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List of Commonly Used Acronyms and Abbreviations

SMA ---------------------------------------------- Shoreline Management Act
SMP ---------------------------------------------- Shoreline Master Program
City ----------------------------------------------- City of Concrete, Washington
WAC --------------------------------------------- Washington Administrative Code
RCW ----------------------------------------------- Revised Code of Washington
CFS ---------------------------------------------- Cubic Feet Per Second
OHWM ------------------------------------------ Ordinary High Water Mark
FEMA -------------------------------------------- Federal Emergency Management Agency
NFIP --------------------------------------------- National Flood Insurance Program
GMA ---------------------------------------------- Growth Management Act
CARs -------------------------------------------- Critical Area Regulations
SEPA --------------------------------------------- State Environmental Policy Act
WDOE ------------------------------------------- WA State Department of Ecology
WDFW ------------------------------------------ WA State Department of Fish and Wildlife
WDNR ------------------------------------------- WA State Department of Natural Resources
CWA --------------------------------------------- Clean Water Act
NEPA ----------------------------------------------- National Environmental Policy Act
USACE ------------------------------------------ U.S. Army Corps of Engineers
USFWS ------------------------------------------ U.S. Fish and Wildlife Service
NMFS -------------------------------------------- National Marine fisheries Services
ESA ----------------------------------------------- Endangered Species Act
WSR ---------------------------------------------- Wild and Scenic River
1.0 Introduction

1.1 Background and Purpose
The purpose of this report is to document an inventory and characterization of conditions within Shoreline Management Act (SMA) jurisdiction of the City of Concrete, Washington (City). Data was collected during the fall and winter of 2010 and 2011. The report was prepared in the summer of 2011 and amended in December 2011 to reflect comments from City and Washington State Department of Ecology Staff. The report was funded through Shoreline Master Program (SMP) Grant Agreement No. G1000082 administered by the Department of Ecology (Department). The report is based on the guidelines established under Washington Administrative Code (WAC) 173-26 for updating SMPs. The City is scheduled to complete the update process by July 2012. The report incorporates pertinent reasonably available data, plans, studies, inventories, maps and other information listed in Section 8.0 references. The report includes:

- Analysis and characterization of ecosystem wide processes that affect the City’s shorelines;
- Analysis and characterization of shoreline functions;
- Opportunities for protection, restoration, public access and shoreline use; and
- Shoreline management recommendations and policy options for consideration in subsequent phases of the SMP update.

The inventory and characterization documents existing conditions and provides the basis for updating SMP goals, policies and regulations. This report will help the City establish a baseline of shoreline conditions from which a “no net loss” policy will be established. In addition it will analyze functions and values of resources within shoreline jurisdiction and explore opportunities for conservation and restoration of ecological functions. The report also includes a map folio providing visual representations of relevant shoreline features. (Attachment A: Map Folio)

1.2 Shoreline Jurisdiction and Study Area Boundary
Shorelines within the City’s municipal boundaries are limited to areas along the Baker River, Skagit River and Lake Shannon. Streams and lakes which constitute shorelines of the state are defined under WAC 173-18-040 and 173-20-030 as:

"Western Washington. Streams in Western Washington from the point at which the stream reaches a mean annual flow of twenty cubic feet per second down to the mouth of said stream or river...”

"Lakes" means all the surface water areas of the state, including reservoirs; except

(a) Lakes less than twenty acres in size;”
The Baker River and the Skagit River exceed a mean annual flow of 20 CFS and Lake Shannon exceeds the 20 surface acre threshold and are therefore subject to the policies and regulations of the SMA. The mean annual flow of the Baker River, measured at the City of Concrete downstream of the Lower Baker River Dam is approximately 2,649 cubic feet per second. The mean annual flow of the Skagit River measured at Mount Vernon is 16,710 cubic feet per second. Lake Shannon exhibits a surface area of 2,190 acres. The area subject to SMA jurisdiction is based on language contained under the SMA (RCW 90.58.030(2)(f)):

“those lands extending landward for 200 feet in all directions as measured on a horizontal plane from the ordinary high water mark; floodways; and contiguous floodplain areas landward 200 feet from such floodways and all associated wetlands and river deltas”

The areas within shoreline jurisdiction as defined in the statute and rule above are the areas within 200 feet landward of the ordinary high water mark (OHWM) of the Baker River, Skagit River and Lake Shannon. Also included within the jurisdictional area are the FEMA designated floodway, 200 feet of the FEMA designated 100-year floodplain contiguous to the Floodway and wetlands associated by proximity and influence to the shoreline. The area of shoreline jurisdiction is the study area boundary.

Rivers, in Western Washington, with flows exceeding 1000 cubic feet per second and lakes with a surface area greater than 1000 acres are also designated as Shorelines of Statewide Significance (RCW 90.58.030(2)(f)(v)(A). All shorelines within the municipal boundaries are designated as Shorelines of Statewide Significance. The Baker and Skagit Rivers within the City’s municipal boundaries exceed the 1000 cubic foot per second threshold and are designated Shorelines of Statewide Significance. Lake Shannon exceeds the 1000 surface acre threshold and is also designated as a Shoreline of Statewide Significance. Shorelines of Statewide Significance also include associated uplands located within the SMA jurisdictional area. The SMA requires “optimum implementation” of its provisions within Shorelines of Statewide Significance. Policies addressing Shorelines of Statewide Significance are addressed in subsection 4.1.5. Map 1 in Attachment A depicts the areas of shoreline jurisdiction within the City.

1.3 Shoreline Planning Segments
Five planning segments were identified within the study area boundaries. The planning segments were identified based on distinct geographic boundaries, similar shoreline characteristics, land use patterns and comprehensive plan and zonings designations. The planning segments are described as follows below.

1.3.1 The Lake Shannon Segment is located north (upstream) of the Lower Baker River Dam and extends north to the City’s municipal boundary. Lake Shannon is a reservoir created by the Lower Baker River Dam. While the reservoir is characterized as a lake it is an impoundment of the Baker River. The Lake Shannon Segment constitutes approximately 880 linear feet of shoreline and a shoreline jurisdictional area of approximately 17.77 acres. The shoreline is
lacustrine in character. The lake level rises and falls seasonally and in conjunction with rainfall/snow melt events and through operation of the Baker River Dams. Comprehensive plan and zoning designations are public lands/open space. The only significant development is associated with the Lower Baker Dam including the log boom and surface fish collector.

1.3.2 *The Baker River Canyon Segment* is located south (downstream) of the Lower Baker Dam and extends south to and including the Thompson Bridge. The right (west) bank of the segment is riverine and relatively natural in character while the left (east bank) includes the Lower Baker powerhouse and powerhouse access road. The Baker River Canyon Segment constitutes approximately 2,860 linear feet of shoreline and a jurisdictional area of approximately 43 acres. Comprehensive plan and zoning designations are public lands/open space along the right bank and public lands/open space and industrial along the left bank.

1.3.3 *The Baker River Channel Segment* is located south (downstream of the Thompson Bridge and extends southward past the SR-20 Bridge. The left (east) bank continues on to the confluence with the Skagit River while the right (west) bank ends at the City’s municipal boundary approximately 350 feet north of the confluence. The segment is riverine in character and is maintained as a conveyance channel. Both banks are armored with rock. The right bank is generally undeveloped while the left bank has been subject to structural development. The area from the Thompson Bridge south to SR-20 is utilized by Puget Sound Energy in conjunction with Baker River Hydropower Facilities. Shoreline jurisdiction within this segment includes areas of designated floodway and contiguous floodplain. The Baker River Channel Segment consists of approximately 2,420 linear feet of shoreline and a jurisdictional area of approximately 36.7 acres. Comprehensive plan and zoning designations consist of public lands along the right bank and industrial along the left bank.

1.3.4 *The Upper Skagit River Segment* extends from the Baker/Skagit confluence upstream (east) to the City’s eastern municipal boundary. The shoreline itself is riverine and relatively natural in character, however, portions of the floodway and contiguous floodplain have been subject to residential and commercial development. The segment includes the two existing public shoreline access areas in the City. Shoreline jurisdiction within this segment includes areas of designated floodway and contiguous floodplain. The segment consists of 1100 linear feet of shoreline and 16.7 acres. Comprehensive plan and zonings designations are public lands, commercial, light industrial, and residential.

1.3.5 *The Lower Skagit River Segment* is located approximately .5 miles downstream from the Baker/Skagit confluence. The shoreline is riverine in character and exists in a natural condition that provides a full suite of riparian functions including a side channel which may be a remnant of the Little Baker River. Shoreline jurisdiction within this segment includes areas of designated floodway and contiguous floodplain. The segment includes a shoreline area of 1540 linear feet.
and an area of 23.3 acres. There is no development within the shoreline area. The comprehensive plan and zonings designation is open space.

The following summary table compares the five planning segments in terms of size, shoreline type and condition, comprehensive plan and zoning designation, and existing land use. The five planning segments are delineated on an aerial photograph along with individual photographs of the segments as an attachment to this report. (Attachment B. Map and Photographs of Planning Segments)

Table 1: Comparison Summary of Planning Segments

<table>
<thead>
<tr>
<th>Segment</th>
<th>Size</th>
<th>Condition</th>
<th>Comp/Zoning</th>
<th>Land Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Lk. Shannon</td>
<td>880-ft</td>
<td>Lake (Reservoir)</td>
<td>Open Space</td>
<td>Hydropower</td>
</tr>
<tr>
<td></td>
<td>17.7-acres</td>
<td></td>
<td></td>
<td>Open Space</td>
</tr>
<tr>
<td>2. Baker Canyon</td>
<td>2,860-ft</td>
<td>River Natural/Altered</td>
<td>Open space Residential Industrial</td>
<td>Open Space Residential (2) Hydropower</td>
</tr>
<tr>
<td></td>
<td>43-acres</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>36.7-acres</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Upper Skagit</td>
<td>1,100-ft</td>
<td>River Developed floodway-Floodplain</td>
<td>Public lands Residential Commercial Light Industrial</td>
<td>Public lands Residential (1) Commercial Light Industrial</td>
</tr>
<tr>
<td></td>
<td>16.7-acres</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Lower Skagit</td>
<td>1,540-ft</td>
<td>River Natural Shoreline</td>
<td>Open space</td>
<td>Open space</td>
</tr>
<tr>
<td></td>
<td>23.3-acres</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Area Totals:</td>
<td>8,800-ft</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>122.4-acres</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 2.0 Summary of Existing Regulatory Framework

#### 2.1 Shoreline Management Act

A citizen initiative that evolved into legislative action resulted in The Shoreline Management Act of 1971. The legislative findings and policy intent of the SMA states:

“There is, therefore, a clear and urgent demand for a planned, rational, and concerted effort, jointly performed by federal, state, and local governments, to prevent the inherent harm in an uncoordinated and piecemeal development of the states shorelines (RCW 90.58.020).”

While protecting shoreline resources by regulating development, the SMA is also intended to provide a balance between protection and property rights by encouraging water-dependent or water oriented uses while also conserving or enhancing shoreline ecological functions and values. SMPs are required to be based on state guidelines, but should be tailored to the specific conditions and needs of the local community.

#### 2.2 City of Concrete

The City of Concrete adopted the Skagit County Shoreline Management Master Program following completion of its development 1976. The City has utilized the County Master Program since that time. The existing Shoreline Master Program provides policies and
regulations for protection of the various shoreline environment designations, standards for development of compatible uses and administrative provisions for implementation of permit requirements. While the City has effectively implemented the County Master Program, City officials have determined that the development of a City SMP will enhance coordination with other City regulations, localized conditions and the needs of its citizens.

The updated SMP will differ significantly from the Skagit County Master Program in that it will be based on an inventory of current shoreline conditions which represent the existing baseline environment. Existing conditions will provide a practical point of beginning for the development of shoreline environment designations and a benchmark from which a “no net loss” standard can be established. The “no net loss” standard is intended to protect the shoreline environment over the planning period by preventing degradation of ecological functions below existing conditions. In addition the update is required to consider restoration and increased public access opportunities. The update also allows the City to utilize current data sources including information generated by Puget Sound Energy through the Federal Energy Regulatory Commission re-licensing process associated with of the Lower Baker Hydroelectric facility.

The City has developed and maintains a system of land use plans and codes which include a comprehensive plan, and critical areas regulations as required under the Growth Management Act (GMA). The comprehensive plan, adopted in 2005, establishes an environmental land use goal and policies specific to the natural environment under Chapter 3:

Goal LU-9: “Protect the scenic beauty, water quality, wildlife habitat areas, anadromous fisheries open spaces and cultural resources that contribute to the quality of life and give the Concrete area its rural character”

Policy LU 9.1: “Sensitive Areas - Utilize the best available science to protect wetlands, streams, frequently flooded area and other fragile ecological systems, to minimize disturbance of significant natural features, and to mitigate in accordance with adopted standards”

Updated Critical Area Regulations (CARs) were adopted in 2008 under Chapter 16.12 of the Concrete Municipal Code. Critical areas identified and regulated by the City are geologically hazardous areas, aquifer recharge areas, fish and wildlife habitat conservation areas, wetlands and frequently flooded areas. Frequently flooded areas, wetlands and fish and wildlife habitat conservation area relate directly to the City’s Shorelines. The City has mapped the potential critical areas on the Critical Areas Overlay District Map. The City is required to assure consistency between the comprehensive plan and development regulations including CARs and the SMP under the Growth Management Act. The City’s Critical Areas Overlay District is included in this report as Map 2 of Attachment A. The following table summarizes the presence of critical areas by Planning Segment.
Table 2: Critical Areas Located in Shoreline Jurisdiction by Planning Segment

<table>
<thead>
<tr>
<th>Planning Segment</th>
<th>NWI Wetlands</th>
<th>Fish and Wildlife Habitat Areas</th>
<th>Aquifer Recharge Areas</th>
<th>Geologic Hazard Areas</th>
<th>Frequently Flooded Areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Lake Shannon</td>
<td>Lake Shannon</td>
<td>*Lake Shannon</td>
<td>&gt;30% Slope</td>
<td>Floodplain</td>
<td></td>
</tr>
<tr>
<td>2. Baker Canyon</td>
<td>Baker River</td>
<td>*Baker River</td>
<td>&gt;30% Slope</td>
<td>Floodplain</td>
<td></td>
</tr>
<tr>
<td>3. Baker Channel</td>
<td>Baker River</td>
<td>*Baker River</td>
<td>&gt;30% Slope</td>
<td>Floodplain</td>
<td></td>
</tr>
<tr>
<td>4. Upper Skagit</td>
<td>Hydric Soils</td>
<td>*Skagit River</td>
<td></td>
<td>Floodplain</td>
<td></td>
</tr>
<tr>
<td>5. Lower Skagit</td>
<td>NWI Wetlands</td>
<td>*Skagit River</td>
<td></td>
<td>Floodplain</td>
<td></td>
</tr>
</tbody>
</table>

* The standard buffer for S waters (Waters inventoried under the Shoreline Management Act) is 200 feet.

The standard riparian buffer requirement established under the City’s CARs for shorelines of the state inclusive of the Skagit River, Baker River and Lake Shannon is 200 feet. This standard is considered sufficient to protect the riparian functions of water quality, bank stabilization, shade/temperature, instream habitat/LWD, and productivity. Buffer widths of between 100 feet and 200 feet have been adopted for use in critical area regulations throughout communities in Western Washington. While wildlife habitat and microclimate functions may require wider buffers for full protection, widths between 150 feet to 200 feet were identified as sufficient for maintaining the most critical elements of those functions. The following table summarizes the range of effective riparian buffer widths by function. (Watershed Company, 2007).

Table 3: Range of Effective Buffer Widths for Applicable Riparian Functions

<table>
<thead>
<tr>
<th>Function</th>
<th>Range of Effective Buffer Widths</th>
<th>Notes on Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water Quality (Sediment and pollution removal)</td>
<td>80 to 150 feet</td>
<td>Provides for 80% nutrient/sediment removal</td>
</tr>
<tr>
<td>Bank Stabilization (erosion control)</td>
<td>80 to 125 feet</td>
<td>Disproportionately large increases required beyond 100 feet to improve function</td>
</tr>
<tr>
<td>Shade/Temperature</td>
<td>80 to 100 feet</td>
<td>Based on adequate shade</td>
</tr>
<tr>
<td>Microclimate</td>
<td>80 to 525 feet</td>
<td>Up to a distance of two to three site potential tree heights (SPTH)</td>
</tr>
<tr>
<td>Wildlife Habitat</td>
<td>100 to 600 feet</td>
<td>Coverage not inclusive</td>
</tr>
<tr>
<td>In-stream Habitat</td>
<td>33 to 200 feet</td>
<td>Up to one SPTH</td>
</tr>
<tr>
<td>Productivity</td>
<td>80 to 100 feet</td>
<td>Disproportionately large increases required beyond 100 feet to improve function</td>
</tr>
</tbody>
</table>

2.3 State Regulations and Agencies

Aside from the SMA there are several other State regulatory programs which relate directly to the City’s Shorelines. These programs include the Growth Management Act (GMA) State Hydraulic Code, State Environmental Policy Act (SEPA), Watershed Planning Act, Water Resources Act, Salmon Recovery Act as well as tribal agreements and associated case law. State agencies that play a primary role in shoreline management are:

Washington State Department of Ecology (WDOE) – Plays a primary role in the development and review of critical area regulations relating to wetlands by providing technical assistance to local governments pursuant to the GMA. WDOE plays a particularly critical role in shoreline management by reviewing all projects that require a
shoreline permit. The department maintains specific authority over Shoreline Conditional Use Permits and Shoreline Variances. The department also plays a role in the review of federal permits. WDOE plays a significant role in Clean Water Act review by providing water quality certification under Section 401 of the Act.

Washington State Department of Fish and Wildlife (WDFW) – Plays a primary role in the development and review of critical area regulations relating to fish and wildlife species and habitats by providing technical assistance to local governments pursuant to the Growth Management Act. WDFW is responsible for administering the State Hydraulic Code. A Hydraulic Project Approval is required for all projects within or over the ordinary high water line of Waters of the State.

Washington State Department of Natural Resources (WDNR) – Plays a proprietary role in the management and use of state owned aquatic lands. WDNR is responsible for the administration of the State Aquatic Lands Program. In addition WDNR is also responsible for administering the State Forest Practice Act.

Local or state governments may act as lead agency under the State Environmental Policy Act (SEPA). SEPA requires disclosure of potential impacts associated with proposed project (and non-project) actions. The lead agency under SEPA is generally the agency with permit authority. WDOE oversees and Coordinates SEPA review.

2.4 Federal Regulations and Agencies
Federal regulations that may play a significant role in the management of the City’s shorelines include the Clean Water Act (CWA), Rivers and Harbors Acts, Endangered Species Act (ESA) and National Environmental Policy Act (NEPA). Federal agencies that may play a significant role in shoreline management are:

U. S. Army Corps of Engineers (USACE) – Is responsible for implementation of the regulatory element of the Clean Water Act contained under Section 404 which regulates the discharge of dredged or fill material into waters of the U.S. including wetlands. The USACE administers a system of individual and nationwide permits with oversight authority provided by the U. S. Environmental Protection Agency (USEPA). In addition the USACE is responsible for implementation of Section 10 the federal Rivers and Harbors Appropriation Act of 1899 which regulates activities that may affect navigation of “navigable” waters. Navigable waters include the portion of the Skagit River that falls within the municipal boundaries of the City of Concrete.

U.S. Fish and Wildlife and National Marine Fisheries Services (USFWS/NMFS) – The Services provide “consultation” under Section 7 of the Endangered Species Act. Consultation is required when an activity with the potential to affect federally listed species is proposed that requires a federal permit, relies upon federal funds or is located on Federal lands. Activities requiring a Section 404 permit under the Clean Water Act or a Section 10 Permit under the Rivers and Harbors Act may also require consultation.
NEPA is a federal environmental review process which requires the disclosure of potential impacts associated with proposed project (and non-project) actions. The implementing agency under NEPA is generally the federal agency issuing a permit or approval.

Over 158 miles of the Skagit River and its tributaries, upstream of the pipeline crossing at Sedro Woolley are federally designated as “Wild and Scenic Rivers” (WSR). The WSR designation identifies the Skagit River as “recreational” indicating that portions are accessible by road, may have some shoreline development and may have a history of impoundment or diversion. While the WSR designation is not a regulatory program the designation applies to approximately 58 miles of the Skagit River including the portions of the river within the Municipal boundaries of Concrete. The WSR designation and its associated programs are administered by the Mount Baker/Snoqualmie District of the U.S. Forest Service. (Skagit Wild and Scenic River Management Plan, 1983)

The Federal Emergency Management Agency (FEMA) is responsible for administration of the National Flood Insurance Program (NFIP). FEMA has promulgated regulatory guidance and map resources relating to management of special flood hazard areas. Local governments, including the City of Concrete, must adopt flood regulations as a condition of participation in the NFIP

3.0 Shoreline Functions

3.1 Ecosystem-wide Functions/Watershed Context
Shorelines in the City are located predominantly within the Baker River Basin or Watershed. The Baker River Watershed is located in northwest Washington within north-central Skagit County and south-central Whatcom County. The watershed covers 297 miles and ranges in elevation from 10,775 feet at the summit of Mount Baker to 170 feet at the confluence of the Baker River and the Skagit River at Concrete. The headwaters of the Baker River are located northeast of the study area along the slopes of Mount Challenger and Whatcom Peak. From the headwaters the Baker River flows to the southwest approximately 25 miles to its confluence with the Skagit River. Baker Lake and Lake Shannon are the largest bodies of surface water in the basin and are reservoirs created by the Upper Baker and Lower Baker Dams respectively. The primary tributary streams flowing into the reservoirs are the Baker River and numerous smaller streams including Swift, Park, Boulder, Noisy, Thunder, Sulphur, Rocky and Bear Creeks. (Puget Sound Energy, 2002)

The Baker watershed is a subbasin of the Skagit Watershed which is the largest of the Puget Sound basins and drains an area of 3,115 Square miles (inclusive of the Baker watershed). The headwaters of the Skagit River originate in the snowfields of Silvertip Mountain in southern British Columbia. The river discharges to Skagit Bay approximately 162 miles to the southwest. Three dams, Ross, Diablo and Gorge, are located in the forested headwaters north of the Town of Newhalem. The major tributaries of the river are the Sauk, Cascade and Baker Rivers. The Skagit River flows past the City of Concrete at approximate river mile 56. Notwithstanding hydroelectric dams operated
by Puget Sound Energy and Seattle City Light, the watershed is noted for its intact ecological functions owing, in part, to the rugged terrain and large tracts of federal lands within the basin. (Puget Sound Energy, 2002) (Attachment C: Drainage Basin/Watershed Map)

3.2 Background Elements – The City of Concrete is located in the Upper Skagit Water Resource Inventory Area (WRIA 4). Approximately 44% of the watershed is within National Forest boundaries or protected in North Cascades National Park, a national recreation area, or a designated wilderness area. Due to the rugged landscape and predominance of federally protected lands in the watershed the overall population has remained relatively low. The estimated population is approximately 7,500 people. Many of the towns including Concrete originated as mining or logging camps and continue to rely upon resource industries for their economic base. The following discussion documents the general character of the watersheds relative to background ecological elements including geology/topography, soils, vegetation and fish and wildlife. (Puget Sound Energy, 2002)

3.2.1 Geology and Topography in the mountainous portions of the Baker River basin consist primarily of metamorphic rocks such as phyllites, slates, shales, schists and gneisses and igneous rocks including intrusive granitics, and more recently, andesitic lavas and pyroclastic deposits associated with Mount Baker. Valley walls within the basin are typically mantled with a mixture of colluvium and, to a considerable elevation, by deposits of continental and alpine glaciation. Deposits of glacial origin are generally a heterogeneous mixture of sand and gravel together with variable quantities of silt and clay, depending on the mode of deposition.

The Baker River and Skagit River watersheds are generally very steep with slopes from 20 to 40 percent over most of their areas with the exception of the valley bottoms along the channels of the rivers and some of the major tributary streams.

3.2.2 Soils in the Baker River watershed have been derived in two fundamental ways: directly, as result of glacial action to produce tills, outwash deposits, glacial lake deposits and other glacial materials, or indirectly by weathering of bedrock materials and glacial deposits. The soils of the watersheds fall generally into one of two general classifications: alluvial soils or upland soils. The deeper and more fertile alluvial soils are associated with the floodplains of the Baker and Skagit Rivers, while upland soils are characteristically relatively shallow, low in fertility and found on steep slopes.

3.2.3 Vegetation in the basins varies spatially and is influenced by several factors particularly elevation. The basin is mostly forested below an elevation of 5,500 feet; above elevation 5,500 feet only scrub vegetation exists, with little or no vegetation on rock outcrops, glaciers and permanent snowfields. Elevations below 2,000 feet generally have abundant growth, including a dense timber canopy consisting of alder (*Alnus rubra*), cedar (*Thuja plicata*), maple (*Acer*...
macrophyllum), Douglas fir (Psuedotsuga menziesii), and cottonwood (Populus balsamifera). The lower elevations of the basin are also characterized by a vigorous understory of small tree and native shrubs including vine maple (Acer circinatum), indian plum (Oemlearia cerasiformis), salal (Gaultheria shallon), sword fern (Polystichum munitum) and salmonberry (Rubus spectabilis). Elevations between 2,000 and 4,000 feet typically exhibit a dense canopy of trees with a higher proportion of conifers relative to elevations below 2,000 feet. The 2,000 – 4,000 foot elevation band is also characterized by an understory that is less dense relative to elevations below 2,000 feet. The forest canopy thins at elevations above 4,000 feet with dominant trees consisting primarily of mountain hemlock (Tsuga mertensiana). Timber harvesting has occurred over parts of the basin, primarily in areas forested with coniferous trees.

3.2.4 The Skagit and Baker River watersheds support a wide range of fish and wildlife species. Various anadromous fish species occur in the basin including five species of pacific salmon native to North America. Sockeye (Oncorhynchus nerka), coho (Oncorhynchus nerka), chinook (Oncorhynchus tsawytches), pink (Oncorhynchus gorbuscha) and chum (Oncorhynchus keta) are all located in the watersheds with coho and sockeye being the most prominent within the Baker watershed. Winter and summer runs of steelhead (Oncorhynchus mykiss) and cutthroat trout (Salmo clarki clarki) are also present. Bull trout (Salvelinus confluentus) and Dolly Varden (Salvelinus malma) are present and display both anadromous and resident life histories. (Campbell, 1982)

Wildlife species in the basin are diverse containing mammals, birds, reptiles and amphibians. At least 55 species of mammals potentially utilize the watershed. Black tailed deer (Odocoileus hemionus comumbianus) are the most common large mammal. Roosevelt elk (Cervus Canadensis roosevelti), black bear (Ursus americanus), mountain lions (Puma concolor) and mountain goats (Oreamnos americanus) also inhabit the watershed. Many small mammals are also common. Over 150 species of birds including waterfowl, shorebirds, gamebirds, raptors and songbirds and 19 species of reptiles and amphibians likely find suitable habitat in the riparian, wetland and upland areas in the basin.

3.3 Digest of Ecosystem-wide Functions - The background elements discussed above, many of which are located outside of shoreline areas act in concert to influence the character of the City’s shorelines. As discussed earlier in the report all of the shorelines within the City’s municipal boundaries are riverine or riparian in character. Riparian areas occur adjacent to streams and contain elements of both aquatic and terrestrial ecosystems. Riparian areas play an important role in the overall health of the stream and its ability to support aquatic organisms. The City’s shorelines can be assessed in terms of the commonly described and interrelated riparian functions as follows:

3.3.1 Water Quality - Sediment contributions to streams is generally supplied by erosion and upland processes. Sediment input to confined low order streams such as the tributaries to Lake Shannon is generally provided by hillside slope
processes. Sediment input to higher order streams such as the Baker River and Skagit River is typically driven by fluvial or stream action processes. In undeveloped or unmodified watersheds, aquatic systems and their associated organisms are adapted to the natural rate of sediment input. Slope aspect, soils and vegetation act together in a manner which promotes a natural equilibrium. Modifications which remove native vegetation and increase the area of impervious surfaces, are accompanied by increased stormwater runoff. Such modifications alter the balance of the aquatic regime resulting in higher flow rates and increases in turbidity and nutrient concentrations.

3.3.2 Bank Stabilization – Riparian vegetation is generally recognized as contributing the stability of stream banks. This function is accomplished through the network of tree roots, brush and soil/rock that weaves soil and rock together in a manner that withstands increased flows and velocity. In addition to stream bank vegetation and root structure large woody debris (LWD) also promotes stable banks on smaller streams by slowing velocities and capturing sediments as they are transported downstream thereby promoting the water quality function described above. (Watershed Company, 2007)

3.3.3 Shade and Temperature – The primary factors influencing water temperature are shade, humidity, ambient air temperature, channel size groundwater and overhead vegetation cover. Shade, provided by a forest canopy appears to be the most valuable contributor to the maintenance of cool stream temperatures.

3.3.4 Microclimate – Microclimate affects many ecological processes and functions, including plant growth, decomposition, nutrient cycling, succession, productivity, migration and dispersal of flying insects, soil microbe activity and fish habitat. Microclimate, like other riparian functions is closely linked to native vegetation communities particularly intact forest canopy.

3.3.5 Wildlife Habitat – Because it exists as a narrow band, riparian habitat represents a relatively small portion of the City. While riparian habitat performs many functions that are essential to fish species, these areas are also of critical importance to wildlife. Up to 80% of Washington States vertebrate species use riparian habitat for essential life activities. Forested riparian habitat includes an abundance of snags, downed logs and multi layered vegetation communities which provide habitat for birds amphibians, reptiles and small animals as well as the fish species which inhabit the stream itself. Overall, riparian wildlife habitat is based on structural complexity, ecological connectivity, food and water availability and moderate microclimate. Riparian areas serve as refuges and travel corridors for wildlife. The number of wildlife species present in riparian areas is directly proportional to the width of the vegetated riparian zone. (WDFW, 1997)

3.3.6 In-stream Habitat (Large Woody Debris) – As discussed above under “bank stabilization” LWD contributes to stable channel morphology in smaller streams. In larger streams such as the Baker and Skagit Rivers LWD plays an important
role in providing in-water habitat structures. These structures range from isolated root wads and anchored logs to large semi-permanent log jams. The structures improve salmon habitat by creating refugia which provides safe havens from heavy flow velocities and predators and improved foraging conditions. LWD also traps additional woody debris which in turn further enhances habitat conditions. LWD is “recruited” from adjacent riparian forests when trees fall into the stream. A sufficient forest contiguous to the stream is essential to assure a source of LWD over the long term.

3.3.7 Productivity – Smaller streams receive nutrients from allochonous input (consisting of litterfall and terrestrial insects) from the riparian zone adjacent to the channel. These smaller streams serve as food conduits to larger streams contributing a significant numbers of macroinvertebrates to rivers. Studies in the Puget Sound Region have found that stream health is closely tied to the vegetated character of the riparian zone. In short fully vegetated riparian areas provide the functions listed above as well as a food source that supports salmon and other fish species. (Watershed Company, 2007)

3.3.8 Storage and Conveyance – In addition to the functions discussed above the channel migration zone (CMZ) is an area within the lateral extent of likely stream channel movement resulting from stream bank destabilization and erosion, rapid stream incision aggradation, avulsions and shifts in the location of the channel. The extent of the CMZ is limited by hydrologic modifications resulting from the development and operation of the Lower Baker Hydroelectric facility. While the CMZ has not been mapped for the City, the floodplain and floodway have been mapped by the Federal Emergency Management Agency. The floodplain provides an area for the storage of floodwaters during overbank flood events. The floodway, generally located immediately adjacent to the active channel provides for the discharge and conveyance of flood flows. The floodplain and floodway have special significance in the context of shoreline management as discussed earlier under section 1.2 Shoreline Jurisdiction and Study Area Boundary. In addition new development within the CMZ or floodway are limited to uses and activities listed in WAC 173-26-221(3)(b) and (3)(c)(i).

In addition to conveyance and storage functions the floodplain of the Baker River and Skagit River provide valuable habitat functions including enhanced water quality, a source of potential woody debris, shade and refugia. The National Marine Fisheries Service issued a Biological Opinion (BO) on September 22, 2008. The opinion concluded that discretionary elements of the National Flood Insurance Program (NFIP) cause harm to Puget Sound ESU Chinook Salmon and the distinct population segment (DPS) of southern resident killer whales (*Orcinus orca*). The service developed reasonable and practical alternatives (RPAs) including guidelines and procedures to avoid harm to listed species. In response to the BO, the Federal Emergency Management Agency (FEMA) has required communities participating in the NFIP to address the RPAs in a manner that avoids impacts to listed species. FEMA has directed local governments, that have
not mapped the CMZ to consider the entire 100-year floodplain or special flood hazard area in the evaluation of impacts to listed salmonids.

3.4 Impairment of Shoreline Functions - Resource extraction and processing, transportation and utility development and commercial and residential land uses have contributed to impairment of shoreline functions basin wide and within the shoreline jurisdictional area of the City of Concrete. Discussion relating to impairment of shoreline functions is framed in the context of the riparian functions outlined under subsection 3.3.

3.4.1 Forest Products Industry - Logging in the upper Skagit Valley was initiated in the second half of the 19th century. The earliest record of timber harvest in the Concrete area consisted of the cutting of cedar shingle bolts which were flumed into the Baker River and floated down to the Skagit River, possibly via an excavated channel known as the Little Baker River. By 1918 the Puget Sound Sawmill and Shingle Company of Bellingham obtained timber holdings to the north of Concrete along the Baker River. Joint use of a railroad shared with the Superior Portland Cement Company provided access into the interior of the Baker River basin which put logging operations in full production. The timber company removed approximately 100 million board feet of timber in the area that was flooded by Lake Shannon in conjunction with construction of the Lower Baker Dam. (Thompson, 1989)

Timber harvest conducted over the past 150+ years has had the effect of impairing riparian functions. Large woody debris recruitment, shade, bank stability, water quality, microclimate and wildlife habitat have been impacted by the removal of mature forests along streams and rivers. In some cases the forest canopy has been replaced with developed impervious surfaces which accelerate stormwater runoff rates increasing peak flows, and resulting in the problems of flooding, erosion and sedimentation. In addition shingle and lumber mills have often been established in shoreline areas and utilized excavated and dredged channels such as the Little Baker River as transportation corridors.

3.4.2 Mining - Two mining efforts were found to be sustainable in the Concrete area: 1) The extraction of gypsum, lime and clay needed for the production of cement and 2) The mining of bituminous coal used to fuel the cement plants. The first Cement plant in the northwest was built at Concrete in 1906. Concrete had two cement plants, the Washington and Superior Portland Cement Plants. The plants employed 400 workers and achieved a daily production of approximately 5,000 barrels of cement. (Herald Publishing Company 1921:5, Post, 1908:9)

Mineral extraction and processing facilities have impacted shoreline areas through mining activities associated with aggregate resources and cement production. Areas along the shoreline of the Lower Baker River have been utilized in conjunction with aggregate processing, stockpiling and storage of cement products. Existing concrete silos built by Superior Portland are located along the
left bank of the Baker River just above the SR-20 bridge crossing as a testament to the City’s mining and industrial history.

3.4.3 Transportation Facilities - A number of public and private transportation facilities are located along the shorelines of Concrete. The Baker River is crossed by two bridges within the City’s municipal boundaries. The SR-20 bridge, dedicated to long time state legislator Lowell Peterson, crosses the river approximately 0.25 miles upstream from the confluence with the Skagit River. The Thompson Bridge is located an additional 0.25 miles upstream connecting East Main Street along the left (East) bank of the Baker River with Main Street on the right (west bank). Portions of Main Street and SR-20 are also located within Shoreline jurisdiction. A gravel road along the left bank of the Baker River provides access the Lower Baker powerhouse. Access roads are also located near the left and right banks of the Baker River linking City roads and SR-20 with the shoreline of the Baker to its confluence with the Skagit River.

Transportation infrastructure along the City’s river shorelines confine channel migration and may require maintenance activities such as bank armoring which further degrades riparian functions. In addition concrete supporting piers are located in-stream at both the Peterson and Thompson bridges.

3.4.4 Hydropower - Hydropower development constitutes the most significant impairment to riparian functions along the Baker and Skagit Rivers. Although the dam operators (Puget Sound Energy, Seattle City Light) have worked diligently to minimize impacts on fish, dams have reduced the magnitude of peak flows in the Skagit River by 50% (Beamer et al. 2000). Reduction of peak flows impairs sediment and water transport processes, as well as the development and maintenance of off channel habitats, woody debris recruitment and other riparian functions. (Watershed Company, May 2007)

Puget Sound Energy (PSE) is the owner operator of the Baker River Hydroelectric Project which consists of the upper and lower Baker Developments located in Whatcom and Skagit Counties respectively. The Lower Baker Dam is located within the municipal boundaries of Concrete and was constructed in 1925 (PSE, 2006). PSE received a 50-year operating license from the Federal Energy Regulatory Commission (FERC No. 2150) on October 17, 2008. The new license results from years of collaborative studies and negotiated agreements between PSE and a group of 23 other parties, including governmental entities, Indian tribes, fisheries interests and environmental organizations (PSE, 2008).

Major new license provisions contained in the settlement agreement include:

- Construction of improved fish passage systems for moving salmon, both upstream and downstream, around the upper and lower Baker River dams. Improvements include a new “floating surface collector” on Lake Shannon which captures and collects juvenile salmon for downstream transport to the Skagit River.
- Provisions to increase the project's flood-storage capacity during winter months by up to 29,000 acre-feet at Lower Baker under conditions acceptable to the Corps of Engineers
- Enhanced camping, hiking, and boating access for the public within the Baker project boundaries.

3.4.5 Commercial and Residential Development - Commercial and residential development, particularly within the floodplain of the Skagit River, has resulted in impairment of floodplain functions. By occupying the floodplain with structural development residential and commercial development displaces waters during flood events thereby reducing conveyance and storage functions.

3.5 Digest of Shoreline Functional Impairment - The following table summarizes impairment of riparian functions by planning segment. Numerical values are attributed to the level of impairment of the function, with 1 representing a high level of impairment and 5 a low level. A full suite of riparian functions, based on a three strata native plant community and intact mature forest canopy, functioning at the highest level would score 40 points.

Table 4: Summary Table of Riparian Function Impairment by Planning Segment

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</table>

While Planning Segment 1 consists of the reservoir above the Lower Baker Dam known as Lake Shannon, riparian functions within the segment rank relatively high with a total score of 24 points. The contributing basin is managed, in large, as federal forest and park lands. Many of the tributaries to the lake include forested riparian zones which promote water quality and productivity. The shoreline of the lake itself is bordered by a mixed forest. Although sand bars are present during low lake levels, the banks are relatively stable. Because the lake bottom was logged prior to construction of the Lower Baker Dam there is an abundance of in-stream habitat suitable for a variety of fish species. The lake plays a valuable storage function during storm events by holding floodwaters before release to the Skagit River and its associated floodplain.

Planning Segments 2 and 3 received total scores of 18 points. Segment 2 extends from the Lower Baker Dam to and including the Thompson Bridge while Segment 3 extends from the Thomson Bridge to a point approximately 0.25 miles south of the SR-20 (Lowell Peterson) Bridge. Although the segments received identical total overall scores they differ significantly. The left (east) banks of both segments are dominated by hydropower related facilities operated by PSE and a mix of other predominantly private ownerships. Management of the segment for hydropower contributes to low to moderate
scores for all riparian functions. The absence of riparian plant communities over a portion of the segment in combination with bank hardening to protect infrastructure improvements and areas developed with impervious surfaces limits riparian functions. Overall, segments 2 and 3 are managed for conveyance purposes in conjunction with the Lower Baker Dam. The right bank of segment 3 consists of an area utilized historically for mineral extraction, processing and stockpiling. A network of unimproved access roads is also present with the shoreline area of segment 3. The primary distinction between the left and right banks is that the left bank is managed for hydropower while the right bank is managed for a mix of land uses including open space and public lands.

Planning Segment 4 received a total score of 21 points. Riparian functions are provided by a three strata native plant community that includes a mixed forest canopy. The riparian plant community broadens from the City boundary in the east to the mouth of the Baker River in the west. Shoreline jurisdiction in the segment extends landward from the OHWM and includes the FEMA designated floodway and 200 feet of the contiguous floodplain. While native vegetation is present contiguous to the OHWM, commercial, transportation and residential development impairs riparian water quality, microclimate, wildlife habitat, and conveyance and storage functions within the adjacent floodway and floodplain.

Planning Segment 5 ranked the highest of the segments for riparian functions scoring a total of 32 points. The segment exhibits diverse topography ranging from floodway/floodplain to a steep but stable (> 30%) slope. The floodway/floodplain portion is dominated by alder and cottonwood transitioning to a dominance of cedar and fir along the upland slope. The segment also includes a side channel which provides for conveyance and storage of floodwaters as well as off channel habitat which provides refugia for juvenile salmonids during flood events. The side channel appears to be the mouth of the little Baker River which, because of its high potential for salmon habitat restoration, has been the subject of study for many years. Overall segment 5 is a relatively undisturbed shoreline which has retained its natural character.

Impairment of shoreline functions can be demonstrated based on the current state of aquatic resource science. It is important to recognize, however, that impairment requires an understanding of the historic context in which development and its associated impacts has occurred and the societal benefits derived from the activities which resulted in impairment. For example, while hydropower development has resulted in significant impacts to fisheries resources, it has also provided our communities with relatively low cost electric power. Similarly resource extraction activities provided the economic basis for establishment of a viable frontier community.

4.0 Land Ownership and Existing Uses

4.1 Overview - While federal lands comprise a sizable area within the Baker and Skagit River watersheds, there is no federal ownership within the City’s shoreline areas. State ownership includes areas along the SR-20 right of way, a fishing access along the Skagit River and a small mineral resource area adjacent to the SR-20 right of way on the right
The bank of the Baker River. The City of Concrete owns public and parklands located within shoreline jurisdiction. The remaining lands are owned by private individuals and corporate entities including Glacier Northwest (Formerly LoneStar Northwest Inc.), and Puget Sound Energy.

4.2 General Land Use Patterns - The general land use pattern in the vicinity of Concrete consists of areas of undeveloped land mixed with utility, industrial, commercial, residential and recreational development. Land uses have typically been influenced by the road network and resulting development patterns.

4.2.1 Transportation Development – Highways and Roads located within shoreline jurisdiction located within Planning Segments 2, 3 and 4 are described below.

- SR-20 is the primary travel route along the Skagit River. It connects Skagit Valley communities along the river with the I-5 corridor to the west and the Methow Valley and other areas in Eastern Washington to the east. SR-20 crosses the Baker River within the municipal boundaries of Concrete.
- The Baker River Road connects Concrete to Lake Shannon and the Lake Shannon boat ramp located north of the City in unincorporated Skagit County.
- The private access road to the Lower Baker Power House connects PSE facilities along East Main Street with the powerhouse below the Lower Baker Dam. Portions of East Main Street are also within shoreline management jurisdiction as is the Thompson Bridge crossing of the Baker River.
- North Dilard Avenue and Lagoon Avenue are located within shoreline jurisdiction along the right bank of the Baker River.
- Unimproved roads located south of the SR-20 Bridge provide access to the lower reaches of the Baker River. The road along the left bank extends to the confluence of the Baker River with the Skagit River.

4.2.2 Industrial and Utility Development – Industrial and utility development consists of mineral resource processing and hydropower located within Planning Segments 2 and 3. The presence of the mineral resource processing industry is limited primarily to the structural remains of the cement storage facilities visible along the left bank of the Baker River just north of the SR-20 Bridge. An old cement plant was also located adjacent to the right bank of Planning Segment 3 just south of the SR-20 Bridge. While Glacier Northwest (currently affiliated with CalPortland) is a major building materials provider and possesses substantial land holdings on the Concrete area, mineral processing in Concrete is generally viewed in a historic context.

PSE’s Lower Baker Hydropower facilities have recently been re-licensed through the Federal Energy Regulatory Commission. Major improvements of the facility are being undertaken at both the Upper and Lower Baker River sites. Improvements at the Lower Baker site include a new power house and fish collection facilities. PSE’s Lower Baker site is located within a relatively narrow corridor of land extending from the dam south to a point just below SR-20. The
project offices and maintenance structures occupy an area of 6 acres adjacent to left bank of the river approximately 0.25 miles downstream from the dam. The site includes a garage, storage and fueling facilities as well as several abandoned cement silos. The dam, powerhouse, surge tank and two residences once utilized as part of the facility are located within shoreline jurisdiction north of the project offices.

4.2.3 Commercial Development – Commercial development is limited to a single motel located between SR-20 and the Skagit River in Planning Segment 4. A number of recreational vehicles utilize the area south of the motel.

4.2.4 Residential Development – Single-family residences within shoreline jurisdiction are limited to the two homes historically utilized in conjunction with PSE facilities in Planning Segment 2 and a single home located north of SR-20 in Planning Segment 4.

4.2.5 Recreational Development – Existing recreational development is limited to 2 sites:

- A shoreline access managed jointly by the U.S. Forest Services, Washington Department of Fish and Wildlife and Washington Department of Transportation is located near the City’s eastern boundary. The facility provides access to the Skagit and Baker Rivers within Planning Segment 4. The facility includes a paved parking area contiguous with SR-20, signage and a dilapidated stairway to the river. In addition a primitive boat launch is located at the confluence of the Baker and Skagit Rivers.

- A wood frame gazebo and picnic area is maintained by the City near the western approach to the Thompson Bridge east of Dilard Avenue in Planning Segment 3.

- In addition to the two recreational developments described above the access roads along the left and right banks of the Baker River in planning segments 3 and 4 are utilized on an informal basis for recreational purposes.

4.2.6 Public Lands and Open Space – Despite the presence of the land uses discussed above, the majority of the City’s shoreline areas are zoned as public land and open space. The intent and distribution of the designations are discussed below.

The Public Lands district is “intended to provide for the availability of public land for the placement of public buildings, facilities, parks, open-space, habitat conservation areas, recreation and semi-public uses that will enhance and contribute to the quality of life and services of the community.” (Concrete Zoning Code, Title 19, 1998) Public Lands are designated over the entire right bank of planning segment 3, the southern portion of the left bank of Planning Segment 3 and the western portion of planning segment 4.

The open space district is “intended to encourage desirable and appropriate land uses in areas of the town which by reason of location, soil, topographic or flooding characteristics, public ownership, wetlands, wildlife habitat, or values to the community for scenic, recreation, agriculture, forest, or open space, are not suited to intensive land development patterns as determined by the comprehensive plan and may require specific
management or development techniques.” (Concrete Zoning Code, Title 19, 1998) The open space designation is applied to all of Planning Segments 1 and 2 and the northeastern portion of Planning Segment 3.

4.2.7 Opportunities for increased Shoreline Access – Although City policies and regulations support additional access to the City’s shoreline areas; there are hazards at a number of locations which preclude access. Additionally the most attractive location for such access is located on private property in planning segment 5. While locations for additional public shoreline access are limited by public safety concerns and restricted by private ownership, the existing access area owned by the state and currently managed for public access is in need of repair and improvement. The shoreline access in planning segment 5 near the City’s eastern boundary requires immediate attention to repair a dilapidated stairway which is a hazard in its own right. In addition picnic facilities and moveable amenities could be added to the area near the confluence of the Baker and Skagit Rivers. The Proposed Concrete Bike and Trails Plan is included in this report as Map 4 of Attachment A.

Table 5: Summary of Existing Land Uses by Planning Segment

<table>
<thead>
<tr>
<th>Seg</th>
<th>Transportation</th>
<th>Ind/Utility</th>
<th>Commercial</th>
<th>Residential</th>
<th>Recreation</th>
<th>Pub/Open</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Baker River Rd.</td>
<td>Lk. Shannon</td>
<td></td>
<td></td>
<td>Lake Shannon</td>
<td>Entire segment designated O-S</td>
</tr>
<tr>
<td>2</td>
<td>Baker River Rd. - Powerhouse Access Rd. - Thompson Bridge</td>
<td>Lower Baker Dam/Powerhouse/ Surge tank</td>
<td>2 PSE owned residences</td>
<td></td>
<td>Majority of segment designated O-S</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Baker River Rd. - Powerhouse Access Rd. - East Main St. - Dilard Ave. - Lagoon Ave. - SR-20 Bridge-unimproved access roads</td>
<td>Project offices-maintenance structures-fish collection facilities-interior roads and laydown</td>
<td>Un-developed commercial designation along left bank below SR-20</td>
<td>Public lands along right bank and lower portion of left bank utilized for recreation</td>
<td>Entire right bank and southern portion of left bank designated P</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>SR-20</td>
<td>Motel</td>
<td>1 private residence</td>
<td>Public Access to Skagit River</td>
<td></td>
<td>Portion along right bank of Skagit River designated P</td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
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<td></td>
<td>Entire segment designated O-S</td>
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</tbody>
</table>

Seg = Planning Segment, O-S = Open Space, P = Public Lands

4.3 Projected Future Use of City’s Shorelines - Future use along the City’s shoreline areas are based to a large degree on the continued operation of the Lower Baker Hydroelectric Project, existing authorized development and land use plans and
regulations promulgated by the City including an updated Shoreline Master Program. Map 3 of Attachment A depicts existing zoning designation within shoreline jurisdiction.

4.3.1 Baker River Hydro Electric Project - With the relicensing of the Baker Hydroelectric Project in 2008, Puget Sound Energy is licensed to continue operation of the facility for 50 years. PSE has also obtained shoreline permit authorizations to construct a number of improvements to facilities within the City of Concrete including a new powerhouse. Future permit requirements for additional hydropower related improvements are complicated by the legal question of Federal pre-emption and the development of new shoreline regulations resulting from the Master Program update. Recognizing that PSE owns a large portion of the shoreline area in Planning Segments 1, 2 and 3 it is reasonable to expect that the shorelines will continue to be managed for hydropower. While Lake Shannon, the Baker River Canyon and lower Baker River channel are managed primarily for storage and conveyance purposes, there are substantial environmental benefits that result from PSE’s management of the facility many of which were derived through the settlement agreement negotiated through the FERC licensing process.

4.3.2 Existing Uses - With the exception of the Lower Baker Hydroelectric Project there is little existing development within the City’s shoreline jurisdictional area. SR-20, City roads and streets and private access roads exist in Planning Segments 1 through 4. While existing transportation corridors may be maintained, expansion and further improvement of highways, streets and roads will require shoreline authorizations. The motel located in Planning Segment 4 may also constitute an existing structure and use, however the regulatory status of extended recreational vehicle parking south of the motel should be clarified and resolved. Three existing homes represent the only shoreline single-family residential development in the City.

4.3.3 Comprehensive Plans, Zoning and Urban Growth Area – Future land use and development within shoreline areas is dependent to a degree on comprehensive plan and zoning designations. The City’s designated Urban Growth Area extends west of the existing municipal boundaries and does not include any areas within shoreline jurisdiction. The industrial zoning designation of the shoreline area along the left bank of Planning Segment 3 reflects existing uses associated with the Lower Baker Hydroelectric Project. A single area of Commercial-Light Industrial Zoning is located along the left bank of Planning Segment 3. Residential Zoning is limited to the outer boundary of the shoreline jurisdictional area north of SR-20 in Planning Segment 4 and an area along the right bank of Planning Segment 2 above the Thompson Bridge. There is little, if any, potential for additional residential development based on existing zoning designations. Open Space and Public Land designations over the remainder of the City’s shorelines support beneficial public uses such as maintenance of open space values, habitat areas and recreational uses including shoreline access.
4.3.4 Other Land and Aquatic Area Management Programs – Although the Wild and Scenic River Management Plan is non-regulatory by design it carries with it an emphasis on preserving the natural character of the Skagit River for recreational purposes. The U.S. Forest Services is an active participant in management issues within the WSR corridor.

4.3.5 Water Oriented Uses and Public Access - Guidance for the development of Shoreline Master Programs emphasizes the evolving concept of utilizing shoreline areas for water-oriented uses. Water oriented uses range from “water dependent” uses such as the Lower Baker Dam and other instream components of the Lower Baker Hydroelectric Project to “water related uses” such as the powerhouse to “water enjoyment” uses which include public access to shorelines. RCW 90.58.020 identifies specific policy guidance for management of Shorelines of Statewide Significance as follows:

“The legislature declares that the interest of all of the people shall be paramount in the management of shorelines of statewide significance. The department, in adopting guidelines for shorelines of statewide significance, and local government, in developing master programs for shorelines of statewide significance, shall give preference to uses in the following order of preference which:

(1) Recognize and protect the statewide interest over local interest;
(2) Preserve the natural character of the shoreline;
(3) Result in long term over short term benefit;
(4) Protect the resources and ecology of the shoreline;
(5) Increase public access to publicly owned areas of the shorelines;
(6) Increase recreational opportunities for the public in the shoreline;
(7) Provide for any other element as defined in RCW 90.58.100 deemed appropriate or necessary.”

The table on the following page summarizes water oriented shoreline uses as defined under WAC 173-26-020. Examples of existing water oriented uses in the City are provided in the right column.
### Table 6: Water Oriented Uses Definitions and Examples

<table>
<thead>
<tr>
<th>Water Oriented Use Definitions</th>
<th>Examples within the City of Concrete</th>
</tr>
</thead>
</table>
| “Water-dependent use” means a use or portion of a use which cannot exist in a location that is not adjacent to the water and which is dependent on the water by reason of the intrinsic nature of its operations. (WAC 173-26-020(36)) | Lower Baker Dam  
Surface Fish Collector (Lake Shannon)  
Upstream fish trap (Baker River) |
| “Water related uses” means a use or portion of a use which is not intrinsically dependent on a waterfront location but whose economic viability is dependent upon a waterfront location because:  
(a) The use has a functional requirement for a waterfront location such as the arrival or shipment of materials by water or the need for large quantities of water; or  
(b) The use provides a necessary service supportive of water-dependent uses and the proximity of the use to its customers makes its services less expensive and/or more convenient. (WAC 173-26-020(40)) | Lower Baker Power House  
Lower Baker Surge Tank  
Power House access Road |
| “Water enjoyment use” means a recreational use or other use that facilitates public access to the shoreline as a primary characteristic of the use; or a use that provides for recreational use or aesthetic enjoyment of the shoreline for substantial number of people as a general characteristic of the use and which through location, design and operation ensures the public’s ability to enjoy the physical and aesthetic qualities of the shoreline. In order to qualify as a water-enjoyment use, the use must be open to the general public and the shoreline-oriented space within the project must be devoted to the specific aspects of the use that fosters shoreline enjoyment. (WAC 173-26-020(37)) | Shoreline Access (Skagit River)  
Gazebo Picnic Area (Baker River)  
PSE Visitors Center  
Eagles Nest Motel |

#### 4.3.6 Shoreline Use Conflicts

Because of the general absence of shoreline development outside of that associated with the Lower Baker Hydroelectric Project within the City’s municipal boundaries there are no existing use conflicts. Recreational vehicle parking south of the existing motel in planning segment 3 may represent a code issue requiring resolve under existing zoning and shoreline requirements. While most of the City’s shorelines are zoned for public uses, access to steep slopes and swift currents may expose individuals to hazards. Public shoreline access proposals should be carefully planned to avoid hazardous areas. Use conflicts should be considered carefully in the development of updated shoreline policies and regulations.

#### 5.0 Cultural and Historic Resources

##### 5.1 Traditional Cultural Resources

Several Indian tribal groups have used areas near or within the present City of Concrete. The Upper Skagit Indian Tribe consists of these consolidated bands that lived along the Skagit, Cascade and Baker Rivers and their tributaries. Villages were comprised of extended family groups and represented an economic, social and political kinship unit (Hollenbeck, 1987). Two small winter villages are believed to have been located along the lower Baker River near Concrete:
Spa-dak - Two small winter house located north of the Skagit River below the Town of Concrete

Too-Kalb – (North side of Skagit River) Five small winter houses located to the west of where where the Baker River flows into the Skagit River.

5.2 National Register Structures – The Lower Baker River Hydroelectric Power Plant (constructed 1924-1925) was listed in the National Register of Historic Places on July 7, 1990. Contributing structures in the listing include the dam, intake, main pressure tunnel, circular forbay or surge chamber, branch tunnel and penstocks. The significance was documented to be based on its example of medium-head hydroelectric technology from the 1920s with the Dam reflecting the standard design for deep narrow canyons. The construction of the dam and tunnel in difficult terrain represents an important engineering accomplishment (Soderberg, 1986). (Attachment D: Historic Photos of Construction of the Lower Baker River Dam)

5.3 Other Historic Landmarks – In addition to the cultural and historic resources discussed above there are other local landmarks located within shoreline jurisdiction along the Baker River including the Thompson Bridge in Planning Segment 2 and the Superior Portland Cement Silos located along the left bank of the Baker River just upstream of the SR-20 Bridge in Planning Segment 3. The Historic Register and Landmark Properties Map is included in the report as Map 5 of Attachment A.

6.0 Shoreline Management Recommendations

6.1 Transition from Inventory to Management - The data collected in the inventory and characterization is translated into shoreline designations, policies and regulations in the updated Master Program. The updated Master Program must also incorporate all requirements of the Shoreline Management Act (RCW 90.58) and the Shoreline Master Program Guidelines (WAC 173-26)

6.2 Environment Designations – As outlined in WAC-26-191 (1)(d) Shoreline Management must address a wide range of physical conditions and development setting along shoreline areas. Effective shoreline management requires that the shoreline master program prescribe different sets of environmental protection measures, allowable use provisions, and development standards for each shoreline segment” In WAC 173-26-211(2)(a), the Guidelines further direct development and assignment of environment designations based on “existing use pattern, the biological and physical character of the shoreline, and the goals and aspirations of the community as expressed through comprehensive plans. Designations utilized in conjunction with the existing (County) Shoreline Master Program are Urban, Rural and Aquatic. The guidelines recommend potential use of six (6) unique environment designations described under WAC 173-26-211 as; High Intensity, Rural Conservancy, Urban Conservancy, Shoreline Residential, Natural and Aquatic. Local jurisdictions may develop and adopt alternate environment designations or retain existing designations, provided that they provide equal or better protection than Ecology’s recommended designations. The purpose of each of the
designations is provided in the following subsections as excerpted from WAC 173-26-211.

6.2.1 High Intensity - The purpose of the "high-intensity" environment is to provide for high-intensity water-oriented commercial, transportation, and industrial uses while protecting existing ecological functions and restoring ecological functions in areas that have been previously degraded.

6.2.2 Rural Conservancy - The purpose of the "rural conservancy" environment is to protect ecological functions, conserve existing natural resources and valuable historic and cultural areas in order to provide for sustained resource use, achieve natural flood plain processes, and provide recreational opportunities. Examples of uses that are appropriate in a "rural conservancy" environment include low-impact outdoor recreation uses, timber harvesting on a sustained-yield basis, agricultural uses, aquaculture, low-intensity residential development and other natural resource-based low-intensity uses.

6.2.3 Urban Conservancy - The purpose of the "urban conservancy" environment is to protect and restore ecological functions of open space, flood plain and other sensitive lands where they exist in urban and developed settings, while allowing a variety of compatible uses.

6.2.4 Shoreline Residential - The purpose of the "shoreline residential" environment is to accommodate residential development and appurtenant structures that are consistent with this chapter. An additional purpose is to provide appropriate public access and recreational uses.

6.2.5 Natural - The purpose of the "natural" environment is to protect those shoreline areas that are relatively free of human influence or that include intact or minimally degraded shoreline functions intolerant of human use. These systems require that only very low intensity uses be allowed in order to maintain the ecological functions and ecosystem-wide processes. Consistent with the policies of the designation, local government should include planning for restoration of degraded shorelines within this environment.

6.2.6 Aquatic - The purpose of the "aquatic" environment is to protect, restore, and manage the unique characteristics and resources of the areas waterward of the ordinary high-water mark.

6.3 Existing and Potential Future Shoreline Environment Designations – Application of shoreline environment designations to shorelines within each of the planning segments must be accompanied by citizen input and careful consideration of objectives and designation criteria. The following table provides a simple point of comparison between existing shoreline environment designations under the County Master Program with those developed under WAC 173-26-211.
Table 7: Shoreline Designation Table by Planning Segment

<table>
<thead>
<tr>
<th>Planning Segment</th>
<th>Existing Environment Designation</th>
<th>WAC 173-26-211 Designation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Lake Shannon</td>
<td>Aquatic/Conservancy/Rural</td>
<td>Aquatic/Urban Conservancy</td>
</tr>
<tr>
<td>2. Baker Canyon</td>
<td>Aquatic/Urban</td>
<td>Aquatic/High Intensity/Urban Conservancy</td>
</tr>
<tr>
<td>3. Baker Channel</td>
<td>Aquatic/Urban/Rural</td>
<td>Aquatic/Urban Conservancy</td>
</tr>
<tr>
<td>4. Upper Skagit</td>
<td>Aquatic/Urban</td>
<td>Aquatic/Urban Conservancy</td>
</tr>
<tr>
<td>5. Lower Skagit</td>
<td>Aquatic/Rural</td>
<td>Aquatic/Natural</td>
</tr>
</tbody>
</table>

6.4 Parallel Designations and Internal Consistency - Parallel environment designations may also be considered by local governments. Parallel designations divide shorelands into different sections generally running parallel to the shoreline. Parallel environments may be used to accommodate resource protection near the shoreline while allowing existing development further from the shoreline. Parallel environments should not be inconsistent with one another. Similarly designation should be internally consistent with comprehensive plans and other development regulations such as zoning designations.

7. Restoration Opportunities

7.1 Restoration Plan - A shoreline restoration plan will be prepared in a subsequent phase of the Shoreline Master Program Update process consistent with WAC 173-26-201(2)(f). The restoration plan will address the following six items as set forth under WAC 173-26-201(2)(f)(i-vi).

(i) Identify degraded areas, impaired ecological functions, and sites with potential for ecological restoration;
(ii) Establish overall goals and priorities for restoration of degraded area and impaired ecological functions;
(iii) Identify existing and ongoing projects and programs that are currently being implemented, or are reasonably assured of being implemented (based on an evaluation of funding likely in the foreseeable future) which are designed to contribute to local restoration goals;
(iv) Identify additional projects and programs needed to achieve local restoration goals, and implementation strategies including identifying prospective funding sources for those projects and programs;
(v) Identify timelines and benchmarks for implementing restoration projects and programs and achieving local restoration goals; and
(vi) Provide for mechanisms or strategies to ensure that restoration projects and programs will be implemented according to plans and to appropriately review the effectiveness of the projects and programs in meeting the overall restoration goals.

The restoration plan will “include goals, policies, actions for restoration of impaired shoreline functions. These master program provisions should be designed to achieve overall improvements in shoreline ecological functions over time, when compared to the status upon adoption of the master program” The restoration plan will mesh potential projects with additional projects, regional or local efforts, and programs of each.
jurisdiction, watershed groups, and environmental organizations that contribute or could potentially contribute to improved ecological functions of the shoreline.

7.2 Restoration Projects – Preliminary discussions with the City of Concrete Planning Commission identified several potential restoration projects, most notably restoration of the Little Baker River. The restoration site is located in both the City of Concrete and in unincorporated Skagit County. This project has received considerable attention for many years. The Skagit Fisheries Enhancement Group prepared the Little Baker River Restoration Conceptual Alternative Study in 1999. The study identified a preferred alternative which includes the following elements:

- Construction of a perched channel adjacent to the Baker River
- Access trail and viewing areas to observe salmon and habitat areas
- Restrooms and interpretive/educational facilities

The project would create (restore) approximately 5,500 feet in length of stream channel and approximately 220,000 square feet of potential salmonid rearing and possible spawning habitat. Additionally, it will provide/restore access to approximately 25,000 square feet of pond habitat. Puget Sound Chinook, steelhead and bull trout which are listed as threatened species under the ESA along with other salmonids would directly benefit from the project. Restoration of the Little Baker River will provide critical rearing habitat in one of few areas available for the listed species. Additionally, the project may be pursued in concert with a shoreline access/recreational area located at the site of the old cement plant discussed earlier under Sub-section 4.2.2.

The restoration project was pursued jointly by the Enhancement Group, local, state and federal agencies. Grant funding through the USACE was obtained to conduct the feasibility phase in 2001. Project planning was discontinued in 2010 for lack of federal funds.

8. Summary and Conclusion

Sections 1 through 5 of the Inventory and Characterization report represent the existing baseline conditions from which the “no net loss” policy for future management of the City’s shorelines will be derived. The no net loss policy will provide the conceptual basis for the development of policies and regulations through the remainder of the master program update process. Because the inventory relied to a large degree on fresh information sources, much of which was assembled through the re-licensing of the Lower Baker Hydroelectric facility, relatively few data gaps were identified. It should be noted however that the City has not attempted to map the channel migration zone and will rely upon the FEMA designated floodplain and floodway maps for the purpose of compliance with WAC 173-26-221(3). Sections 6 and 7 outline subsequent steps of applying shoreline environment designations and identifying potential restoration opportunities. Development of the regulatory provisions of the master program will continue to incorporate public input through review by the City of Concrete Planning Commission and final local adoption by the City Council.
9. References

9.1 Hard Documents

Concrete Municipal Code, Title 19, Comprehensive Zoning Ordinance including accompanying maps depicting zoning designations, Town of Concrete WA, [Ord. 426 § 10.03.010, 1998].

Concrete Municipal Code, Chapter 15.16 Critical Areas Regulations including Critical Area Overlay Map, Town of Concrete WA, (Adopted November, 2008).

Concrete, Town of. Imagine Concrete; Preliminary Findings established by the Vision Steering Committee, (Vision Duties & Responsibilities Document Finalized, August 18, 2009).


Puget Sound Energy. Construction Photographs of Lower Baker Dam 1920s through 1960s. Provided by; McMeekin, Jeff, Land Planner.


Washington State Department of Fish and Wildlife and Western Washington Treaty Indian Tribes. 1994. Salmon and Steelhead Stock Inventory (SASSI). Olympia, WA.


9.2 Websites


9.3 Personal Communications


Cisar, Rick - Town of Concrete Planner: Discussions regarding shoreline and adjacent development, critical areas, recreational uses and land use regulations. 2009 – 2010.


Gerrits, Lyle – Resident of Concrete and Lake Shannon: Discussion relating to mineral extraction and processing activities. August 27, 2010.


Kramer, Stephanie – Assistant Archaeologist: Discussion relating to the presence of historic and cultural resources in the Town of Concrete. December 7, 2010.


Stevenson, Betsy – Senior Planner/Team Supervisor, Skagit County Planning and Development Services: Meetings regarding coordination with County wide SMP update process. March 2010.


Tolles, Patti – Project Assistant, CalPortland Company: Discussion regarding company ownership within area of shoreline jurisdiction.

Town of Concrete Planning Commission: Special Meetings on Shoreline Master Program Update, February 2 and June 22, 2010.


Wilkins, Alan – Town of Concrete Public Works Director: Site inspection and discussion regarding failure along west shoulder of Upper Baker River Road. February 18, 2010.
