAN MITIGATION BANK SITE
-  MAJOR RIVERS AND STREAMS
-  FLOODPLAIN AREA
-  HUC12 WATERSHED BOUNDARY
-  COWEEMAN MITIGATION BANK UNIVERSAL CREDIT SERVICE AREA

SERVICE AREA LIMITATIONS:

- COLUMBIA RIVER UPSTREAM LIMIT: INTERSTATE 5 BRIDGE IN VANCOUVER
- COLUMBIA RIVER DOWNSTREAM LIMIT: RIVER MILE 56 NEAR STELLA
- COWLITZ WATERSHED: ALL OF WRIA 26 BELOW MAYFIELD DAM

NOTES:

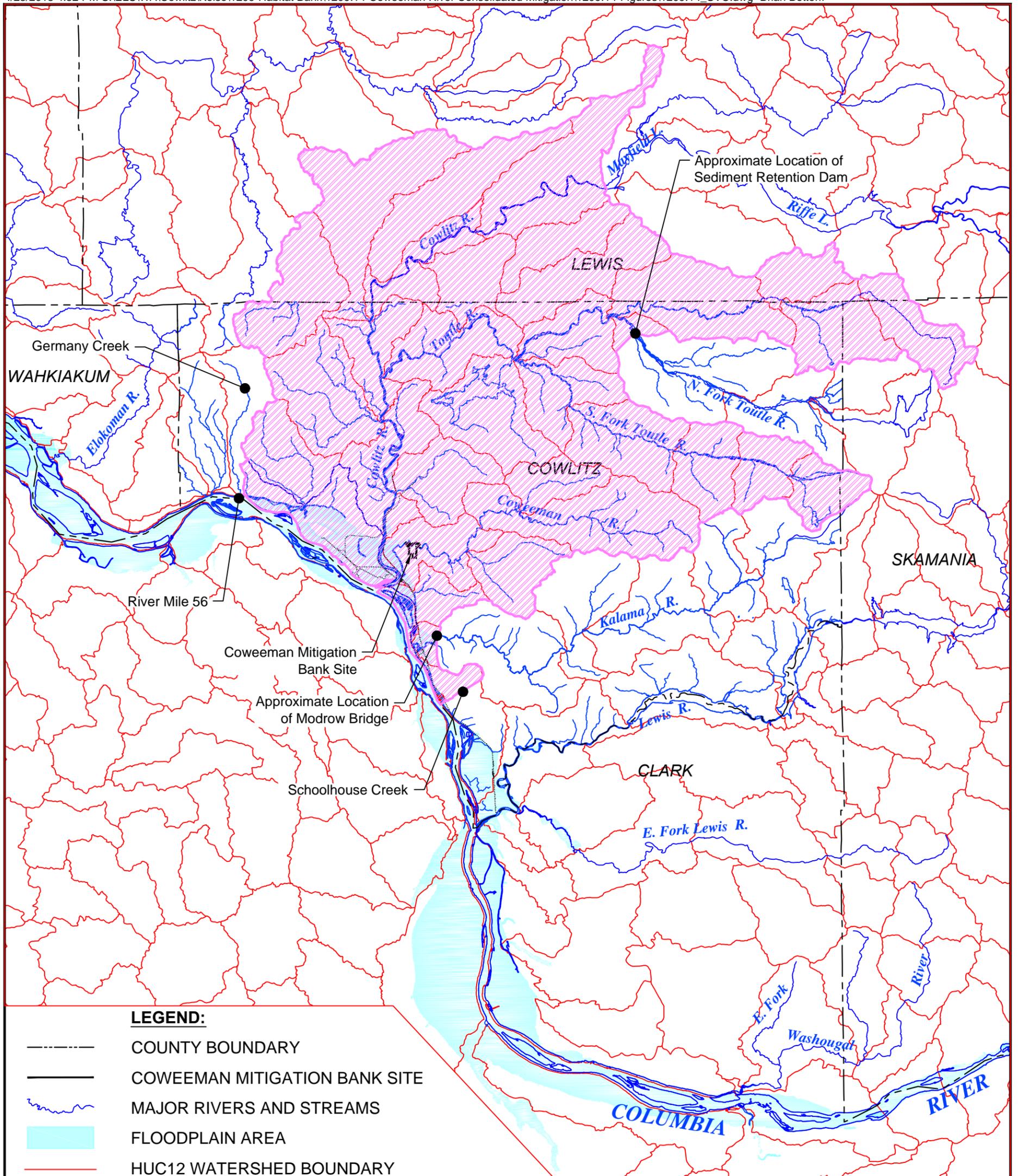
1. STATE, COUNTY, RIVERS, AND STREAM BOUNDARIES FROM ECOLOGY WEBSITE:
<http://www.wsdot.wa.gov/mapsdata/geodatacatalog/default.htm>
2. FLOODPLAIN DATA FROM J. BURKE, UNIVERSITY OF WASHINGTON.
3. HUC12 WATERSHED BOUNDARIES FROM USGS WEBSITE:
<http://www.water.usgs.gov/wsc/cat/17080001.html>.
4. BASE MAP PREPARED BY ECOLOGICAL LAND SERVICES, INC., FEBRUARY 2015.



 **ECOLOGICAL LAND SERVICES, INC.**
1157 3rd Ave., Suite 220
Longview, WA 98632
Phone: (360) 578-1371 Fax: (360) 414-9305

DATE: 4/21/15
DWN: BCB
REQ. BY: ST
PRJ. MGR: ST
CHK:
PROJECT NO:
1209.14

Figure E-1
COWEEMAN BANK UNIVERSAL CREDIT SERVICE AREA
Coweeman Mitigation Bank
Habitat Bank LLC
City of Kelso, Cowlitz County, Washington
Section 31, Township 8N, Range 1W, W.M.
Section 36, Township 8N, Range 2W, W.M.



LEGEND:

- COUNTY BOUNDARY
- COWEEMAN MITIGATION BANK SITE
- MAJOR RIVERS AND STREAMS
- FLOODPLAIN AREA
- HUC12 WATERSHED BOUNDARY
- COWEEMAN MITIGATION BANK DSAY SERVICE AREA *

SERVICE AREA LIMITATIONS:

COLUMBIA RIVER UPSTREAM LIMIT: BETWEEN RIVER MILE 77 & 78 AT SHOOLHOUSE CREEK

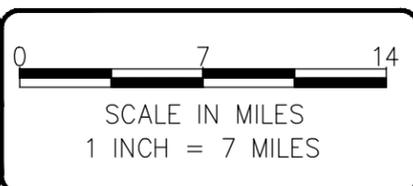
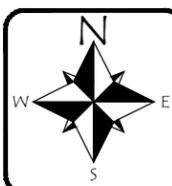
COLUMBIA RIVER DOWNSTREAM LIMIT: RIVER MILE 56 NEAR STELLA

COWLITZ WATERSHED: ALL OF WRIA 26 BELOW MAYFIELD DAM EXCEPT FOR ABOVE SEDIMENT RETENTION STRUCTURE (SRS) ON THE NORTH FORK OF THE TOUTLE RIVER

NOTES:

1. STATE, COUNTY, RIVERS, AND STREAM BOUNDARIES FROM ECOLOGY WEBSITE: <http://www.wsdot.wa.gov/mapsdata/geodatacatalog/default.htm>
2. FLOODPLAIN DATA FROM J. BURKE, UNIVERSITY OF WASHINGTON.
3. HUC12 WATERSHED BOUNDARIES FROM USGS WEBSITE: <http://www.water.usgs.gov/wsc/cat/17080001.html>.
4. BASE MAP PREPARED BY ECOLOGICAL LAND SERVICES, INC., FEBRUARY 2015.

*For details on DSAY use for specific fish species within the DSAY Service Area Boundary, please refer to the service area limitations and boundaries for certain species contained in section E.3 of Appendix E.



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DATE: 4/21/15
 DWN: BCB
 REQ. BY: ST
 PRJ. MGR: ST
 CHK:
 PROJECT NO:
 1209.14

Figure E-2
COWEEMAN BANK DSAY CREDIT SERVICE AREA
 Coweeman Mitigation Bank
 Habitat Bank LLC
 City of Kelso, Cowlitz County, Washington
 Section 31, Township 8N, Range 1W, W.M.
 Section 36, Township 8N, Range 2W, W.M.

APPENDIX F

ESTABLISHMENT PERIOD MONITORING, REPORTING, MAINTENANCE, AND REMEDIAL ACTION

During the establishment period, the Sponsor shall monitor and report on the progress of the Bank toward achieving the goals, objectives, and performance standards established by these Appendices and take all actions directed by the Corps and/or Ecology, following consultation with the IRT, to remediate any consideration that prevents a component of the Bank from achieving the goals, objectives and performance standards of the Bank. Procedures for as-built reports, monitoring reports and remedial actions are described below.

F.1 As-Built Reports

As-built reports will be submitted to the IRT upon the completion of construction to verify topography, hydrology, and planting. This may be one report that describes all construction, or it may be separated into two reports that are submitted at different times, one following grading and related construction, the other following completion of planting. At a minimum, the following components should be included in one or both (as appropriate) of the as-built reports:

- Name and contact information for the parties responsible for the Bank construction site including the Bank Sponsor, engineers, and wetland professional on site during construction
- Ecology, Corps, and Local permit numbers
- Dates when activities began and ended such as grading, removal of invasive plants, installing plants, and installing habitat features
- Photographs of the site at as-built conditions taken from photo stations (panoramic photos are recommended)
- Description of any problems encountered and solutions implemented (with reasons for changes) during construction of the Bank site
- List of any follow-up actions needed with a schedule
- 11x17 maps of the Bank site showing:
 - Topography with one-foot contours surveyed and stamped by a licensed surveyor. Include relevant elevations of flood overflow elevation notch. Include a description of how elevations were determined. Based on size of site and complexity of design, Sponsor may be required to submit an overview map and multiple individual maps of Areas A, B and C that adequately show the bank details.
 - Installed planting scheme – quantities, densities, sizes, approximate locations, and the sources of plant material
 - Locations of dataloggers that remain after construction
 - Locations of habitat features
 - Locations of permanent photo stations
 - Date when the maps were produced and, if applicable, when information was collected

As-built reports will be submitted to each member of the IRT within 90 days of completing construction of the Bank, and must demonstrate compliance with Appendix B and any

modifications to the Bank development plan and design, approved by the Corps and Ecology prior to their construction or implementation, following consultation with the other members of the IRT.

Permanent photo points will be established in Year 0 to document the progression of each habitat type. Photo point locations will be documented in the as-built report. A Coweeman Mitigation Bank construction manager will document Year 0 post-construction conditions in the as-built report for grading, plantings, large woody material and other habitat features; and will include photographs and as-built drawings. The as-built reports will also establish baseline conditions for future monitoring.

Post-construction grading elevations will be surveyed by a licensed surveyor to 1-foot contours.

F.2 Establishment Period Monitoring

A performance monitoring program will be implemented to determine the degree of success of the mitigation effort during the establishment period. Monitoring will include periodic surveys and site evaluations to establish the foundation on which the Bank can demonstrate to the IRT that pertinent performance standards have been achieved and continue to be maintained. Monitoring will include measurements and observations of site stabilization, wetland hydrology, vegetative cover, plant survival, vegetation structure, species composition and fish and wildlife observations, specifically fish presence surveys in the existing and created aquatic habitat areas.

F.2.1 Overview of Monitoring Requirements

As-built and on-going monitoring requirements specific to each performance standard (see Section C.2 of Appendix C) are summarized below.

Ecologic Goal #1: Hydrology

Create additional wetland hydrology and fish accessible aquatic habitat in the graded portions of Areas A, B and C and maintain existing wetland hydrology on the remainder of the site. Increase floodplain connectivity and fish accessibility through the construction of an overflow notch into Wetland A. Reconnect Tributaries 2 and 5 to Wetland A. Improve, and make fish passable, the Wetland A outlet tributary to the Coweeman River. Pull back the incised banks of the Coweeman River to create riparian wetland bench habitat that is also fish accessible.

- Submit as-built drawings and photographs showing completed grading per the approved plan with key elevations and cross sections (Performance Standard 2A).
- Submit wetland determination in Year 3 (Performance Standard 2B).
- Submit wetland delineations in Years 5 and 10, documenting wetland acreage, vegetation and soil development (Performance Standard 2C).
- Collect and submit annual Coweeman River water elevation data to document whether surface water levels reach the 13-foot elevation contour on an annual basis in the Riparian wetland bench habitat. Report in Years 1, 3, 5, 7 and 10 (Performance Standard 2D).

- Document juvenile fish passable status in the re-contoured portion of the Wetland A outlet in Years 1, 3, 5, 7 and 10 (Performance Standard 2E).
- Collect and submit annual Wetland A datalogger graphs comparing pre and post construction hydrology and hydroperiod for Wetland A.

Ecologic Goal #2: Vegetation

Remove cattle and eliminate grazing on the Bank property. Remove invasive species and reestablish native wetland and adjoining upland vegetation communities comparable to pre-agricultural conditions, in accordance with the Appendix B planting plan and the targeted hydrologic regimes across the site.

For all habitat types (PAB, PEM, PSS, PFO, Riparian Upland Habitat) on site:

- Submit as-built report showing vegetation community locations, planted acreages, species, planting quantities, planting densities, and seeding rates (Performance Standard 3A).
- Submit monitoring reports for Years 3, 5, 7, and 10 documenting non-native invasive species presence and cover (Performance Standard 3B).
- Submit monitoring reports for Years 3, 5, 7, and 10 documenting cover of reed canarygrass and meadow foxtail (Performance Standard 3C).
- Conduct annual inventories for aggressive non-native invasive species including Japanese knotweed, Purple loosestrife, English Holly, and English Ivy, and document presence and eradication in monitoring reports for Years 1, 3, 5, 7, and 10 (Performance Standard 3D).

For Palustrine Emergent Habitat Type:

- Document species presence and percent cover within sampling plots for Years 1, 3, 5, 7, and 10 (Performance Standards 3E, 3F).

For Palustrine Scrub-shrub Habitat Type:

- In created PSS habitat (including existing PEM converted to PSS), document stem density of native woody vegetation in Years 1 and 3 and percent cover in Years 5, 7, and 10 (Performance Standard 3G).
- In existing PFO/PSS habitat, document native woody species presence and cover in Years 1, 3, 5, 7, and 10 (Performance Standard 3H).

For Palustrine Forested Habitat Type:

- In created PFO habitat (including existing PEM converted to PFO), document stem density of native woody vegetation in Years 1, 3, 5, 7, and 10 (Performance Standard 3I) and cover of native trees and shrubs in Years 3, 5, 7, and 10 (Performance Standard 3J).

For Riparian Upland Enhancement Areas:

- Document stem density of native woody vegetation in Years 1 and 3 and percent cover in Years 5, 7, and 10 (Performance Standard 3K).

Ecologic Goal #4: Hillside Preservation Area

- Confirm the presence and baseline ratings of wetlands along Tributaries 1 and 2 in Year 5. Assess and document any changes to the preserved hillside area from human activities or significant natural changes in Year 5 and 10. Consult with City of Kelso and the IRT on any necessary changes to the management and protection plan (Performance Standard 4A).

Ecologic Goal #5: Habitat

- Submit as-built drawings and photos showing removal of old farm equipment from river and installation and location of large woody material, spawning gravel, log jams, downed logs, bird nest boxes, and fish passable crossings (Performance Standard 5A).
- Document locations and numbers of habitat features present in Year 10 (Performance Standard 5B).
- Survey for and document the presence of adult salmon and spawning activities including redds in the Bank's wetlands and tributaries and in alcove areas along the Coweeman River in Years 1, 3, 5, 7, and 10. Conduct juvenile salmonid fish presence surveys in Years 1, 3 and 7 in the riparian bench, alcoves areas, Wetlands A, B, and C and Tributaries 1, 2, and 5 during the most appropriate times of year to capture habitat utilization within each given area (Performance Standards 5C and 5D). Surveying activities will follow proper timing and survey protocols from NMFS and Washington Department of Fish and Wildlife.

F.2.2 Monitoring Protocol

Formal monitoring will include both qualitative and quantitative monitoring to address fulfillment of the Bank objectives and performance standards (see Appendix C). Formal monitoring will occur throughout Years 1, 3, 5, 7, and 10 according to the monitoring schedule and sampling protocol described below. For Year 3, formal monitoring will include a wetland determination which includes spot checking in the areas that are intended to be wetland to determine if site characteristics related to the extent and duration of wetland hydrology are establishing. The areas that have been checked for wetland characteristics will be shown on a determination map. For Years 5 and 10, formal monitoring will include a full wetland delineation on the entire site, using the *1987 Corps of Engineers Wetland Delineation Manual* (U.S. Army Corps of Engineers 1987) and appropriate supplements. The wetland edge will be clearly marked in the field by a qualified wetland biologist. The wetland edge will be surveyed and mapped by a licensed land surveyor. A GPS-based survey method is acceptable as long as it has sub-meter accuracy and the resulting map is stamped by a licensed land surveyor.

Computer-aided drawing software will be used to calculate the size of each wetland area after the determination and delineation have been completed as well as the size and location of each vegetation type (PAB, PEM, PSS, PFO) within each wetland area. Results from both formal and informal monitoring will be summarized in the Monitoring Reports submitted to the IRT.

Informal monitoring provides a general overview of site progress, and will be conducted during Years 2, 4, 6, and 8 for which there is no formal quantitative monitoring reporting requirement to ensure that the site appears to be progressing towards meeting performance standards. Specifically, a qualitative visual inspection of the Bank will be conducted during periodic site

visits to identify concerns associated with meeting Bank objectives and performance standards, if any. Informal monitoring will usually include observation notes and site photos. Informal monitoring may quantitatively address some performance standards for upcoming years, but may be less statistically rigorous than formal monitoring. Informal monitoring will be the only monitoring method during the years for which there are no performance standards, although it will also be employed during years of formal monitoring.

F.2.3 Vegetation

A stratified random sampling approach as described in Elzinga et al. (1998) will be used to collect data to assess attainment of performance standards related to vegetation (Performance Standards 3A through 3K).

The vegetation communities on the site are: Palustrine Aquatic Bed, Palustrine Emergent Wetland, Palustrine Scrub-Shrub Wetland, Palustrine Forested Wetland, Riparian Wetland and Riparian Upland. Formal vegetation monitoring will not occur in the Hillside Preservation area except for that required to verify the presence and ratings of wetlands as stated in Performance Standard 4A. Informal vegetation observations will be made to document any notable changes in the Hillside Preservation Area compared to baseline conditions, specifically the presence of any noxious or invasive plant infestations.

The performance standards address PFO, PSS, PEM, and PAB vegetation strata separately. Each vegetation community will be treated as a separate stratum to the extent possible. However, because mosaic wetland habitats and communities are already present and additional communities will be created on the site it may not be possible to effectively map separate vegetation strata (PFO, PSS, PEM) boundaries for some areas post-construction. Therefore, in mosaic habitats, enough potential plot coordinates will be generated to meet the minimum sampling requirements for both woody (PFO/PSS) and emergent vegetation (PEM). Each individual plot will be assigned to a vegetation strata (PFO, PSS, PEM) at the time of monitoring based on as-built plantings and on the ground conditions. If both PEM and woody vegetation are present in the same plot then the plot will be determined based on the dominant vegetation community contained in the majority of the plot and monitored accordingly and/or be moved in a direction to fully encapsulate whatever vegetation community is being monitored for the plot. Additional plots may be added during field monitoring at the biologist's discretion. If a plot has to be adjusted by length or width in the wetland mosaic area to account for the clustered approach to planting, the biologist will note that in field notes and within the monitoring report. If the monitoring methodology as written does not accurately inform the IRT about the success of a particular habitat area even though it may be thriving, the Bank Sponsor will coordinate with the IRT about changing the monitoring approach, which performance standards to apply in those areas or how existing performance standards could be modified.

Using AutoCAD, 4 grid patterns will be generated to fit each of the three Areas on the site (A, B, and C) and overlaid onto each corresponding vegetation community within each Area as defined on the final as-built planting plan. The length and distance of grid-pattern lines and intersections will be evenly spaced over each vegetation community at distances able to generate an adequate number of potential monitoring points within each community. Grid-pattern line intersections

falling within the vegetation community will be utilized while intersections falling outside the vegetation community will be discarded. Potential monitoring points will be identified at each grid pattern line intersection. Within each vegetation community, all grid-pattern line intersections will be assigned numbers and monitoring points will be randomly selected using a random number generator, utilizing that number set. The amount of randomly generated monitoring points will depend on the monitoring protocols for that vegetation stratum being sampled. A minimum of 1% of the total acreage of PSS, PFO, and Riparian Upland vegetation communities will be sampled and a minimum of 3 plots per acre of the PEM and PAB habitats will be sampled. In wetland vegetation mosaic communities, enough potential plot coordinates will be generated to meet the minimum sampling requirements for both woody (PFO/PSS) and emergent vegetation (PEM). The coordinates of each random monitoring plot location will be compiled using the computer program AutoCAD Civil 3D. Monitoring plot coordinates will then be entered into a hand held Global Positioning System (GPS) unit and located in the field.

Plot locations will be field-verified and if a plot is determined to be unusable during field sampling, (e.g., lies in the middle of an access path) another randomly located plot will be substituted. An example of locating monitoring points using the stratified random sampling approach and grid pattern line intersections is shown on **Figure F-1**. Final plot locations will be shown on site maps in monitoring reports and the same plot locations will be sampled during each monitoring period.

Sampling plots are established to measure species presence, percent cover and stem density of vegetation to determine site progress in meeting performance standards. Where it occurs in a sample plot, percent cover of bare soil will be estimated and counted towards the total percent cover of the community being monitored. Minimum sampling requirements are established by the acreage of each habitat type, where at least 1% of the area of each forested and shrub habitat type (Palustrine Forested Wetland, Palustrine Scrub-shrub wetland, Riparian Upland) is sampled, and a minimum of 3 plots per acre are sampled in the herbaceous habitat types (Palustrine Emergent Wetland, Palustrine Aquatic Bed). The minimum sampling area for each habitat type was determined based on methods described in Tiner (Wetland Indicators: A Guide to Wetland Identification, Delineation, Classification, and Mapping, 1999) and Krebs (Ecological Methodology, 1999), and in consultation with the IRT.

Sample Plot Sizes:

Forested and Shrub communities (PFO, PSS, Riparian Bench Wetlands and Upland) shall be sampled with a 30-foot radius circle (area of the sample plot equals 2,826 square feet).

Herbaceous communities (PEM, PAB) shall be sampled with a 3-foot radius circle.

Additional sample plots may be added if deemed necessary by the Sponsor or by the IRT. Plot locations can be adjusted to not penalize results due to beaver activity. All monitoring plot locations will be shown on maps in the monitoring reports.

Table F-1 Sample Plots by Area and Proposed Vegetation Community

Area/Vegetation Community	Proposed Acreage	Minimum Sample Plots Required (1% of area of habitat type for PFO and PSS, UPL, 3 plots/acre PEM and PAB)		Proposed # of Sample Plots	
		PFO/PSS/UPL	PEM/PAB	PFO/PSS/UPL	PEM/PAB
Area A					
Wetland Creation: PFO/PSS/PEM Mosaic*	12.31	2	Up to 37	4	Up to 37
Riparian Wetland Bench Creation: PSS/PEM Mosaic*	1.68	1	Up to 6	3	Up to 6
Wetland Preservation: PAB	6.12	--	13	--	13
Wetland Enhancement: PFO/PSS	14.17	3	--	3	--
Wetland Rehabilitation: PEM to PFO/PSS Mosaic*	13.22	3	Up to 40	3	Up to 40
Riparian Upland Enhancement: PFO/PSS	19.96	4	--	4 [#]	--
Area B					
Wetland Creation: PFO/PSS/PEM Mosaic*	5.28	1	Up to 16	2	Up to 16
Riparian Wetland Bench Creation: PSS/PEM Mosaic*	0.32	1	Up to 1	1	Up to 1
Wetland Rehabilitation: PEM to PFO/PSS Mosaic*	0.44	1	--	1	--
Riparian Upland Enhancement: PFO/PSS	5.34	1	--	2	--
Area C					
Wetland Creation: PFO/PSS/PEM Mosaic*	1.74	1	Up to 6	1	Up to 6
Wetland D Enhancement: PSS/PEM to PSS/PFO	.36	1	--	1	--
Wetland C Rehabilitation PEM to PSS/PFO	1.02	1		1	
Riparian Upland Enhancement: PFO/PSS	3.59	1	--	1	--
TOTAL PLOTS	--	21	Up to 119	27	Up to 119
<p>* In mosaic habitats, both woody and emergent vegetation will be intermingled in irregular patterns. Enough potential plot coordinates will be generated to meet the minimum sampling requirements for both woody (PFO/PSS) and emergent vegetation (PEM). Each individual plot will be assigned to a vegetation strata (PFO, PSS, PEM) at the time of monitoring based on as-built plantings. If both emergent and woody vegetation are present in the vicinity of the same plot center then a PEM plot may be nested within the larger woody vegetation sampling plot. Some PEM plots will transition to woody vegetation-dominated over time.</p> <p>[#]One plot will be located in non-creditable buffer area.</p>					

For all vegetation communities, non-native invasive species presence and percent cover will be documented in monitoring reports as recorded at each sampling plot for Years 3, 5, 7, and 10. The cover of reed canarygrass, Himalayan blackberry, scotch broom, tansy ragwort, Canada thistle, jewel weed, meadow foxtail, and bull thistle shall be documented separately for each vegetation community, and reported in monitoring reports for Years 3, 5, 7, and 10. There shall be zero tolerance for Japanese knotweed (and hybrids), Purple loosestrife, and English Ivy and English Holly on site. Presence and eradication of these species must be noted in monitoring reports for Years 1, 3, 5, 7, and 10. Annual surveys for these species shall occur.

Monitoring for vegetation will be conducted after full-leaf out of woody species and when the majority of plant species are expected to occur in each vegetative stratum. Plants must have been in the ground for a minimum of five months prior to monitoring.

F.2.4 Hydrology

Following construction and grading of the site, additional permanent hydrologic monitoring devices (Dataloggers) will be installed in shallow ground water monitoring wells per the Corps protocol, within the wetland creation areas in Areas A, B and C at locations documented in the as-built report. Each Datalogger will be identified on as-built drawings and will record groundwater and/or surface water levels as well as water temperature, at least one time every 24 hours (totaling 365 readings per year), throughout each year of the Bank's 10-Year monitoring period. A map showing approximate locations of the Dataloggers at the Bank site is shown on **Figure F-1**. Dataloggers will be placed within perforated tubing at a depth between 24 and 40 inches below the soil surface. Readings will be compensated for barometric pressure at the site and distance below the ground surface at each monitoring location. Continuous hydrologic data collection at relevant locations and elevations across the site will be used to measure the attainment of performance standards relating to the reestablishment of wetland hydrology and duration of inundation on the site. Datalogger data collected during the fall and winter after grading and construction and prior to planting will assist in determining the planting boundaries between various habitat communities across the site.

Existing Dataloggers installed in Wetland A will be left in place after construction. These Dataloggers will provide data to show any changes in Wetland A hydroperiod after construction compared to the three years before construction.

Hydrologic data collected from Dataloggers in Years 0, 1, 2 and 3 will be used in the wetland determination in Year 3 to measure the attainment of performance standard 2B, "*a minimum of 55 acres of the site will have wetland hydrology present at Year 3*". In addition to data collected from the Dataloggers, shallow soil pits will be located across the site during the Year 3 wetland determination to provide additional documentation of wetland hydrology and hydric soil development above and beyond Datalogger data.

Shallow soil pits (20 inches in depth) are intended to document the presence of shallow groundwater, saturated soils, and hydric soil development that would support wetland conditions, which may not be captured by Dataloggers. Wetland hydrology for the project site is defined as

Datalogger readings, soil saturation to the surface, or free water in the soil pits, at 12 inches or less below the soil surface for a minimum of at least 30 consecutive days in the growing season, where the growing season is defined by the U.S. Army Corps of Engineers 2010 Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region, or as updated by the U.S. Army Corps of Engineers. Each shallow soil pit should have documentation of hydric soil development, which shall include observation of chroma color, any redoximorphic feature developments/mottles, oxidized rhizospheres and depth. If performance standards are not met, further data collection will be conducted, as necessary.

Hydrologic data collected from the Dataloggers will also provide relevant information for wetland delineations conducted in Years 5 and 10 at the site (Performance Standard 2C). In addition to Datalogger data, hydrologic data will be collected from shallow groundwater monitoring wells (24 inches in depth) or pits during the growing seasons of Years 5 and 10 to assist in determining wetland boundaries.

The extent of wetlands in Years 5 and 10 will be determined by conducting a wetland delineation on the entire Bank site using the *1987 Corps of Engineers Wetland Delineation Manual* (U.S. Army Corps of Engineers 1987) and appropriate supplements. The results, including a wetland boundary map with data points and acreages, will be included in the Year 5 and 10 monitoring reports.

In addition, Coweeman River water level data collected from Dataloggers on-site will be reviewed annually to document whether surface water levels were at or above the 13-foot elevation contour in the Riparian wetland bench habitat in Years 1, 3, 5, 7 and 10 (Performance Standard 2D). Additionally, the re-contoured portion of the Wetland A outlet channel will be assessed in Years 1, 3, 5, 7 and 10 to document that fish passage criteria for juvenile salmonids between the Coweeman River and Wetland A are met, which is defined for this project as: “no drop in surface water elevation of more than 6 inches will be present within the outlet tributary channel of Wetland A, but not including the drop in distance between the Coweeman River itself and the outlet tributary channel” (Performance Standard 2E).

F.2.5 Habitat, Wildlife and Fish Monitoring

The location of features intended for wildlife use on the site will be recorded on the final as-built. Wildlife features include: downed logs, root wads, perch poles, and nest boxes for wood ducks and songbirds. Numbers and locations of wildlife habitat features will also be documented in Year 10 (Performance Standard 5B). Although there are no performance standards for terrestrial and amphibian species, monitoring reports will include observations of wildlife use of the site. Anecdotal observation of wildlife use, including types of wildlife and/or their sign, will be recorded while staff is on site for other monitoring purposes.

As-built drawings will show locations of spawning gravel, fish-passable crossings installed on-site, Wetland A outflow gauge station location and datalogger locations. Use of the Bank’s wetlands, tributaries and alcove areas along the Coweeman River by both adult and juvenile salmonids will be documented in monitoring reports submitted to the IRT. A fish presence and

habitat survey (Performance Standard 5C) will occur in years 1, 3, and 7 within the riparian wetland bench areas, alcoves, Wetlands A, B and C and Tributaries 1, 2 and 5. Fish presence and habitat data will be collected throughout the year with adult fish presence and spawning data collected in the fall and winter and juvenile fish presence data collected from the early spring to the end of summer in relevant monitoring years. Fish presence monitoring will revolve around the known seasonal life stage events and corresponding Coweeman River flow events which trigger adult and juvenile migration. Wetland A outlet flows will be documented using a gauge or flowmeter device in order to show proper function per the approved design and Performance Standards 2E and 5C. Annual percent inundation of wetlands will be documented with Solinst datalogger data, and for Wetland A compared to pre-construction data. Water temperature in Area A will be collected with Solinst dataloggers and compared with historical data for the same location.

The presence of adult salmon and spawning activities within the bank project will be assessed in Years 1, 3, 5, 7, and 10 (Performance Standard 5D) and reported on in corresponding monitoring reports. Visual and/or photo documentation of adult salmon and spawning activities will occur in the fall and winter of each monitoring year. Potential species include Chinook, coho, chum, steelhead, and coastal cutthroat. The timing of surveys will depend on the occurrence of flow events which allow fish ingress to the Bank's aquatic areas and site accessibility during flood events. Adult surveys in tributaries may occur more frequently especially during the peak fall run times.

F.3 Reports

The Sponsor or their consultant will prepare and submit to the IRT monitoring reports that will inform the IRT of the status of Bank establishment and operation. The Reports will include the name of the entity responsible for preparing the report, the names of the individuals who gathered the data and who authored the report and will include a summary table comparing relevant performance standards for that years report to monitoring results. These reports will document Bank conditions and provide the supporting information required to document the attainment of goals, objectives, and performance standards, as a basis for a decision whether to award credits. Monitoring reports for each calendar year will be submitted by February 1 of the following year, with a copy for each member of the IRT. Each monitoring report will contain the following information:

A. An overview of the current ecological condition of the Bank, including a survey of the vegetative communities, effectiveness of the restoration and reestablishment activities accomplished to date, and progress of the Bank in achieving the specific performance standards of the Bank. To provide data for evaluating progress towards achievement of performance standards, vegetation plots, hydrologic monitoring points and photo points will be established at selected locations within the Bank to evaluate relevant performance standards. Vegetation data in forested, scrub-shrub, emergent and riparian upland areas will include, species presence, cover by species, and density as identified in individual performance standards. IRT approved vegetation measures and techniques will be used to demonstrate whether performance standards

are being met. Experience in the field may indicate that other performance monitoring methods would provide more useful information; the Corps and Ecology, following consultation with the IRT must approve in advance any changes in the means of gathering or reporting performance data. All monitoring will be conducted by qualified personnel.

B. A detailed discussion about the likely cause and impact of any setback or failure that occurred and recommendations for future actions and strategies that might resolve those problems.

C. Pertinent additional information on such aspects of the Bank as hydrology, soils, vegetation, fish and wildlife use of the area, recreational and scientific use of the Bank, and natural events such as disease, wildfire, and flooding that occurred.

D. Explanations of the need for any contingency or remedial measures, and detailed proposals for their implementation.

E. Photographs of the Bank taken from permanent locations that are accurately identified on the as-built drawings. The photographs are intended to document the progress of each component of the Bank, as well as the Bank in general, toward achieving the objectives and performance standards of the Bank. Such photo-monitoring will include general vantage points around the margin of the Bank, vantage points within the Bank, and at specific monitoring locations such as sampling points or habitat features.

Table F-2 Summary of Annual Monitoring Tasks

Bank Year	Report name	Performance Standard	Monitoring Task	Monitoring Area	Expected Site Visits
Year 0	Baseline	2B, 2C	Collect hydrology data over site after grading and before planting	Entire Bank site	Multiple August - March
	As-built Report	2A	Submittal of grading as-built	Entire Bank site	90 days after completion
		3A	Cattle removed. Submittal of planting as-built	Entire Bank site	90 days after completion
		5A	Habitat features installed	Entire Bank Site	90 days after completion
Year 1	Year 1 Monitoring Report	2B	Collect hydrology data over site	Entire Bank site	Multiple March-June
		2D	Document river levels \geq 13 feet (1-year flood)	Riparian Wetland Bench	One time to retrieve levellogger data
		2E	Document fish passable conditions and properly functioning stream channel	Wetland A Outlet	Multiple, year round
		3D	Full site survey for zero-tolerance invasives-knotweed, purple loosestrife, English holly, and English ivy	Entire Bank Site	June-Sept, one time in year
		3F	Collect species presence and cover data for native species	PEM	June-Sept, one time in year
		3G	Collect stem density data for native species	PSS Creation Areas	June-Sept, one time in year
		3H	Collect species presence and cover data for native species	PFO/PSS Enhancement Areas	June-Sept, one time in year
		3I	Collect stem density data for native species	PFO Creation Areas	June-Sept, one time in year
		3K	Collect stem density data for native	Riparian Upland	June-Sept, one time in year

			species	Enhancement Areas	
		5C	Perform fish presence and habitat surveys	Wetlands A,B,C and Tributaries 1, 2, 5	surveys Feb.-Aug. Consult with NOAA and WDFW on add'l survey methods and timing
		5D	Document use by adult salmonids	Wetlands, Tributaries, Alcove Areas	Fall and Winter
Year 2	--	2B	Collect hydrology data over site	Entire Bank site	Multiple March-June
Year 3	Year 3 Monitoring Report	2B	Submit Wetland Determination	Entire Bank site	March-June, one time in year
		2D	Document river levels \geq 13 feet (1-year flood)	Riparian Wetland Bench	One time to retrieve levellogger data
		2E	Document fish passable conditions and properly functioning stream channel	Wetland A Outlet	Multiple, year round
		3B, 3C, 3D	Monitor for non-native invasive species	Within each Vegetation Community	June-Sept, one time in year
		3E, 3F	Collect species presence and cover data for native species	PEM	June-Sept, one time in year
		3G	Collect stem density data for native species	PSS Creation Areas	June-Sept, one time in year
		3H	Collect species presence and cover data for native species	PFO/PSS Enhancement Areas	June-Sept, one time in year
		3I	Collect stem density data for native species	PFO Creation Areas	June-Sept, one time in year
		3J	Collect percent cover data for native species	PFO Creation Areas	June-Sept, one time in year
		3K	Collect stem density data for native species	Riparian Upland Enhancement Areas	June-Sept, one time in year
		5C	Perform fish presence and habitat surveys	Wetlands A,B,C and Tributaries 1, 2, 5	surveys Feb.-Aug. Consult with NOAA and WDFW on add'l survey methods and timing
		5D	Document use by adult salmonids	Wetlands, Tributaries, Alcove Areas	Fall and Winter
Year 4	--	2B	Collect hydrology data over site	Entire Bank site	Multiple March-June
Year 5	Year 5 Monitoring Report	2B	Collect hydrology data over site	Entire Bank site	Multiple March-June
		2C	Submittal of wetland delineation	Entire Bank Site	Multiple March-June
		2D	Document river levels \geq 13 feet (1-year flood)	Riparian Wetland Bench	One time to retrieve levellogger data
		2E	Document fish passable conditions and properly functioning stream channel	Wetland A Outlet	Multiple, year round
		3B, 3C, 3D	Monitor for non-native invasive species	Within each Vegetation Community	June-Sept, one time in year
		3E, 3F	Collect species presence and cover data for native species	PEM	June-Sept, one time in year
		3G	Collect percent cover data for native species	PSS Creation Areas	June-Sept, one time in year
		3H	Collect species presence and cover data for native species	PFO/PSS Enhancement Areas	June-Sept, one time in year
		3I	Collect stem density data for native species	PFO Creation Areas	June-Sept, one time in year
		3J	Collect percent cover data for native	PFO Creation Areas	June-Sept, one time in year

			species		
		3K	Collect percent cover data for native species	Riparian Upland Enhancement Areas	June-Sept, one time in year
		4A	Assess hillside preservation area for changes from baseline conditions	Hillside Preservation Area	Multiple
		5D	Document use by adult salmonids	Wetlands, Tributaries, Alcove Areas	Fall and Winter
Year 7	Year 7 Monitoring Report	2D	Document river levels \geq 13 feet (1-year flood)	Riparian Wetland Bench	One time to retrieve levellogger data
		2E	Document fish passable conditions and properly functioning stream channel	Wetland A Outlet	Multiple, year round
		3B, 3C, 3D	Monitor for non-native invasive species	Within each Vegetation Community	June-Sept, one time in year
		3E, 3F	Collect species presence and cover data for native species	PEM	June-Sept, one time in year
		3G	Collect percent cover data for native species	PSS Creation Areas	June-Sept, one time in year
		3H	Collect species presence and cover data for native species	PFO/PSS Enhancement Areas	June-Sept, one time in year
		3I	Collect stem density data for native species	PFO Creation Areas	June-Sept, one time in year
		3J	Collect percent cover data for native species	PFO Creation Areas	June-Sept, one time in year
		3K	Collect percent cover data for native species	Riparian Upland Enhancement Areas	June-Sept, one time in year
		5C	Perform fish presence and habitat surveys	Wetlands A,B,C and Tributaries 1, 2, 5	Snorkel surveys Feb.-Aug. Consult with NOAA and WDFW on add'l survey methods and timing
		5D	Document use by adult salmonids	Wetlands, Tributaries, Alcove Areas	Fall and Winter
Year 10	Year 10 Monitoring Report	2C	Submittal of wetland delineation	Entire Bank site	Multiple March-June
		2D	Document river levels \geq 13 feet (1-year flood)	Riparian Wetland Bench	One time to retrieve levellogger data
		2E	Document fish passable conditions and properly functioning stream channel	Wetland A Outlet	Multiple, year round
		3B, 3C, 3D	Monitor for non-native invasive species	Within each Vegetation Community	June-Sept, one time in year
		3E, 3F	Collect species presence and cover data for native species	PEM	June-Sept, one time in Year
		3G	Collect percent cover data for native species	PSS Creation Areas	June-Sept, one time in year
		3H	Collect species presence and cover data for native species	PFO/PSS Enhancement Areas	June-Sept, one time in year
		3I	Collect stem density data for native species	PFO Creation Areas	June-Sept, one time in year
		3J	Collect percent cover data for native species	PFO Creation Areas	June-Sept, one time in year
		3K	Collect percent cover data for native species	Riparian Upland Enhancement Areas	June-Sept, one time in year
		4A	Assess hillside preservation area for changes from baseline conditions	Hillside Preservation Area	Multiple
		5B	Document numbers and locations of	Entire Bank site	June-Sept, one time in Year

			habitat features		
		5D	Document use by adult salmonids	Wetlands, Tributaries, Alcove Areas	Fall and Winter

F.4 Remedial Action during the Establishment Period of the Bank

In the event that one or more components of the Bank do not achieve performance standards or comply with any other requirement of this Instrument, the following sequence of remedial actions will be taken.

A. If the monitoring reports, or inspection by representatives of the IRT agencies, indicate persistent failure to achieve and maintain the prescribed performance standards, the Sponsor will propose adaptive management actions to correct the shortcomings. A thorough analysis of vegetation, wetland, stream, and fish habitat monitoring data may result in the identification of other factors, not identified in the performance standards or monitoring data, causing the project to fall short of its objectives. The Corps and/or Ecology, following consultation with the IRT and the sponsor may also direct adaptive management actions if the Corps and/or Ecology identify a need for corrective action and no adaptive management plan acceptable to the IRT has been submitted within a reasonable period of time. The adaptive management plan shall specify the nature of further examination of areas for potential causes of failure and/or corrective action to be conducted, the schedule of completion for those activities, and a monitoring plan for assessing the effectiveness of the corrective action. The objective of the adaptive management plan shall be to attain the originally prescribed project objectives, either through achieving the original performance standards or through new standards subsequently developed based on evaluation of the site as it matures and is assessed. The Sponsor shall also implement all mitigation that the Corps and/or Ecology, following consultation with the IRT determines is reasonably necessary to compensate for those authorized impacts to the aquatic environment that have not been successfully redressed by the Bank pursuant to the requirements of this Instrument. If modified or replacement performance standards are proposed, the Sponsor may not initiate activities designed to achieve those replacement standards until those performance standards are approved by the Corps and/or Ecology, following consultation with the IRT. During the period that a specific component of the Bank is out of compliance, the Corps and/or Ecology, following consultation with the IRT may direct that credits generated by that Bank component may not be sold, used, or otherwise transferred.

B. If remedial actions taken by the Sponsor under the provisions of the preceding paragraph do not bring that performance standard of the Bank into compliance with the requirements of this Instrument, including any approved changes to the Instrument, the Sponsor may request approval to discontinue efforts to achieve one or more performance standards for the Bank. If the Corps and Ecology, following consultation with the IRT, approve of the proposal to discontinue efforts to achieve one or more performance standards, they need not be accomplished but no additional credits may be awarded for those performance standard(s). At the discretion of the Corps and Ecology, following consultation with the IRT, the Sponsor may also be released from future maintenance and monitoring obligations for those performance standard(s), provided that

releasing the Sponsor from those obligations does not adversely affect the remainder of the Bank, or affect credits already sold, used, or transferred to date.

C. If the Corps and Ecology, following consultation with the IRT, determine that the failure of one or more performance standards of the Bank to comply with the requirements of this Instrument adversely affects the ability of the Bank to achieve its goals or objectives, or if the Sponsor does not make a reasonable effort to bring the Bank into compliance with this Instrument, the Corps and Ecology, following consultation with the IRT, may terminate this Instrument and the operation of the Bank pursuant to Article IV.J.

D. If the Corps and/or Ecology, following consultation with the IRT, direct remedial or adaptive management action pursuant to Section F.4.A. and compliance with the performance standards is not restored within a further reasonable period of time, and the Sponsor does not obtain approval of any request to discontinue efforts pursuant to Section F.4.B, the Corps and/or Ecology may alternatively implement remedial action on their own initiative, acting through a Third Party Designee, by accessing the financial assurance instrument pursuant to Article III.C.1. and Section H.1 of Appendix H to this Instrument.

F.5 Maintenance during the Establishment Period of the Bank

General maintenance will be performed throughout the year to address conditions that may limit the success of the Bank and attainment of performance standards and objectives. The Sponsor is responsible for all site maintenance activities throughout the establishment period of the Bank. Maintenance activities will include, but are not limited to, vegetative maintenance (including replanting, repair of any areas subject to erosion, weed control around plantings, mowing, control of invasive species, control and discouragement of voles, beaver and deer foraging on plants) and general maintenance (including fence repair, cleaning and repair of nesting boxes, road and trail maintenance as necessary, and clean-up of trash).

References

1987 Corps of Engineers, Wetland Delineation Manual (U.S. Army Corps of Engineers 1987) and appropriate supplements.

Elzinga et al, Measuring and Monitoring Plant Populations, 1998. BLM/RS/ST-98/005+1730

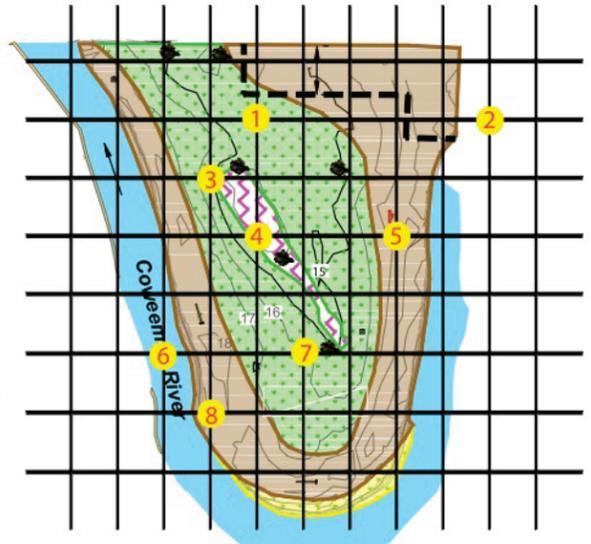
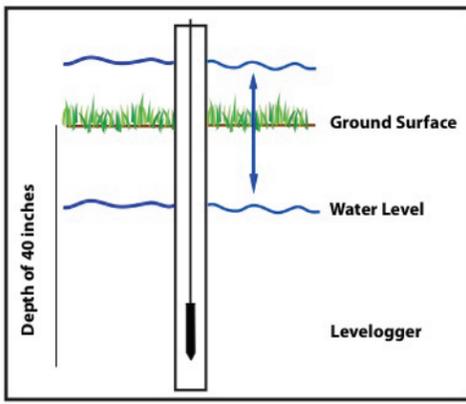
Krebs, C.J. 1999. Ecological Methodology, 2nd ed. Addison-Wesley Educational Publishers, Inc.

Lower Columbia Fish Recovery Board. 2004. Lower Columbia Salmon Recovery and Fish and Wildlife Subbasin Plan. Vol II, Chapter E- Cowlitz, Coweeman and Toutle. 494 pages.

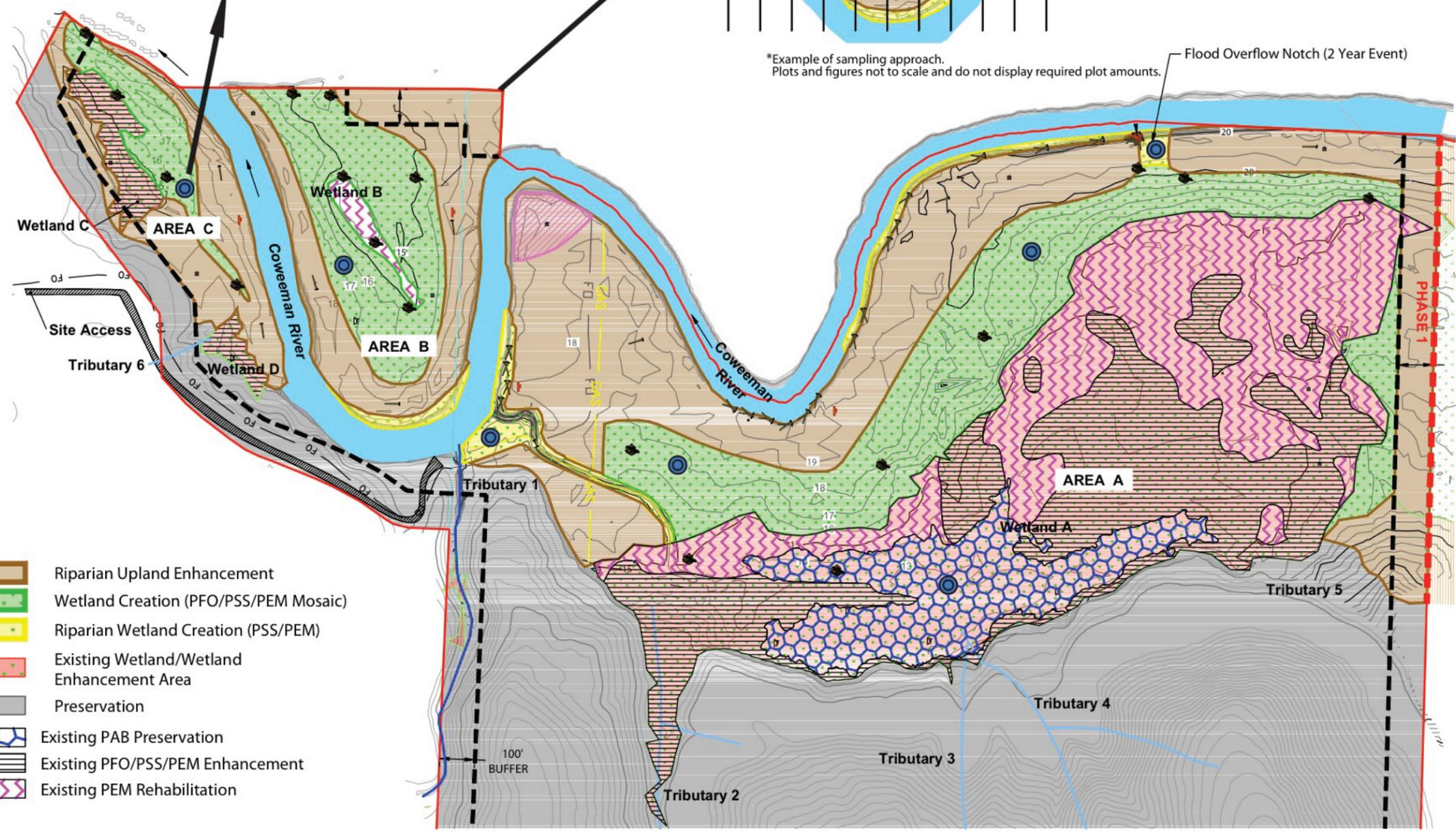
Tiner, R. Wetland Indicators: A Guide to Wetland Identification, Delineation, Classification, and Mapping, 1999.

Washington Department of Fish and Wildlife. January 2013. Lamperth, J. et al. Coweeman River Salmonid Production Evaluation: 2011 Completion Report. 77 pages.

U.S. Army Corps of Engineers. 2010. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0), ed. J. S. Wakeley, R. W. Lichvar, and C. V. Noble. ERDC/EL TR-10-3. Vicksburg, MS: U.S. Army Engineer Research and Development Center.



- ### Stratified Random Sampling Approach
1. Vegetation stratum defined (PFO/PSS/PEM/PAB/UPL)
 2. Grid pattern lines for each area established through AutoCAD.
 3. All grid pattern line intersections assigned numbers within a vegetation stratum and area of the site (A, B, C, D).
 4. An adequate number of monitoring points chosen by random number generator for each stratum, points outside area discarded.
 5. Coordinates for each monitoring plot determined using AutoCAD Civil 3D.
 6. Coordinates uploaded to GPS and located in the field.



Area/Vegetation Community	Proposed Acreage	Minimum Sample Plots Required (1% of area of habitat type for PFO and PSS, UPL, 3 plots/acre PEM and PAB)		Proposed # of Sample Plots	
		PFO/PSS/UPL	PEM/PAB	PFO/PSS/UPL	PEM/PAB
Area A					
Wetland Creation: PFO/PSS/PEM Mosaic*	12.31	2	Up to 37	4	Up to 37
Riparian Wetland Bench Creation: PSS/PEM Mosaic*	1.68	1	Up to 6	3	Up to 6
Wetland Preservation: PAB	6.12	--	13	--	13
Wetland Enhancement: PFO/PSS	14.17	3	--	3	--
Wetland Rehabilitation: PEM to PFO/PSS Mosaic*	13.22	3	Up to 40	3	Up to 40
Riparian Upland Enhancement: PFO/PSS	19.96	4	--	4 [#]	--
Area B					
Wetland Creation: PFO/PSS/PEM Mosaic*	5.28	1	Up to 16	2	Up to 16
Riparian Wetland Bench Creation: PSS/PEM Mosaic*	0.32	1	Up to 1	1	Up to 1
Wetland Rehabilitation: PEM to PFO/PSS Mosaic*	0.44	1	--	1	--
Riparian Upland Enhancement: PFO/PSS	5.34	1	--	2	--
Area C					
Wetland Creation: PFO/PSS/PEM Mosaic*	1.74	1	Up to 6	1	Up to 6
Wetland D Enhancement: PSS/PEM to PSS/PFO	.36	1	--	1	--
Wetland C Rehabilitation: PEM to PSS/PFO	1.02	1	--	1	--
Riparian Upland Enhancement: PFO/PSS	3.59	1	--	1	--
TOTAL PLOTS	--	21	Up to 119	27	Up to 119

* In mosaic habitats, both woody and emergent vegetation will be intermingled in irregular patterns. Enough potential plot coordinates will be generated to meet the minimum sampling requirements for both woody (PFO/PSS) and emergent vegetation (PEM). Each individual plot will be assigned to a vegetation strata (PFO, PSS, PEM) at the time of monitoring based on as-built plantings. If both emergent and woody vegetation are present in the vicinity of the same plot center then a PEM plot may be nested within the larger woody vegetation sampling plot. Some PEM plots will transition to woody vegetation-dominated over time.
[#]One plot will be located in non-creditable buffer area.

FIGURE F-1
Coweeman River Mitigation Bank
Vegetation Monitoring and Levellogger Locations
 Habitat Bank LLC.

APPENDIX G LONG-TERM PROTECTION AND MANAGEMENT

G.1 Conservation Easements

A. The Sponsor will ensure, pursuant to Article III.D. of this Instrument, that an appropriate conservation easement is granted from each landowner and recorded dedicating in perpetuity the property constituting the Bank, that is to be created, restored, or enhanced for credit. These conservation easements must be approved by the Corps and Ecology, following consultation with the IRT, and shall be recorded with the Cowlitz County Auditor. A copy of the recorded easements shall be provided to all members of the IRT. The conservation easements shall reflect that they may not be removed, modified, or transferred without written approval of the Corps and Ecology, in consultation with the IRT. The Corps and Ecology may consider any alteration or rescission of the conservation easement a default of the Sponsor's obligations under this Instrument and may institute appropriate action pursuant to Article IV.J. The Sponsor shall provide no less than 60 days written notice to the IRT of any transfer of fee title or any portion of the ownership interest in the Bank real property to another party. Use prohibitions reflected in the easements will preclude the site from being used for activities that would be incompatible with the establishment and operation of the Bank. All restrictions shall be granted in perpetuity without encumbrances or other reservations, except those encumbrances or reservations (e.g., retention of recreation and privileges by the landowners and their guests) approved by the Corps and Ecology and not adversely affecting the ecological viability of the Bank. Any portion of the site not encumbered by the conservation easements will not be credited for use in the Bank.

B. The conservation easements shall provide that all structures, facilities, and improvements within the Bank, including roads, trails and fences, that are merely incidental to the functionality of the mitigation site but are necessary to the Bank management and maintenance activities, shall be maintained by the Sponsor or its assignee for as long as it is necessary to serve the needs of long-term management and maintenance. All structures, facilities and improvements that directly and substantially contribute to the functionality of the mitigation site will be included within the responsibilities delineated in the Long-Term Management and Maintenance Plan.

G.2 Long-Term Management and Maintenance Plan

A. The Sponsor is responsible for ensuring that a Long-Term Management and Maintenance Plan is developed and implemented to protect and maintain in perpetuity the aquatic functions and values of the Bank site. This plan must be approved by the Corps and Ecology, following consultation with the IRT, prior to the termination of the establishment period of the Bank. Once the establishment period of the Bank has terminated pursuant to Article IV.K. of this Instrument, the Sponsor will assume responsibility for implementing that Plan, as provided in Article IV.M. of this Instrument,

unless the Sponsor assigns this responsibility pursuant to the provisions of Article IV.M. and Section G.2.D. of this Appendix.

B. To gain IRT approval, the Long-Term Management and Maintenance Plan will consist of enumerated objectives. The Bank will document that it is achieving each objective by submitting status reports to the IRT on a schedule approved by the IRT. A primary goal of the Bank is to create a self-sustaining natural aquatic system that achieves the intended level of aquatic ecosystem functionality with minimal human intervention, including long-term site maintenance. As such, natural changes to the vegetative community, other than changes caused by noxious weeds, that occur after all Bank performance standards have been met are not expected to require remediation.

C. The Long-Term Management and Maintenance Plan will include those elements necessary to provide long-term protection for the aquatic ecosystem and habitat resources of the Bank site. The specific elements of the Plan must be tailored to meet the specific protection needs of the site. At minimum, the IRT will likely find the following core elements to be necessary for inclusion in the Long-Term Management and Maintenance Plan. The particular characteristics of the Bank site at the end of the establishment period may necessitate including other elements not specified below, that are needed to protect the ecosystem resources present at the Bank.

(1) Periodically patrol the Bank site for signs of trespass and vandalism. Maintenance will include reasonable actions to deter trespass and repair vandalized Bank features.

(2) Monitor the condition of structural elements and facilities of the Bank site such as signage, fencing, roads, and trails. The Long-Term Management and Maintenance Plan will include provisions to maintain and repair these improvements as necessary to achieve the objectives and functional performance goals of the Bank and comply with the provisions of the conservation easement. Improvements that are no longer needed to facilitate or protect the ecological function of the Bank site may be removed or abandoned if consistent with the terms and conditions of the conservation easement.

(3) Inspect the Bank site annually to locate and eradicate any occurrence of knotweed. The IRT anticipates that this long-term control will involve identifying and eradicating a relatively small number of recurrences each year. In the event the Corps and Ecology, in consultation with the IRT, determines that the watershed within which the Bank is located becomes infested with knotweed in the future, so that its effective control on the Bank site is either no longer practicable or unreasonably expensive, the IRT will consider appropriate changes to the Long-Term Management and Maintenance Plan.

(4) Inspect the site annually to locate and control noxious weeds other than knotweed. Noxious weed control measures may include mechanical vegetation control, herbicide treatments, and temporary plantings

D. If the Sponsor elects to request the approval of the IRT to assign long-term management and maintenance to a Long-Term Steward pursuant to Article IV.M.2., the long-term management and maintenance assignment agreement will reflect that the assignee has assumed (1) the obligation, owed to the IRT, of accomplishing the Long-Term Management and Maintenance Plan; as well as (2) the legal responsibility for continued accomplishment and maintenance of the compensatory mitigation requirements associated with all impacting projects that satisfied their mitigation requirements through the application of Bank credits. The Corps and Ecology will also execute this assignment agreement. In exchange for the assignee's promise to achieve the Long-Term Management and Maintenance Plan, contemporaneously with the assignment of long-term management and maintenance responsibilities the Corps and Ecology will direct disbursement of the "full funding" amount specified in Article III.C.2.c. of this Instrument from the Long-Term Management and Maintenance Endowment Fund escrow account, pursuant to Article III.C.2.e. of this Instrument. In the event the responsibility for executing the Long-Term Management and Maintenance Plan is not assigned to a third-party assignee, at the termination of the establishment period of the Bank the "full funding" amount specified in Article III.C.2.c. of this Instrument will be disbursed from the Long-Term Management and Maintenance Endowment Fund escrow account to the Sponsor.

APPENDIX H FINANCIAL ASSURANCES

The Sponsor will institute and maintain financial assurances in accordance with the subsections immediately below. The Sponsor will provide a Letter of Credit to provide financial assurance underlying the establishment and initial functionality of the Bank.

H.1 Letter of Credit

A. The Irrevocable Letter of Credit prescribed in Article III.C.1. of this Instrument, underlying the establishment and functionality of the Bank, will adhere to the following form and contents.

B. Each Letter of Credit will be irrevocable and without condition other than those authorized in this Instrument. Each Letter of Credit may not be withdrawn or canceled by the issuing financial institution prior to the designated expiration date, which may be no earlier than 12 years from the date of issuance. If the Letter of Credit applicable to the Bank shall expire by its own terms prior to the termination of the establishment period of the Bank as specified in Article IV.K. of this Instrument, the Sponsor must reinitiate an acceptable Letter of Credit so that there is no interval in which there is no Letter of Credit in effect. In lieu of a Letter of Credit with an effective period of 12 years, the Sponsor may elect to submit a Letter of Credit with an initial expiration date that is a minimum period of one year from the date of issuance. The Letter of Credit shall provide that, unless the issuer provides the Beneficiaries written notice of non-renewal at least 60 days in advance of the current expiration date, the Letter of Credit is automatically extended without amendment for one year from the expiration date, or any future expiration date, until a period of 12 years commencing with the date of first issuance is completed. If the Sponsor does not furnish an acceptable replacement Letter of Credit, or other acceptable financial assurance, at least 30 days before a Letter of Credit's expiration, the Corps and/or Ecology may immediately draw on the existing Letter of Credit up to its full value without any notice to the Sponsor. If the Corps and Ecology determine that the issuing financial institution's rating has dropped below the requirements specified in Article III.C.1. of this Instrument, the Corps and Ecology may direct the Sponsor to provide an acceptable substitute Letter of Credit within 30 days. If an acceptable substitute is not provided within the prescribed period, the Corps and/or Ecology may immediately draw on the Letter of Credit up to its full value without any further notice to the Sponsor. No further credits will be awarded from the Bank without an effective Letter of Credit. Each Letter of Credit will provide that the issuing financial institution shall honor the credit engagement and pay to the Third Party Designee the directed sum without inquiring whether the directing Beneficiary agency or the receiving Third Party Designee has a right to make such a demand.

C. Each Letter of Credit will be issued to, and will designate, the Corps and Ecology as distinct and independent Beneficiaries. If the IRT has informed the Sponsor that one has been so designated, each Letter of Credit shall identify and designate the Third Party Designee. Upon presentation of a sight draft by either the Corps or Ecology, in writing on agency letterhead, accompanied by no other documentation other than the original Letter of Credit, the issuing financial institution shall disburse from the credit funds account to the Third Party Designee the

amount specified by the Corps or Ecology, up to a maximum cumulative amount as reflected in the Letter of Credit. The Corps or Ecology shall be authorized to direct or make partial drawings, and multiple successive drawings, upon the credit account. The Corps and Ecology shall have the exclusive authority to direct disbursement of funds from the credit funds account, and the direction of only one of these two agencies is required in order to accomplish a disbursement.

D. Each Letter of Credit shall acknowledge that, from time to time, the Beneficiary agencies may authorize a reduction in the required level of credit during the effective period of the Letter of Credit. Any such reduction must be authorized by both the Corps and Ecology, as Beneficiary agencies. Upon receipt of both authorizations, in writing on agency letterhead, the issuing financial institution will be authorized to reduce the level of maximum extended credit, and it may, as arranged between the Sponsor and the issuing financial institution, reissue or amend the applicable Letter of Credit accordingly to reflect that change.

E. Each Letter of Credit shall acknowledge that the Beneficiary agencies may authorize cancellation of the Letter of Credit prior to the scheduled expiration date reflected therein. Any such cancellation must be authorized by both the Corps and Ecology, as Beneficiary agencies. Upon receipt of both authorizations, in writing on agency letterhead, the issuing financial institution will be authorized to withdraw or rescind, as arranged between the Sponsor and the issuing financial institution, the applicable Letter of Credit.

F. If so directed by the Corps and Ecology, the Sponsor agrees to substitute the identification of the Third Party Designee with a replacement entity for each applicable Letter of Credit. The Sponsor agrees that it shall execute either an amendment or replacement of each applicable Letter of Credit in order to effect such a substitution. If substitution of the Third Party Designee is directed, all other terms and conditions of the applicable Letter of Credit shall remain unchanged, particularly including the credit amount and the expiration date.

G. Upon request of the Sponsor, the Corps and Ecology, in consultation with the IRT, may authorize reductions in the required credit account limits of each of the Letters of Credit when the Corps and Ecology have determined, in consultation with the other members of the IRT and the Sponsor, that the Bank objectives and performance standards reflected in Appendix C are being timely met.

H. The Sponsor is solely responsible for any costs, fees, or premiums associated with the issuance, modification, continuation in force, or termination of each Letter of Credit. Any such costs may not be deducted from the principal of the Letter of Credit.

H.2 Long-Term Management and Maintenance Endowment Fund

A. In order to implement the Long-Term Management and Maintenance Endowment Fund, prescribed in Article III.C.2. of this Instrument and underlying management and maintenance actions to be taken following completion of the establishment period of the Bank, the Sponsor will establish an escrow account in an accredited and Federally-insured financial institution, as follows.

B. The Long-Term Management and Maintenance Endowment Fund escrow account will be incrementally funded until it is fully funded, as prescribed in Articles III.C.2.b. and III.C.2.c. of this Instrument. Once the Long-Term Management and Maintenance Endowment Fund is fully funded, the Sponsor will be released from any further obligation to deposit a designated sum corresponding to each sale, use, or transfer of credits. The Sponsor will be permitted to accelerate contributions to the Long-Term Management and Maintenance Endowment Fund, and by doing so, the Sponsor may defer subsequent contributions until the balance in the Endowment Fund no longer matches or exceeds the balance required by the computation in Article III.C.2.b. The Sponsor will provide to the IRT an annual account statement displaying a cumulative tabulation of all deposits into the Long-Term Management and Maintenance Endowment Fund escrow account, with each deposit referencing the associated sale/use/transfer transaction, as well as the principal balance and total account balance, as of December 31 of the previous calendar year, by February 1 of each year. This statement will be submitted until (1) the Long-Term Management and Maintenance Endowment Fund is fully funded or (2) until approval by the Corps and Ecology, in consultation with the IRT, of the Sponsor's written request to permanently cease banking activities.

C. The Long-Term Management and Maintenance Endowment Fund escrow account may bear interest or other earnings. Any earnings generated by the escrow funds shall remain deposited with other escrow account funds. Earnings in excess of the full funding amount specified in Article III.C.2.c. of this Instrument will be returned to the Sponsor at the time that the full funding amount is disbursed to the Long-Term Steward. The Long-Term Management and Maintenance Fund account contents may be invested only in the following: an interest-bearing savings or passbook account, savings certificate, or certificate of deposit, held in each case by an institution that is insured by the Federal Deposit Insurance Corporation; alternatively, the Fund principal and earnings may be invested in direct obligations of the Government of the United States of America, in obligations of agencies or insurers that are guaranteed by the Government of the United States of America, or in a money market mutual fund consisting solely of such obligations.

D. The Sponsor will be responsible for all escrow agency and associated account fees, including account termination and final reconciliation costs, which may not be paid out of escrow account funds, or out of the interest or earnings generated thereon.

E. The terms of the escrow instructions will permit regular recurring deposits to the escrow principal as sales, use, or transfers of credits are made and designated sums corresponding to those sales, use, or transfers are deposited to the escrow account.