

MEMORANDUM

DATE: June 15, 2021

FROM: Lyndon C. Lee, Ph.D., PWS, City's Consulting Biologist
Rebecca Lowell, Principal Planner

SUBJECT: SMP, Appendix A Update

BACKGROUND:

The City's Shoreline Master Program (SMP) is required by State law to include goals, policies, and regulations designed to direct development activities and uses in a manner that will prevent degradation of ecological functions compared to existing conditions. It must address adverse cumulative impacts, and fairly allocate the burden of addressing these impacts among development opportunities. These requirements are found in the Revised Code of Washington (RCW) 90.58.020, the Washington Administrative Code (WAC) Chapter 173-26-176, WAC 173-26-201(2)(c).

The City's 2011 SMP includes the accompanying Appendix A that met the above-identified requirements related to preventing the degradation of ecological functions, addressing adverse cumulative impacts, and allocating the burden of these impacts.

The current update to the City's 2011 SMP is required to include the analyses in this memo. In completing the 2021 update, we have ensured that the updates/changes made in 2021 do not result in substantive changes to the analyses included in Appendix A (accompanying this memo) that was completed in 2011.

CHANGES/UPDATES TO THE 2011 SMP:

Following is a summary of the changes/updates made in 2021 to the previously adopted 2011 SMP. This summary is provided because the analyses included in this memo are limited to the changes made in 2021 to the 2011 SMP:

- References to the Community and Economic Development Department or Director have been changed to the Development Services Department or Director.
- The procedural requirements for the different types of shoreline permits are organized into one section (versus several) and clarified. No changes were made to the way shoreline permits are processed.

- The type of development not requiring a shoreline permit is cross-referenced to State law (WAC 173-27-044 and 173-37-045) and the text of the State law is removed from the SMP.
- The description of how shoreline jurisdiction is determined is elaborated upon to ensure jurisdictional areas are properly and consistently identified.
- Existing zoning and comprehensive plan designations were added to the list of factors that determine environmental designations.
- Figures 2 and 3 within the 2021 SMP map several areas being subject to shoreline jurisdiction that were not identified in the 2011 SMP. Importantly, these areas would have been subject to shoreline jurisdiction under the 2011 plan; however, they were not mapped as potentially being subject to the SMP. These areas are potentially subject to shoreline jurisdiction due to wetlands, that if present, could be associated with, influence, or be influenced by, either the Skagit River or Barney Lake.

In the 2021 update, the City has identified these parcels that could be subject to shoreline jurisdiction due to the presence of associated wetlands by using cartographically distinct hatching patterns on the revised maps to differentiate these areas from other mapped environmental designations.

Staff analyzed these areas and assigned environmental designations based on the following factors that are listed under sub-section III(B) of the SMP: ecosystem characteristics, environmental functions, restoration potential, existing uses, development and redevelopment potential, existing Zoning and Comprehensive Plan Designations, and public and private plans.

- There are four (4) general areas where the environmental designations were updated or changed to ensure the designations were consistent with the factors listed in sub-section III(B) of the SMP (these factors are also listed in the paragraph immediately above). Descriptions of these areas and the reasons why their designations were changed are provided below. These areas are described in much greater detail in the parcel-by-parcel SMP Mapping Update Summary that is attached to this memo.

Area 1 (mapped on Figures 2 and 3) is located at the far north and northeast portions of the City. Following adoption of the 2011 SMP a new levee was completed along the north side of Hoag Road, east of the Burlington Northern Santa Fe railroad tracts. This new levee is identified on the SMP maps along with areas waterward of the levee, and areas 200 feet landward of the levee as subject to SMP jurisdiction. See the Mapping Update Summary attached to this memo for the justification for the shoreline environmental designations assigned in this location.

Other areas are identified on Figures 2 and 3 as potentially being subject to shoreline jurisdiction, but only if wetlands are found on these areas that influence, or are influenced by, the Skagit River or Barney Lake. These areas were identified following a site-specific review where wetlands were found on a site that were influenced by the Skagit River; and this site was not shown as

being subject to shoreline jurisdiction in the City's 2011 SMP. The accompanying Technical Memorandum dated April 30, 2021 from Dr. Lyndon Lee - Mitzell, contains a detailed background and analysis of this site. Once one site was identified staff had Dr. Lee complete an exercise of all nearby properties to see whether or not wetlands on these properties could influence, or be influenced by, the Skagit River or Barney Lake. These properties are shown on Figures 2 and 3 with horizontal lines through them. The justification for the environmental designations for these properties is detailed in the accompanying Mapping Update Summary. Importantly, these areas would have been subject to shoreline jurisdiction under the City's 2011 SMP; but they would have been assigned an environmental designation of Urban Conservancy until the City could update the shoreline map. This 2021 update eliminates the potential for multiple piecemeal map amendments by completing a comprehensive review and update of these areas.

Area 2 (mapped on Figure 5) consists of areas on the east and south side of the Skagit River. Following the adoption of the 2011 SMP the City completed additional portions of a floodwall and levee system that are updated on Figure 5. The newly constructed portions of the floodwall and levee slightly changed the areas subject to shoreline jurisdiction because this jurisdiction is identified as extending 200 feet landward from these areas. The environmental designations in these areas remained as Urban Conservancy on the properties owned by the City on and near the wastewater treatment plant and was kept as Urban Mixed Use on the landward side of the new floodwall and levee of the properties not owned by the City.

Area 3 (mapped on Figure 5) consists of areas waterward of the existing levee within and surrounding the City's Edgewater Park. The 2021 update modified the boundary between the Shoreline Natural and Shoreline Urban Conservancy Environmental Designations such that the Urban Conservancy designation encompasses the portions of Edgewater Park that are used by the public and actively maintained (i.e. mowed and trimmed) by the City's Park and Recreation Department. The Shoreline Urban Conservancy Environmental Designation in this area was also updated such that it extends between the Ordinary High Water Mark (OHWM) of the Skagit River to the existing levee – in the existing SMP this shoreline area is identified as extending from the OHWM but does not extend to the existing levee. See the accompanying Mapping Update Summary for additional details regarding the updates in this location.

Area 4 (mapped on Figure 5) consists of two tax parcels owned by the Mount Vernon School District that are developed as part of Washington Elementary School. The parcel numbers are P26397 and P26391. The 2011 SMP identified the area of these parcels 200 feet landward of the existing levee designated as Shoreline Residential. Because these two parcels are developed as part of an elementary school their designation has been changed to Urban Mixed Use. See the accompanying Mapping Update Summary for additional details regarding the updates in this location.

- The following General policy has been removed from the SMP because it mirrors requirements in existing State law thereby making it unnecessary to have in the City's SMP. This policy is as follows:
 - a. The Director of the Community Development Services Department will periodically initiate review of conditions on the shoreline and conduct appropriate analyses to determine whether or not other actions are necessary to protect and restore the ecology, protect human health and safety, upgrade visual qualities, and enhance residential, commercial, and recreational uses on the City's shorelines. Specific issues to address in such evaluations include, but are not limited to:
 - i. Water quality
 - ii. Conservation of aquatic vegetation (e.g. control of noxious weeds and enhancement of vegetation that supports more desirable ecological functions and recreational conditions)
 - iii. Upland vegetation
 - iv. Changing visual character as a result of new development, including redevelopment and individual vegetation conservation practices
 - v. Shoreline stabilization and modifications
- The currently adopted version of the City's critical areas ordinance is adopted into Appendix C sans the provisions DOE requires be removed.
- The relief for shoreline restoration projects from WAC 173-27-215 is adopted by reference into the updated SMP.
- The definition of associated jurisdictional wetlands is expanded to include the definition of such found in WAC 173-22-040.
- The date of receipt of the final decision is updated to the date of filing of a final decision throughout the plan.
- A definition for Substantial Development is added to the SMP.

ANALYSIS OF SMP UPDATES/CHANGES TO APPENDIX A OF 2011 SMP:

The City's 2021 SMP updates/changes to Appendix A focused on refinement of Environmental Designations and associated mapping protocols to ensure City-wide consistency of designations and mapping results. Areas of interest are highlighted for edited designations in the 2021 revised and edited Shoreline Master Program document. They include the Natural Environment, Urban Conservancy, and Urban Mixed-Use environments. For example, the SMP updates offers edits for the Natural Environment Designation to include specific properties such as areas:

- a. Within the City limits near Lions Park
- b. Near the Nookachamps Wetland Mitigation Bank and the intersection of Lindegren Creek with the Skagit River
- c. North of the levee abutting the City's Wastewater treatment plant north to the Skagit River and east to the point where the levee and the floodwall meet

d. At the intersection of the River Bend Road and the east City limit line east approximately 1,375 linear feet then south approximately 970 linear feet along the west side of Freeway Drive then northwest along the Skagit River approximately 1,920 linear feet to the east City limit line and then north approximately 135 feet

e. Due west of Barney Lake. Note: Barney Lake is approximately 147 acres in size, has a shoreline length of approximately 4.3 miles, and is located northeast of the city limits within unincorporated Skagit County.

The Barney Lake shoreline area is largely undeveloped on its east and south sides and has dispersed single-family residential development on its north and west sides. Between 1995 and 2016 the Skagit Land Trust acquired nearly 370 acres around the west and south sides of Barney Lake. [Barney Lake Property - Skagit Land Trust]

Since Barney Lake is not located within the incorporated portions of the city an analysis was not completed by the City. However, the City did review Skagit County's Draft Shoreline Analysis Report dated September 1, 2011.

In the 2021 SMP update, the City also focused on interpretations of "Associated jurisdictional wetlands or Associated wetlands", defining them as those wetlands that are in proximity to and either influence or are influenced by shorelines of significance to the State. These wetlands are subject to the Shoreline Management Act. Consistent with WAC 173-22-040 this definition includes wetlands that are determined by the City to be in proximity to, and either influence or are influenced by the Skagit River. Within the City, this influence includes but is not limited to one or more of the following: periodic inundation, location within a floodplain, or surface or shallow subsurface hydrologic connection(s) that may be permanent or which occur seasonally (e.g. during the wet winter/spring season) with intermittent flow connections.

The City's biologist, Dr. Lyndon Lee, has reviewed all the proposed changes to the 2021 SMP update and finds with these changes the City's SMP remains consistent with the requirements RCW 90.58.020, the WAC Chapter 173-26-176, and WAC 173-26-201(2)(c) because it remains a regulatory document that prevents degradation of ecological functions compared to existing conditions, it addresses adverse cumulative impacts, and it fairly allocates the burden of addressing these impacts among development opportunities.

ATTACHMENTS:

- Appendix A of City's 2011 SMP
- Technical Memorandum dated April 30, 2021 from Dr. Lyndon Lee - Mitzell
- Dr. Lyndon Lee's CV
- SMP Mapping Updates

Appendix A of City's 2011 SMP

APPENDIX A

**SHORELINE INVENTORY, CHARACTERIZATION, AND
CUMULATIVE IMPACTS REPORT****I. INTRODUCTION**

The Skagit River drains an area of 3,140 square miles and flows for 162 miles from its headwaters in the Cascade Mountains, through low-lying valleys, and finally through the broad Skagit Delta to Puget Sound. The Skagit River is the largest in the Puget Sound basin and possesses the most abundant and diverse populations of salmon, steelhead trout, and bull trout in the region. It is the sixth largest drainage on the west coast of the continental United States.

A. EXTENT OF CITY SHORELINES

Mount Vernon's shorelines regulated by the Shoreline Master Program (SMP) are limited to those portions of the Skagit River "Big Bend Reach" that occur within the City's corporate limits. This encompasses approximately seven miles of the river's shoreline. Shoreline regulatory jurisdiction within Mount Vernon varies in width as shown in Figure A-1 dependent upon the proximity of wetlands within and adjacent to the Shoreline Management Act-mandated 200-foot jurisdiction area and flood-prone areas between the ordinary high water mark (OHWM) and topographic or manmade features that mark the landward edges of the 100-year floodplain.

Mount Vernon and the Skagit River are located on a large alluvial plain that was created by geological forces including glacial advance and retreat, hydrology, and periodic vulcanization. As such, the portions of the Skagit River within the City's jurisdiction are adjacent to floodplains. A comprehensive summary of flooding and flood history in the Mount Vernon area is provided on pages 9 through 13 of the Skagit River Big Bend Reach Habitat Restoration Feasibility Study, December 2004, prepared by the Skagit River System Cooperative. [Note: Information on current FEMA floodplain mapping is available from the Mount Vernon Community and Economic Development Department]

B. SCIENTIFIC AND TECHNICAL INFORMATION

In preparing the SMP, the City identified and assembled the most current, accurate, and complete scientific and technical information available. Information was collected from a variety of sources including City plans and studies, Skagit River watershed plans and studies from the Washington Department of Ecology and local planning groups, Dike Districts, private plans, and aerial photographs. Prior to incorporation into the shoreline inventory, the context, scope, magnitude, significance, and potential limitations of the information was considered. For a complete list of resources, see Appendix D of the SMP.

During the public participation process, additional information was provided by property owners and the several Dike Districts having jurisdiction over shorelines within Mount Vernon (Dike Districts 1, 3, and 17).

Due to the amount of information available, the consistency of the data, and the contained nature of the shorelines within the City, it is assumed that the SMP provisions are based on analyses of accurate information that can be readily verified on a case-by-case basis at the time a land use action is proposed.



Figure A-1
Mount Vernon Shoreline Jurisdiction

II. SHORELINE MASTER PROGRAM INFORMATION SOURCES

This Shoreline Master Program relies substantially on existing information that has been developed since the year 2000. Following is a list of the primary sources used in this Report. A complete list of the resources used in the SMP, with a description of the information provided, is provided in Appendix D.

- River Basin Analysis of the Skagit and Samish Basins: Tools for Salmon Habitat Restoration and Protection, February 2000
- Skagit River Shoreline Inventory & Restoration Plan, June 2003
- Edgewater Park Restoration Project – Phase I, September 2003
- Skagit River Big Bend Reach Habitat Restoration Feasibility Study, December 2004
- Mount Vernon Downtown Flood Protection Alternatives, Draft EIS, January 2007
- Final EIS: Mount Vernon Downtown Flood Protection Alternatives, July 2007
- Mount Vernon Downtown Flood Protection Biological Assessment, December 2007
- Downtown and Waterfront Master Plan, July 15, 2008
- City of Mount Vernon 2005 Comprehensive Plan (as amended)
- City of Mount Vernon 2008 Parks, Recreation & Open Space Plan
- Aerial Photographs, 2003, 2007, and 2009

There has been little change in the conditions of the Skagit River shoreline or in the level of development and land use mix in adjacent upland areas during the time these sources of information were being developed. This has been confirmed by a comparative review of the aerial photographs and discussions with staff and consultants familiar with the City's development. As a result, the assumption in this SMP is that these information sources remain valid for shoreline planning purposes.

In addition, the Big Bend Reach of the Skagit River has undergone extensive environmental study over the last decade by both public and private organizations, assessing existing conditions, restoration potential, and impacts from known plans and projects. At this time, there are no identified information gaps that would affect the development of SMP goals, policies, and regulations. Site specific information would be provided during the normal permitting of individual projects.

III. SHORELINE INVENTORY SUMMARY

The City's Skagit River shoreline has been divided into four geographic units for purposes of the shoreline inventory and characterization of conditions. The units represent locations where landscape processes, land use, river function, and habitat exhibit more or less similar attributes. These units are generally based on the six inventory areas defined in the 2003 Skagit River Shoreline Inventory & Restoration Plan (Inventory), prepared by Graham Bunting & Associates. Adjustments have been made in the width of the units of the inventory to include adjacent upland areas. While not necessarily part of the City's Shoreline Management Zone (SMZ), activities on adjacent uplands have potential for affecting shoreline conditions and functions.

Most of the information summarized below is from the Inventory. The Inventory was organized around three groups of categories: physical, biological, and man-made. Environmental baselines were determined for each category in each inventory unit. These, in turn, are based on an assessment of individual features that either provide or impact ecological functions within those categories. Individual features are discussed further in the Characterization of Ecological Functions section of this SMP.

What follows is a descriptive summary of the physical conditions found on and adjacent to the City's shorelines organized by inventory unit.

A. INVENTORY UNIT #1:

Location: East bank of the Skagit River from river mile (RM) 18 downstream to RM 16.25, from Mount Vernon's northerly limit south to the east edge of the railroad right-of-way at the railroad bridge. Included is the adjacent floodplain and upland between the river and Hoag Road. [Figure A-2]

Description: This is the most significant section of the Skagit River shoreline within Mount Vernon where there is a direct connection between the river and adjacent floodplain (see also discussion of Lions Park North in Unit #4, below). There is a relatively intact band of trees and riparian vegetation at the shoreline that extends the entire length of this reach, widening at the north end, to form a significant stand of floodplain forest at the area known as Ten Dollar Bar. Several existing wetlands are located at the south end of this unit. Historically, this area had a more extensive complex of wetlands and back channels providing freshwater fish habitat. Lindegren Creek enters the Skagit at the south end of this inventory unit.

There has been little development within this unit. At the south end, immediately east of the railroad bridge between Hoag Road and the river, there are several single-family homes. Historic uses within the floodplain have been primarily agriculture and the seasonal flooding has discouraged conversion to other types of land uses. As a result, less than 5 percent of this unit is encumbered with impervious surfaces. There is an approximately 1,900 foot long segment of levee between the shoreline and Hoag Road.

The majority of the properties in this unit have been purchased by Nookachamps LLC, which has established a wetland mitigation bank (the Nookachamps Wetland Mitigation Bank) and is implementing a restoration plan at the site. This is discussed in more detail in the Appendix B of the SMP, "Shoreline Restoration Planning."

B. INVENTORY UNIT #2:

Location: Along the south bank of the river from RM 16.24 to RM 15.25, starting at the west edge of the railroad right-of-way at the railroad bridge and proceeding downstream to approximately 1,200 feet west of the Interstate 5 bridge. The inventory area includes the properties between the shoreline and Stewart/Hoag Road. [Figure A-2]



Figure A-2
Inventory Units 1 and 2

Description: The bank of the Skagit River within Inventory Unit #2 is armored with riprap its entire length. A levee that prevents direct connection to the historic floodplain is located immediately adjacent to the shoreline. There are no tributaries or wetlands that connect to the river within this unit and no intact riparian vegetation.

The land between the levee and Stewart/Hoag Road has historically been an area of development. Ownership is private, Dike District, and City. There are three river crossings: at the railroad, at Riverside Drive, and at Interstate 5. Between the railroad and Riverside Drive, development consists primarily of single-family structures on large lots. There are, however, undeveloped lots between the developed parcels.

West of Riverside Drive, the City owns a large parcel of land that is used for stormwater control, a storage garage, and has paved surfaces for parking and access. West of I-5 to the City limit, development consists of an existing recreational vehicle park and a commercial establishment, which is surrounded by parking. Impervious surfaces within this unit currently account for approximately 50 percent of the land area.

C. INVENTORY UNIT #3:

Location: West bank of the river from approximately RM 12 to RM 10.5, starting at the City boundary at Dunbar Road and proceeding downstream past the Division Street bridge to the westerly City boundary at Edgewater Park. [Figure A-3]

Description: This unit contains a natural shoreline area known as Young's Bar, which is privately-owned land, and the City's Edgewater Park. The levee in this unit has been set back from the shoreline from 150 feet at the north end of the unit to approximately 1,000 feet at the south end of Edgewater Park at the City's west boundary. The levee setback in the vicinity of the Division Street Bridge ranges from 300 to 400 feet. During high flows, connectivity to the floodplain is restricted to the area waterward of the levee. There are no tributaries entering the river in this unit.

This unit offers a variety of habitats. There is large woody debris (LWD) at the upstream end of the unit adjacent to Young's Bar and accumulations of it south of the Division Street Bridge along the Edgewater Park shoreline. A large stand of trees is located at the north end of the unit and a well-established riparian zone extends south into Edgewater Park just north of the bridge. Approximately 800 feet south of the bridge another riparian zone begins that extends to the south end of the park and west beyond the City limits into the adjacent Goodrich Bar. A floodplain forest exists between the levee and the shoreline on Goodrich Bar and the southern portion of Edgewater Park.

A significant amount of the development in West Mount Vernon occurs immediately adjacent to and landward of the levees on either side of West Division Street. Land uses are retail and other commercial establishments along West Division Street, with residential uses located north and south of the commercial core.

Recreational use within this unit consists of both active and passive activities associated with Young's Bar and the Park. Young's Bar is an extensive sand bar located just north of the park along the shoreline. Although this is private property, it is regularly used by the community for fishing, sunbathing, and shoreline access.

Edgewater Park has been developed to provide both active recreational use and conservation of on-site riparian habitat. The active use portion of the park is approximately 28 acres and includes a playground, picnic area, covered stage, three multi-use ballfields, restrooms, and 150 parking spaces. A boat launch with 14 boat trailer parking stalls is located at the south end of the active use area. Primitive campsites that are used seasonally, usually in conjunction with special events, are also located at the south end of the Park. The park includes about 38 acres of wetland and woodland conservation area at the south end along the river. This area has been restored to include re-establishment of a historic back channel for salmon habitat enhancement.

The Mount Vernon 2008 Parks, Recreation & Open Space Plan notes that both Young's Bar and Goodrich Bar would be logical extensions of Edgewater Park. Both are characterized by having forested riparian habitat, natural shoreline, and sand bar accretion that could support additional off-channel salmon refuge and rearing habitat.

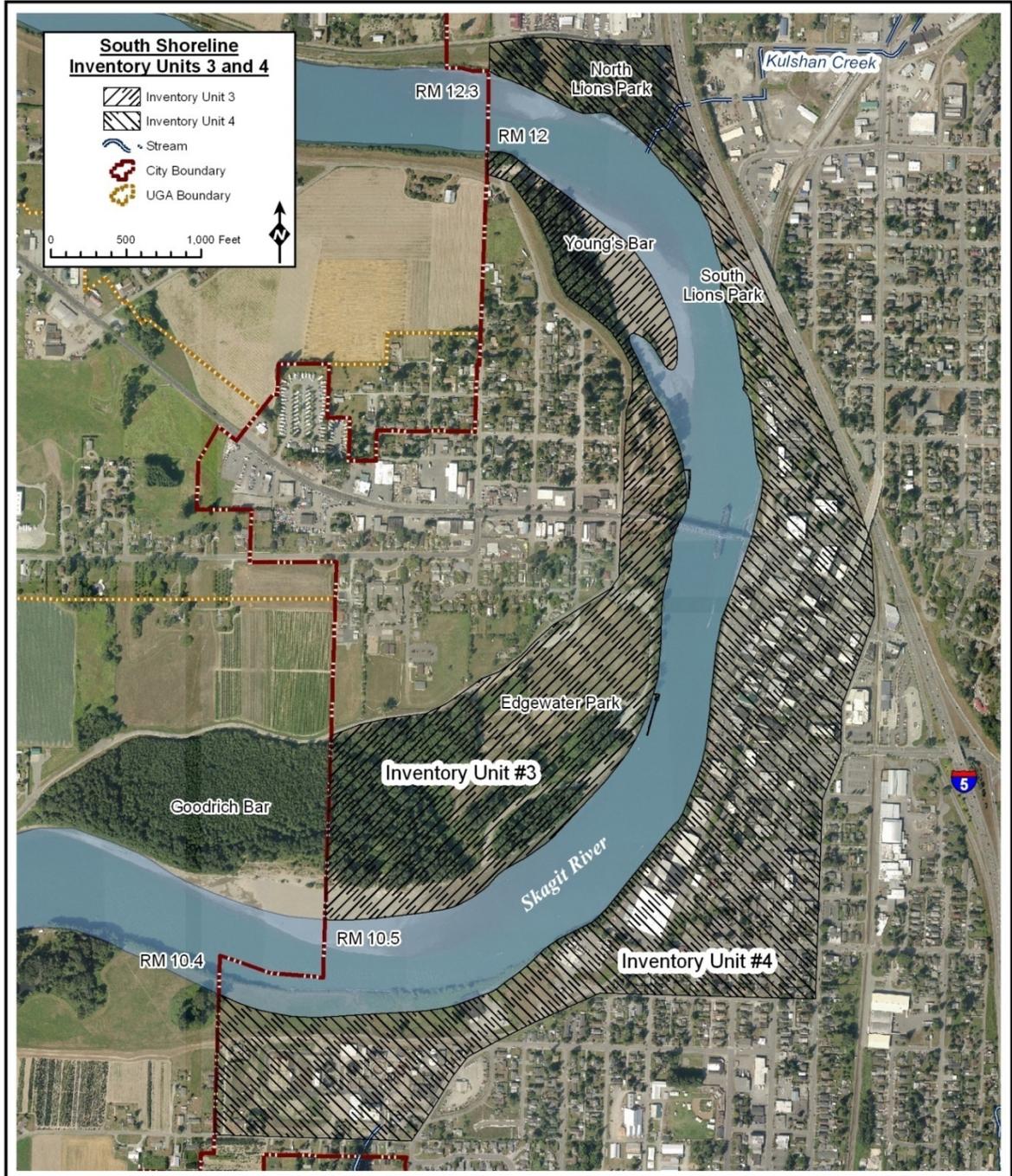


Figure A-3
Inventory Units 3 and 4

D. INVENTORY UNIT #4:

Location: East bank of the river from RM 12.3 to RM 10.4, starting at the north end of Lions Park North and proceeding downstream past the Division Street Bridge to the City boundary just west of Riverview Lane. This unit includes the adjacent Downtown located between the river and Interstate 5 to the east and the areas waterward of Britt Road and Dike Road at the south end of the unit. [Figure A-3]

Description: North of Division Street this unit has a range of shoreline types. The portion just north of the Division Street Bridge is low in plant diversity and high in adjacent development. The upstream portion has a greater diversity of plants and includes a remnant of floodplain forest within the batture at Lions Park North. Kulshan Creek enters the Skagit River at Lions Park.

Immediately north of Division Street, there is a mixture of auto-oriented retail and office uses with on-site surface parking. Between these commercial uses and Lions Park South are auto-oriented businesses that have surface parking adjacent to the river, an armored riverbank, levee, and trail. The 1.6 acre Lions Park South is located on a high bank shoreline overlooking the river and Downtown. It has been developed with a kiosk, picnic shelters and tables, a multipurpose trail, playground and restrooms, RV dump station, and 33 parking spaces. The 15.4 acre triangular-shaped portion of the park, Lions Park North, has a low bank shoreline as one leg of the triangle, a levee along the north, and I-5 along the third side to the east. The site is dominated by a remnant floodplain forest within the batture. Old pilings and similar structural remnants, which date from when the Park was a site for loading goods and moorage, are visible along the riverfront. Lions Park North has been improved with dirt trails and a 2.5 acre open space, but sees relatively light use, except by day hikers.

South of Division Street, the area within the Shoreline Management Zone (SMZ) is dominated by a revetment, built over an armored, sloped bank that provides flood risk reduction to the City's Downtown and surface parking for 350 vehicles.

Moving south beyond the Downtown, the shoreline is protected by riprap and a levee from Kincaid Street south and west to the city limit. The levee setback from the river varies from approximately 150 feet at the north to between 300 and 400 feet at the south end of this unit.

The area south of Downtown is a mix of industrial and commercial uses, surface parking, and residential. South to Section Street is a neighborhood in transition that has a mix of auto-oriented commercial, institutions, residences converted to businesses, vacant land, surface parking, government offices, and multi-family and single-family residences. Between Section Street and Hazel Street, immediately east of First Street, land uses are primarily residential. South of Kincaid Street, a large cold storage facility is located between the river and the levee and farther south, the wastewater treatment plant is immediately landward of the levee.

IV. CHARACTERIZATION OF ECOLOGICAL FUNCTIONS

The concept of ecological functions recognizes that any ecological system is composed of a wide variety of interacting physical, chemical, and biological components that are interdependent to varying degrees and scales and that produce the landscape and habitats as they exist at any given time. Ecological functions are the work performed or role played individually or collectively within ecosystems by these individual components. Managing shorelines for protection of their natural resources depends on sustaining the functions provided by:

- **Ecosystem-wide processes**, such as those associated with the flow and movement of water, sediment and organic materials, the presence and movement of fish and wildlife, and the maintenance of water quality.
- **Localized individual components and processes**, such as those associated with shoreline vegetation, soils, water movement through the soil and across the land surface, and the composition and configuration of the beds and banks of water bodies.

The loss or degradation of the functions associated with ecosystem-wide processes and localized individual components and processes can significantly impact shoreline natural resources and may also adversely impact human health and safety. Shoreline master programs are required to address ecological functions associated with applicable ecosystem-wide processes, and localized individual components and processes identified in the ecological systems analysis described in WAC 173-26-201(3)(d)(i).

Most shoreline areas, even substantially developed or degraded ones, still retain some level or type of ecological function. For example, even though there is little off-channel habitat or spawning and rearing habitat along the City's shorelines, the Skagit main-stem is a critical fish migration corridor. Ecosystems are also interconnected. For example, the life cycle of anadromous fish depends upon the viability of freshwater, marine, and terrestrial shoreline ecosystems, and many wildlife species depend on the health of both terrestrial and aquatic environments. Therefore, the SMA policies for protecting and restoring ecological functions generally apply to all shoreline areas, not just those that remain relatively unaltered.

A. BIG BEND REACH ECOSYSTEM CHARACTERISTICS

The Skagit River Big Bend Reach Habitat Restoration Feasibility Study was completed for the City in December 2004. The study examines the conditions and potential for restoring fish habitat from between the confluence of Nookachamps Creek downstream to the Skagit Forks. It includes characterizations of the Big Bend Reach as a whole and discussions of historical conditions, which provide information for examination of past/future shoreline cumulative impacts, discussed in this SMP. The Big Bend Reach is used here as the relevant geographic area for discussion of ecosystem-wide conditions and functions.

B. REACH MORPHOLOGY

Within this reach, the river occupies a single channel, with levees framing the shorelines. The reach has a sinuosity that has been maintained in place by the presence of levees for at least the last 60 years and, more likely, for the last 100. The right bank is lined continuously with riprap that forms the toe of the levees for the entire length of the study reach. The left bank is lined almost continuously downstream with riprap beginning just east of the railroad bridge.

The Skagit in this reach is in transition from a meandering river to a deltaic system. The river retains features of both systems in the study reach. The meandering river upstream is gravel-bedded, highly sinuous, and steep, while the river downstream is very low-gradient, distributary in nature, with mid-channel bars common, and with sand the predominant sediment size.

The area adjacent to the river channel has characteristics typical of two very different landforms. At the large bend in the river above downtown Mount Vernon, “ridge and swale” topography can be seen. This landform is characterized by numerous low ridges, which parallel meander bends. It represents previous locations of point bars and shows the lateral growth and accretion of the bars. This feature is part of a meandering stream system. The extent of the ridge and swale topography indicates a sustained pattern of point-bar accretion. The feature is approximately 1 mile wide, while in the direction of accretion it is at least 1.5 miles long.

Downstream at approximately Edgewater Park, the features of a delta become more evident. Multiple distributary channels are evident on topographic maps of the area, starting at about RM 12.5. Irregular topography immediately west of the study reach is indicative of overflow channels and former distributary channels. This topography consists of discontinuous depressions that both parallel the main channel and radiate away from it. These features have been highly modified by past agricultural activities.

Portions of the project reach are also tidally influenced. While the effect of tides has been reported to reach to Downtown Mount Vernon, the tidal influence in this reach is minimal, and probably only happens during extreme high-tide events. Tides have a much greater effect downstream from where the river splits into the North and South Forks.

C. LARGE WOOD

Large woody debris and logjams, once extremely common in the Lower Skagit River, had a significant effect on river morphology, flow conveyance, and flood inundation. Large wood fall into the river would have provided areas of refuge and rearing habitat. However, clearing and development has basically eliminated these structural habitat components from the river within this reach.

Due to the size of the river main-stem and force of the flows experienced through this section of the river, wood must be of extremely large diameter and length to be considered stable. It is estimated that any given tree would need to be at least 28 inches or greater in diameter to have any chance of remaining stable through this reach. Currently the reach has no significant accumulations of large woody debris. Individual pieces found at Young's Bar could be considered potential key members. Additionally, there are some accumulations of imbedded LWD in the vicinity of Goodrich Bar. These accumulations can be seen during low water conditions and may be remnants of the historic log jams once located at these sites.

Large woody debris does not play a significant role in the existing channel dynamics. It has not been present in quantities sufficient to affect channel formation since the early 20th century. Generally, LWD is only found piled against bridge abutments and buried in sediment on the few point bars present in the reach. There are only two small areas with recruitable LWD, both near Downtown Mount Vernon. However, the river channel averages about 500 feet wide in this reach and LWD is not expected to affect river processes significantly unless large logjams form.

D. FLOODPLAIN FOREST

Floodplain forests used to be present throughout the reach, but due to over a century of agriculture and other development they now exist only in patches between the levees and the river's edge. Floodplain forests in the study area are generally very similar and have an age range of 40 to 52 years, and are comprised of predominantly black cottonwood. The number of live overstory trees ranges from 130-160 stems per acre with a tree area of 200-250 square feet per acre, which is typical of a moderately aged forest. One notable exception was a mixed stand of conifer and hardwoods in the vicinity of Britt Slough. This mature stand had approximately 100 trees per acre, with a tree area of around 600 square feet per acre. In this case, a grove of mature red cedars contributed a significant portion of the tree volume. At the other end of the scale, the lowest density data was retrieved from a former clear-cut area at Goodrich Bar. Here the forest is less than 20 years old, has 775 trees per acre, and a tree area of only 103 square feet per acre.

There are no floodplain forest lands of long-term significance within the city boundaries of Mount Vernon. In determining whether forest land is primarily devoted to growing trees for long-term, commercial timber production on land that can be economically and practically managed for such production, the following factors are considered: (a) the proximity of the land to urban, suburban, and rural settlements; (b) surrounding parcel size and the compatibility and intensity of adjacent and nearby land uses; (c) long-term local economic conditions that affect the ability to manage for timber production; and (d) the availability of public facilities and services conducive to conversion of forest land to other uses.

E. EDGE CONDITIONS

Of the almost 125,000 feet of edge habitat along the Skagit River in the Big Bend Reach study area, six condition classes are identified. Most of the edge habitat, over 78,000 ft, falls within a “modified edge” type. A “hardened bank” condition, which includes features such as large riprap, rubble, bridge pilings, and piers occurs on both sides of the river, with greater occurrence on the right bank. An additional modified feature, identified as “bar/riprap,” stretches 390 ft between two bar features on the left bank. “Bar” conditions along this stretch of the river compose about 24,300 ft with approximately half occurring on each bank. “Non-hardened bank” conditions cover 21,500 ft, most of which occurs on the left bank (14,500 ft). Lastly, “backwater” conditions are found in two locations along the right bank and cover approximately 550 ft of edge habitat.

F. FLOODPLAIN

It is estimated there are a total of 1,340 acres of available floodplain throughout the entire study area located between the river and existing levees. The study designates the floodplain by categories based on elevation above mean water level (MWL). Approximately 80 acres are Category One (0-5 feet relative to MWL, largely exposed bars), 475 acres are Category Two (5-10 feet relative to MWL), 125 acres are Category Three (10-15 feet relative to MWL), and 660 are Category Four (15-20 feet relative to MWL). The strongest relationship to off-channel habitat is found in Category Two.

G. SHORELINE WETLANDS

Wetlands associated with the floodway are limited to areas within the batture. Wetlands associated with the non-diked floodplain are within the Natural environmental designation at the Nookachamps Mitigation Bank.

H. SUMMARY OF ECOSYSTEM CONDITIONS

Natural functions on the Skagit Delta below Mount Vernon are estimated to be 69 percent degraded from historic levels. The Skagit Basin has also been identified as being limited for Coho winter habitat, with winter rearing habitat concentrated in the few remaining side-channel sloughs on the river floodplain. The largest loss in habitat area and juvenile production for Coho salmon has occurred in side channel and distributary sloughs, resulting in winter and summer production losses of up to 52 percent from historic levels. Many of these habitat areas were once located in the Big Bend Reach area, including at Mount Vernon.

Levee construction and upland habitat conversion have resulted in the loss of almost all floodplain wetlands in the Mount Vernon jurisdiction. Levees confine the river and have eliminated the majority of backwater and off-channel sloughs that provided key habitat for salmonids, cavity nesting ducks, dabbling ducks, swans, beavers, and other riparian fauna. In Mount Vernon nearly all of the agricultural uplands have been converted to housing and other urban land uses.

Modification of the Skagit River shoreline began in the 1860s and by the early 1900s nearly all of the river's shoreline from Sedro-Woolley downstream to Skagit Bay had been confined and stream banks hardened in some fashion, typically with levees and/or rip-rap. Consequently, at Mount Vernon, the river occupies a single channel, with levees framing the majority of the shorelines. The river channel has remained relatively stable since the turn of the last century. While the river does continue to occasionally flood adjacent lands, the presence of the levee system constrains any actual migration of the main-stem itself. For planning and policy purposes it is assumed that the river's main stem will continue to be confined within the limits of the existing levee system.

I. CITY SHORELINE ECOLOGICAL FUNCTIONS

The Shoreline Inventory and Restoration Plan completed in 2003, provides a snapshot of the condition of ecological functions provided along the City's shorelines. As noted earlier, there has been little change in shoreline and near upland development since the inventory was prepared, so the results of the inventory are considered current for planning purposes.

As a whole, the portion of the Skagit River flowing through Mount Vernon serves an important function, acting as a migration corridor between the river estuary and up-river spawning habitats. Every salmonid must pass through the City twice over the course of its life, as a juvenile and as an adult. Along these lower reaches of the river there is only a limited amount of potential habitat, which is evident from looking at City maps and aerials. These small areas are disproportionately significant as refuge places and are particularly valuable because of the overall habitat scarcity within this reach.

Table A-1 summarizes the ecological functional conditions of the City's shorelines by inventory unit. Ten features are presented in the table as being representative of the functions evaluated in the inventory. They are summarized below:

- **Stream bank:** refers to the relative stability of the shoreline, erosion potential, and whether it is hardened or natural.
- **Flood Plain Connectivity:** the degree to which the river has connectivity to adjacent floodplains.
- **Over-Wintering Habitat:** refers to features that allow juvenile salmon refuge from high river flows. Physical features include riparian zone vegetation, large angular riprap, and woody debris.
- **Large Woody Debris (LWD):** any large piece of relatively stable woody material having a diameter of over a foot and a length of about 10 feet that intrudes into the river channel.
- **Side Channel Restoration:** presence of a side channel and/or the degree to which there is potential for re-establishing off-channel rearing habitat and refuge.

- **Plant Diversity:** based on the relative mix and abundance of herbs, shrubs, and mixed deciduous and evergreen trees. Shoreline plant communities provide a variety of functions including input of organic material into the river, bank stability and erosion control, and recruitment of LWD.
- **Wetlands:** presence or absence of wetlands.
- **Open Space:** presence or absence of significant open space along the river, including parks, preserves, and private properties.
- **Physical Barriers:** refers to barriers to upstream migration into Skagit tributaries.
- **Riparian Reserve:** refers to the presence or absence of an intact riparian and adjacent upland plant community.

All of these features were rated into four categories:

- **Properly Functioning (PF):** indicates that, in general, the feature is providing acceptable levels of functions.
- **Function at Risk (FAR):** indicates the feature is degraded within the inventory unit and that restoration could improve functioning.
- **Not Properly Functioning (NPF):** typically indicates the feature is absent or that other features are negatively impacting the functional attributes.
- **Not Applicable (N/A):** Does not apply in the situation

These ratings are presented in the following **Table A-1**.

Table A-1 Summary of City Shoreline Ecological Features and Functions

FEATURE	INVENTORY UNIT			
	#1	#2	#3	#4
Stream Bank	PF – stable natural	PF – riprap bank is stable	PF – stable riprap and natural	PF – mostly stable riprap
Floodplain Connectivity	PF	NPF	PF – limited to within levee setbacks	NPF
Refuge	FAR → PF - currently poor access from river , but will become functional with restoration of Nookachamps Preserve.	FAR – minimal, only refuge is found in large riprap and vegetation zone	FAR/PF – only Edgewater Park has a functioning side channel, the result of restoration.	NPF – restoration constrained by presence of revetments; potential exists at Lions Park
Over-wintering Habitat	FAR – limited due to lack of access for fish	NPF – no habitat available for fish or terrestrial species	FAR – opportunities for habitat exist on Young’s and Goodrich Bars	NPF - restoration constrained by presence of revetments; potential exists at Lions Park
Large Woody Debris (LWD)	FAR → PF – current lack of LWD, but will be installed as part river bank restoration.	FAR – LWD accumulation is associated with two of the bridges located in the flow channel	FAR – accumulations not very complex	NPF – limited riparian zone
Side Channel Restoration	FAR for current conditions; high potential for side channel restoration	NPF – no potential for restoration	FAR – could be improved on Young’s and Goodrich Bars	NPF – no opportunity available due to adjacent development; limited potential at Lions Park.
Plant Diversity	PF – shoreline contains a significant strip of mature trees. Floodplain forest to be restored.	NPF – riparian zone is narrow and not complex	PF – Young’s Bar and Edgewater Park contain a mix of riparian vegetation.	FAR – north at Lions Park and south of the revetments may have potential
Wetlands	PF	NPF – no wetlands	FAR – wetland restoration potential exists near shore	NPF – no wetlands
Open Space	PF	None	PF	FAR
Physical Barriers	PF – restoration of historic back-channel fish habitat part of Nookachamps Wetland Mitigation Bank	N/A - no tributary	N/A – no tributary	PF – barrier removed at Kulshan Creek in Lions Park
Riparian Reserve	PF	NPF – no riparian reserve for LWD or trees on waterward side of levee	PF	NPF
Sand Bar Accretion	None	None	PF – Young’s Bar and a portion of Goodrich Bar.	None

V. CUMULATIVE IMPACTS REVIEW

The discussions below provide an overview and summary of historic shoreline conditions and activities that have impacted the shoreline over time, and the likely cumulative effects of SMP goals and regulations, along with known plans and development activities.

A. PRE-EUROPEAN SETTLEMENT

Information regarding conditions in the lower Skagit Basin prior to European settlement comes from land surveys conducted by the Government Land Office. Early mapping of the lower river indicates that it was considerably more complex than it is today, consisting of numerous channels, immense accumulations of wood debris, and vast wetlands across its extensive floodplain. The 90,000+ acre floodplain was comprised primarily of forested floodplain and scrub-shrub wetlands and, along the lower reaches of the river, estuarine habitat. Prior to European settlement, the river frequently crested its banks and inundated the large wetlands that extended across the Skagit / Samish Valley.

Prior to European settlement, large wood debris and logjams were common in the Lower Skagit River and in the near vicinity of Mount Vernon. Logjams had a significant effect on river morphology, flow conveyance, and flood inundation. Logjams diverted flows and raised water elevations to create and sustain side channels and large areas of surrounding forested floodplain and wetlands. Snags, logjams, and beaver activity formed pools and provided complex cover and hydraulic refugia for the runs of Skagit River salmon.

B. EUROPEAN SETTLEMENT

Large scale European settlement of the Skagit started in the mid 19th century with the arrival of permanent settlers on Fidalgo Island. The late 1800s brought homesteaders to the upper reaches of the Skagit with the first settlement at Mount Vernon in 1870 and in Burlington in 1890.

Logjam clearance by settlers began in about 1871. The removal of the logjams was said to have increased flows and flood heights in the Fir Island area while flood heights west of Mount Vernon were decreased with the removal of the logjams. With the opening of the river, large-scale steamboat navigation began on the Skagit. Piers were constructed at numerous locations on the river downstream from Sedro Woolley, remnants of which are still visible today. By the 1890s the river had been mostly cleared of wood debris and partially diked. Gold-seekers pushed up river in the 1890s and large-scale logging started at about the same time.

Up until the mid-1960s, federal “snag boats” were used on a regular basis to remove accumulated logs that got hung up on bridge pilings. More than 35,000 snags were removed from the Skagit River between 1881 and 1910. In addition, over 5,000 trees were cut from the river banks by 1910. The rate of snag removal and tree-cutting decreased dramatically after about 1910.

Channel and floodplain modifications have dramatically changed the land use pattern in the valley. Over several decades during the late 19th and early 20th centuries, a system of levees and drainage systems continued to be constructed to make the cleared and drained land suitable for crop production. The rich soil has fostered an agricultural community of family farms known for flower bulbs, crop and dairy production, and vegetable seed.

C. CURRENT ECOSYSTEM CONDITIONS

The city's shorelines reflect the legacy of substantial modification over a period of more than a hundred years. The current landscape setting of the Mount Vernon shoreline is a result of the interaction of natural landscape processes and human interventions that have occurred in the Skagit River system as a whole. Anthropogenic changes to the river system such as land clearing and draining of the floodplain for agriculture and settlement, the removal of wood and large log jams, and regulation of water flow in the river have led to the need for local infrastructure such as levees, revetments, and other hydromodifications, to support and protect urbanization and other development.

In addition to modification by levees and similar structures, the Skagit shoreline at several locations in Mount Vernon is armored with rip-rap. To accommodate the levees and land-side development most, if not all, of the shoreline vegetation has been removed. Therefore most riverine shoreline ecological functions are either degraded from historic conditions or are absent altogether, resulting in the loss and isolation of large segments of riparian and wetland habitat critical to the various life stages of salmon.

D. LEVEES AND REVETMENTS

The dominant feature of the Skagit River shoreline in Mount Vernon is the presence of the extensive and nearly continuous system of dikes/levees and revetments. Flood risk reduction systems are a permanent feature of the City's shoreline and adjacent upland environments. Where they separate the upland portion of the SMZ from the river, development is typically backed up to the dike on its landward side. However, this condition only accounts for 24 percent of the City's total shoreline, and will be further reduced when the levee at the north end of the City is relocated inland.

There are three dike districts within Mount Vernon and their collective long-term goal is to rebuild and reconfigure the dike system such that much of the area within the City historically impacted by flooding will be protected. This will allow recertification of the affected areas and their removal from the FEMA 100-year floodplain maps.

Lands that are isolated between the river's edge and the levees/dikes or revetments are collectively called the "batture". A majority of the City's shorelines occur within the batture, as well a majority of the shoreline jurisdiction. In the three bridges area at the north end of the City and along the downtown waterfront, levees and revetments are located within the SMZ.

E. CRITICAL AREAS

The City conducted three critical area inventories during the development and subsequent implementation of its Critical Areas Ordinance (CAO). These studies have been used to identify the type and location of critical areas within the shoreline environment. They include:

- “*Wetland and Stream Inventory*”, Shannon & Wilson, January 2000.
- “*Assessment of Waters/Wetland Ecosystem Conditions and Functions*” L.C. Lee et al, January, 2007.
- “*Mount Vernon Stream Study*”, WSP, 2008.

The result is that statutory critical areas on the City’s shorelines are limited by type, extent, and previous development. Within the SMP jurisdiction, critical areas consist of the main stem of the Skagit River, associated wetlands, and fish and wildlife habitat conservation areas. There are no known non-aquatic resource lands, geologically hazardous areas, or designated aquifer recharge areas. Floodplains are regulated under Chapter 15.36 MVMC, “Floodplain Management Standards.”

The Skagit River is designated as having shorelines of statewide significance and, as such, is a Type S stream under the Department of Natural Resources waters typing system. The river reaches that flow through the City provide fish passage as the primary ecological function.

The shoreline critical areas identified in the referenced studies all occur within the batture, or within the active floodplain at the north end of the City where there is no levee. No critical areas were identified within areas of the SMP jurisdiction landward of a levee or revetment. This is due to those lands having been developed with uses that back up to and abut the levees or revetments.

One wetland, at the south end of Edgewater Park, was part of the restoration of that segment of shoreline and adjacent upland. The restoration included re-establishment of an historic side-channel as a refuge for migrating fish. Other potential jurisdictional wetland areas are located outside of the SMZ within the river’s active floodplain. Of note is the Nookachamps Wetland Mitigation Preserve, the construction of which will result in restoration of historic wetlands and their hydrologic connection to the river. Wetlands are regulated under the provisions found in Appendix ‘C’ of the Shoreline Master Program.

Other locations identified as potential critical areas included the confluence of both Lindegren and Kulshan Creeks with the Skagit River, Young’s Bar north of Edgewater Park, and the recently restored side-channel fish habitat at the south end of Edgewater Park. These areas have been identified, respectively, on Figures B-7, B-3, B-4, and B-5 of Appendix B of the SMP.

F. SHORELINE ACCESS AND VIEWS

As noted above, the levees/dikes and revetments separate upland uses from the shoreline. This impacts both the ability to provide physical access to and views of the shoreline. In the three bridges area at the north end of the City the levee runs parallel to the shoreline and splits the SMZ between the batture and adjacent uplands. As a result, there is no direct physical access to the shoreline and because of the height of the levee there are no views from the adjacent upland uses.

In West Mount Vernon, the levee is setback considerable distances from the shoreline, with intense development occurring landward. The levee height eliminates views from these upland uses, but both access and views are provided for at Edgewater Park.

Along the downtown shoreline, the revetment parallel to the river and elevated above both the river and the downtown core along First Street, effectively blocks views from both the street and downtown buildings, with a few exceptions where there may be views available from taller buildings. Visual access, but not direct physical access, is available from the top of the revetment. During 2009, the City conducted a series of Downtown Design Guidelines workshops, which included a study of downtown views and the impacts of a range of building heights. Given the overall lack of existing views it was determined that the fifty-five foot height limit identified for downtown redevelopment would not adversely affect views of the shoreline. The redevelopment of the downtown shoreline will result in improved public visual access to the river, including removing the existing parking atop the revetments and developing a waterfront pedestrian promenade, a public plaza, open spaces at street ends and other public amenities. Private redevelopment will be required to modulate structures to reduce impacts of massing and provide for water-enjoyment via pedestrian access, where practical.

G. SHORELINE USE ANALYSIS

Future new shoreline development potential is extremely limited since there are few vacant parcels within the Shoreline Management Zone. These consist of parcels, primarily zoned for residential or commercial use, located between Lindegren Creek and the I-5 Bridge along Hoag and Stewart Roads. Virtually every other shoreline parcel has been developed to an urban or recreational use, with the exception of the shoreline north of Lindegren Creek adjacent to the Nookachamps Wetland Mitigation Bank. This means that the majority of future development activities will be in the form of redevelopment of existing lots and structures. Streets and roads have been constructed and major utilities installed, limiting future infrastructure-related activities in the shoreline to primarily maintenance and upgrade.

There are approximately 29,850 lineal feet of Skagit River shoreline within the City's corporate boundaries. Uses on the shoreline can be grouped into four general categories and are briefly described below.

1. Areas where there is no dike/levee or revetment on or near the shoreline or in the adjacent upland and where there are no significant structures, roads and other infrastructure: This condition is found in north Mount Vernon, where there is an approximately 7,300 foot reach of shoreline adjacent to the active floodplain that comprises the Nookachamps Wetland Mitigation Bank. This reach accounts for 24 percent of the City's shorelines. This area will be kept in preserve and will allow for limited passive recreation use and public access to the shoreline.
2. Areas of significant open space within the batture: These include the entire shoreline on the west side of the river across from Downtown; Lions Park North; and the vacant/undeveloped properties south of the Dairy Valley plant to the City boundary. Uses include both active and passive recreation consistent with a shoreline location (e.g. small craft launch) in Edgewater Park, Lions Park, and informal use of Young's Bar, which is private ownership. The Washington Department of Fish and Wildlife has land and a boat launch immediately north of Young's Bar and additional property south of Edgewater Park. The properties south of Dairy Valley are vacant and unlikely to develop to an intense use since they are in the floodplain between the river and levee. Taken together, these areas account for 40 percent of the City's shorelines.
3. Area of single-family residential development: This is found only in north Mount Vernon, between Lindegren Creek and the Riverside Drive Bridge. This 3,450 foot reach accounts for 12 percent of the City's shorelines. Between the railroad bridge and Riverside Drive bridge all but a few of the residences are separated from the river by a levee. About half of these properties have been acquired by Dike District #17, which is pursuing a long term plan to acquire the rest of these residential properties, so the levee can be relocated upland closer to the Hoag/Stewart Roads right-of-way.
4. Areas of more intense urban development, characterized by a mix of uses including residential, retail, commercial, office, and industrial: These areas are found from the Riverside Drive Bridge west to the City limits in north Mount Vernon, and the shoreline adjacent to Downtown from Lions Park south to the Dairy Valley property. In the Downtown area, dikes and levees are typically located near the river's edge, with development backed up to them. As noted above, the levee along Stewart/Hoag Roads will probably be relocated, but at present it separates existing uses from the shoreline. Urban mixed-use accounts for approximately 24 percent of the City's shoreline.

As noted above, large segments of the shoreline are in some type of open space use, characterized by having connectivity to at least part of the adjacent floodplain. They account for approximately 76 percent of existing shoreline land use. The nature of the ownerships (much of it public) and uses on these shorelines, their connectivity to the floodplain, underlying zoning restrictions, and restoration potential preclude intense urban uses from developing in these shoreline areas.

When Dike District #17 is able to acquire the land to relocate the levee farther from the river along Stewart/Hoag Roads, open space uses would account for a higher percentage of the City's shorelines. This would also result in a corresponding reduction of both residential uses and more intense urban uses along the City's shorelines.

There are no water-dependent or water-related businesses or transportation facilities located on the City's shoreline. In addition, there is no viable potential for such uses to develop in Mount Vernon. This is due to the following factors:

1. Currently, 76 percent of the City's shorelines are areas where commercial, industrial, and transportation facilities would be prohibited from development, due to the underlying zoning. That figure will increase to 82 percent in the future when the levee at the north end of the City is relocated further upland.
2. In those areas of the shoreline where water-dependent commercial, industrial, and transportation uses would be allowed, dikes, levees, and revetments separate such uses from the shoreline. These flood risk reduction structures have been in place for much of the City's history, and current plans for the downtown and waterfront include removing revetments and relocating portions of levees closer to the shoreline to protect downtown properties. Flood risk reduction measures represent a significant investment and will continue to be a permanent feature of the City's shorelines.

Since water-dependent and water-related commercial, industrial, and transportation uses are unlikely to develop in the future, the City is pursuing policies and regulations that provide for non-water oriented uses to remain and encourage redevelopment in the shoreline areas where such uses are allowed. Development or redevelopment will be required to provide facilities for water-enjoyment such as boardwalks and viewpoints.

Given decades of conversion and use along much of the City's shoreline and the substantial investments made over time to those uses, particularly Downtown, the development pattern, general mix of land uses, and infrastructure are essentially established and in place. While this has had significant cumulative impacts to the City's shoreline functions up to this point, the limited new development potential that remains suggests there is, in general, a reduced potential for future significant impacts.

H. ENSURING NO NET LOSS

SMP goals, policies, and regulations have been developed to ensure a no net loss goal. Public and private restoration projects have and will continue to improve the ecological functions along significant sections of the Skagit shoreline. Provisions for restoration, improved stormwater controls, and enhancement during development and redevelopment should, over time, provide an incremental lift in shoreline functions. Below is a brief description of the environmental designations and general statements about SMP goals and regulations contributing to the goal of "no net loss." (For a complete discussion about environmental designations and designation maps, see the Shoreline Master Program Section IV, "Shoreline Environmental Designations.")

1. **Natural Environment**

This designation is primarily located between Lindegren Creek and the north City/County boundary, adjacent to the Nookachamps Wetland Mitigation Bank. The Wetland Bank construction will restore historic back-channels and wetlands in the floodplain and restore hydraulic connectivity to the river. Although a trail for public access is planned, SMP goals, polices, and regulations prohibit higher intensity development or use in this area. Restoration of this area will provide a significant lift in ecosystem-wide shoreline functions.

Areas at Young's Bar, the Kulshan Creek confluence at Lions Park North, the Lindegren Creek confluence, and the south shoreline edge of Edgewater Park are also designated Natural Environment. Past and future restoration of the riparian environment and ecological functions in these areas, including re-establishing an historic forested wetland and associated back-channel at Edgewater Park, will increase ecosystem-wide shoreline functions.

2. **Urban Conservancy**

This designation includes portions of Lions Park South, Edgewater Park and adjacent parcels on the west side, those shoreline areas located between the ordinary high water mark and the levee in the three bridges area to the north, and those parcels that are south of the Dairy Valley plant to the City boundary in the southwest. All these locations exist between a levee and the river. SMP goals, policies, and regulations prohibit higher intensity uses within this designation. Active recreation is allowed provided that shoreline impacts are mitigated and/or provide for restoration/enhancement of ecological functions.

3. **Shoreline Residential**

Residential development on the City's shoreline is limited to a stretch of the river less than $\frac{3}{4}$ mile in length, between Lindegren Creek and the Riverside Drive Bridge. Between the railroad bridge and Riverside Drive Bridge residential lots are functionally separated from the river's edge by levees. East of the railroad bridge, residential development is at a higher elevation and not at risk from flooding. Land west of the railroad bridge may be acquired by the Dike District in the future, for levee relocation. SMP goals, policies, and regulations limit more intense uses.

4. **Urban Mixed-use**

At the north end of the City this designation occurs between the Riverside Drive Bridge and the City boundary to the west. Uses in this area are functionally separated from the river by a levee. It is intent of Dike District #17 to also acquire these properties for future levee relocation.

This designation also occurs north of the levee at Lions Park North, from Lions Park South along the Downtown waterfront to south of the Dairy Valley plant and City-owned land immediately to the south. In these locations ecological functions are severely limited due to past development. The designation also reflects the existing conditions and built nature of this shoreline area and is consistent with the Comprehensive Plan and Downtown and Waterfront Master Plan.

Existing and allowed uses include residential, retail, commercial, and industrial. SMP goals, policies, and regulations allow for the continuation of these uses. These properties may redevelop to mixed-use in the future and provide for water-enjoyment use (e.g. boardwalk, trail) to increase public access. Redevelopment may require upgrades to on-site stormwater facilities.

I. CUMULATIVE IMPACTS CONCLUSION

The Skagit River shorelines located within the City's corporate boundaries are characterized by significant modifications that have occurred since European settlement in the area began in the late-1800s. Most of the adjacent floodplain that historically contained complex waters/wetland systems and habitats was drained and filled for agricultural purposes early in the City's history and later converted to urban uses. A system of levees/dikes and revetments has been constructed to protect adjacent properties from seasonal flooding. This flood risk reduction system is a dominant physical feature effecting shoreline functions, visual and physical access, restoration potential, and planning.

Historic activities along the City's shorelines have resulted in cumulative impacts that have significantly impacted ecological functions. Most of these functions have been degraded to varying degrees, with many absent altogether along certain segments of the City's shoreline. The existing development pattern and land uses are unlikely to change significantly, but controlling how redevelopment occurs on the shorelines will reduce the potential for continued impact to shoreline functions.

As noted, over 76 percent of the City's shoreline environments are in some form of open space, and are designated as either Natural or Urban Conservancy. Intense urban development and uses are prohibited within these designations, and there is additional restoration potential within these environments (see Appendix B).

The remaining 24 percent of the shorelines contain a mix of urban uses and are essentially fully developed. Future relocation of the levee along Stewart/Hoag Roads will reduce that down to approximately 12 percent, and add more lands to the batture and Urban Conservancy designation, with potential for additional restoration of some shoreline functions.

As with many cities founded during the nineteenth century along rivers, Mount Vernon's downtown does not focus on its waterfront. The redevelopment of the waterfront, anticipated to occur in tandem with the introduction of more effective flood risk reduction measures, provides the opportunity to rectify this situation by expanding public accessibility to the shoreline. The Downtown and Waterfront Master Plan will improve public access to the river the full length of Downtown Mount Vernon. The shoreline, from north of the Division Street bridge south beyond the Commercial Cold Storage industrial area, will eventually be accessible to the community by means of a public walkway between the floodwall and the Skagit River.

The facilities that will make this feasible and the amenities that will make it attractive to the public will be provided during the course of waterfront and downtown redevelopment. Although the flood risk reduction element will be financed with public funds, private investment will make the vision of a "public waterfront" a reality.

The Downtown and Waterfront Master Plan, the Shoreline Master Program and its associated development standards, and the Downtown Design Guidelines each serve a purpose with the underlying single goal of ensuring that future development enhances the quality of life for the Mount Vernon community.

Based on the analyses and discussions above it is anticipated that the cumulative impacts of implementation of the SMP will result in an improved shoreline environment, both from the standpoint of providing greater public access and enjoyment, and achieving the goal of no net loss of ecological functions.

**Technical Memorandum dated April 30, 2021 from Dr. Lyndon Lee -
Mitzell**



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*Technical Memorandum
April 30, 2021*

To: Rebecca Lowell & Chris Phillips
Development Services
City of Mount Vernon

From: Lyndon C. Lee, Ph.D., PWS
L.C. Lee & Associates, Inc.

CC: LCLA/cf

Ref. Mr. Dan Mitzel – Swan View Plat – Shorelines

I. Introduction

This Technical Memorandum has been developed to clarify the logic I used to determine that three Category IV depressional wetlands (A, B, and D on Figure 1) on Mr. Dan Mitzell’s Swan View plat in the City of Mount Vernon (City) are “Associated” with the Shoreline Areas of the Skagit River and Lindgren Creek. The Mitzell Property Skagit County Assessor parcel number is P24350. The general configuration of the property is shown in Figure 1. Latitude/longitude coordinates for the approximate centroid of the property are 48.45295 N/-122.305011 W.

To summarize, my recommendation that the wetland A, B, and D ecosystems are “Associated” is founded on the fact that their structure and functioning in the landscape are influenced by their immediate proximity and physical and functional connections to the Skagit River and Lindgren Creek floodplains and “Shoreline” ecosystems. These connections include the facts that –

- (a) Within the Skagit River/Lindgren Creek landscape-scale habitat mosaic that exists in the vicinity of the Mitzell Property, Wetlands A, B, and D contribute multiple food and cover resources, including travel and dispersal pathways and hiding, resting thermal and escape cover for a range of native faunal species that use all elements of the habitat mosaic.
- (b) Wetlands A, B, and D are likely at least seasonally and intermittently connected hydrologically via shallow subsurface water flows and circulation processes that occur between Wetlands A, B, and D and the abutting wetlands C and E and floodplains of the Skagit River and its perennial tributary, Lindgren Creek. They are part of a seasonally expanding and contracting network of hydrologically active (or variable) source areas that contribute water flows to the Skagit River/Lindgren Creek floodplain system. The rate at which these water flows travel and the volume of flows that move downgradient from Wetlands A, B, and D to the Skagit River/Lindgren floodplains are governed in part by antecedent wetness conditions in the Skagit River/Lindgren Creek floodplains.

II. Physical Setting – Overview

The Mitzell Property is located near the western edge of a late Pleistocene/early Holocene Skagit River terrace feature that exists on the eastern (river left) side of the current active Skagit River channel (Figure 2). The modal soil mapped by the Natural Resources Conservation Service (NRCS) in the vicinity of wetlands A, B, and D is the Tokul gravelly medial loam (Tokul soils) (Figure 3). Within the boundaries of wetlands A, B, and D depressions, hydric soil inclusions in the NRCS mapped Tokul soils unit are present. This is typical at scale within NRCS mapped soil units. Table 1 lists characteristics of the Tokul soils unit. These soils are moderately well drained. They developed in volcanic ash mixed with loess over recessional glacial till layers. As is typical throughout the Puget Sound lowlands, Tokul soils and recessional till layers like it are incompletely draped over the Skagit River terrace feature shown in Figure 2. They overlay highly compacted and relatively impermeable advance glacial till layers that occur at depth in the soil profile (33-62 inches – Table 1).

The dominant slope gradient on the Mitzell Property is to the west and towards the steeper portions of the old Skagit River terrace hillslope (Figures 1 and 2). The seasonal surface and shallow subsurface water storage and exchange processes that occur in depressional wetlands A, B, and C interact with surrounding Tokul soils, especially during winter wet seasons. Combined with the locally steep westerly hillslope gradient, this means that subsurface water from wetlands A, B, and D can and most likely does exfiltrate to the west and downhill past (or through) wetlands C and E (Figure 1) and then further west to the Skagit River/Lindgren Creek floodplains.

Along the entire western boundary of the Mitzell Property, the Lindgren Creek ecosystem is inset and flows within the mapped Federal Emergency Management Agency (FEMA) floodplain of the Skagit River (Figure 4). The flow direction of Lindgren Creek is generally south and west along the toe slope of the old Skagit River terrace (Figure 2 – Blue Arrow). Along the reach where the Mitzell Property abuts it, Lindgren Creek is a perennial, fish bearing stream that has direct surface and subsurface water connections to the Skagit River. As such, it is a tributary to the Skagit River. Along this same Mitzell Property reach, the Lindgren Creek ecosystem includes relatively narrow and continuous bands of riparian wetlands that directly abut the main Lindgren Creek channel and which occur at and slightly above its Ordinary High Water Mark (OHWM) and along the toeslope of the old Skagit River Terrace.

Especially during winter wet seasons when the wetland depressions A, B, and D are full of water and when the soil water storage capacity in the surrounding Tokul soils is saturated or nearly so, water from wetlands A, B, and D will combine with precipitation that infiltrates the surface of the Tokul soils on the Mitzell Property. If antecedent wetness and storm event timing and magnitude allow, these combined shallow subsurface flows will move downward (near vertically) on gravity in the Tokul soil profile until they contact the cemented and relatively impermeable advance till layers at approximately 33 – 62 inches in depth. Not being able to move further downward (vertically), this subsurface water then will move west and down the hillslope gradient, in the Tokul soils and along the contact of the advance and recessional till layers. Especially when antecedent moisture conditions are at or nearly saturated (e.g. winter wet seasons, during long duration or back to back storms) shallow subsurface flows from the Mitzell Property, including wetlands A, B, and D will eventually connect with the Skagit River and Lindgren Creek floodplains along the colluvial toeslope seep/wetland features that occur in the



transition areas from the old Skagit River terrace to the active floodplains of the Skagit River/Lindgren Creek ecosystem. This toeslope seepage of shallow subsurface water from upslope waters/wetlands and contributing areas is a natural process that occurs throughout the Skagit River Valley and throughout the Puget Sound Lowlands. It is evidenced locally by toeslope seep wetlands that do occur on the river left toeslope and bank features that occur in the Lindgren Creek system from the vicinity of the Mitzell property south towards the so-called “Hoag” wetlands that occur just upstream of the junction of Lindgren Creek with the main channel of the Skagit River.

III. Opinions

A. Overview

The January 15, 2021 Email from Rebecca Lowell (City of Mount Vernon) to Lauren Bromley (Washington State Department of Ecology) includes the following section:

“I’ve spoken with our City Biologist (Dr. Lyndon Lee) about the criteria you outlined for us in your email below and Dr. Lee confirmed for us that:

1. The eastern three wetlands not located in the floodplain do not influence the Skagit River.
2. The eastern three wetlands not located in the floodplain are influenced by the Skagit River.
3. The eastern three wetlands not located in the floodplain would have subsurface hydraulic connection(s) to the abutting floodplain and the Skagit River.”

In developing the three opinions listed immediately above, I used standard definitions and criteria listed in WAC 173-22 Adoption of Designations of Shorelands and Wetlands Associated with Shorelines of the State (Table 2).

B. Opinion 1

Mitzell Property wetlands A, B, and D (Figure 1) are not located in the Skagit River floodplain. They are located due east if it on an old Skagit River terrace feature. Because of their relatively small size and landscape position, they do not significantly influence the hydrologic, biogeochemical, or plant community structure and functioning of the Skagit River ecosystem. However, given their landscape position that is immediately proximate to the Skagit River and Lindgren Creek ecosystems, they are important as components of relatively intact mosaic of wetland and floodplain habitat patches and food and cover resources in the vicinity of the Mitzell Property. Several classes of faunal species depend upon these types of wetland and floodplain landscape mosaics to complete critical portions of their life cycles such as growth and reproduction.



C. Opinion 2

Mitzell Property wetlands are not located in the Skagit River floodplain but their faunal support/habitat functions at site-specific and landscape scales are connected to and significantly influenced by the structure and functioning of the Skagit River and Lindgren Creek ecosystems, the eastern (river left) boundaries of which are located immediately west of the Mitzell Property.

Specifically, on the Mitzell property, it is my opinion that wetlands A, B, and D are captured within Shoreline jurisdiction because they are "Associated wetlands." This means that they are—

“...in proximity to and either influence or are influenced by tidal waters or a lake or stream subject to the Shoreline Management Act.” (Table 2. Showing WAC 173-22 definitions and criteria)

In laying out Shoreland Area Designation Criteria, the Table 2 WAC also states -

“The following criteria contain the standards for the department's designation of shoreland areas associated with shorelines of the state which are subject to the jurisdiction of chapter 90.58 RCW:

(c) Those wetlands which are in proximity to and either influence or are influenced by the stream. This influence includes *but is not limited to* one or more of the following: Periodic inundation; location within a flood plain; or hydraulic continuity” (emphasis added)

For the sake of clarity, the Washington State term “Associated” and the criteria used to determine whether a wetland is “associated” (as cited immediately above) are different from current U.S. Federal definitions of “Adjacent.” In the current U.S. Federal regulations [PART 120—DEFINITION OF WATERS OF THE UNITED STATES, Sec. 120.1 Purpose and scope, 120.2 Definitions. Authority: 33 U.S.C. 1251 *et seq.*] an adjacent wetland is defined as follows:

“(i) *Adjacent wetlands.* The term *adjacent wetlands* means wetlands that:

(A) Abut, meaning to touch at least at one point or side of, a water identified in paragraph (1)(i), (ii), or (iii) of this definition;

(B) Are inundated by flooding from a water identified in paragraph (1)(i), (ii), or (iii) of this definition in a typical year;

(C) Are physically separated from a water identified in paragraph (1)(i), (ii), or (iii) of this definition only by a natural berm, bank, dune, or similar natural feature; or

(D) Are physically separated from a water identified in paragraph (1)(i), (ii), or (iii) of this definition only by an artificial dike, barrier, or similar artificial structure so long as that structure allows for a direct hydrologic surface connection between the wetlands and the water identified in paragraph (1)(i), (ii), or (iii) of this definition in a typical year, such as through a culvert, flood or tide gate, pump, or similar artificial feature. An adjacent wetland is jurisdictional in its entirety when a road or similar artificial structure divides the wetland, as long as the structure allows for a direct hydrologic surface connection through or over that structure in a typical year.”



The major “stream” and Shoreland Area in question here is the Skagit River. It is the dominant geomorphic feature that drives landscape-scale ecosystem structure and functioning in the vicinity of the Mitzell Property. While the main channel of the Skagit River is approximately 3,350 ft west of the Mitzell Property, the mapped Federal Emergency Management Agency (FEMA) floodplain (“Zone A1”) boundary abuts the western boundary of the Mitzell Property (Figure 4). The Zone A1 designation means that FEMA has determined that the area that will be inundated by the flood event having a 1-percent chance of being equaled or exceeded in any given year. The 1-percent annual chance flood is also referred to as the base flood or 100-year flood.¹

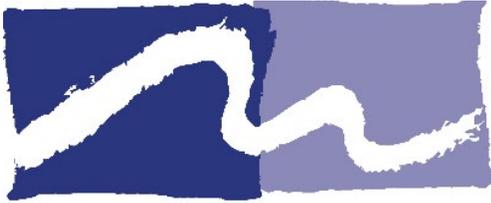
Given the immediate proximity of wetlands A, B, and D to the Skagit River and Lindgren Creek ecosystems, it is my opinion that there are no doubt important movement and dispersal pathways and habitat connections that are used by several classes of faunal species that either seasonally migrate to or reside wholly within wetlands A, B, and D and other waters/wetland elements of the Skagit River/Lindgren Creek landscape. The fact is that resident and migratory native faunal species rely upon the size and connectivity of intact habitat patches and intact landscape connections among the Skagit River ecosystem and its associated tributary streams and wetlands to complete important parts of their life cycles such as reproduction and growth. Examples of species that would use the transitions from the Mitzell Property wetlands to the Skagit River and Lindgren Creek floodplain include (a) resident and migratory waterfowl, (b) resident and migratory birds including raptors such as eagles, owls and hawks, (c) semi-aquatic vertebrates such as frogs and salamanders, and (d) mid-sized mammals such as racoons, coyotes and bobcats who would use and depend upon food and cover resources in the Mitzell – Skagit River/Lindgren Creek floodplain transitional areas.

C. Opinion 3

Given the geomorphologic and physical conditions at the Mitzell Property summarized in Section II in this Technical Memorandum, it is my opinion that the eastern three wetlands (A, B, and D) that are not located in the Skagit River floodplain would most likely have at least seasonal, intermittently flowing subsurface hydraulic connection(s) to the abutting floodplains of the Skagit River and Lindgren Creek. This would be especially true when antecedent wetness conditions in the soils that dominate the old Skagit River terrace feature are wet due to long duration, intense or back to back winter/wet season storm events. These types of landscape-scale hydrologic connections are important in maintaining the suite of hydrologic, biogeochemical, plant community, and faunal support/habitat functions that are performed by the Skagit River and Lindgren Creek ecosystems and their associated wetlands.

¹ The Skagit River reach in the vicinity of the Mitzell Property is also designated as (a) a Traditional Navigable Water (TNW) of the U.S. by the Seattle District of the U.S. Army Corps of Engineers, and (b) critical habitat for Puget Sound Chinook Salmon (*Oncorhynchus tshawytscha*), which is listed as threatened in the Skagit River.





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Figure 1. Swan View Site in the City of Mount Vernon

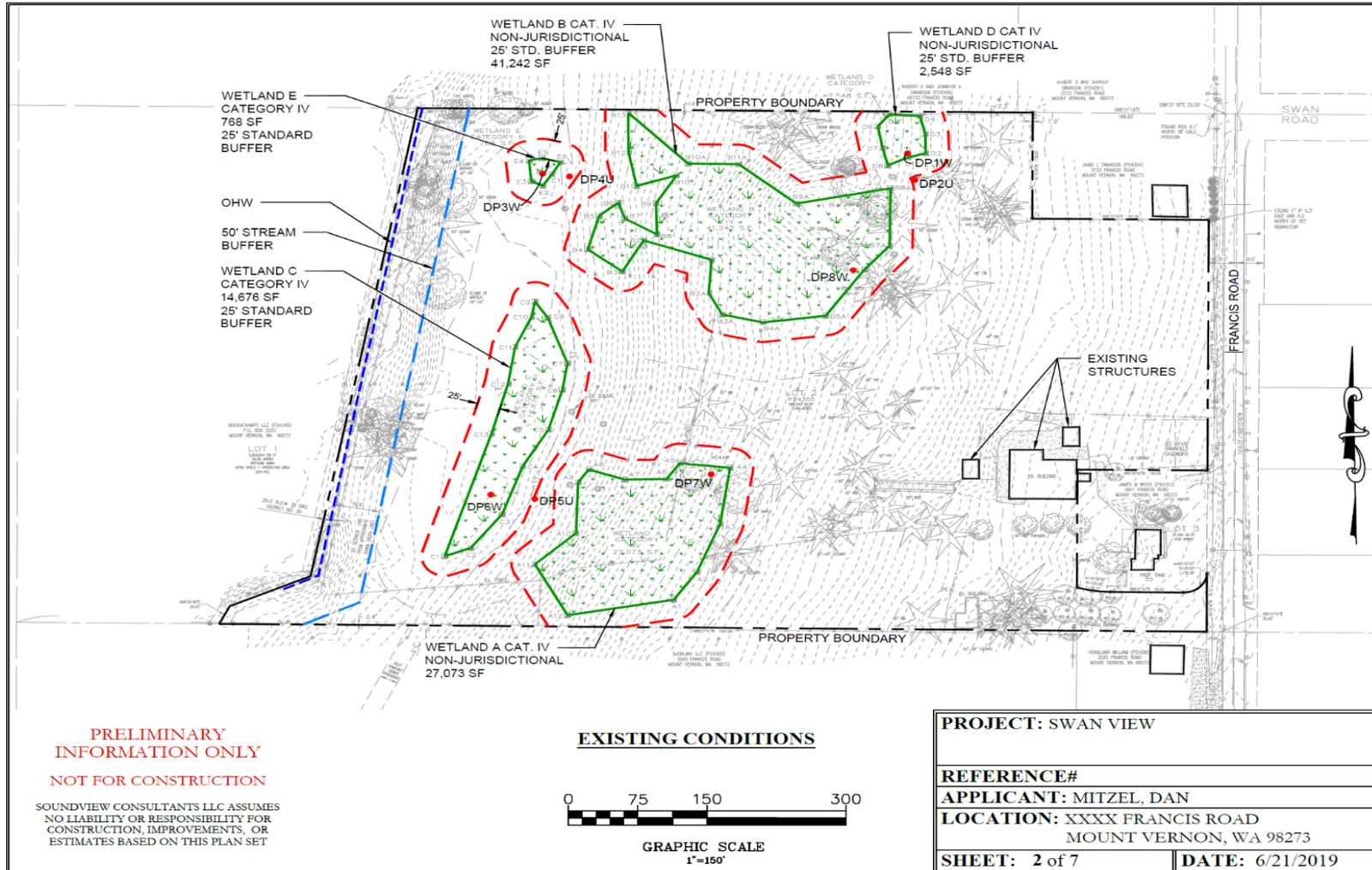


Figure 2. Light Detection and Ranging (LiDAR) Image and Topography in the Vicinity of the Mitzel Property.

Note: The Blue Arrows shows the location of the Skagit River late Pleistocene/Early Holocene River Terrace Feature on the Western Boundary of the Mitzel Property, and the approximate location of the Lindgren Creek channel.

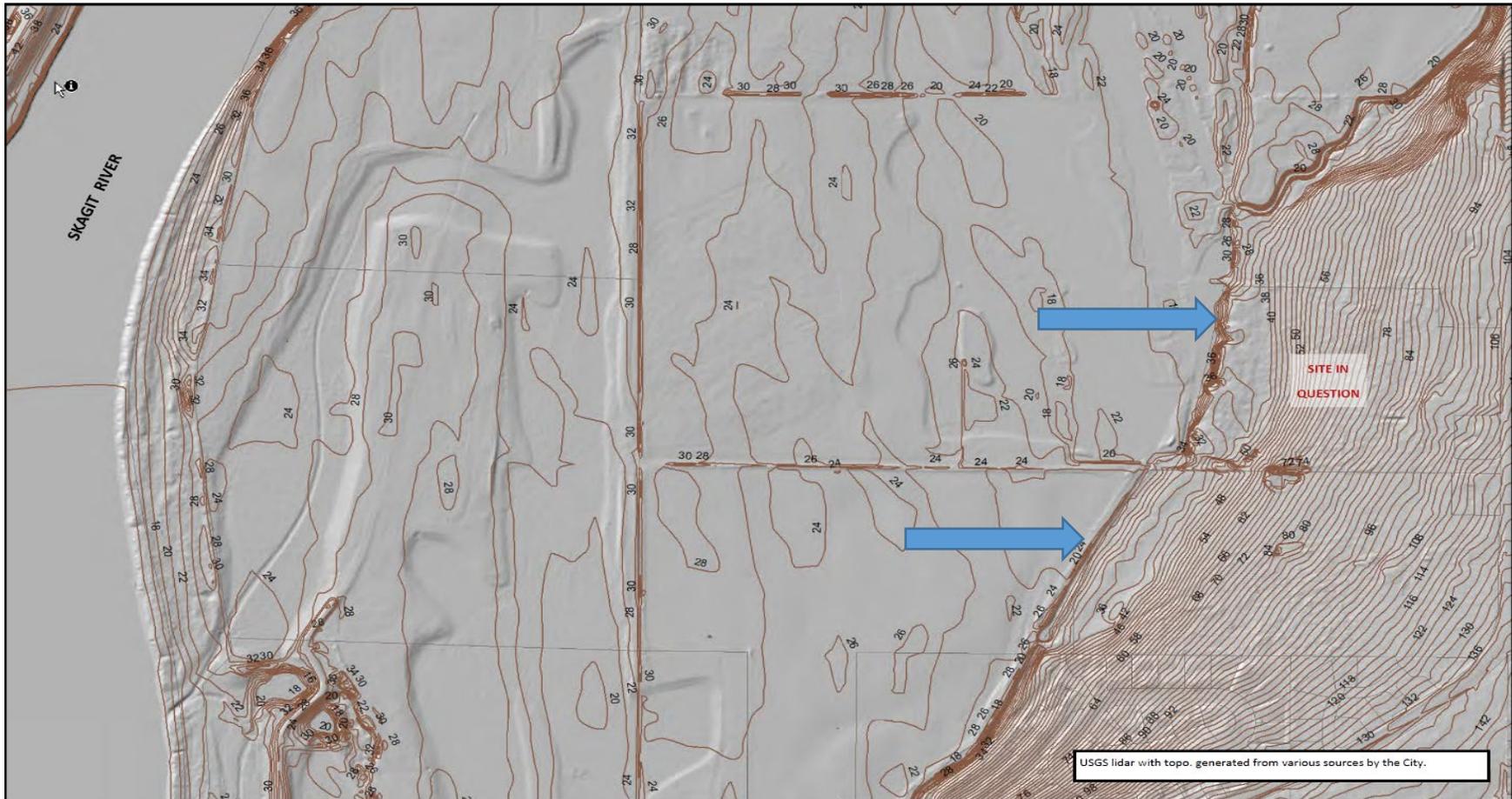


Figure 3. Natural Resources Conservation Service Soils Map of the Mitzel Property.

Note: Blue arrow indicates the NRCS mapping of the main channel of Lindgren Creek.

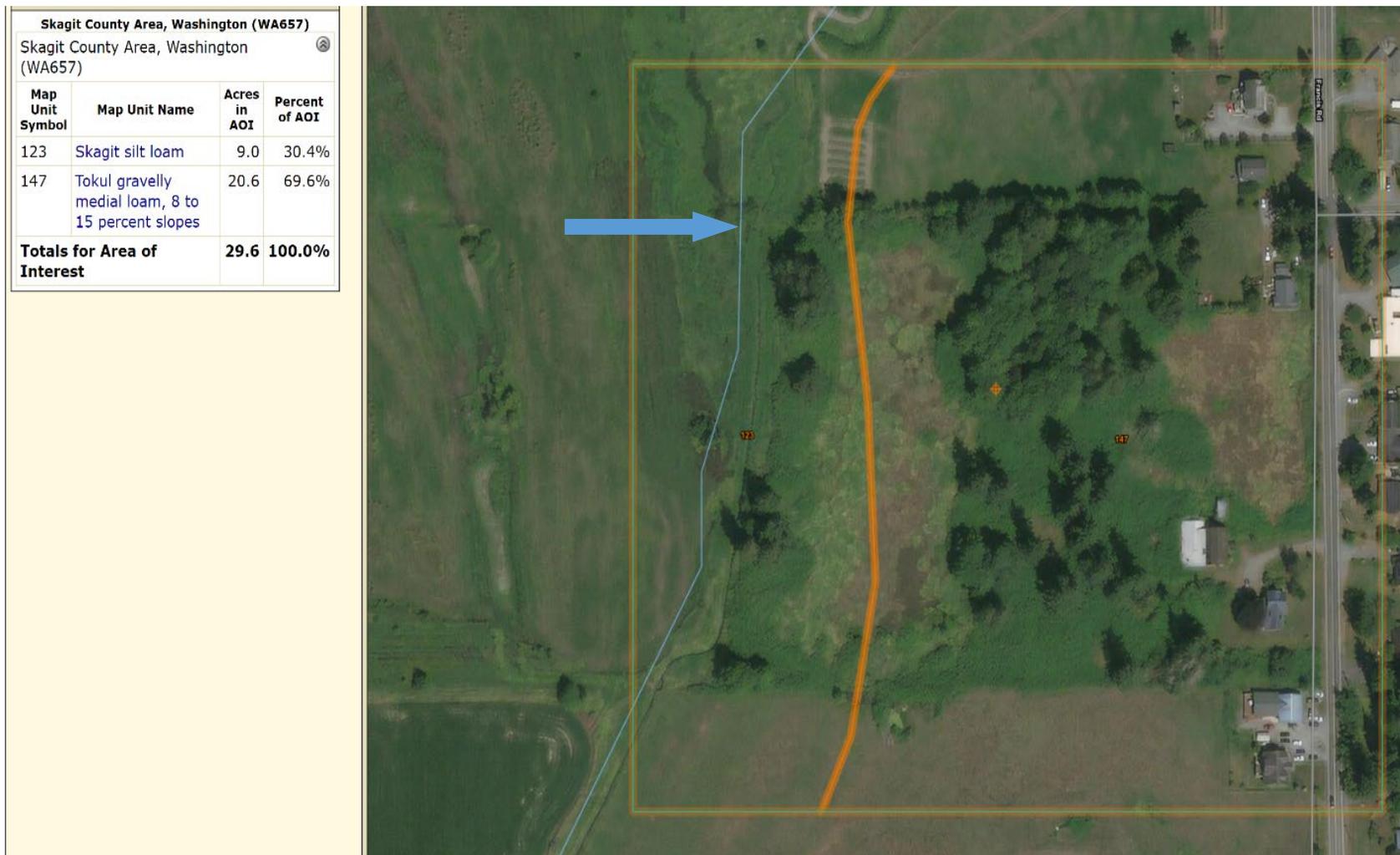


Figure 4. Federal Emergency Management Agency Mapping in the Vicinity of the Mitzell Property

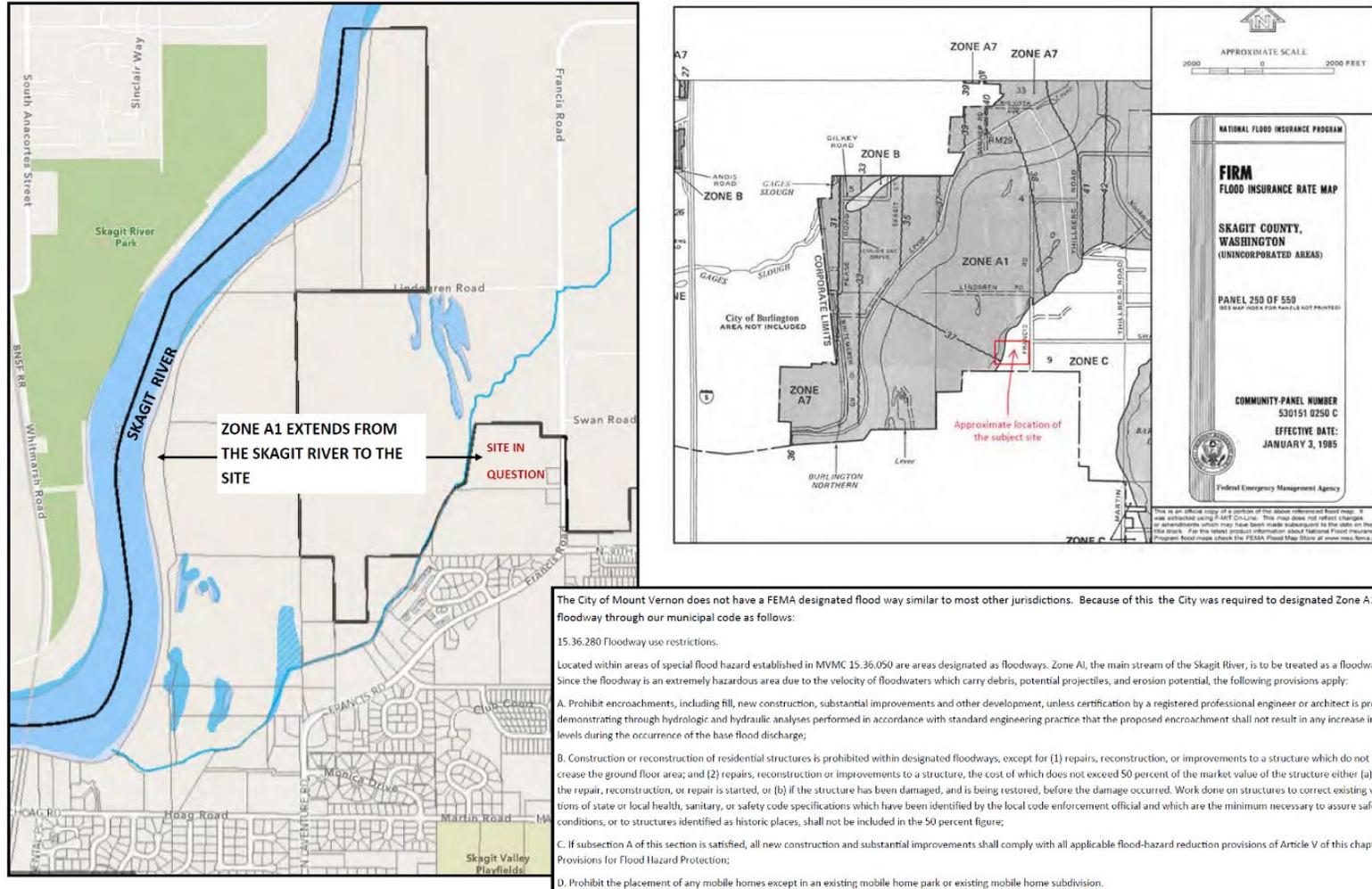


Table 1. Map Unit Description of the Tokul gravelly medial loam

Map Unit Description: Tokul gravelly medial loam, 8 to 15 percent slopes---Skagit County Area, Washington

Skagit County Area, Washington

147—Tokul gravelly medial loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 2t611

Elevation: 160 to 1,150 feet

Mean annual precipitation: 45 to 70 inches

Mean annual air temperature: 46 to 52 degrees F

Frost-free period: 140 to 200 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Tokul and similar soils: 70 percent

Minor components: 30 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Tokul

Setting

Landform: Hillslopes, till plains

Landform position (two-dimensional): Toeslope

Landform position (three-dimensional): Side slope, tread

Down-slope shape: Convex

Across-slope shape: Convex

Parent material: Volcanic ash mixed with loess over glacial till

Typical profile

O_i - 0 to 1 inches: slightly decomposed plant material

O_a - 1 to 2 inches: highly decomposed plant material

A - 2 to 6 inches: gravelly medial loam

B_{s1} - 6 to 9 inches: gravelly medial loam

B_{s2} - 9 to 17 inches: gravelly medial loam

B_{s3} - 17 to 24 inches: gravelly medial loam

BC - 24 to 33 inches: gravelly medial fine sandy loam

2B_{sm} - 33 to 62 inches: cemented material

Properties and qualities

Slope: 8 to 15 percent

Depth to restrictive feature: 20 to 39 inches to cemented horizon;

20 to 39 inches to densic material

Drainage class: Moderately well drained

Capacity of the most limiting layer to transmit water (K_{sat}): Very low to moderately low (0.00 to 0.06 in/hr)

Depth to water table: About 18 to 36 inches

Frequency of flooding: None

Frequency of ponding: None

Available water capacity: Moderate (about 8.7 inches)



Table 2. WAC 173-22 ADOPTION OF DESIGNATIONS OF SHORELANDS AND WETLANDS ASSOCIATED WITH SHORELINES OF THE STATE

WAC 173-22-030

Definitions.

As used herein, the following words have the following meanings:

(7) "Shorelands" or "shoreland areas" means those lands extending landward for two hundred feet in all directions as measured on a horizontal plane from the ordinary high water mark; floodways and contiguous flood plain areas landward two hundred feet from such floodways; and all wetlands and river deltas associated with the streams, lakes, and tidal waters which are subject to the provisions of this chapter; the same to be designated as to location by the department of ecology. Any county or city may determine that portion of a one hundred-year flood plain to be included in its master program as long as such portion includes, as a minimum, the floodway and the adjacent land extending landward two hundred feet therefrom;

(1) "Associated wetlands" means those wetlands which are in proximity to and either influence or are influenced by tidal waters or a lake or stream subject to the Shoreline Management Act;

(6) "River delta" means those lands formed as an aggradational feature by stratified clay, silt, sand and gravel deposited at the mouths of streams where they enter a quieter body of water. The upstream extent of a river delta is that limit where it no longer forms distributary channels;

WAC 173-22-040

Shoreland area designation criteria.

The following criteria contain the standards for the department's designation of shoreland areas associated with shorelines of the state which are subject to the jurisdiction of chapter 90.58 RCW:

(1) Tidal waters. The shoreland area shall include:

(a) Those lands which extend landward two hundred feet as measured on a horizontal plane from the ordinary high water mark; and

(b) Those wetlands which are in proximity to and either influence or are influenced by the tidal water. This influence includes but is not limited to one or more of the following: Periodic tidal inundation; hydraulic continuity; formation by tidally influenced geohydraulic processes; or a surface connection through a culvert or tide gate;

(2) Lakes. The shoreland area shall include:

(a) Those lands which extend landward two hundred feet as measured on a horizontal plane from the ordinary high water mark; and

(b) Those wetlands which are in proximity to and either influence or are influenced by the lake. This influence includes but is not limited to one or more of the following: Periodic inundation or hydraulic continuity;

(3) Streams. The shoreland area shall include the greater of:

(a) Those lands which extend landward two hundred feet as measured on a horizontal plane from the ordinary high water mark;

(b) Those flood plains which extend landward two hundred feet as measured on a horizontal plane from the floodway: Provided, that local government may, at its discretion, include all or a larger portion of the one hundred-year flood plain within the associated shorelands. Designation of this shoreland area shall be in accordance with chapter 173-26 WAC, the state master program. If the applicable master program does not designate the shoreland area for a stream, it shall be designated under the rules which applied at the time of adoption by the department;

(c) Those wetlands which are in proximity to and either influence or are influenced by the stream. This influence includes but is not limited to one or more of the following: Periodic inundation; location within a flood plain; or hydraulic continuity; and

(d) Those lands within a river delta flood plain except for those lands that can reasonably be expected to be protected from flood waters by flood control devices maintained by or maintained under license from the federal government, the state, or a political subdivision of the state.



Dr. Lyndon Lee's CV



Lyndon C. Lee, Ph.D., PWS

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Email: lyndon@lcleeinc.com

Website: www.lcleeinc.com
(ver. March, 2021)

I. EDUCATION

Ph.D. (April 1983) - College of Forest Resources, University of Washington, Seattle, Washington. *Majors:* Ecosystem Ecology, Wetland & River Science. Attended from 1980 - 1983.

M.Sc. (March, 1979) - School of Forestry, University of Montana, Missoula, Montana. *Majors:* Forest Ecology, Silviculture. Attended from 1975 - 1977.

B.S. (December, 1974) - School of Forestry, University of Montana, Missoula, Montana. *Majors:* Forest Ecology, Silviculture.

Tufts University, Medford, Massachusetts. *Major:* Ecology. Attended from 1969 - 1971.

II. SUMMARY OF PROFESSIONAL EMPLOYMENT

A. Applied Science & Management

President and Principle Ecologist, L.C. Lee & Associates, Inc. and Director, National Wetland Science Training Cooperative. Independent private consultant specializing in wetland and river science, ecosystem restoration, regulatory assistance, and training. L.C. Lee & Associates, Inc. (LCLA) is a nationally based environmental consulting firm with offices in Bellingham, Washington. Lee's emphasis within the company is on applied science including (a) design and construction of waters/wetlands and forested ecosystem restorations, (b) assessment of impacts to waters/wetlands, (c) management of the movement and fate of contaminants in waters/wetland ecosystems, and (d) training of environmental professionals. Since 1990, Lee has often served the U.S. federal government as a national waters/wetlands regulatory expert. In this capacity, Lee has functioned as a national technical team member and leader on several complicated and/or controversial technology development, restoration and/or Clean Water Act enforcement projects throughout the U.S. and abroad. Lee's emphasis is always on the application of best available science to federal, state and local regulatory programs that focus on protection and restoration of aquatic ecosystems. (January, 1990 – Present)

Principal Ecologist & Vice President, Ecosystem Science & Restoration Services, WSP Environment & Energy, Seattle, Washington and London, U.K. (February 2007 – August, 2009)



Principal Ecologist & Vice President, Ecosystem Science & Restoration Services, BBL/Arcadis, Seattle, Washington (June 2004 – January 2006)

Senior Wetlands Ecologist, Office of Wetlands Protection, U.S. Environmental Protection Agency, Washington, DC & **Assistant Research Ecologist**, Savannah River Ecology Laboratory, Institute of Ecology, University of Georgia. This appointment was a 3-year Cooperative Agreement between the University of Georgia's Savannah River Ecology Laboratory and the EPA Headquarters Office of Wetlands Protection. Dr. Lee functioned as the Senior Wetland Scientist responsible for (a) National Technical Oversight and Assistance of EPA Regional Wetlands Protection Programs, (b) National Training Programs In Wetland and Ecosystem Sciences and the U.S. Clean Water Act, (c) National Office Of Wetlands Protection Liaison to the Superfund and RCRA programs, and (d) Headquarters EPA - University Research Liaison (May 1986 - February 1989).

Research Manager and Assistant Research Ecologist, Division of Wetlands Ecology, Savannah River Ecology Laboratory (SREL), Institute of Ecology, University of Georgia, Aiken, South Carolina. Dr. Lee served as the supervisor of 11 PhD staff, 20 technicians and the \$3,500,000/year Wetlands Research Program based at the U.S. Department of Energy Savannah River Nuclear Facility and National Environmental Research Park. Program focus was on (a) assessment and monitoring of the effects of weapons grade radionuclide production on waters/wetland ecosystems, (b) management of the fate, transport and removal of radionuclide, heavy metal, and complex organic contaminants in waters/wetlands, and (c) restoration of waters/wetland ecosystems degraded by thermal effluents and radionuclide and heavy metal contamination (Dr. R. R. Sharitz, Supervisor) (June 1984 - June 1986).

Research Associate, College of Forest Resources, University of Washington, Seattle, WA. Lee completed doctoral research on wetland and river ecosystems throughout the Pacific Northwest, including Alaska. Study design and direction, grant and contract development and management, employee and field-crew supervision, laboratory and data analyses, dissertation preparation, delivery, and publication of peer reviewed articles (Drs. C. C. Grier and T. M. Hinckley, Co-Chairmen) (January 1980 - June 1983).

Principal Habitat Ecologist, Interagency Grizzly Team, Border Grizzly Project. This job was with the Montana Forest and Conservation Experiment Station and Cooperative Wildlife Studies Unit, University of Montana, Missoula, Montana. Lee developed, conducted and supervised research on the definition, description, classification, protection and restoration of grizzly bear and grey wolf habitats throughout the northern Rocky Mountains, SE British Columbia, and northern Mexico. Responsibilities included research project design, planning, and direction, grant proposal preparation & funding, employee, student and field crew supervision in very remote areas, laboratory and data analyses, report development and publication, wildlife habitat impact assessment, and mitigation consultation (Drs. C. J. Jonkel and R. Ream, Directors) (January 1978 - January 1980).

Research Assistant, School of Forestry, University of Montana, Missoula, Montana. Completed Master's study on riparian/wetland ecosystems in mid-montane and high elevation habitats throughout western Montana (December 1975 - June 1977).

Forestry Technician, U.S. Forest Service, Intermountain Forest and Range Experiment Station, Missoula, Montana. Wind River Range, near Dubois, Wyoming and Coram Experimental Forest, Hungry Horse, Montana. Lee worked as a project scientist and forester documenting (a) management approaches for chipped slash in high elevation *Pinus contorta* forests, (b) field testing a habitat type classification for the Wind River Range, and (c) measuring surface and shallow subsurface runoff from clearcut *Larix occidentalis* forests (June - November 1975).



Project Technician, Silvicultural Harvest Practices Demonstration Area, Lubrecht Experimental Forest, School of Forestry, University of Montana, Missoula, Montana. Lee worked as the project technician, setting up demonstrations of silvicultural systems for mid-montane forests in the Garnet Range, Montana (June - September 1973).

Research Technician, Lubrecht Ecosystems Project, School of Forestry, University of Montana, Missoula, Montana. Lee worked as a survey crew member (June - September 1972).

B. Academic

Assistant Research Ecologist, Division of Wetlands/Ecology, Savannah River Ecology Laboratory, Institute of Ecology, University of Georgia, Aiken, South Carolina. Created and administered a Cooperative Agreement with the Office of Wetlands Protection, US Environmental Protection Agency (EPA), Washington, DC to serve as the Senior Scientist in the EPA Headquarters Office of Wetlands Protection. Lee also provided national EPA Programs with training and regional technical assistance. During the course of this appointment, Lee served on two doctoral and two master's committees. He also supervised one AAAS Science and Engineering Fellow, one EPA Senior Fellow, and three interns (May 1986 - February 1989).

Adjunct Assistant Professor, Department of Biology, George Mason University, Fairfax, Virginia (March 1987 - December 1990).

Adjunct Assistant Professor, Department of Biology, University of South Carolina, Columbia, South Carolina (December 1987 - February 1989).

Assistant Research Ecologist, Institute of Ecology, Savannah River Ecology Laboratory, University of Georgia. Postdoctoral (2), graduate (2) and undergraduate (1) student supervision in wetlands and ecosystems ecology at the Savannah River Ecology Laboratory, Aiken, South Carolina (June 1984 - May 1986).

Teaching Assistant, College of Forest Resources, University of Washington, Seattle, Washington (Silviculture, Plant Physiology) (January 1980 - January 1982).

Principal Instructor, Forest Habitat Classification & Silvicultural Management Short Course Series, MacMillan Bloedel Ltd., Woodlands Services, Nanaimo, British Columbia, Canada. Developed and delivered training for MacMillan Bloedel technical and field staff on forest site classification and "best silvicultural management practices" throughout Vancouver Island and the south coast of British Columbia, Canada (June - September 1981).

Teaching Assistant, Montana Forest and Conservation Experiment Station & U.S. Forest Service. Restructured the Montana Forest Habitat Type course curriculum, and authored *A Training Manual for Montana Forest Habitat Types* (January 1976 - June 1978).

Teaching Assistant, School of Forestry, University of Montana, Missoula, Montana (Forest Ecology, Silviculture, Soil Chemistry, Dendrology, Forest Ecosystem Ecology and Classification) (January 1975 - June 1977).

Instructor, Montana Forest Habitat Type Short Courses. Conducted and administered cooperative continuing education in forest habitat type classification and timber management for forest and range specialists from federal and state agencies, universities, corporations and small private entities from throughout the Rocky Mountains (Month of June, 1975 - 1979).



III. SELECTED PROJECT EXPERIENCE

A. Completed Ecosystem Restoration Projects

Presidio Trust/National Park Service, San Francisco California. Planned and designed the restoration of Dragonfly Creek, a perennial creek tributary to San Francisco Bay within the San Francisco Presidio, Golden Gate National Recreation Area (2004 – 2005).

Stanford University, Palo Alto, California. Planned, designed, permitted, and constructed a series of waters/wetlands in the Stanford Academic Reserve that served as breeding/metamorph aquatic habitat for the California Tiger Salamander (*Ambystoma californiense*) (2003 – 2005).

U.S. Department of Justice, Washington, D.C. Borden Ranch, Galt, California. Developed plans/recommendations for mitigation of non-compliance activities in agricultural waters/wetlands (2001).

Natural Resources Conservation Service and Headwaters Ranch Cooperative, Quilcene, Washington, Andrews Creek Restoration (2000 – Present).

University of Washington-Bothell/ Cascadia Community College Co-located Campus,



Bothell, Washington. Environmental assessment, planning, permitting, mitigation design, construction supervision, native plant nursery development and operation, and monitoring of the 58- acre stream ecosystem restoration in North Creek (1994 to 2004).

City of Pacifica, California

San Pedro Creek Restoration. Flood Control/ Steelhead and California red-legged frog habitat restoration) (1990 – 2004). *Calera Creek Restoration*: Pacifica Wastewater Treatment Plant. Environmental planning, permitting, grant procurement, mitigation design, endangered species issues, stream design, stream native plant propagation, construction supervision, and compliance monitoring of a 18- acre riparian waters/wetlands restoration on California's north-central coast (1989-2004).





Milagra Creek Restoration: Flood control (1996 - 1997) *Upper Calera Creek*: Riverine restoration in association with new police station (2000 – 2004). *Capistrano Bridge*: Rebuilt fish passage / riparian restoration (2001 – 2004).

Boeing Company, Seattle, Washington. Longacres Park Waters/Wetlands and Aquatic Gardens (1990-1995).

City of New York, New York. Restoration Advisor/Peer Review for waters/wetlands restoration projects (1993).

City of Portland, Oregon: Ramsey Lake Storm Water Treatment Wetlands at the Willamette Columbia River confluence (1995-1998).

Washington State Department of Corrections, Monroe, Washington. Restoration of forested slope wetlands (1999 – 2002).

Washington State Department of Corrections, Olympia and Aberdeen, Washington. Restoration of a tidally influenced reach of Newkah Creek, a tributary to Gray’s Harbor, Washington (1998 – 2004).

Robert Cole Property. Tidal marsh restoration in Puget Sound, Anderson Island, Washington (1996 – 2002).



Shell Oil Company, Anacortes Refinery Clean Fuels Project, Anacortes, Washington. Permitted, designed mitigation, supervised construction, and monitored 16-acre restoration site adjacent to Padilla Bay National Estuarine Research Reserve (1993-2001).

Shell Oil Company/ Tesoro, March Point Refinery, Anacortes, Washington. Slope and riparian waters/wetland restoration in a tributary to the Padilla Bay National Estuarine Reserve (1992 – 2001).

International Paper, Ticonderoga, New York. Main Wastewater Pipeline Replacement Project. Emergency response, environmental assessment, planning, permitting, mitigation design, restoration construction, monitoring of a 63-acre waters/wetland ecosystem adjacent to Lake Champlain (1992 -2000).

Shell Oil Company, Sewaren, New Jersey. Tidal marsh restoration in a tributary to the Arthur Kill/New York Harbor (1990-1992).

Boeing Company, Seattle Washington Customer Services Training Center. Master planning, land acquisition, design, permitting, and construction of the Longacres Corporate Park waters/wetlands, Boeing Customer Service Training Center (1990-1995).



National Arboretum, Washington, D.C. Restoration Advisor/Peer Review National Aquatic Gardens, Anacostia River Restoration (1989-1991).

U.S. Department of Energy/University of Georgia, Savannah River Plant, Aiken, South Carolina. Designed and constructed the 93 acre “L-Reactor” cooling lake and associated waters/wetlands (1984-1989).



Shurgard Storage, Seattle, Washington. Richards Creek Restoration. Resolve non-compliance issues in a salmon-bearing tributary to Lake Washington (1983-1986).

Bonhoeffer Botanical Gardens - Stanwood, Washington. Resolve noncompliance issues relating to clearing and earthwork in forested wetlands - develop a botanical gardens and learning center. (2010 - 2012)

Hoag Restoration, Mount Vernon, Washington. Restore a series of depressional wetlands on the floodplain of the Skagit River, City of Mount Vernon, Washington (2011 - Present)

Big Wave Project, Half Moon Bay, California. Environmental assessment, planning, permitting, waters/wetlands design to date; design and develop native plant nursery, permit and construction 7-acre landscape restoration pending (2008 – Present).

Chevron EMC, San Luis Obispo, California. San Luis Obispo Tank Farm Remediation and Landscape Restoration, San Luis Obispo, CA. Environmental assessment, planning, permitting, landscape mitigation design to date; design and develop native plant nursery, permit and construction 130-acre landscape restoration pending (2008 - 2018).

City of Mount Vernon, Washington. Kulshan, Logan, and Trumpeter Creeks. Restore riverine forested ecosystem structure and functioning to three different salmon bearing urban creeks owned and managed by the City of Mount Vernon Integrate each restoration with the City's existing park and trail networks (2006 – present).

Lobisser Property, Bainbridge Island, Washington. Remediate contamination and restore estuarine ecosystem structure and functioning to a 2.5 acre tidal wetland in Port Madison, (Puget Sound), Washington (2006 – 2010).

Elma Horse Ranch, Elma, Washington. Restore riverine forested ecosystem structure and functioning to a 600 ft (3 acres) reach on an unnamed, salmon-bearing tributary of the Chehalis River (2006 – 2014).



B. Expert Witness Work and Testimony

Expert Witness, Environment and Natural Resources Defense Section, U.S. Department of Justice, United States v. Electron Hydro. Provide expert services/technical team leadership in the matter of U.S. v Electron Hydro. Sarah Buckley and John Borderick (Attorneys). Analyze impacts and mitigation/restoration opportunities for unauthorized placement of artificial turf in a bypass channel within the Puyallup River. (January, 2021 – Present).

Expert Witness, Environment and Natural Resources Defense Section, U.S. Department of Justice, U.S. v. U.S. v. Joan V. Bayley; Philip N. Bayley individually and in his capacity as the Trustee of Frihet Trust and Bid D's Beach Cabin, LLC. Provide expert services/technical team leadership in the matter of U.S. v Bayley et. al. Kent Hanson, Attorney. Determination of the impacts to the Hood Canal as a result of unauthorized construction of a bulkhead below the high tide line. (November, 2020 - Present).

Expert Witness, Environment and Natural Resources Defense Section, U.S. Department of Justice, Washington and International Border Water Commission, San Diego and El Paso.



Provide expert services/technical team leadership in the matter of Imperial Beach et.al. v. U.S. Andrew Coghlan and Debra Carfora, Attorneys. Determination of the structure, functioning and jurisdictional status of six tributary streams to the Tijuana River Estuary. (August, 2019 - Present).

Expert Witness, Environment and Natural Resources Defense Section, U.S. Department of Justice, Washington D.C. and U.S. Environmental Protection Agency Region 8 – Denver.

Provide expert services/technical team leadership in the matter of U.S. v Paul Bunn and Steven Snyder. Hydraulic dredging and filling of riverine waters/wetlands in the Yaak River, Montana. (June, 2018 - Present).

Expert Witness, Environment and Natural Resources Defense Section, U.S. Department of Justice, Washington, D.C. and U.S. Army Corps of Engineers, Sacramento District.

Provide expert services/technical team leadership in the matter of U.S. Army Corps of Engineers v. Roger J. LaPant, Jr. *et al.* Ripping for conversion of vernal depression, swale, and tributary stream waters/wetlands in northern California (October, 2016 – Settled, February, 2021).

Expert Witness, Environment and Natural Resources Defense Section U.S. Department of Justice, Washington D.C. and U.S. Army Corps of Engineers, Sacramento District.

Provide expert services/technical team leadership in the matter of Duarte v. U.S. Army Corps of Engineers. Ripping and conversion of vernal depression, swale, and tributary stream waters/wetlands in northern California (August, 2014 – Settled - August 2017).

Expert Witness, Environment and Natural Resources Defense Section, U.S. Department of Justice, Washington, D.C. and U.S. Environmental Protection Agency, Region 9 – San Francisco.

Provide expert services/technical team leadership in the matter of U.S. v. Greka Oil. This project focuses on documentation and restoration of the impacts of large-scale crude oil discharges to waters of the U.S., including wetlands - (November 2008 – Present)

Expert Witness, Environment and Natural Resources Defense Section, U.S. Department of Justice, Washington, D.C. and U.S. Environmental Protection Agency, Region 9, San Francisco.

Provide expert services/technical team leadership in the matter of U.S. v. Anchordoguy. This project focuses on documentation and restoration of the impacts of earthwork and development in vernal pools and swales and other waters of the U.S., US Environmental Protection Agency Region IX, San Francisco, California. (May, 2012 – 2016 - Settled).

Expert Witness, Environment and Natural Resources Defense Section, U.S. Department of Justice, Washington, D.C. and U.S. Environmental Protection Agency Region 10, Seattle.

Provide expert services/technical team leadership in the matter of U.S. v. Port of Tacoma. This project focuses on documentation and restoration of the impacts of earthwork in wetlands and other waters of the U.S. in Tacoma, Washington. (April, 2011 – December, 2013 - Settled).

Expert Witness, Environment and Natural Resources Defense Section, U.S. Department of Justice, Washington, D.C. and U.S. Environmental Protection Agency Region 6 – Dallas.

Provide expert services/technical team leadership in the matter of U.S. v. Lipar. This project focuses on documentation and restoration of the impacts of earthwork and development in forested wetlands and other waters of the U.S. (June, 2011 – Present).

Expert Witness, Environment and Natural Resources Defense Section, U.S. Department of Justice, Washington, D.C. and U.S. Environmental Protection Agency Region 10 –



Seattle. Provide expert services/technical team leadership in the matter of U.S. v. Rader Farms. This project focuses on documentation and restoration of the impacts of mechanical clearing, earthwork, drainage, and conversion of forested wetlands to blueberry production, Whatcom County, Washington. (November, 2012 – 2015 - Settled).

Expert Witness, Environment and Natural Resources Defense Section, U.S. Department of Justice, Washington, D.C. and U.S. Environmental Protection Agency Region 10 – Seattle. Provide expert services/technical team leadership in the matter of U.S. v. Klock. This project focuses on documentation and restoration of the impacts of mechanical clearing, earthwork, drainage, and conversion of forested wetlands to agricultural production, Snohomish County, Washington. (November, 2013 – Present).

Expert Witness, Environment and Natural Resources Defense Section, U.S. Department of Justice, Washington, D.C. and U.S. Environmental Protection Agency, Region 10 – Seattle. Provide expert services/technical team leadership in the matter of U.S. v. Case. This project focuses on documentation and restoration of the impacts of levee construction in the North Fork Santiam River, Oregon. US Environmental Protection Agency Region X, Seattle, (October, 2105 – Present).

Expert Witness, Environment and Natural Resources Defense Section, U.S. Department of Justice, Washington, D.C. and U.S. Environmental Protection Agency, Region 10 – Seattle. Provide expert services/technical team leadership to the U.S. Department of Justice in the matter of U.S. v. Alaska Department of Transportation, throughout the Kenai Peninsula, Alaska (Court # A01-378 CV(RRB)). This project focuses on documentation of unauthorized hardening of several river and stream reaches and restoration of hardened reaches using bioengineering, installation of large wood jams, etc. (Outcome: Settled).

Expert Witness, Environment and Natural Resources Defense Section, U.S. Department of Justice, Washington, D.C. and US Environmental Protection Agency Region IV – Atlanta. Provide expert services / technical team leadership in the matter of U.S. v. Cundiff. This case focused on documentation and restoration of the impacts of large-scale mechanized land clearing in bottomland hardwood forested waters/wetlands in Muhlenberg County, Kentucky. U.S. Won in District Court (6th Circuit -480F. Supp. 2d 940 – 945) and in the 6th Circuit Court of Appeals (Nos. 65-5469/5905; 07-5630) (November 2007 - February 2009).

Expert Witness, Environment and Natural Resources Defense Section, U.S. Department of Justice, Washington, D.C. and U.S. Environmental Protection Agency Region 10 – Seattle. Provide expert services/technical team leadership to the Department of Justice in the matter of U.S. v. Abeldgaard *et al.*, Stariski Creek, Kenai Borough, Alaska (Court #: A01-378 CV(RRB)). This project involves documentation of unauthorized filling in and restoration of large slope fen wetlands on the Kenai Peninsula. (Outcome: Pending; 2002 – 2015 - Settled).

Expert Witness, Environment and Natural Resources Defense Section, U.S. Department of Justice, Washington, D.C. and U.S. Environmental Protection Agency Region 9 – San Francisco. Expert witness and technical team leader for the U.S. Department of Justice in the matter of U.S. v Adams Brothers Farming, Inc. *et al.* (Case No. 10074522). Outcome: Trial bifurcated. U.S. won both jurisdictional and impact issues in 9th Circuit District Court, resulting in restoration orders and civil penalties in excess of \$1,000,000 (2000 – 2004).

King County, Washington, Griffin v. Anderson. Represented the Griffin family in alleged manipulation of waters/wetlands at a horse farm in rural Washington. Outcome: Arbitrated



settlement and restoration of waters/wetlands ditched and drained for water management (2000 – 2001).

Parviz Mohandessi in Mohandessi v. State of Washington, Department of Ecology and City of Sammamish. Represented Mohandessi family in requiring review of an ordinary high water mark determination on Lake Sammamish, Washington. Outcome: Washington State Coastal Commission ordered revision of State Determination(s) of Ordinary High Water mark on Lake Sammamish, Washington (2001).

Expert Witness, Environment and Natural Resources Defense Section, U.S. Department of Justice, Washington, D.C. and U.S. Environmental Protection Agency Region 9 – San Francisco. Provided expert services and technical team leadership in the matter of Borden Ranch Partnership vs. U.S. Army Corps of Engineers and U.S. Environmental Protection Agency. This landmark case focused on documentation and restoration of the impacts of large-scale deep ripping of waters/wetlands in grazed pastures during conversion of these lands to vineyards. Outcome: Won in U.S. District Court, Won 9th Circuit Court of Appeals, and Won U.S. Supreme Court (1997 – 2000).

Washington State Attorney General. Expert testimony on behalf of Washington State v. 180th Associates, *et al.* Outcome: Settled in favor of Washington State (1993).

Expert Witness, Land and Natural Resources Defense Section, U.S. Department of Justice, Washington, DC and U.S. Environmental Protection Agency Region 2 – New York. Served as the U.S. Department of Justice, U.S. Army Corps, and US Environmental Protection Agency wetlands expert and technical team leader in the matter of Russo Development Corporation vs. Reilly (Civil No. 87-3916 (HLS)(D.N.J.)). This case focused on filling of tidal “meadowlands” waters/wetlands adjacent to the Hudson River near Newark, N.J. Settled in 1990.

Expert Witness, Land and Natural Resources Division, U.S. Department of Justice, Washington, DC. And U.S. Environmental Protection Agency Region 3 – Philadelphia. Served as the U.S. Department of Justice, U.S. Army Corps and U.S. EPA wetlands expert in the matter of U.S. v. F. Wayne McLeskey, Jr. (Civil Action No. 89-54-N). (Jury Trial). This case focused on unauthorized clearing and filling of tidal wetland forests along a tributary to the Chesapeake Bay in Virginia Beach, VA. Outcome: Settled in favor of the U.S. prior to jury deliberation) (1989).

Expert Witness, Land and Natural Resources Division, U.S. Department of Justice, Washington D.C. and U.S. Environmental Protection Agency Region 4 – Atlanta. Served as the U.S. Department of Justice wetlands expert in the matter of Bayou Marcus Livestock & Agricultural Co. vs. US Environmental Protection Agency and US Army Corps of Engineers [(No. 88-30275-WEA (N.D. Florida)]. This case focused on mechanized clearing and drainage of bottomland hardwood forests near Pensacola, Fl. Outcome: Won on summary judgment) (1989).

C. Waters/Wetlands Ecosystem Functional Assessment Models, Methodologies, and Guidebook Development Programs and Publications

Lee, L.C., W.L. Nutter, M.C. Rains and S.R. Stewart. 2015 and revised 2018. Guidebook for Assessment of the Functions of Low Order Riverine, Slope, and Depressional Waters/Wetlands Situated on Pliocene and/or Pleistocene Sandstone, Shale, and Gravel Deposits in the North Central Valley, California. Prepared for the Environment and Natural Resources Defense Section, U.S. Department of Justice and the U.S. Army Corps of Engineers, Sacramento District.



Lee, L. C., K. L. Fetherston, A. K. Knox, and P. L. Fiedler. 2008. *Draft Guidebook to Assessment of Riverine, Slope and Depressional Waters/Wetlands in the City of Mount Vernon, Washington.* Prepared for the City of Mount Vernon by WSP Environment & Energy.

WSP Environment & Energy. 2007. *Operational Field Draft Guidebook to Assessment of Riverine, Slope and Depressional Waters/Wetlands Functions at the Chevron Tank Farm, San Luis Obispo, California.* Consultant's report developed for Padre Associates, Inc. for use by Chevron EMC at San Luis Obispo, California Tank Farm. November 2007. (**L. C. Lee**, principal author).

Entrix, Inc. 2006. *Operational Field Draft Guidebook to Assessment of Estuarine Fringe Waters/Wetlands Functions at Shell Pond, Pittsburg, California.* Consultant's report developed for Pacific Gas & Electric Company, San Ramon, California (**L. C. Lee**, principal author).

National Wetland Science Training Cooperative. 2004. *Guidebook to Hydrogeomorphic Functional Assessment of Riverine Waters/Wetlands in the Santa Margarita Watershed.* Peer Review Draft, (1977). Operational Draft, (2004). In cooperation with U.S. EPA, Region IX, California Coastal Conservancy, California Regional Water Quality Control Board (San Diego). (**L. C. Lee**, principal author).

Lee, L. C., Fiedler, P.L., Stewart, S.R., Curry, R.R., Partridge, D.J., Mason, J.A., Inlander, E.M., Almy, R.B., Aston, D.L., Spencer, M.E. 2001. *Draft Guidebook for Reference Based Assessment of the Functions of Riverine Waters/Wetlands Ecosystems in the South Coast Region of Santa Barbara County, California.* In cooperation with Santa Barbara County Water Agency, Santa Barbara, CA and U.S. EPA Region IX.

Brinson, M. M., R. D. Smith, D. F. Whigham, **L. C. Lee**, R. D. Rheinhardt, W. L. Nutter. 1998. Progress in development of the hydrogeomorphic approach for assessing the functioning of wetlands. Pages 383- 406, in A. J. McComb and J. A. Davis, editors, *Wetlands for the Future.* Gleneagles Publishing, Adelaide, Australia.

Lee, L. C., M. L. Butterwick, J. L. Cassin, R. A. Leidy, J. A. Mason, M. C. Rains, L. E. Shaw, E. G. White. 1997. *Draft Guidebook for Assessment of the Functions of Waters of the U.S., Including Wetlands, on the Borden Ranch, Sacramento and San Joaquin Counties, California.* Seattle, Washington. In cooperation with U.S. Department of Justice and U.S. EPA Region IX.

National Wetland Science Training Cooperative. 1997. *Guidebook for the Hydrogeomorphic Assessment of Temporary and Seasonal Prairie Pothole Wetlands.* Operational Draft. In cooperation with Natural Resource Conservation Service Wetlands Institute, Wash. DC. (**L. C. Lee**, principal author).

National Wetland Science Training Cooperative. 1996. *Draft Guidebook for the Application of HGM Functional Assessments in Precipitation-Driven Wetlands in Interior Alaska.* In cooperation with State of Alaska, Department of Environmental Conservation and U.S. EPA Region X. (**L. C. Lee**, principal author).

National Wetland Science Training Cooperative. 1996. *Draft Regional Guidebook to Functional Assessments in Riverine Wetlands and Slope Wetlands in Southeast Alaska.* In cooperation with the State of Alaska, Department of Environmental Conservation, U.S. EPA Region X, Natural Resources Conservation Service. (**L. C. Lee**, principal author).

National Wetland Science Training Cooperative. 1996. *Draft Guidebook to Functional Assessments in 3rd and 4th Order Riverine Waters/Wetlands of the Central California Coast.* In cooperation with



California Coastal Commission, U.S. EPA Region IX and City of Pacifica, California. (**L. C. Lee**, principal author).

National Wetland Science Training Cooperative. 1995. *Draft Guidebook for Functional Assessment of Depressional Wetlands in the Pacific Northwest/Puget Sound Lowlands Region*. (**L. C. Lee**, principal author).

Brinson, M. M., F. R. Hauer, **L. C. Lee**, W. L. Nutter, R. D. Rheinhardt, R. D. Smith and D. Whigham. 1995. *Guidebook for Application of Hydrogeomorphic Assessments to Riverine Wetlands*. Technical Report TR-WRP-DE-11, Waterways Experiment Station, Army Corps of Engineers, Vicksburg, Mississippi. (**L. C. Lee**, principal author).

National Wetland Science Training Cooperative. 1995. *Draft Guidebook for Functional Assessment of Depressional Wetlands in the Mid-Atlantic Coastal Plain*. Natural Resource Conservation Service, Wetlands Institute. (**L. C. Lee**, principal author).

National Wetland Science Training Cooperative. 1995. *Draft Guidebook for Functional Assessment of Riverine Wetlands in the Inner Coastal Plain of Chesapeake Bay*. Natural Resource Conservation Service, Wetlands Institute. (**L. C. Lee**, principal author).

Brinson, M. M., W. Kruczynski, **L. C. Lee**, W. L. Nutter, R. D. Smith, and D. F. Whigham. 1994. *Developing an approach for assessing the functions of wetlands*. Pages 615-624, in W. J. Mitsch, editor, *Global Wetlands: Old World and New*. Elsevier Science B.V., Amsterdam.

Olsen, E. A. and **L. C. Lee**. 1992. *The use of hydrogeomorphic and vegetation data in differentiating functions among forested wetlands*. Prepared for Riverine Functional Assessment Group and R. Daniel Smith, Wetlands Section, Waterways Experiment Station, U.S. Army Corps Of Engineers, Vicksburg, Mississippi.

IV. HONORARIES, AWARDS, FELLOWSHIPS, PROFESSIONAL ORGANIZATIONS

Honoraries:

Xi Sigma Pi, Forestry Honorary (inducted 1976).
Sigma Xi, National Research Honorary (inducted 1983).

Academic Fellowships:

R.D. Merrill Fellowship, College of Forest Resources, University of Washington, Seattle, Washington (1983).

Graduate School Tuition Scholarship, University of Washington, Seattle, Washington (1983).

Northwest Scientific Association Research Fellowship (1983).

J.H. Bloedel Forestry Research Graduate Scholarship, College of Forest Resources, University of Washington, Seattle, WA (1982).

Professional Organizations:

Society for Ecological Restoration (2006 – 2010)

Society of Wetland Scientists (1984 - Present)



- a. Bulletin Editor (1985 - 1991)
- b. National Scientific Program Chairman (1987 & 1988)
- c. Scientific Program Committee Member (1986, 1987, 1988, 1989, 1990)
- d. Awarded lifetime membership (1998)
- e. Professional Wetland Scientist Certification (1995): Registration #000385

Association of State Wetland Managers (1984 - 1989)

- a. Science Advisory Board (1985 - 1989)

Ecological Society of America (1978 - 2003)

American Association for the Advancement of Science (1978 - 2003)

Northwest Scientific Association (1979 - 1995)

Society of American Foresters (1983 - 1995)

Project Awards:

U.S. Environmental Protection Agency, Region IX. "Outstanding Environmental Achievement, Earth Day 2000". (Calera Creek Restoration) (2000).

Assemblyman Lou Papan, State Senator Jackie Speirer, Congressman Tom Lantos, Congresswoman Anna Eshoo, and State Senator Byron Sher. Commendation from: San Mateo County Board of Supervisors (Calera Creek Restoration) (2000).

California Legislature Assembly Resolution #3110 – Congratulating the City of Pacifica for success of Calera Creek Water Recycling Facility (Calera Creek Restoration) (2000).

Construction Excellence Award (Team Member with Mortenson and Active Construction), University of Washington-Bothell / Cascadia Community College Co-located Campus – North Creek Restoration (1998).

Team of the Year, Project Management Institute, Puget Sound Chapter Project, Boeing Longacres Park (1995).

V. PUBLICATIONS, PRESENTED PAPERS, WORKSHOPS AND SYMPOSIA

A. Refereed Journal Articles

Hardwick, K.A., P. Fiedler, **L.C. Lee**, B. Pavlik, R.J. Hobbs, J. Aronson, M. Bidartondo, E. Black, D. Coates, M.I. Daws, K. Dixon, S. Elliott, K. Ewing, G. Gann, D. Gibbons, J. Gratzfeld, M. Hamilton, D. Hardman, J. Harris, P.M. Holmes, M. Jones, D. Maberley, A. Mackenzie, C. Magdalena, R. Marrs, W. Milliken, A. Mills, E. nic Lughadha, M. Ramsay, P. Smith, N. Taylor, C. Trivedi, M. Way, O. Whaley and S.D. Hopper. 2011. The Role of Botanic Gardens in the Science and Practice of Ecological Restoration. *Conservation Biology* 25:265-275

Gosselink, J. G., G. P. Shaffer, **L. C. Lee**, D. M. Burdick, D. L. Childers, N. C. Liebowitz, S. C. Hamilton, R. Boumans, D. Cushman, S. Fields, M. Koch, and J. M. Visser. 1990. Can we manage cumulative impacts? Landscape conservation in a forested wetland watershed. *Bioscience*, Vol 40, (8); 588 - 600.



Shaffer, G. P., D. M. Burdick, J. G. Gosselink, and **L. C. Lee**. 1992 A cumulative impact management plan for the Tensas Basin, Louisiana. *Wetlands Ecology and Management*, Vol. 1, (4): 199 – 210

Day, F. P., P. Megonigal, and **L. C. Lee**. 1989. Cypress root decomposition in experimental wetland mesocosms. *Wetlands* 9(2):263-282.

Leitch J. A., T. Golz, and **L. C. Lee**. 1988. Profile of Society of Wetland Scientists Membership, 1986. *Bulletin of the Society of Wetland Scientists* 5:6-8.

Lee, L. C. and J. G. Gosselink. 1988. Cumulative impact assessment in bottomland hardwood forests: linking scientific assessments with regulatory alternatives. *Environmental Management* 12(5):591 - 602.

Cooper, D. J. and **L. C. Lee**. 1987. Rocky Mountain wetlands: ecosystems in transition. National Wetlands Technical Council and the Environmental Law Institute. *National Wetlands Newsletter* 9:2-6.

Wolf, R. B., **L. C. Lee**, and R. R. Sharitz. 1986. Wetland creation and restoration in the United States from 1970 to 1985: an annotated bibliography. *Wetlands* 6:1-88.

Lee, L. C., T. M. Hinckley, and M. L. Scott. 1985. Plant water status relationships among major floodplain sites of the Flathead River, Montana. *Wetlands* 5:15-34.

Scott, M. L., R. R. Sharitz, and **L. C. Lee**. 1985. Disturbance in a cypress-tupelo wetland: an interaction between thermal loading and hydrology. *Wetlands* 5:53-68.

Lee, L. C. and C. J. Jonkel. 1981. Grizzlies and wetlands. *Western Wildlands* 7(4):26-30.

B. Books, Book Chapters & Theses

Mitsch, W. J., P. L. Fiedler, **L. C. Lee** and S. R. Stewart. 2001. Wetlands. *McGraw Hill Encyclopedia of Science and Technology*, 9th Edition. McGraw Hill, New York, NY.

Brinson, M. M., R. D. Smith, D. F. Whigham, **L. C. Lee**, R. D. Rheinhardt, and W. L. Nutter. 1998. Progress in development of the hydrogeomorphic approach for assessing the functioning of wetlands. Pages 383-406, in A. J. McComb and J. A. Davis, editors. *Wetlands for the Future*. Gleneagles Publishing, Adelaide, Australia.

Brinson, M. M., W. Kruczynski, **L. C. Lee**, W. L. Nutter, R. D. Smith, and D. F. Whigham. 1994. *Developing an approach for assessing the functions of wetlands*. Pages 615-624 in W.J. Mitsch, editor. *Global Wetlands: Old World and New*. Elsevier Science B.V., Amsterdam.

Gosselink, J. G., **L. C. Lee**, and T.A. Muir, editors. 1990. *Ecological Processes and Cumulative Impacts - Illustrated by Bottomland Hardwood Wetland Ecosystems*. Lewis Publishers, Chelsea, Michigan. 708 pp.

Sharitz, R. R. R. L. Schneider, and **L. C. Lee**. 1990. Composition and regeneration of a disturbed floodplain wetland in South Carolina. Pages 195-218, in J. G. Gosselink, L. C. Lee, and T.A. Muir, editors. *Ecological Processes and Cumulative Impacts - Illustrated by Bottomland Hardwood Wetland Ecosystems*. Lewis Publishers, Chelsea, Michigan.

Gosselink, J. G., M. M. Brinson, **L. C. Lee**, and G. T. Auble. 1990. Human activities and ecological processes in bottomland hardwood ecosystems: the report of the ecosystem



workgroup. Pages 549-598, in J. G. Gosselink, L. C. Lee, and T.A. Muir, editors. *Ecological Processes and Cumulative Impacts - Illustrated by Bottomland Hardwood Wetland Ecosystems*. Lewis Publishers, Chelsea, Michigan.

Gosselink, J. G., **L. C. Lee** and T. A. Muir. 1990. The regulation and management of bottomland hardwood forest wetlands: implications of the EPA-sponsored workshops. Pages 638-671, in J. G. Gosselink, L. C. Lee, and T.A. Muir, editors. *Ecological Processes and Cumulative Impacts - Illustrated by Bottomland Hardwood Wetland Ecosystems*. Lewis Publishers, Chelsea, Michigan.

Gosselink, J. G. and **L. C. Lee**. 1989. Cumulative impact assessment in bottomland hardwood forests. *Wetlands* Volume 9, Special Issue. Society of Wetland Scientists, Wilmington, N.C. 174 pp.

Lee, L. C. 1983. The floodplain and wetland vegetation of two Pacific Northwest river ecosystems. Ph.D. Dissertation, College of Forest Resources, University of Washington, Seattle, WA. 268 pp.

Lee, L. C. 1979. A study of plant associations in upland riparian habitats in western Montana.. Master's Thesis, School of Forestry, University of Montana, Missoula, MT. 250 pp.

C. Published Reports and Proceedings

Fiedler, P. L., **L. C. Lee** and S. D. Hopper. 2007. Gnammas as rare wetlands in the Southwest Australian Floristic Region. In "Proceedings of the MEDECOS XI 2007 Conference, 2-5, September, Perth, Australia." Eds. D. Rokich, G. Wardell-Johnson, C. Yates, J. Stevens, K. Dixon, R. McLelland, and G. Moss, pp. 85-86. Kings Park and Botanic Garden, Perth, Australia.

Brinson, M. M., F. R. Hauer, **L. C. Lee**, W. L. Nutter, R. D. Rheinhardt, R. D. Smith and D. Whigham. 1995. *Guidebook for Application of Hydrogeomorphic Assessments to Riverine Wetlands*. Technical Report TR-WRP-DE-11, Waterways Experiment Station, U.S. Army Corps of Engineers, Vicksburg, Mississippi.

Lee, L.C. and F. E. Gross. 1989. Restoration, creation, and management of wetland and riparian ecosystems in the American West: a summary and synthesis of the symposium. Pages 201 - 219, K. M. Mutz, D. J. Cooper, M. L. Scott, and L. K. Miller, editors. *Proceedings of the Symposium on Restoration, Creation, and Management of Wetland and Riparian Ecosystems In The American West*. Rocky Mountain Chapter of the Society of Wetland Scientists, Denver, Colorado.

Gosselink, J. G., G. P. Shaffer, **L.C. Lee**, D. M. Burdick, D. L. Childers, N. Taylor, S. C. Hamilton, R. Boumans, D. Cushman, S. Fields, M. Koch, and J. M. Visser. 1989. *Cumulative Impact Assessment and Management in a Forested Wetland Watershed in the Mississippi River Floodplain*. Marine Sciences Department And Coastal Ecology Institute (LSU-CEI-89-02), Center For Wetland Resources, Louisiana State University, Baton Rouge, LA. 131 pp.

Lee, L. C., R. R. Johnson, and T. A. Muir. 1989. Riparian ecosystems as essential habitat for raptors in the American West. Pages 15-26, in B. G. Pendleton, C. E. Ruibal, D. L. Krahe, K. Steenhof, M. N. Kochert, and M. N. LeFranc, editors. 1989. *Proceedings of the Western Raptor Management Symposium and Workshop*. Institute For Wildlife Research, National Wildlife Federation, Scientific and Technical Series No. 12. Washington, D.C. 320 pp. National Wildlife Federation Raptor Management Symposium Series, Washington, D.C.

Lee, L. C. 1989. Mitigation for wetland loss: how much is appropriate? Pages 189-195 in N. A. Robinson, editor. 1989. *Proceedings of a Conference on the Preparation and Review of*



Environmental Impact Statements, November 1987. President's Council On Environmental Quality and the Environmental Law Section of the New York State Bar Association. West Point, New York.

Brinson, M. M. and **L. C. Lee**. 1989. In-kind mitigation for wetland loss: statement of ecological issues and evaluation of examples. Pages 1069 – 1085, R. R. Sharitz and J. W. Gibbons, editors. *Freshwater Wetlands and Wildlife*. Proceedings of a symposium held at Charleston, South Carolina, March 24-27, 1986. U.S. Department Of Energy Office of Health & Environmental Research, Washington, D.C.

Magistro, J. L. and **L. C. Lee**. 1988. Association of Superfund sites with wetlands. Pages 136 – 140, in J. A. Kusler, S. Daly, and G. Brooks, editors. 1988. *Proceedings of the National Wetlands Symposium*, Urban Wetlands, Oakland, CA. Association of State Wetland Managers, Berne, New York.

Muir, T. A., **L. C. Lee**, and S. Sarason. 1987. The Environmental Protection Agency's initiative on bottomland hardwood ecosystems: a status report. Pages 27-31, K. M. Mutz and L. C. Lee, editors. 1987. *Wetland and Riparian Ecosystems of the American West*. Proceedings of the eighth annual meeting of the Society of Wetland Scientists. Society of Wetland Scientists - Western Chapter. Denver, Colorado.

Mutz, K. M. and **L. C. Lee**, editors. 1987. *Wetland and Riparian Ecosystems of the American West*. Proceedings of the eighth annual meeting of the Society of Wetland Scientists. Society of Wetland Scientists - Western Chapter. Denver, Colorado. 349 pp.

McCort, W. D., **L. C. Lee**, and G. R. Wein. 1987. Mitigating for large-scale wetland loss: a realistic endeavor? Pages 359-367, in J. A. Kusler, M.L. Quammen, and G. Brooks. 1987. Proceedings of the National Wetland Symposium On Mitigation Of Impacts And Losses, October 8-10, 1986, New Orleans, Louisiana. Association of State Wetland Managers, Berne, New York.

Gosselink, J. G. and **L. C. Lee**. 1987. Cumulative impact assessment principles. Pages 196-203, in J. A. Kusler, M. L. Quammen, and G. Brooks, editors. 1987. Proceedings of the National Wetland Symposium on Mitigation Of Impacts And Losses, October 8-10, 1986, New Orleans, Louisiana. Association of State Wetland Managers, Berne, New York.

Sharitz, R. R. and **L. C. Lee**. 1985. Recovery processes in Southeastern riverine wetlands, in R. R. Johnson, C.D. Ziebell, D.R. Patton, P.F. Folliott, and R.H. Hamre, editors. 1985. *Riparian Ecosystems and Their Management: Reconciling Conflicting Uses*. Proceedings of the First North American Riparian Conference. USDA Gen. Tech. Rpt. RM-120:499-501.

Sharitz, R. R. and **L. C. Lee**. 1985. Limits on regeneration processes in Southeastern riverine wetlands. Pages 139 - 143 in, Johnson, R. R., C. D. Ziebell, D. R. Patton, P. F. Folliott, and R. H. Hamre, editors. *Riparian Ecosystems and Their Management: Reconciling Conflicting Uses*. Proceedings of the First North American Riparian Conference. USDA Forest Service Gen. Tech. Rpt. RM-120: 139-143.

Chapman, R., **L. C. Lee**, R. O. Teskey, and T. M. Hinckley. 1982. Impact of water level changes on woody riparian and wetland communities, Vol. X - index and addendum to Volumes I - VIII. U.S. Fish and Wildlife Service Office of Biological Services FWS/OBS-82/23. USDI, Washington, D.C. 111 pp.



Lee, L. C. and T. M. Hinckley. 1982. Impact of water level changes on woody riparian and wetland communities, Vol. IX - Alaska. U.S. Fish and Wildlife Service Office of Biological Services FWS/OBS -82/23. U.S.D.I., Washington, D.C. 213 pp.

Lee, L. C. and R. D. Pfister. 1978. *A Training Manual for Montana Forest Habitat Types*. Montana Forest and Conservation Experiment Station, University of Montana, Missoula, MT. 142 pp.

D. Selected Oral Presentations Of Technical Papers, Invited Seminars, and Posters

Lee, L.C., J. Hanson, and D.B. Largen. 2008. Management of Waters/Wetlands Buffers In Urbanizing Landscapes: Do Big Passive Buffers Always Make Sense? 8th International Wetlands Conference (INTECOL), July 20-25, 2008, Cuyaba, Brazil.

Fiedler, P. L., **L. C. Lee** and S. D. Hopper. 2007. Gnammas as rare wetlands in the Southwest Australian Floristic Region. MEDECOS XI 2007 Conference, 2-5, September, Perth, Australia.

L. C. Lee, P. L. Fiedler, J. Gage, M. Keever, A. E. Launer, and S. Anderson. 2003. Restoration of breeding habitat for the California tiger salamander (*Ambystoma californiense*) on Stanford University lands - I. Design & implementation. Poster presented for the State of the Estuary, Challenges and Changes, 2003. October 21-23, 2003, Oakland, California.

S. Anderson, A. E. Launer, P. Oliveira, **L. C. Lee**, P. L. Fiedler, J. Gage, and M. Keever. 2003. Restoration of breeding habitat for the California tiger salamander (*Ambystoma californiense*) on Stanford University lands - II. Performance criteria and assessment. Poster presented for the State of the Estuary, Challenges and Changes, 2003. October 21-23, 2003, Oakland, California

Lee, L. C. and D. M. Spada. 2002. Working Buffer: Enhancement and Restoration as Compensatory Mitigation in a Chronically Degraded Wetland. Annual meeting of the Society of Wetland Scientists. June 2-7, 2002., Lake Placid, New York.

Fiedler, P. L., **L. C. Lee**, and S. Holmes. 1999. Continuity in urban stream restoration. Meeting of the Association of State Wetland Managers, October 25-27, 1999, Annapolis, Maryland.
Cassin, J., Fiedler, P. L., and **L. C. Lee**. 1999. The importance of weeds control in wetland restoration. Meeting of the Association of State Wetland Managers, October 25-27, 1999, Annapolis, Maryland.

Fiedler, P. L., L. C. Ellis, **L. C. Lee**, and M. C. Rains. 1997. Development of a monitoring plan for restored riverine waters/wetlands along the central California coast using HGM wetland functional assessment: The Calera Creek Project. Meeting of the Association of State Wetland Managers, March 10-13, 1997, Annapolis, Maryland.

Ellis, L. R., **L. C. Lee**, P. L. Fiedler, and M. C. Rains. 1995. Use of the hydrogeomorphic approach to assess wetland functions and design restoration of riparian wetlands along the central California coast. 1995 Annual Meeting, Society for Ecological Restoration, September 14-18. Seattle, Washington.

Lee, L. C. 1989. Approaches for Impact Assessment In Jurisdictional Wetlands: The American Experience. Invited paper at the European Community Workshop on Wetland Functions and Values. April 27-30, 1989, University of Exeter, United Kingdom.

Lee, L. C. and J. G. Gosselink. 1988. Cumulative impact assessment in bottomland hardwood forests of the Southeastern U.S. Third International Wetlands Symposium, September 18 -23, 1988, Rennes, France (Published Abstract).



Gosselink, J. G. and **L. C. Lee**. 1988. Cumulative impact assessment in bottomlands of the Tensas River basin, Louisiana. Third International Wetlands Symposium, September 18 - 23, Rennes, France. (Published Abstract).

Megonigal, J. P., W. H. Patrick, S. P. Faulkner, W. B. Parker, R. R. Sharitz, and **L. C. Lee**. 1988. Relationships among vegetation, soils and hydrology as they relate to wetland delineation. 9th Annual Meeting of the Society of Wetland Scientists, May 31 - June 3, 1988, Washington, DC (Published Abstract).

Smith, R. D. and **L. C. Lee**. 1988. Effects of assessment area boundary selection on functional ratings of the Wetland Evaluation Technique: how to drive WET wild. 9th Annual Meeting of the Society of Wetland Scientists, May 31 - June 3, 1988, Washington, DC (Published Abstract).

Burdick, D. M., G. P. Shaffer, J. G. Gosselink, and L. C. Lee. 1988. Planning for cumulative impact management using landscape pattern and principles of conservation biology. International Association of Landscape Ecologists, March 16-19, 1988, Albuquerque, NM. (Published Abstract).

Magistro, J. L. and **L. C. Lee**. 1988. Association of wetlands with Superfund sites: a pilot study. 9th Annual Meeting of the Society of Wetland Scientists, May 31 - June 3, 1988, Washington, D.C. (Published Abstract).

Gosselink, J. G., **L. C. Lee**, R. Boumans, D. Burdick, D. Cjilders, D. Cushman, S. Fields, S. Hamilton, M. Koch, G. Shaffer, N. Taylor, and J. Visser. 1988. Cumulative impact assessment and management in bottomlands of the Tensas basin, Louisiana. 9th Annual Meeting of the Society of Wetland Scientists, May 31 - June 3, 1988, Washington, DC. (Published Abstract).

Muir, T. A., **L. C. Lee**, and S. Sarason. 1987. The EPA initiative on bottomland hardwood ecosystems: a status report. 9th Annual Meeting of the Society of Wetland Scientists, May 26-29, 1987, Seattle, WA. (Published Abstract).

Megonigal, J. P., W. H. Patrick, S. P. Faulkner, R. R. Sharitz, and **L. C. Lee**. 1987. Wetland boundary delineation in the southeast using vegetation, soils, hydrology, soil aeration/reduction-oxidation status. 9th Annual Meeting of the Society of Wetland Scientists, May 26-29, 1987, Seattle, WA. (Published Abstract).

Lee, L. C. 1987. Scoping wetland mitigation projects: where to begin, when to stop, and what to expect. National Wildlife Federation Symposium on "Preserving Our Wetland Heritage", October 4-7, 1987, Washington, D.C.

Lee, L. C. 1987. Riparian ecosystems as essential habitat for raptors in the American West. Paper presented to the National Wildlife Federation and the Idaho Chapter of the Wildlife Society, Western Raptor Management Symposium, October 26-28, 1987, Boise, ID.

Lee, L. C. 1987. Mitigation for wetland loss: how much is appropriate? President's Council On Environmental Quality, National Symposium On The Preparation And Review Of Environmental Impact Statements, November 3-4, 1987, West Point, NY.

Lee, L. C. 1986-1987. Cumulative impacts in bottomland hardwood forests: linking scientific assessments with regulatory approaches. A series of six seminars given by invitation at Indiana University, Western Illinois University, Smithsonian Environmental Research Laboratory,



University of Vermont, George Mason University, US EPA Region IV (Atlanta) 2nd Annual Wetlands Meeting.

Brinson, M. M. and **L. C. Lee**. 1986. In-kind mitigation for wetland loss. Savannah River Ecology Laboratory's Ninth Symposium: Freshwater Wetlands and Wildlife, March 24-27, 1986, Charleston, SC. (Published Abstract).

Lee, L. C. and T. A. Muir. 1986. Wetland forestry in the American West: approaches for silviculture in intricate ecosystem mosaics. International Symposium for Wetland Ecology and Management, U.S. Forest Service, Charleston, SC.

Lee, L. C. and M. M. Brinson. 1986. Scientific perspectives on mitigation for wetland loss. Plenary address presented to the Association of State Wetland Managers National Symposium On Wetlands Mitigation, October 8-10, 1986, New Orleans, LA.

Gosselink, J. G. and **L. C. Lee**. 1986. Cumulative impact assessment principles. Association of State Wetland Managers National Symposium On Wetlands Mitigation, October 8-10, 1986, New Orleans, LA.

McCort, W. D., **L. C. Lee**, and G. R. Wein. 1986. Mitigating for large-scale wetland loss: a realistic endeavor? Association of State Wetland Managers National Symposium On Wetlands Mitigation, October 8-10, 1986, New Orleans, LA.

Lee, L. C. 1986. Measurement of moisture gradients in floodplain wetland ecosystems of the Pacific Northwest. Moisture Gradient Workshop, Wetland Ecology Group, National Ecology Research Center, U.S. Fish and Wildlife Service, Ft. Collins, CO.

Lee, L. C. 1986. The floodplain and wetland vegetation of two Pacific Northwest river ecosystems. Invited seminar to the Center For Wetlands, University of Florida, Gainesville, FL.

Lee, L. C. 1985. Environmental effects of the L-Reactor restart at the Savannah River Plant, South Carolina. Invited paper, January 30, 1985 meeting of the South Carolina Chapter of the Wildlife Society, Columbia, South Carolina.

Sharitz, R. R. and **L. C. Lee**. 1985. Limits on regeneration processes in Southeastern riverine wetlands. First North American Riparian Conference: "Riparian Ecosystems And Their Management", April 16-18, 1985, Tucson, Arizona (Published Abstract).

Sharitz, R. R. and **L. C. Lee**. 1985. Recovery processes in Southeastern riverine wetlands. First North American Riparian Conference: "Riparian Ecosystems And Their Management", April 16-18, 1985, Tucson, Arizona (Published Abstract).

Lee, L. C., M. L. Scott, and T. M. Hinckley. 1985. Plant water status relationships among major floodplain sites of the Flathead River, Montana. 6th Annual Meeting of the Society of Wetland Scientists, July 29 - August 2, 1985, Durham, New Hampshire (Published Abstract).

Scott, M. L. and **L. C. Lee**. 1985. Biomass and production dynamics along a disturbance gradient in a cypress-tupelo forested wetland. 6th Annual Meeting of the Society of Wetland Scientists, July 29 - August 2, 1985, Durham, NH. (Published Abstract).

Sharitz, R. R., Schneider, R L., and **L. C. Lee**. 1984. Composition and regeneration of a disturbed floodplain wetland in South Carolina. US Environmental Protection Agency Bottomland Hardwood Ecosystem Characterization Workshop, December 3-7, 1984, St. Francisville, Louisiana.



Lee, L. C. 1984. Floodplain and wetland vegetation in western Montana. Invited Seminar to the Montana Forest and Conservation Experiment Station, University of Montana, Missoula, Montana.

Lee, L. C. 1984. Floodplain and wetland plant communities of the North Fork Flathead River, Montana. Northwest Scientific Association 57th Annual Meeting, March 21-24, 1984, Missoula, Montana (Published Abstract).

Lee, L. C. 1984. The floodplain and wetland vegetation of two Pacific Northwest river ecosystems. Society of Wetland Scientists 5th Annual Meeting, San Francisco, California (Published Abstract).

Lee, L. C. 1984. Water balance and leaf area relationships in floodplain plant communities in two Pacific Northwest river ecosystems. Annual Meeting of the Ecological Society of America, Ft. Collins, Colorado (Published Abstract).

Lee, L. C., C. C. Grier, and T. M. Hinckley. 1983. Water balance and leaf area relationships in floodplain plant communities of two Pacific Northwest river ecosystems. Paper presented at the Northwest Scientific Association 56th Annual Meeting, March 24-26, Olympia, WA. (Published Abstract/Best Student Paper award).

Lee, L. C. 1983. Definition, classification, and description of riparian wetlands in the Pacific Northwest. Invited seminar to the School of Landscape Architecture, University of Washington, Seattle, Washington.

Lee, L. C. 1981 - 1984. Nine formal oral and written declarations and testimonies before hearings of the King and Snohomish County Building and Development Divisions regarding assessment of impacts of proposed or existing developments in wetland or riparian habitats.

Lee, L. C. 1981. Gradient modeling of riparian and wetland vegetation. Invited paper presented to the Annual Meeting of the Association of American Geographers, Los Angeles, California (Published Abstract).

Jonkel, C. J., L. C. Lee, P. Zaeger, C. W. Servheen, and R. Mace. 1981. Grizzly bear - livestock competition in riparian ecosystems. Paper presented at the Coeur d'Alene Regional Wildlife Symposium, Coeur d'Alene, Idaho (Published Abstract).

Lee, L. C. 1980. The role of low elevation wetlands in the ecology of free ranging grizzly bears in Montana. Invited seminar presented to the Pacific Northwest Forest and Range Experiment Station, USDA Forest Service, Corvallis, Oregon.

Lee, L. C. 1980. Plant associations in montane riparian habitats in western Montana. Invited seminar presented to the Pacific Northwest Forest and Range Experiment Station, U.S. Forest Service, Corvallis, Oregon.

VI. SELELCTED WORKSHOPS AND SYMPOSIA ATTENDED BY INVITATION

Law Seminars International - Clean Water & Stormwater Continuing Legal Education. May 5, 2014, Seattle, Washington. Waters/Wetlands Jurisdictional Issues – Key Elements In Recent Scientific Studies.



Law Seminars International, Continuing Legal Education Seminar, Wetlands In Washington, October 2, 2013, Seattle, Washington. “Practical Tips For Assessing The Financial Impacts Of Waters/Wetlands Issues - Managing Smooth Sailing Through Permitting Processes”

Law Seminars International - Continuing Legal Education - “Wetlands In Washington”, Seattle, Washington, October 10, 2012.

Lorman Education Services - Continuing Legal Education - “SEPA” (Wetlands Section Speaker) Seattle, Washington. 2007.

Lorman Education Services - Continuing Legal Education - “SEPA” (Wetlands Section Speaker) Tacoma, Washington. 2007.

Law Seminars International. – Continuing Legal Education - “Successful Permitting Strategies.” Seattle, Washington. 1999.

Institute for Wetland Science and Public Policy: The Association of State Wetland Managers, Inc. “Wetlands ‘99” (Plenary Speaker – “Design, Implementation and Monitoring For Successful Ecosystem Restorations”) Annapolis, Maryland. 1999.

Wetlands Biological Assessment and Criteria Development Workshop. Association of State Wetland Managers. Boulder, Colorado. “The Hydrogeomorphic Approach To Assessment of Waters/Wetlands Ecosystem Functioning. 1996.

Alaska Association of Environmental Professionals Eighth Annual Meeting. “The Hydrogeomorphic Approach To Assessment of Waters/Wetlands Ecosystem Functioning In Discontinuous Permafrost Landscapes.” Anchorage, Alaska. 1996.

Living Waters Symposium, Bass Anglers Sportsman's Society, Montgomery, Alabama. Offered perspectives on eco system impacts of flow regulation/reservoir management in the southeastern U.S. 1990.

Wet Environments: RCRA Subtitle D Monitoring Guidance. Office of Research and Development, U.S. Environmental Protection Agency Systems Laboratory. Tallahassee, Florida. April 17-19, 1989.

Restoration, Creation, and Management Of Wetland And Riparian Ecosystems in the American West. Lakewood, Colorado. (Plenary Speaker – “Restoration, creation, and management of wetland and riparian ecosystems in the American West: A summary and synthesis of the symposium”). November 14 - 15, 1988.

Cumulative Impacts Workshop. Wetlands Ecology Program, U.S. Environmental Protection Agency Environmental Research Laboratory, Corvallis, Oregon.. Summarized Gosselink and Lee work on cumulative impact assessment in bottomland hardwood forests of the southeastern U.S. 1987.

Restoration of Bottomland Hardwood Wetlands. Division of Wetlands Ecology, Savannah River Ecology Laboratory, Aiken, South Carolina. Follow-up symposium on lessons learned in the design, construction and monitoring of the L-Reactor Lake wetlands. 1987.

National Wetlands Technical Council Great Basin Desert and Montane Wetlands Workshop, Logan, Utah. (“Food Chain Support/Habitat” Workgroup Chairman). February 27-28, 1986.



Moisture Gradient Workshop. Wetland Ecology Group, National Ecology Research Center, U.S. Fish and Wildlife Service, Ft. Collins, Colorado. Summarized site water balance work in the North fork of the Flathead Valley (LCL Ph.D. Dissertation). 1986.

National Wetlands Technical Council Pacific Region Workgroup, San Francisco, California. ("Food Chain Support" workgroup Chairman). April 14-16, 1985.

US Environmental Protection Agency "Bottomland Hardwood Ecosystem Characterization Workshops". St. Francisville, Louisiana (December 3-7, 1984); Lake Lanier, Georgia (July 15-19, 1985); and, Savannah, Georgia (January 13-17, 1986). Cumulative Impacts Workgroup Chairman. 1984, 1985, and 1986.

VII. ORGANIZATION OF PROFESSIONAL MEETINGS, TRAINING PROGRAMS AND SYMPOSIA

A. Meetings and Symposia

Session Chairman, "*Global Habitat Assessment.*" MEDECOS XI: The International Mediterranean Ecosystems Conference, Perth, Australia. September 2 - 5, 2007.

Panel Organizer & Moderator, "*No Net Loss: Approaches for Implementing Policies To Sustain Wetland Area And/Or Function.*" Society of Wetland Scientists Tenth Annual Meeting, Orlando, Florida. May 30 - June 3, 1989.

Meeting Co-Coordinator, *Pocosins and Associated Wetlands Of The Carolina Coastal Plain.* Workshop Organized for US Environmental Protection Agency Region IV, Atlanta, Georgia and Duke University Center for Wetlands. 1989.

Scientific Program Chairman, "*The Chesapeake and Its Landscape: Perspectives On The Science, Management, and Protection Of Freshwater and Estuarine Wetlands*" - the Society of Wetland Scientists 9th Annual Meeting. Washington, DC. Responsible for development and organization of all aspects of the SWS scientific for the 9th Annual Meeting. May 31 - June 3, 1988.

Session Chairman, "*Assessment and Management of Contaminants In Wetland Ecosystems*". Technical Session held at the 9th Annual Meeting of the Society of Wetland Scientists, Washington, DC. May 31 - June 3, 1988.

Session Chairman, "*Management of Contaminants in Saturated Media.*" Technical Session held at the Annual Meeting of the Association of State Wetland Managers, Oakland, California. June 26 - 29, 1988.

Scientific Program Chairman, "*Wetland and Riparian Ecosystems of the American West.*" The Society of Wetland Scientists 8th Annual Meeting, Seattle, Washington. Responsible for development and organization of all aspects of the SWS scientific program for the 8th Annual Meeting. May 26 - 29, 1986.

Scientific Program Committee Manager, National Symposium, *Freshwater Wetlands And Wildlife: Perspectives On Natural, Managed, and Degraded Ecosystems.* University of Georgia Savannah River Ecology Laboratory, Ninth Symposium, Charleston, South Carolina. Responsible with Dr. R. R. Sharitz for (a) organization of all wetland technical sessions, (b) selection and



coordination of plenary speakers, and (c) leadership of Freshwater Wetlands field trip. March 24 - 27, 1986.

Session Chairman "*Approaches For Mitigation Of Forestry Impacts To Wetlands*", Technical Session held at the National Symposium On Wetlands Mitigation, Association of State Wetland Managers, New Orleans, Louisiana. October 8 - 10, 1986.

B. Training Programs

Courses taught through Elkhorn Slough National Estuarine Research Reserve Coastal Training Program – Director and Lead Instructor. 2008 - Present.

April 2008: *Jurisdictional Delineation of Waters of the U.S., Including Wetlands On the California Coast: Legal and Ecological Protocols For Diverse and Changing Landscapes*. Elkhorn Slough, California.

November 2008: *Jurisdictional Delineation of Waters of the U.S., Including Wetlands On the California Coast: Legal and Ecological Protocols For Diverse and Changing Landscapes*. Elkhorn Slough, California.

Courses taught through National Wetland Science Training Cooperative (under L.C. Lee & Associates, Inc.) – Director and Lead Instructor. 1989 - 2005.

April 1989: *Jurisdictional Delineation of Wetlands in the Southeastern US*. Mobile, Alabama.

May 1989: *Jurisdictional Delineation of Wetlands in the Mid-Atlantic States*. New Brunswick, New Jersey.

July 1989: *Best Management Approaches for Silviculture in Non-Tidal Wetlands of Maryland*. Salisbury, Maryland. Taught in cooperation with the Maryland Department of Natural Resources, Maryland Forest, Park & Wildlife Service, and Society of American Foresters.

August - November 1989: *Jurisdictional Delineation of Wetlands in the Chesapeake Bay Region* (Seven 1-week courses offered in cooperation with US EPA Region III, the US Army Corps of Engineers, US Fish And Wildlife Service, and US Soil Conservation Service - Federal Ad Hoc Wetlands Group - Chesapeake Bay Program) - Harrisburg, PA; State College PA; Pittsburgh, PA; Annapolis, MD; Easton, MD; Laurel, MD; Richmond, VA.

May 1990. *Jurisdictional Delineation of Wetlands in The Mid-Atlantic States*. Annapolis, Maryland.

May 1990. *Jurisdictional Delineation of Wetlands in Pennsylvania*. State College, Pennsylvania.

June 1990. *Jurisdictional Delineation of Wetlands in the Pacific Northwest*. Seattle, Washington.

August 1990. *Jurisdictional Delineation of Wetlands in the Southeastern United States*. Charlotte, NC.

August 1990. *Jurisdictional Delineation of Wetlands in the American West*. Reno, Nevada.

May 1991. *Jurisdictional Delineation of Wetlands in the Pacific Northwest*. Seattle, Washington.



November 1991. *Jurisdictional Delineation of Wetlands in the Pacific Northwest*. Course taught for King County Building and Land Development), Seattle, Washington.

October 1991. *Restoration and Construction of Wetlands for Storm Water Management in the Pacific Northwest*. Seattle, Washington.

February 1992. Beyond WET: *Functional Assessment of Wetlands in the Southeastern US*. Course taught in cooperation with US EPA, Region IV. Atlanta, Georgia.

April 1992. *An Overview of Jurisdictional Delineation of Waters of the U.S., Including Wetlands on National Forests*. Course taught for the US Forest Service National Hydrology Workshop, Phoenix, Arizona.

June 1992. *Jurisdictional Delineation of Wetlands in the State of Minnesota*. Course taught in cooperation with the State of Minnesota and U.S, EPA Region V. Minneapolis, MN.

July 1992. *Jurisdictional Delineation of Wetlands in the State of Minnesota*. Course taught in cooperation with the State of Minnesota and U.S, EPA Region V. Bemidji, MN.

July 1992. *Jurisdictional Delineation of Wetlands in the State of Minnesota*. Course taught in cooperation with the State of Minnesota and U.S, EPA Region V), Alexandria, MN.

February 1993. *Jurisdictional Delineation of Wetlands in American Samoa*. Course taught in cooperation with the Government of Samoa and EPA Region IX. Pago Pago, American Samoa.

March 1993. *Jurisdictional Delineation of Wetlands in the American West*. Course taught in cooperation with American Fisheries Society. San Francisco, CA.

August 1993. *Advanced Jurisdictional Delineation of Wetlands in Michigan*. Course taught in cooperation with Michigan Department of Natural Resources and Michigan State University and US EPA, Region V. Kellogg Biological Station, Michigan.

August 1994. *Jurisdictional Delineation of Wetlands in Guam*. Course taught in cooperation with EPA Region IX. Guam and Republic of Palau.

October 1994. *The Hydrogeomorphic Approach to Functional Assessment of Wetlands in the Mid-Atlantic States, Annapolis, Maryland*. Course taught in cooperation with US EPA, Region III and the Smithsonian Environmental Research Laboratory.

November 1994. *The Hydrogeomorphic Approach to Functional Assessment of Wetlands in the Santa Margarita Watershed, San Diego, California*. Course taught in cooperation with US EPA, Region IX.

July 1995. *Jurisdictional Delineation of Wetlands in the Caribbean, San Juan, Puerto Rico*. Course taught in cooperation with US EPA Region II and Puerto Rico Department of Natural Resources. San Juan, Puerto Rico

August 1995. *The Hydrogeomorphic Approach to Functional Assessment of Wetlands in the Pacific Northwest*. Course taught in cooperation with Natural Resource Conservation Service Wetlands Institute. Seattle, Washington.



September 1995. *The Hydrogeomorphic Approach to Functional Assessment of Wetlands in the Mid-Atlantic States*. Course taught in cooperation with the Natural Resource Conservation Service Wetlands Institute. Annapolis, Maryland.

April 1996. *The Hydrogeomorphic Approach to Functional Assessment of Wetlands of the Central California Coast*. Course taught in cooperation with Natural Resource Conservation Service Wetlands Institute. San Francisco, California.

May 1996. *The Hydrogeomorphic Approach to Functional Assessment of Wetlands in Alaska*, Course taught in cooperation with the State of Alaska Department of Environmental Conservation and US EPA, Region X. Fairbanks, Alaska.

March 1997. *The Hydrogeomorphic Approach to Functional Assessment of Wetlands in the Kenai River Watershed*. Course taught in cooperation with the State of Alaska Department of Environmental Conservation and US EPA, Region X. Soldotna, Alaska.

May 1997. *The Hydrogeomorphic Approach to Functional Assessment of Wetlands in the Prairie Pothole Region*. Course taught in cooperation with the Natural Resource Conservation Service, Wetlands Institute, Washington, DC. Jamestown, North Dakota.

May 1999. *The Hydrogeomorphic Approach to Functional Assessment of Wetlands in Interior Alaska*. Course taught in cooperation with the State of Alaska Department of Environmental Conservation and US EPA, Region X.

December 2001. *The Hydrogeomorphic Approach to Functional Assessment of Riverine Waters/Wetlands in the South Coast Region of Santa Barbara County, California*. Course taught in cooperation with Santa Barbara County Flood Control & Water Conservation District, Santa Barbara County Water Agency and US EPA, Region IX. Santa Barbara, California.

November 7 – 9, 2005: *Growing Wetlands – Advances in Wetland Conservation and Restoration Workshop*. Invited by the Botanic Garden & Parks Authority, Kings Park & Botanic Garden to develop and teach a workshop on wetland ecosystem restoration. **L. C. Lee** & P. L. Fiedler, instructors. Western Australia Ecology Center, Perth, Western Australia

Program director and lead instructor for the U.S. Environmental Protection Agency Headquarters Office of Wetlands Protection, "National Wetlands Training Program". National 1-week field-based training courses offered by the Office of Wetlands Protection, U.S. Environmental Protection Agency, Washington, D.C. 1987 – 1989.

June 1987. *Jurisdictional Delineation of Wetlands and Riparian Ecosystems in the American West*. Reno, Nevada.

July 1987. *Functional Assessment of Bottomland Hardwood Ecosystems in the Southeastern United States: Introduction to the "Bottomland Hardwood Wetland Evaluation Technique" and "Cumulative Impact Assessment in Bottomland Hardwood Forests."* Charleston, South Carolina.

October 1987. *Jurisdictional Delineation of Wetlands in the Southeastern United States*. University of Georgia Marine Institute, Sapelo Island, Georgia.

November 1987. *Functional Assessment of Wetland and Riparian Ecosystems in the American West*. Ft. Collins, Colorado.



March 1988. *Jurisdictional Delineation of Wetland and Riparian Ecosystems in the Southwestern United States*. Tucson, Arizona.

May 1988. *Jurisdictional Delineation of Wetlands in the State of New Jersey*. East Hanover, New Jersey.

June 1988. *Jurisdictional Delineation of Wetlands in the Mid-Atlantic States*. New Brunswick, New Jersey. (Private Sector Only)

August 1988. *Jurisdictional Delineation of Wetlands in the State Of Virginia*. Virginia Institute of Marine Science, Gloucester Point, Virginia.

August 1988. *Functional Assessment of Wetlands in the Southeastern US: The National And Bottomland Hardwood Wetland Evaluation Techniques*. Galveston, Texas.

September 1988. *Jurisdictional Delineation of Wetlands in the North-Central US*. Kellogg Biological Station, Hickory Corners, Michigan.

October 1988. *Best Management Approaches for Silviculture in Southeastern Forested Wetlands*. Savannah, Georgia.

October 1988. *Cumulative Impact Assessment in Southeastern Wetland Ecosystems: The Pearl River*. Slidell, Louisiana.

SMP MAPPING UPDATES

SMP MAPPING UPDATES

The purpose of this document is to provide detailed justification and provide background information for the changes to the City’s Shoreline Master Plan (SMP) maps that are proposed as part of the City’s 2021 SMP update. This document is intended to be used in conjunction with a GIS story map created to illustrate the different sets of data and information used when making the below-listed changes to the SMP maps.

The GIS story map can be accessed by navigating to the following page. The first two tabs on this page contain the 2021 and 2011 SMP maps. The additional tabs display supplemental data used to update the 2021 SMP maps. For each of the tabs the 2021 designations are displayed as outlines to better display how supplemental data helped form the environmental designations.

<https://mountvernonwa.maps.arcgis.com/apps/MapSeries/index.html?appid=f5341392c70f4a80a0598a7c4bee7d1e>

DESCRIPTION OF CHANGES ON FIGURE 2

A new levee was constructed on the north side of Hoag Road that is now identified. Several properties surrounding this levee are now shown as subject to shoreline jurisdiction. Evaluating the properties identified in **Area #1** consisted of inventorying existing waterbodies (Skagit River, Lindegrin Creek, and prior delineated wetlands), existing hydraulic characteristics with lidar and topographic maps, existing zoning designations, floodplain designations, and development potential.

Below is a table containing the inventory information for the properties identified in **Area #1**. The information summarized in this table is the justification for the Proposed Environmental Designations listed in the far-right column.

AREA AND TAX PARCEL	EXISTING CONDITIONS INFO.	EXISTING ZONING	FLOOD-PLAIN DESIGNATION	DEVELOPMENT POTENTIAL	PROPOSED ENV. DESIGNATION
Area #1 Ptn. of P24187	Developed with an existing single-family residential home, accessory structure, and associated amenities (i.e. landscaping and driveways)	Single-Family Residential (R-1, 4.0)	A1 City designated floodway and C	Additional accessory development associated with the existing home and with a subdivision additional residential lots are possible	Residential – Potential Wetland Connection
Area #1 Ptn. of P24186	Vacant - part of the Nookachamps Wetland Bank	Public	A-1	Little other than as a wetland mitigation bank	Natural – Potential Wetland Connection
Area #1 Ptn. of P111844	Vacant - part of the Nookachamps Wetland Bank	Residential Agricultural (R-A)	A-1	Little other than as a wetland mitigation bank	Natural – Potential Wetland Connection

AREA AND TAX PARCEL	EXISTING CONDITIONS INFO.	EXISTING ZONING	FLOOD-PLAIN DESIGNATION	DEVELOPMENT POTENTIAL	PROPOSED ENV. DESIGNATION
Area #1 Ptn. P83106	Multi-family Family structure with four units	Multi-family Residential (R-3)	C	Additional residential accessory uses possible	Residential
Area #1 P82041	Multi-family Family structure with three units	Duplex and Townhome (R-2)	C	Additional residential accessory uses possible	Residential
Area #1 P82043	Existing Single-Family residential home	Single-Family Residential (R-1, 4.0)	C	Additional residential accessory uses possible	Residential
Area #1 P82051	Existing Single-Family residential home	Single-Family Residential (R-1, 4.0)	A-1 and C	Additional residential accessory uses possible	Residential
Area #1 P25867	Vacant	Single-Family Residential (R-1, 4.0)	A-1 and C	Development of a single-family residential home and residential accessory structures possible	Residential
Area #1 P25866	Existing sewer pump station owned by the City	Single-Family Residential (R-1, 4.0)	C	Possible expansion of existing utility infrastructure possible	Residential
Area #1 P83236	Existing Single-Family residential home	Single-Family Residential (R-1, 4.0)	A-1 and C	Additional residential accessory uses possible	Residential
Area #1 P80780	Existing Single-Family residential home	Single-Family Residential (R-1, 4.0)	A-1 and C	Additional residential accessory uses possible	Residential
Area #1 P80767	Existing Single-Family residential home	Single-Family Residential (R-1, 4.0)	C	Additional residential accessory uses possible	Residential
Area #1 P80766	Existing Single-Family residential home	Single-Family Residential (R-1, 4.0)	C	Additional residential accessory uses possible	Residential
Area #1 P80765	Existing Single-Family residential home	Single-Family Residential (R-1, 4.0)	C	Additional residential accessory uses possible	Residential
Area #1 P80768	Existing Single-Family residential home	Single-Family Residential (R-1, 4.0)	C	Additional residential accessory uses possible	Residential
Area #1 P80779	Existing Single-Family residential home	Single-Family Residential (R-1, 4.0)	C	Additional residential accessory uses possible	Residential
Area #1 P82042	Existing Single-Family residential home	Single-Family Residential (R-1, 4.0)	C	Additional residential accessory uses possible	Residential
Area #1 P82044	Existing Single-Family residential home	Single-Family Residential (R-1, 4.0)	C	Additional residential accessory uses possible	Residential

AREA AND TAX PARCEL	EXISTING CONDITIONS INFO.	EXISTING ZONING	FLOOD-PLAIN DESIGNA-TION	DEVELOPMENT POTENTIAL	PROPOSED ENV. DESIGNATION
Area #1 P82052	Existing Single-Family residential home	Single-Family Residential (R-1, 4.0)	C	Additional residential accessory uses possible	Residential
Area #1 P83237	Existing Single-Family residential home	Single-Family Residential (R-1, 4.0)	A-1 and B and C	Additional residential accessory uses possible	Residential
Area #1 P83238	Vacant	Single-Family Residential (R-1, 4.0)	A-1 and C	Development of a single-family residential home and residential accessory structures possible	Residential
Area #1 P99554	Existing Single-Family residential home	Residential Agricultural (R-A)	C	Additional residential accessory uses possible	Residential
Area #1 P99555	Existing Single-Family residential home	Residential Agricultural (R-A)	C	Additional residential accessory uses possible	Residential

DESCRIPTION OF ADDITIONAL CHANGES ON FIGURE 2

Areas within the City limits east of the Skagit River have been found to have wetlands that are influenced by the Skagit River. See the accompanying Technical Memo from the City Biologist, Dr. Lyndon Lee, that contains his findings regarding tax parcel P24350 located within **Area #2**. Dr. Lee’s Technical memo used the criterion outlined under WAC 173-22-040 finding that on-site wetlands are influenced by the Skagit River and therefore are subject to shoreline jurisdiction.

Once the City was aware of shoreline jurisdiction extending onto tax parcel P24350 staff evaluated nearby areas to determine if these areas could also potentially also be subject to shoreline jurisdiction. Evaluating the properties identified in **Area #2** consisted of inventorying existing waterbodies (Skagit River, Lindegrin Creek, and prior delineated wetlands), existing hydraulic characteristics with lidar and topographic maps, existing zoning designations, floodplain designations, and development potential.

Below is a table containing the inventory information for the properties identified in **Area #2**. The information summarized in this table is the justification for the Proposed Environmental Designations listed in the far-right column.

AREA AND TAX PARCEL	EXISTING CONDITIONS INFO.	EXISTING ZONING	FLOOD-PLAIN DESIGNATION	DEVELOPMENT POTENTIAL	PROPOSED ENV. DESIGNATION
Area #2 Ptn. of P111844	Vacant - part of the Nookachamps Wetland Bank	Residential Agricultural (R-A)	A-1, City designated floodway	Little other than as a wetland mitigation bank	Natural – Potential Wetland Connection
Area #2 Ptn. of P24135	Same as Above	Same as Above	Same as Above	Same as Above	Same as Above
Area #2 Ptn. of P24133	Same as Above	Same as Above	Same as Above	Same as Above	Same as Above
Area #2 P24368	Same as Above	Same as Above	Same as Above	Same as Above	Same as Above
Area #2 P24366	Same as Above	Same as Above	Same as Above	Same as Above	Same as Above
Area #2 Ptn. P24132	Same as Above	Same as Above	Same as Above	Same as Above	Same as Above
Area #2 Ptn. P24123	Same as Above	Same as Above	Same as Above	Same as Above	Same as Above
Area #2 Ptn. P23532	Same as Above	Same as Above	Same as Above	Same as Above	Same as Above
Area #2 Ptn. P23501	Same as Above	Same as Above	Same as Above	Same as Above	Same as Above
Area #2 Ptn. P23499	Same as Above	Same as Above	Same as Above	Same as Above	Same as Above
Area #2 P24379	Vacant, 6,900± s.f. shaped as a triangle with its widest portion being 72± feet wide	Single-Family Residential (R-1, 4.0)	A-1 and C	Little potential for a single-family home, this parcel could be aggregated with an abutting parcel or could have an accessory use placed on it	Residential
Area #2 P24293	Vacant	Residential Agricultural (R-A)	A1	Little potential for development of intense residential uses as this entire parcel is located in a zone A1 – floodway. Residential accessory uses might be possible	Residential
Area #2 P24365	Vacant	Residential Agricultural (R-A)	A1	Little potential for development of intense residential uses as this entire parcel is located in a zone A1 – floodway. Residential accessory uses might be possible	Residential
Area #2 P116052	Existing YMCA Facility	Public	A1 and C	Additional commercial development possible	Urban Mixed Use – Potential Wetland Connection

AREA AND TAX PARCEL	EXISTING CONDITIONS INFO.	EXISTING ZONING	FLOOD-PLAIN DESIGNATION	DEVELOPMENT POTENTIAL	PROPOSED ENV. DESIGNATION
Area #2 P119634	Existing Salem Village Retirement Community with multi-family units and associated amenities	Multi-family Residential (R-4)	A1 and C	Additional multi-family development possible	Residential – Potential Wetland Connection
Area #2 P111843	Same as Above	Same as Above	Same as Above	Same as Above	Same as Above
Area #2 P112213	Same as Above	Same as Above	Same as Above	Same as Above	Same as Above
Area #2 P24223	Vacant Property	Single-Family Residential (R-1, 4.0)	A1 and C	Development of single-family home possible	Residential – Potential Wetland Connection
Area #2 P24221	Developed with a Single-family residential home	Single-Family Residential (R-1, 4.0)	A1 and C	Development of single-family accessory structure and amenities possible.	Residential – Potential Wetland Connection
Area #2 P24378	Vacant Property	R-A	A1 and C	Development of single-family home possible	Residential – Potential Wetland Connection
Area #2 P24395	Vacant Property	R-A	A1	Development of single-family home unlikely but possible	Residential – Potential Wetland Connection
Area #2 P24367	Developed with a Single-family residential home	R-A	A1 and C	Development of additional single-family accessory structure and amenities possible.	Residential – Potential Wetland Connection
Area #2 P24370	Developed with a Single-family residential home	R-A	A1 and C	Development of additional single-family accessory structure and amenities possible.	Residential – Potential Wetland Connection
Area #2 P24373	Developed with a Single-family residential home	R-A	A1 and C	Development of additional single-family accessory structure and amenities possible.	Residential – Potential Wetland Connection
Area #2 P24364	Developed with a Single-family residential home	R-A	A1 and C	Development of additional single-family accessory structure and amenities possible.	Residential – Potential Wetland Connection
Area #2 P122829	Development with a trail, benches, and other amenities for the North Hill development this parcel is part of	Single-Family Residential (R-1, 4.0)	A1 and C	Development of additional single-family accessory structure and amenities possible.	Residential – Potential Wetland Connection
Area #2 P24352	Vacant	Single-Family Residential (R-1, 4.0)	A1	Property could be aggregated with property abutting its east boundary and could be developed with single-family residential uses.	Residential – Potential Wetland Connection

Area #2 P24355	Developed with a Single-family residential home	Single-Family Residential (R-1, 4.0)	A1 and C	Development of additional single-family accessory structures, amenities, and new dwelling units with a subdivision possible.	Residential – Potential Wetland Connection
Area #2 P24350	Vacant	Single-Family Residential (R-1, 4.0)	A1 and C	Development of new dwelling units with a subdivision possible.	Residential – Potential Wetland Connection

The environmental designations for these areas are with hatching because these areas will be subject to shoreline jurisdiction only if: (1) wetlands are identified on these parcels; and (2) these wetlands are found to either influence or be influenced by the Skagit River. As indicated above, this criterion was used because it is what is prescribed under WAC 173-22-040.

The parcels in **Area #2** have been added to the SMP map because there is a potential for these areas to have existing wetlands that could influence or be influenced by the Skagit River.

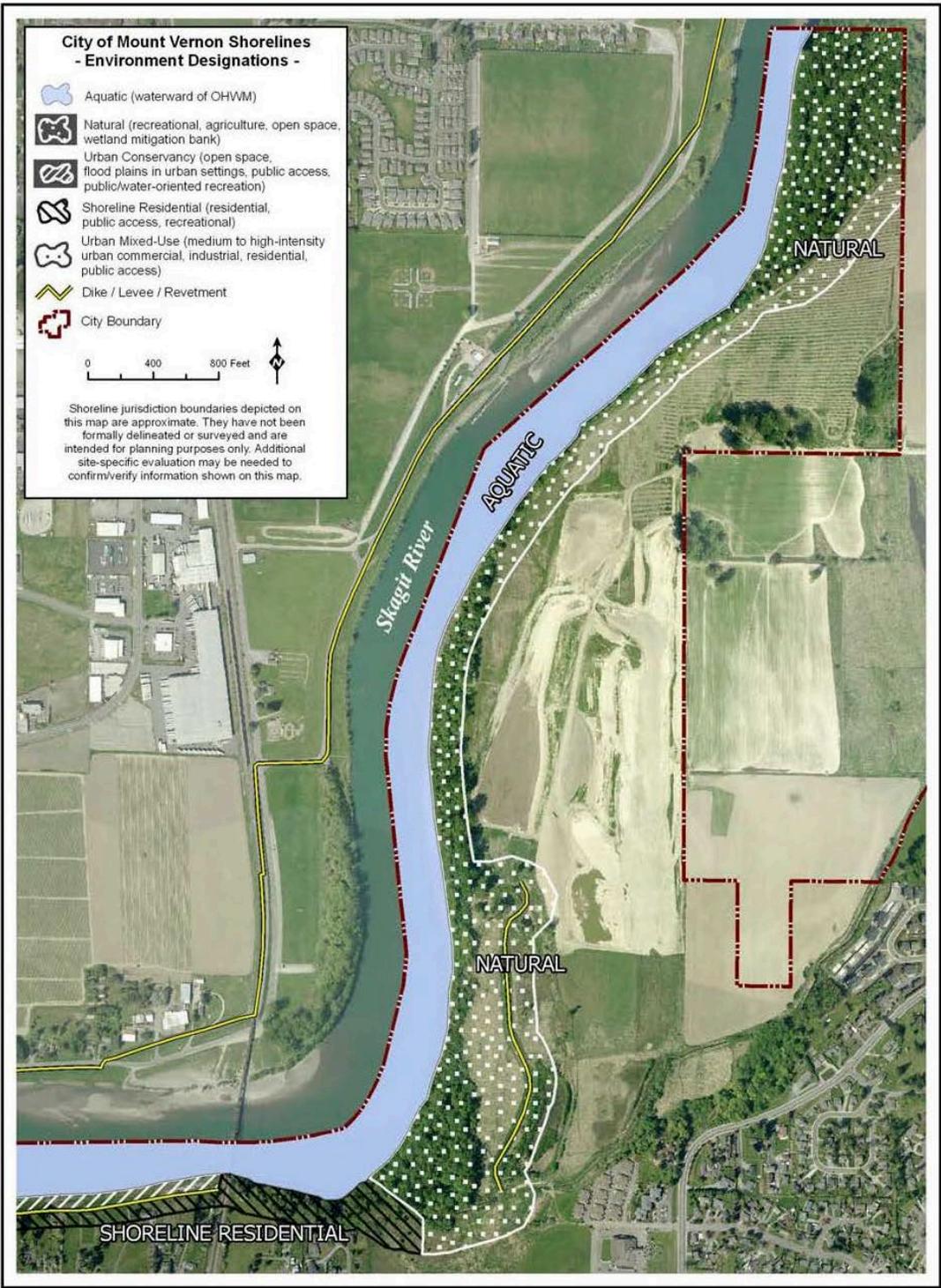
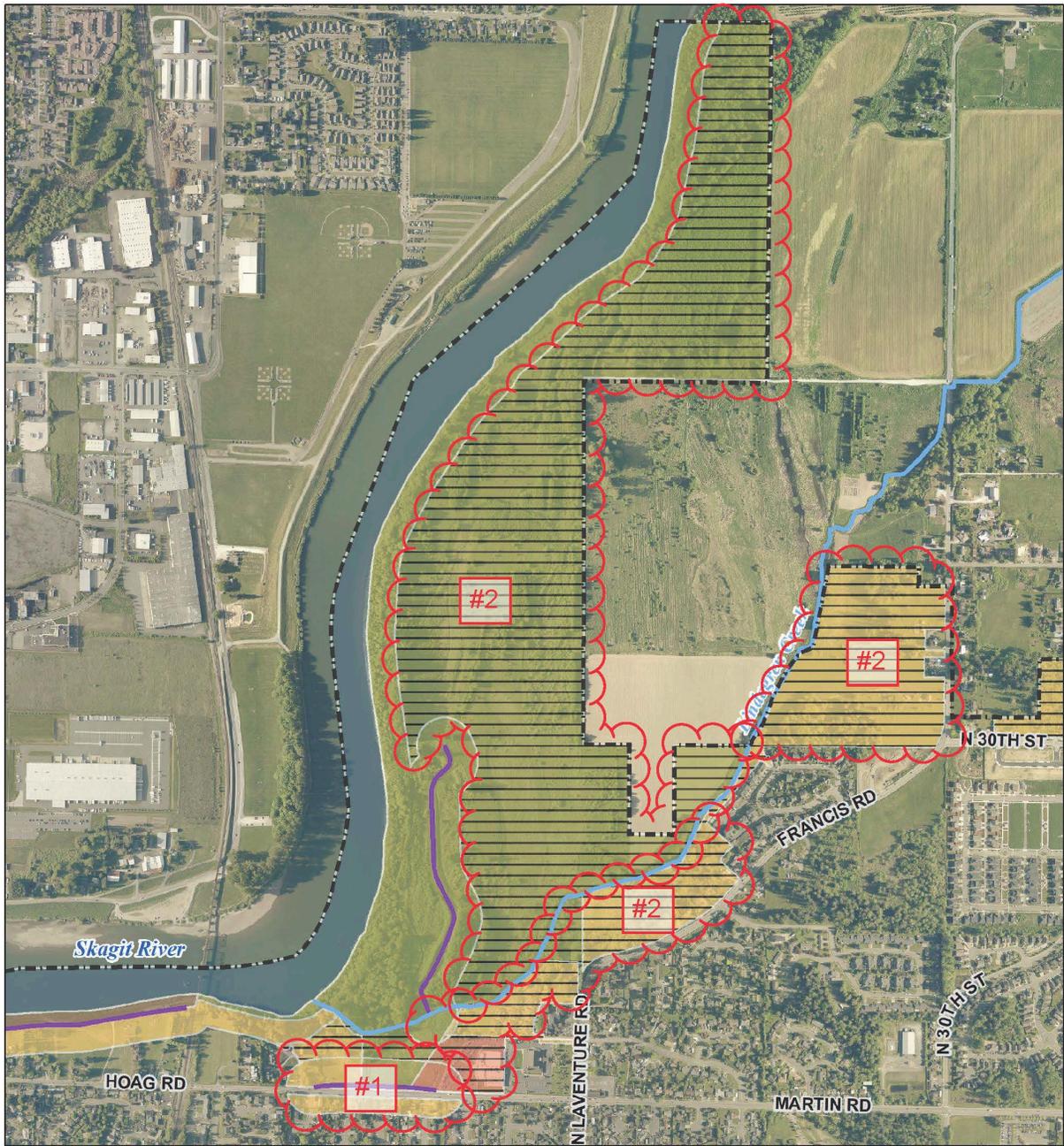


Figure 2 Northeast Mount Vernon Environmental Designations

FIGURE 2 FROM THE CITY'S 2011 SMP



Environmental Designations

- | | | |
|--|---|--------------------------|
| Aquatic (waterward of OHWM) | Urban Conservancy (open space, flood plains in urban settings, public access, public/water-oriented recreation) | Dike / Levee / Revetment |
| Natural (recreational, agriculture, open space, wetland mitigation bank) | Urban Mixed-Use (medium to high-intensity urban commercial, industrial, residential, public access) | Floodwall |
| Natural - Potential Wetland Connection | Urban Mixed-Use - Potential Wetland Connection | Lindegren Creek |
| Shoreline Residential (residential, public access, recreational) | | City Boundary |
| Shoreline Residential - Potential Wetland Connection | | |

Shoreline jurisdiction boundaries depicted on this map are approximate. They have not been formally delineated or surveyed and are intended for planning purposes only. Additional site-specific evaluation may be needed to confirm/verify information shown on this map.



UPDATED FIGURE 2 IN THE CITY'S 2021 SMP

DESCRIPTION OF CHANGES ON FIGURE 3 IN 2011 SMP

Figure 3 in the 2011 SMP became **Figure 4**. **Figure 3** in the 2021 update is a new map all together.

The new **Figure 3** contains areas not included in the 2011 SMP. Areas shown on **Figure 3** were evaluated because of the wetlands identified on tax parcel P24350 that are influenced by the Skagit River. See the accompanying Technical Memo from the City Biologist, Dr. Lyndon Lee, that contains his findings regarding tax parcel P24350 located within **Area #2**. Dr. Lee's Technical memo used the criterion outlined under WAC 173-22-040 finding that on-site wetlands are influenced by the Skagit River and therefore are subject to shoreline jurisdiction.

Once the City was aware of shoreline jurisdiction extending onto tax parcel P24350 staff evaluated nearby areas to determine if these areas could also potentially also be subject to shoreline jurisdiction. Evaluating the properties identified in **Area #2** consisted of inventorying existing waterbodies (Skagit River, Lindegrin Creek, and prior delineated wetlands), existing hydraulic characteristics with lidar and topographic maps, existing zoning designations, floodplain designations, and development potential. In addition to the Skagit River and Lindegrin Creek staff evaluated Barney Lake, located outside of the City limits, as one of the waterbodies that could influence on-site wetlands.

Below is a table containing the inventory information for the properties identified in **Area #2**. The information summarized in this table is the justification for the Proposed Environmental Designations listed in the far-right column.

AREA AND TAX PARCEL	EXISTING CONDITIONS INFO.	EXISTING ZONING	FLOOD-PLAIN DESIGNATION	DEVELOPMENT POTENTIAL	PROPOSED ENV. DESIGNATION
P124125	Vacant – future phase of the Highland Greens Development	Single-family Residential (R-1, 5.0)	C	A subdivision could be completed and this property could be developed with single-family residential lots	Residential – Potential Wetland Connection
P24341	Existing Single-family residential structure and outbuildings	Single-family Residential (R-1, 3.0)	C	A subdivision could be completed and this property could be developed with single-family residential lots	Residential – Potential Wetland Connection
P24340	Existing Single-family residential structure and outbuildings	Single-family Residential (R-1, 3.0)	C	A subdivision could be completed and this property could be developed with single-family residential lots	Residential – Potential Wetland Connection
P128006	Vacant property	Single-family Residential (R-1, 3.0)	C	A subdivision could be completed and this property could be developed with single-family residential lots	Residential – Potential Wetland Connection
P127981	Two multi-family structures with a total of six dwelling units.	Single-family Residential (R-1, 5.0) PUD	C	This property could be developed with additional multi-family residential units	Residential – Potential Wetland Connection
P127974	One multi-family structure with a total of three dwelling units.	Single-family Residential (R-1, 5.0) PUD	C	This property could be developed with additional residential accessory uses	Residential – Potential Wetland Connection

AREA AND TAX PARCEL	EXISTING CONDITIONS INFO.	EXISTING ZONING	FLOOD-PLAIN DESIGNATION	DEVELOPMENT POTENTIAL	PROPOSED ENV. DESIGNATION
P128001	Road serving the surrounding multi-family residential structures	Single-family Residential (R-1, 5.0) PUD	C	Unlikely any additional development will occur	Residential – Potential Wetland Connection
P128002	Two multi-family structures with a total of six dwelling units.	Single-family Residential (R-1, 5.0) PUD	C	This property could be developed with additional multi-family residential units	Residential – Potential Wetland Connection
P127999	One multi-family structure with a total of three dwelling units.	Single-family Residential (R-1, 5.0) PUD	C	This property could be developed with additional residential accessory uses	Residential – Potential Wetland Connection
P127997	One multi-family structure with a total of three dwelling units.	Single-family Residential (R-1, 5.0) PUD	C	This property could be developed with additional residential accessory uses	Residential – Potential Wetland Connection
P127994	One multi-family structure with a total of three dwelling units.	Single-family Residential (R-1, 5.0) PUD	C	This property could be developed with additional residential accessory uses	Residential – Potential Wetland Connection
P127497	Existing NGPA area developed as part of the Highland Greens development	Single-family Residential (R-1, 5.0) PUD	C	Unlikely any additional development will occur	Residential – Potential Wetland Connection
P127494	Multi-family structure with 30+ multi-family units, parking lot, landscaping and other residential amenities	Single-family Residential (R-1, 5.0) PUD	C	This property could be developed with additional residential accessory uses	Residential – Potential Wetland Connection
P127495	Existing clubhouse constructed as part of the Highland Green subdivision, parking, and landscaping	Single-family Residential (R-1, 5.0) PUD	C	Unlikely any additional development will occur	Residential – Potential Wetland Connection
P127496	Existing stormwater facility constructed to clean and attenuate stormwater from the Highland Greens development	Single-family Residential (R-1, 5.0) PUD	C	Unlikely any additional development will occur	Residential – Potential Wetland Connection
P121119	Developed with a Single-family residential home	Single-Family Residential (R-1, 4.0)	C	Development of additional single-family accessory structures, amenities, and new dwelling units with a subdivision possible.	Residential – Potential Wetland Connection
P121120	Developed with a Single-family residential home	Single-Family Residential (R-1, 4.0)	C	Development of additional single-family accessory structures possible.	Residential – Potential Wetland Connection

AREA AND TAX PARCEL	EXISTING CONDITIONS INFO.	EXISTING ZONING	FLOOD-PLAIN DESIGNATION	DEVELOPMENT POTENTIAL	PROPOSED ENV. DESIGNATION
P121121	Same as Above	Same as Above	Same as Above	Same as Above	Same as Above
P121122	Same as Above	Same as Above	Same as Above	Same as Above	Same as Above
P121926	Same as Above	Same as Above	Same as Above	Same as Above	Same as Above
P121927	Same as Above	Same as Above	Same as Above	Same as Above	Same as Above
P121928	Same as Above	Same as Above	Same as Above	Same as Above	Same as Above
P121929	Same as Above	Same as Above	Same as Above	Same as Above	Same as Above
P121155	Vacant property owned by the City that was created as a greenbelt around the Rosewood development	Single-family Residential (R-1, 4.0) PUD	C	Unlikely any additional development will occur	Residential – Potential Wetland Connection
P100823	Developed with a Single-family residential home	Single-Family Residential (R-1, 3.0)	C	Development of additional single-family accessory structures possible.	Residential – Potential Wetland Connection
P100822	Developed with a Single-family residential home	Single-Family Residential (R-1, 3.0)	C	Development of additional single-family accessory structures possible.	Residential – Potential Wetland Connection
P100821	Developed with a Single-family residential home	Single-Family Residential (R-1, 3.0)	C	Development of additional single-family accessory structures possible.	Residential – Potential Wetland Connection
P100820	Developed with a Single-family residential home	Single-Family Residential (R-1, 3.0)	C	Development of additional single-family accessory structures possible.	Residential – Potential Wetland Connection
P24970	Vacant property owned by the Skagit Land Trust	Single-Family Residential (R-1, 4.0)	C	Unlikely any additional development will occur	Natural – Potential Wetland Connection
P24826	Developed with a Single-family residential home	Single-Family Residential (R-1, 4.0)	C and A7	Development of additional single-family accessory structures possible.	Residential – Potential Wetland Connection



Environmental Designations

- | | | |
|--|---|--------------------------|
| Aquatic (waterward of OHWM) | Urban Conservancy (open space, flood plains in urban settings, public access, public/water-oriented recreation) | Dike / Levee / Revetment |
| Natural (recreational, agriculture, open space, wetland mitigation bank) | Urban Mixed-Use (medium to high-intensity urban commercial, industrial, residential, public access) | Floodwall |
| Natural - Potential Wetland Connection | Urban Mixed-Use - Potential Wetland Connection | Lindegren Creek |
| Shoreline Residential (residential, public access, recreational) | | City Boundary |
| Shoreline Residential - Potential Wetland Connection | | |

Shoreline jurisdiction boundaries depicted on this map are approximate. They have not been formally delineated or surveyed and are intended for planning purposes only. Additional site-specific evaluation may be needed to confirm/verify information shown on this map.



NEW FIGURE 3 ADDED TO THE CITY'S 2021 SMP

DESCRIPTION OF CHANGES ON FIGURE 3 IN 2011 SMP

Figure 3 in the 2011 SMP became **Figure 4**.

The new **Figure 4** does not contain any new areas subject to shoreline jurisdiction or any changes to environmental designations. City staff did refine the location of the existing levee using new lidar maps.

F. Urban Conservancy Environment

1. Purpose

The purpose of the Urban Conservancy Environment is to protect and restore ecological functions of open space, floodplain, and other sensitive lands where they exist in developed shoreline settings, while allowing for compatible uses and public access.

2. Designation Criteria

The Urban Conservancy environmental designation has been assigned to those shorelines where the levees are set back significant distance upland from the river's edge, creating open space within the floodplain. The Urban Conservancy Environment has the following characteristics:

- a. Existing open space within the floodplain;
- b. Existing and/or restored shoreline habitat;
- c. Potential for additional restoration; or
- d. Existing or potential for water-related recreation and public access.

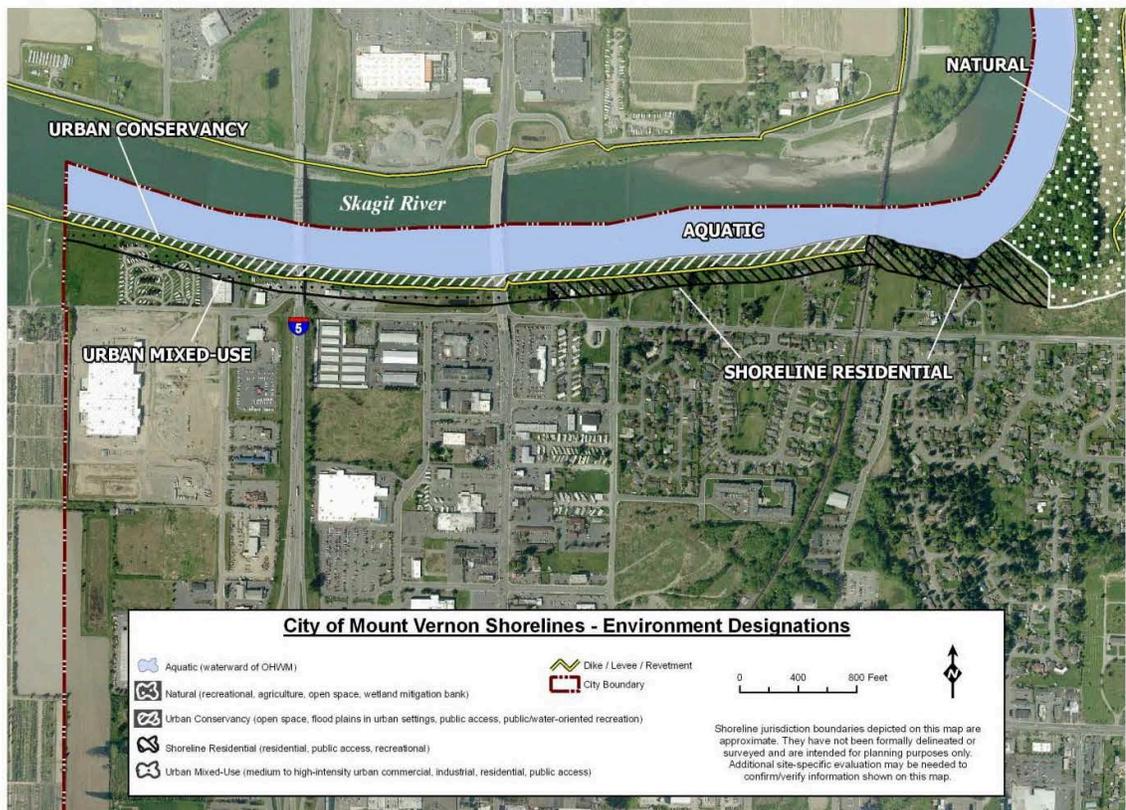
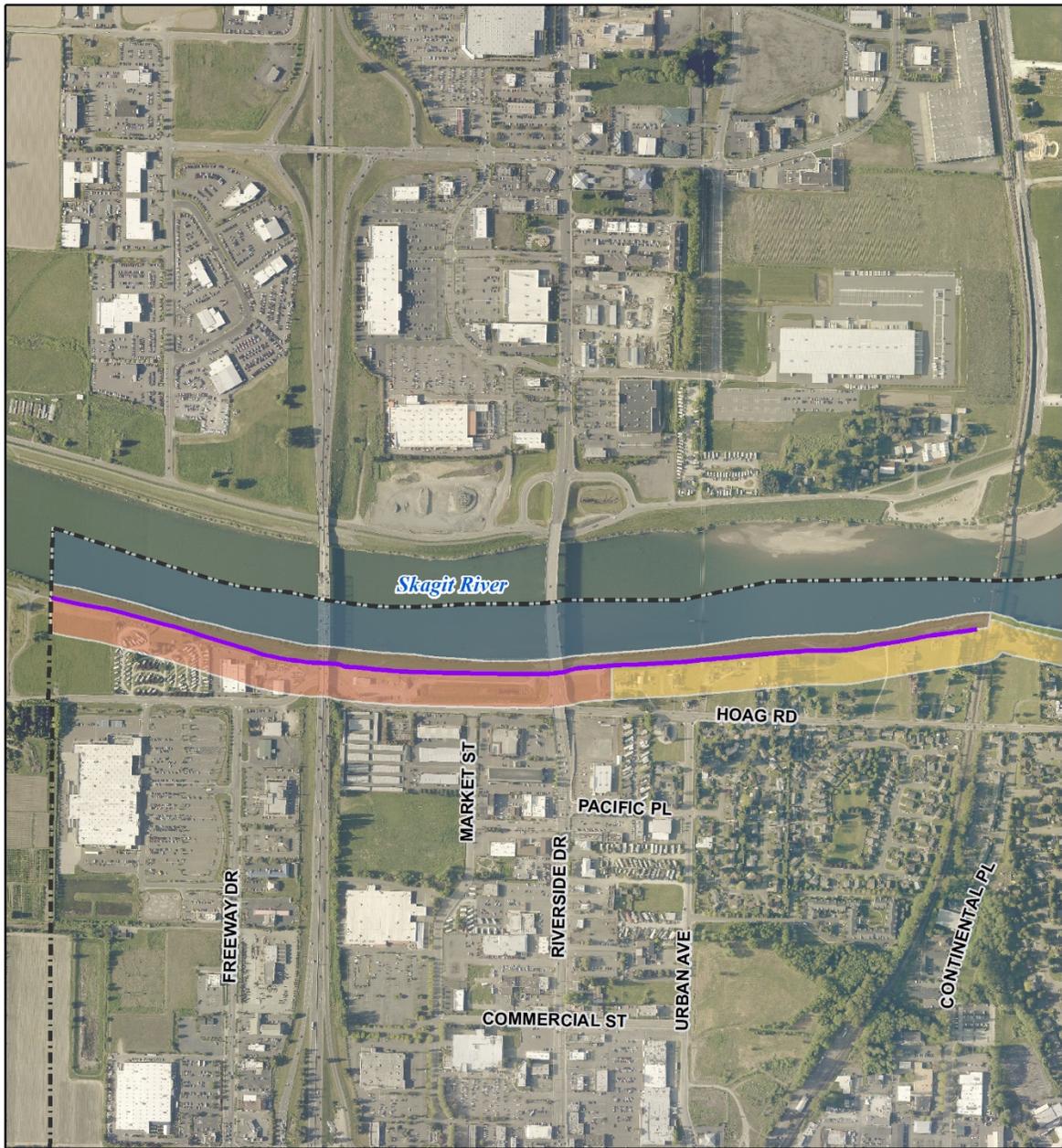


Figure 3 North Mount Vernon Environmental Designations

FIGURE 3 FROM THE CITY'S 2011 SMP – THIS BECAME FIGURE 4



Environmental Designations

- | | | |
|--|---|--|
|  Aquatic (waterward of OHWM) |  Urban Conservancy (open space, flood plains in urban settings, public access, public/water-oriented recreation) |  Dike / Levee / Revetment |
|  Natural (recreational, agriculture, open space, wetland mitigation bank) |  Urban Mixed-Use (medium to high-intensity urban commercial, industrial, residential, public access) |  Floodwall |
|  Natural - Potential Wetland Connection |  Urban Mixed-Use - Potential Wetland Connection |  City Boundary |
|  Shoreline Residential (residential, public access, recreational) | | |
|  Shoreline Residential - Potential Wetland Connection | | |

Shoreline jurisdiction boundaries depicted on this map are approximate. They have not been formally delineated or surveyed and are intended for planning purposes only. Additional site-specific evaluation may be needed to confirm/verify information shown on this map.



FIGURE 4 IN 2021 SMP (WAS FIGURE 3 IN THE 2011 SMP) NO CHANGES EXCEPT THE NAME OF THIS FIGURE

DESCRIPTION OF CHANGES ON FIGURE 4 IN 2011 SMP

Figure 4 in the 2011 SMP became Figure 5.

The new Figure 5 contains two changes to areas subject to shoreline jurisdiction and associated environmental designations that are described in detail below.

Sans the below-described changes, staff updated the location of the City's floodwall and existing levees based on as-builts and new lidar maps. This was important to do because following the 2011 SMP update the City constructed new portions of a floodwall to protect our historic downtown.

Area 3 is within and abutting the City's Edgewater Park on the waterward side of the existing levee. There are two parcels that in 2011 were identified as only partially subject to shoreline jurisdiction. These two parcels are P26659 and a large parcel owned by the City that does not have a tax parcel number that contains three ball fields, a stage, a frisbee golf course, bathrooms and a trail that are all amenities with Edgewater Park. The portions of these parcels not previously identified as subject to shoreline jurisdiction are now identified as being Urban Conservancy to match the Urban Conservancy designation they previously abutted up to the waterside of the existing levee.

Area 4 is within and abutting the City's Edgewater Park where the delineation between the Urban Conservancy and Natural environmental designations were updated such that areas used for active recreation are identified as Urban Conservancy and areas passively used are identified as Natural.

Area 5 is on the west bank of the Skagit River, landward of the existing levee two parcels (P26397 and P26391) owned by the Mount Vernon School District that are developed with an elementary school were changed from an environmental designation of Residential to a designation of Urban Mixed Use because these areas are zoned for Public uses, are developed and used as playgrounds for elementary school children and cannot in their existing condition be developed with residential uses.

AREA AND TAX PARCEL	EXISTING CONDITIONS INFO.	EXISTING ZONING	FLOOD-PLAIN DESIG-NATION	DEVELOPMENT POTENTIAL	PROPOSED ENV. DESIGNATION
Area #3 P52843	Existing single-family home with outbuildings	Single-Family Residential (R-1,7.0)	A03	Development of additional single-family accessory structures possible	Residential
Area #3 P52844	Existing single-family home	Single-Family Residential (R-1,7.0)	A03	Development of additional single-family accessory structures possible	Residential
Area #3 P52845	Existing single-family home	Single-Family Residential (R-1,7.0)	A03	Development of additional single-family accessory structures possible	Residential

AREA AND TAX PARCEL	EXISTING CONDITIONS INFO.	EXISTING ZONING	FLOOD-PLAIN DESIGNATION	DEVELOPMENT POTENTIAL	PROPOSED ENV. DESIGNATION
Area #3 P52846	Existing single-family home	Single-Family Residential (R-1,7.0)	A03	Development of additional single-family accessory structures possible	Residential
Area #3 P52847	Existing single-family home	Single-Family Residential (R-1,7.0)	A03	Development of additional single-family accessory structures possible	Residential
Area #3 P52848	Existing single-family accessory building	Single-Family Residential (R-1,7.0)	A03	Development of additional single-family accessory structures possible	Residential
Area #3 P52849	Existing single-family home	Single-Family Residential (R-1,7.0)	A03	Development of additional single-family accessory structures possible	Residential
Area #3 P52851	Existing single-family home	Single-Family Residential (R-1,7.0)	A03	Development of additional single-family accessory structures possible	Residential
Area #3 P52856	Existing single-family home	Single-Family Residential (R-1,7.0)	A03	Development of additional single-family accessory structures possible	Residential

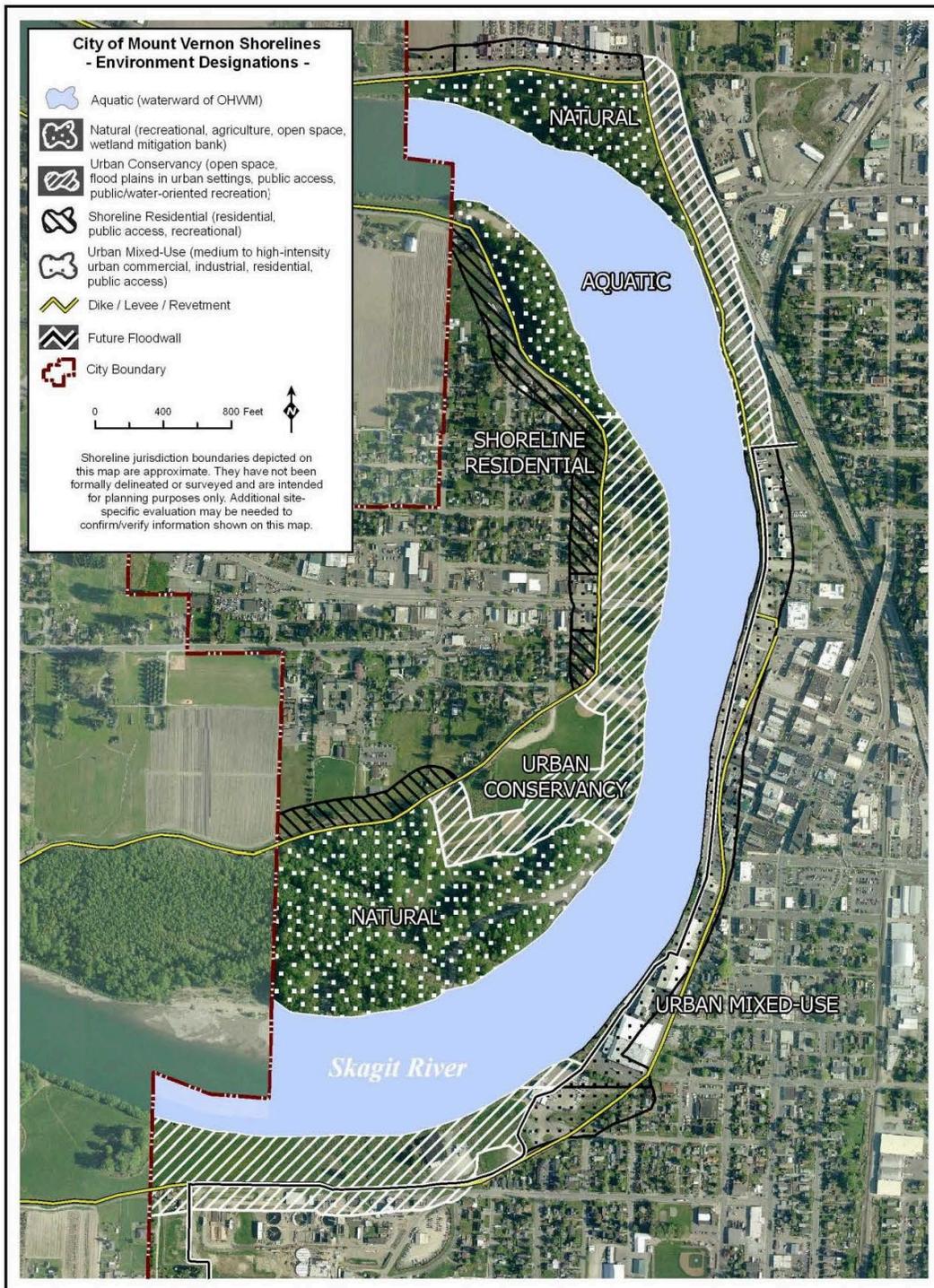
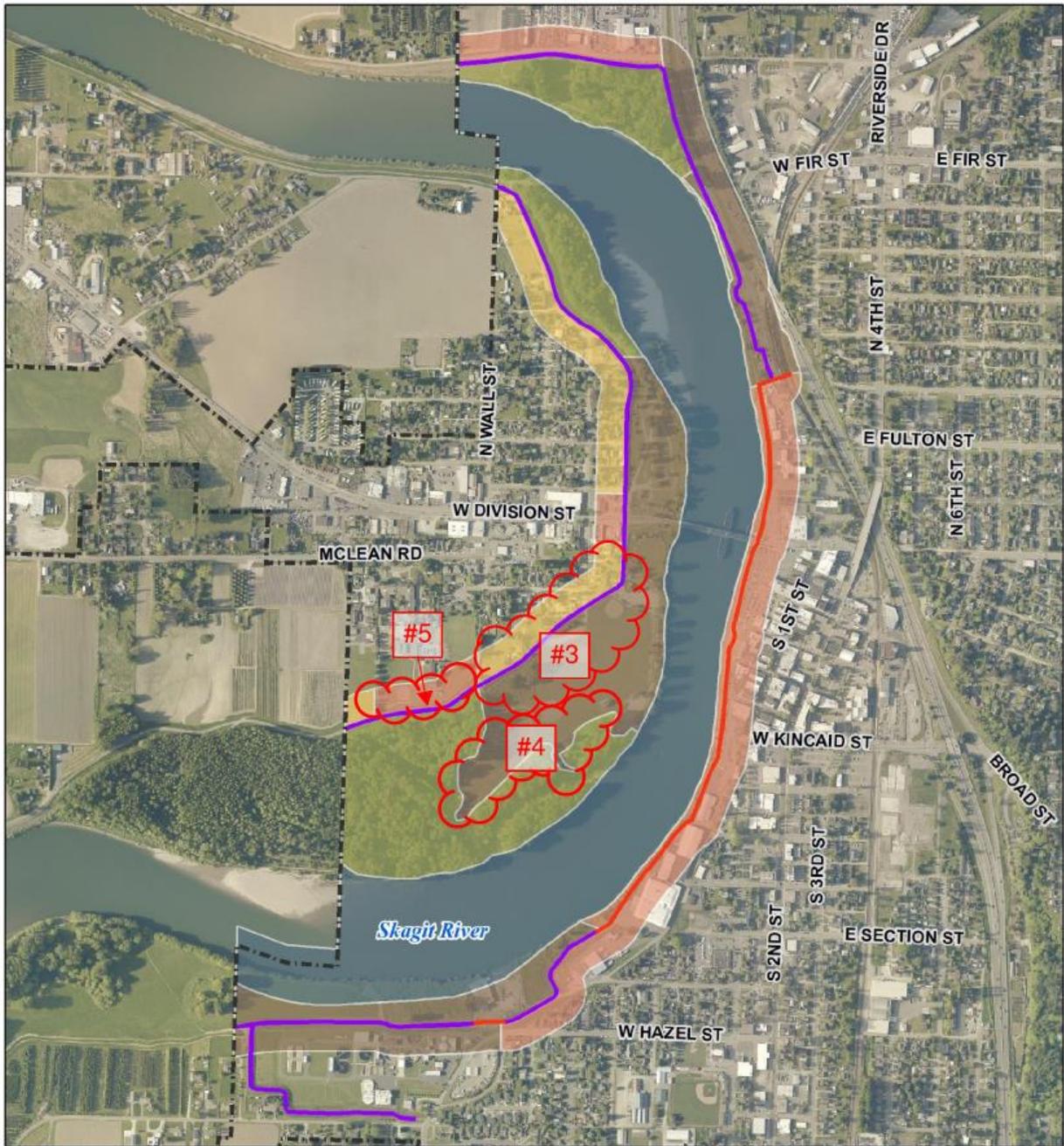


Figure 4 Central Mount Vernon Environmental Designations

FIGURE 4 FROM THE CITY'S 2011 SMP – THIS BECAME FIGURE 5



Environmental Designations

- | | | |
|--|---|--|
|  Aquatic (waterward of OHWM) |  Urban Conservancy (open space, flood plains in urban settings, public access, public/water-oriented recreation) |  Dike / Levee / Revetment |
|  Natural (recreational, agriculture, open space, wetland mitigation bank) |  Urban Mixed-Use (medium to high-intensity urban commercial, industrial, residential, public access) |  Floodwall |
|  Natural - Potential Wetland Connection |  Urban Mixed-Use - Potential Wetland Connection |  City Boundary |
|  Shoreline Residential (residential, public access, recreational) | | |
|  Shoreline Residential - Potential Wetland Connection | | |

Shoreline jurisdiction boundaries depicted on this map are approximate. They have not been formally delineated or surveyed and are intended for planning purposes only. Additional site-specific evaluation may be needed to confirm/verify information shown on this map.



FIGURE 5 IN THE 2021SMP – THIS WAS FIGURE 4 IN THE 2011 SMP