Pend Oreille County Shoreline Master Program Update
Reach-scale Inventory and Assessment

July 2010

Prepared for Pend Oreille County
Department of Ecology Grant No. G0800252
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INTRODUCTION

Pend Oreille County (County) is undertaking a comprehensive update to its Shoreline Master Program (SMP) as required by the implementing guidelines in the Washington Administrative Code (WAC 173-26). This shoreline inventory and analysis report supports this effort by providing a baseline inventory of existing conditions within the shorelines of the County and an assessment of shoreline functions.

The report provides water body and reach-scale inventory information and analysis for all water bodies in the County that meet the jurisdictional requirements of “shoreline of the state” or “shoreline of statewide significance” (RCW 90.558.030). The shoreline areas described and analyzed in this report are referred to as shoreline planning areas (SPA) and are shown in Map 3. The extent of shoreline jurisdiction was assessed on a case-by-case basis and is based on the location of the ordinary high water mark (OHWM), associated wetlands, and floodways. The SPA represents a preliminary geographic boundary for study and planning purposes only.

The reach-scale analysis is required as part of the shoreline inventory in order to assist the County in determining shoreline environment designations and provide technical information in support of the development of goals, policies and regulations (173-26-201(c) and (d)). The intent of the shoreline reach-scale inventory and assessment is to: (1) identify how existing conditions in or near the shoreline have responded to process alterations, as documented in the draft Shoreline Characterization (Dohrn and Associates, 2009); and (2) determine the effects of the alteration on shoreline ecological functions. These findings will help provide a framework for the future updates to the County’s shoreline management policies and regulations.
METHODS

This report was prepared, consistent with state guidelines, using the most current scientific and technical data that was readily available and applicable to the whole County. No field data was collected. Data that comprised the principle sources for the reach-scale analysis included Pend Oreille County GIS data, aerial photographs, WDFW PHS data, National Wetlands Inventory (NWI) data, and Land Use and Land Cover Data produced by the USGS GAP Analysis Program (2010). All data sources utilized are noted in the references section of the report.

Descriptions of existing conditions and shoreline functions are provided for each water body in the text narrative of the report. Where applicable, reach-scale features are also provided in the report narrative. A reach-scale assessment of shoreline functions is provided in Appendix A. Reach-scale data on land use, shoreline designations and zoning are provided in Appendix B. An explanation of methods for assessing contaminated sites is included as Appendix C. Reach-scale land cover and vegetation data are provided in Appendix D. Reach-scale information on wetland types and amounts are included in Appendix E.

Wetlands data within Pend Oreille County SPA were obtained from the National Wetlands Inventory (NWI). The data include the approximate location and type of wetlands based on the Cowardin rating system (Cowardin et al., 1979). It is important to note that the NWI data classifies the open water portion of many of the lakes in the County as lacustrine open water permanently flooded wetlands (L1OWH; Appendix E). This is relevant because the open water portion of lakes are likely to be regulated differently than the other types of listed wetlands. It is further important to note that NWI is a national data set created at a broad scale for planning purposes. It is not necessarily accurate for a site-specific analysis. A project-level permit decision would require an onsite evaluation and/or delineation of wetlands. A summary of the wetland types identified in the NWI data is presented for each water body within the report narrative and a list of the types and amounts of wetlands in each shoreline reach are included in Appendix E.

The County supplied zoning, and comprehensive plan data. Land use data was derived from County Assessor’s database. Tax assessor’s data is the best available source for land use data, but it presents some problems in a land use planning context. Broadly, assessor’s data is maintained for the purpose of tax collection. It does not necessarily track land use changes from year to year. For taxable parcels, assessor’s data is typically accurate, but for lands that are tax-exempt or lands in transition from one use to another, the assessor’s codes can be less reliable. Assessor’s data also does not differentiate land cover types. The designation “vacant” typically indicates that there are no taxable improvements on a property, but it does not indicate the condition of vegetation on that property.

Comprehensive land use designations are planned land uses established through the County’s long-range comprehensive planning process. They are implemented through zoning regulations. The County has established zoning consistent with its comprehensive land use plan. Therefore, comprehensive plan land use designations and zoning are the same. Both are described for each SMA water body in the report narrative and percentages are provided for each reach in Appendix B. County zoning districts are described in Table 1 below:
<table>
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<tr>
<th>Zone</th>
<th>Abbreviation</th>
<th>Description</th>
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<tr>
<td>Rural-5</td>
<td>R5</td>
<td>The residential density of this zoning district is 1 dwelling unit per 5 acres. This zoning district is located along U.S. highways, state routes, designated arterials, and County Major (07) and Minor (08) collectors.</td>
</tr>
<tr>
<td>Rural-10</td>
<td>R10</td>
<td>The residential density of this zoning district is 1 dwelling unit per 10 acres. This zoning district includes parcels with frontage on maintained County roads with adequate access.</td>
</tr>
<tr>
<td>Rural-20</td>
<td>R20</td>
<td>The residential density of this zoning district is 1 dwelling unit per 20 acres. Adequate access is required for parcels within this zone.</td>
</tr>
<tr>
<td>Rural-40</td>
<td>R40</td>
<td>The residential density of this zoning district is 1 dwelling unit per 40 acres. This zoning district is beyond the existing all-weather county road system or private access network.</td>
</tr>
<tr>
<td>Natural Resource Lands-20</td>
<td>NR20</td>
<td>The residential density of this zoning district is 1 dwelling unit per 20 acres. Parcels within this zone must have approved road access and designated as Timber, or Agricultural Lands, or currently in use as a mine.</td>
</tr>
<tr>
<td>Natural Resource Lands-40</td>
<td>NR40</td>
<td>The residential density of this zoning district is 1 dwelling unit per 40 acres. Parcels within this zone have no road access and must be designated as Timber, or Agricultural Lands, or currently in use as a mine.</td>
</tr>
<tr>
<td>Public Lands</td>
<td>PL</td>
<td>The lands within this zone must be publicly owned and all proposed development activities and uses are subject to the provisions of County development code or the requirements of the responsible public agency(s).</td>
</tr>
<tr>
<td>Tribal Lands</td>
<td>TL</td>
<td>The lands within this zone must be located within the boundaries of the Kalispel Reservation and all proposed development activities and uses are subject to approval by the Kalispel Tribe.</td>
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</table>

The County does not maintain zoning data for the incorporated areas. This represents a data gap. Shoreline areas that are within the incorporated areas are coded as “C” for Cusick; “I” for Ione; “M” for Metaline; “MF” for Metaline Falls; and “N” for Newport.

Water quality data contained in this report was derived from Washington State's Water Quality Assessment produced by the Department of Ecology. Section 303(d) of the Federal Clean Water Act requires Washington State to periodically prepare a list of all surface waters in the state for which beneficial uses, such as for drinking, recreation, aquatic habitat, and industrial use, are impaired by pollutants. The Section 305(b) report, required by the Federal Clean Water Act, describes the current conditions of the state's waters to the U.S. Congress and the public. 305(b) is a state-wide assessment of the status of all the state's waters, whereas the 303(d) list reports just on the impaired waters of the state. The water quality assessment list divides waterbody impairments into the following five categories:

1. Category 1 - Meets tested standards for clean waters.

2. Category 2 - Waters of concern: waters where there is some evidence of a water quality problem, but not enough to require production of a water quality improvement project (also known as a TMDL) at this time.
3. Category 3 - Insufficient data: this category will be largely empty. Water bodies that have not been tested will not be individually listed, but if they do not appear in one of the other categories, they are assumed to belong here.

4. Category 4 - Polluted waters that do not require a TMDL: waters that have pollution problems that are being solved:
   a. Category 4a - has a TMDL: water bodies that have an approved TMDL in place and are actively being implemented.
   b. Category 4b - has a pollution control program: water bodies that have a program in place that is expected to solve the pollution problems. While pollution control programs are not TMDLs, they must have many of the same features and there must be some legal or financial guarantee that they will be implemented.
   c. Category 4c - is impaired by a non-pollutant: water bodies impaired by causes that cannot be addressed through a TMDL. These impairments include low water flow, stream channelization, and dams. These problems require complex solutions to help restore streams to more natural conditions.

5. Category 5 - Polluted waters that require a TMDL: the traditional list of impaired water bodies traditionally known as the 303(d) list. Placement in this category means that Ecology has data showing that the water quality standards have been violated for one or more pollutants, and there is no TMDL or pollution control plan. TMDLs are required for the water bodies in this category.

For the purposes of this report, water bodies that have been categorized as either a 4 or 5 are identified in the report narrative. In the functional assessment table (Appendix A), all 303(d) and 305(b) listings are included as part of the assessment. Lack of inclusion on either list is not necessarily an indication that pollutants are not present; it may simply be an indication that testing has not been performed. Based on review of data and aerial photography, some inferences related to water quality at untested water bodies can be made.

Appendix C contains a description of the methods and data sources used to inventory and analyze contaminated sites. A complete map portfolio (draft working maps) showing inventory data at appropriate scales is included as Appendix F.

**Functional Assessment**

The assessment of shoreline functions included in Appendix A provides an assessment of the level of impairment of key ecological functions at each shoreline reach. For each reach, hydrological functions, water quality and shoreline/in-water habitat were assessed. Level of impairment was classified as “low”, “moderate” or “high.” Low impairment represents shoreline functions that are generally intact and high impairment signifies shoreline functions that are highly altered. The functional assessments are based on a review of the inventory data; information contained in the map folio and appendices; the analysis contained in the report narrative; and best professional opinion.

The hydrological impairment ranking for each shoreline reach is based on the amount and type of process and channel modifications, including dams, dikes, levees, land clearing, ditching, agriculture, grazing, logging, or residential and commercial development. A reach is considered to have low hydrological impairment if there have been no or minimal modifications. A reach is considered to have moderate hydrological impairment if there have been some modifications, but some areas are still relatively intact.
A reach is considered to have high hydrological impairment if there have been major modifications (e.g. dams, logging, residential and commercial development).

The assessment of water quality was based on inclusion on the 303(d) list. In general, waterbodies listed on the 303(d) list as category 5 were considered highly impaired. Listings of 4 were considered moderate and listing of 2 or no listing were considered low. These assessments were augmented with review of conditions adjacent to the waterbody. Incorrectly installed or failing septic systems associated with residential development is often a source of surface water pollution, typically increased fecal coliform. Data indicating where septic systems are installed and which are failing was not available. This represents a data gap.

Riparian/lakeshore habitat functions and alterations were assessed based upon a review of aerial photographs and Level III GAP land cover data (USGS, 2010). Vegetation community types within the SPA were described using the GAP definitions (USGS, 2010). In-depth discussion of these community types, including species composition, is available at the NatureServe website: [http://www.natureserve.org/explorer/servlet/NatureServe](http://www.natureserve.org/explorer/servlet/NatureServe).

The habitat impairment rankings for each water body are based on the amount and type of vegetation alteration present, as observed from aerial photography. A water body is considered to have low habitat impairment if there are minimal modifications to shoreline vegetation communities. A water body is considered to have moderate habitat impairment if some alteration is present, but most shoreline areas have relatively intact vegetation communities. A water body is considered to have high habitat impairment if large portions of shoreline vegetation communities have been significantly disturbed (e.g. roads, agricultural, residential and commercial development, and/or power line corridors are present).

**Report Organization**

For ease of use, the report is organized by Water Resource Inventory Areas (WRIA) and then waterbody, which are listed alphabetically within each WRIA. There are 59 waterbodies within the shoreline jurisdiction of Pend Oreille County. These waters are located within one of six WRIA. The waterbodies include 34 lakes; 24 rivers, streams and creeks; and one wetland meeting the definition of shorelines of the state. Table 2 below shows the waterbodies by WRIA.

**Table 2 SMA Waterbodies in Pend Oreille County**

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<tr>
<th>Colville WRIA 59</th>
<th>Little Spokane WRIA 55</th>
<th>Middle Spokane WRIA 57</th>
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<td>Frater Lake</td>
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WRIA 55 LITTLE SPOKANE

1. CHAIN LAKE

Physical and Biological Characterization

Drainage Basin, Tributary Streams, and Associated Wetlands

Chain Lake is located along the downstream reach of Little Spokane River, within Pend Oreille County. Chain Lake consists of three small lakes and a total area of 100-surface acres (unpublished WDFW 1956 as cited in NPCC, 2004). Approximately 15 acres of palustrine seasonal wetlands are located adjacent to the lakes (Map 6). This includes 11 acres of scrub-shrub and 4 acres of emergent wetlands (Appendix E).

Process and Channel Modification

The process modifications adjacent to Chain Lake, located along the Little Spokane River, are:

- Agricultural and residential wells;
- Grazing;
- Residential development; and
- Roads and railroad tracks adjacent to the lake.

The use of agricultural and residential wells has changed the amount of groundwater flowing into the lake. The road and railroad tracks adjacent to the lake may result in excess sediment into the lake. The hydrological processes associated with Chain Lake are partially impaired due to the drawdown of water and sedimentation into the lake.

Geologic and Flood Hazards

A 100-year floodplain has been identified around Chain Lake (Map 6). The identified floodplain is confined by the railroad tracks to the north and the existing wetlands. There are a few adjacent slopes that are greater than 20 percent and may be associated with severe erosion and landslide risks (Map 11 and Map 12). There are no liquefaction hazards identified or other seismic hazards adjacent to Chain Lake (Map 13).

Critical or Priority Habitat and Species Use

The presence of kokanee salmon and rainbow trout is documented in Chain Lake (WDFW, 2009). The mapped priority habitats associated with the lake are white-tailed deer winter range, and riparian habitat with associated wetlands.

In-stream and Riparian Habitats

The majority of the land surrounding Reaches 1 and 2 of the Little Spokane River is mapped as Northern Rocky Mountain Mesic Montane Mixed Conifer Forest, with some areas of Northern Rocky Mountain Ponderosa Pine Woodland and Savanna, and Northern Rocky Mountain Lower Montane Riparian Woodland and Shrubland (USGS, 2010). These vegetation community types provide habitat for a wide
variety of amphibians, reptiles, mammals, and birds (Johnson and O’Neil, 2001). In particular, the terrestrial-aquatic interface within the intact riparian zones (both wetland and upland) of Chain Lake likely contribute to a high degree of biological diversity for both fish and wildlife species.

The northern portion of the Chain Lake shoreline has been altered by an adjacent road and residential development. These land use alterations have negatively affected the habitat value of these areas, as compared to pre-development conditions. Percentages (and acreages) of the Level III landcover types from the GAP analysis within the SPA are provided in Appendix D.

The relatively high levels of disturbance adjacent to the northern shoreline of Chain Lake have made the area susceptible to non-native, invasive plant invasions. Non-native plants that are documented as occurring within lakes and wetlands in the county include common reed, Eurasian watermilfoil, purple and wand loosestrife, knotweeds, reed canarygrass, and yellow flag iris (Pend Oreille County Noxious Weed Control Board, 2010). Invasive plants tend to form mono-specific stands, which compete with native species for moisture, nutrients, sunlight, and space (Cronk & Fennessy, 2001; FISRWG, 2001; Maurer et al., 2003). The replacement of native plants by mono-specific stands of invasive species can lead to a variety of negative effects in aquatic habitats, which include obstruction of water flow, fish and wildlife habitat loss, and an overall reduction in species richness (Antieau, 1998; Cronk & Fennessy, 2001).

**Water Quality**

According to the 2008 Washington State Water Quality Assessment (Ecology, 2008), the water quality at Chain Lake is classified as Category 2 for mercury. Although the lake is not classified as impaired, it is being monitored and is considered a water of concern. The presence of elevated levels of mercury may be due to human modifications in the ecosystem.

**Shoreline Use Patterns**

*Existing Land and Shoreline Use*

Half of the Chain Lake SPA is currently classified as vacant and the other half is a mix of natural resource lands, residential, and public lands.

*Shoreline Modifications - Docks, Piers, Buoys, Floats and Bridges*

There are approximately nine docks mapped on Chain Lake. These are primarily associated with residential development.

*Shoreline Environment Designations, Zoning, and Other Applicable Regulations*

The Lake’s shorelines are currently designated Conservancy (Map 3). The zoning around the lake is a combination of Natural Resource and Rural (Map 18).

*Existing and Potential Public Access Areas*

The only public access available at Chain Lake is an end of roadway access point that is less than one acre in size.
Historic and Cultural Resources

There are no recorded archeological or historic sites (DAHP 2010). However, due to the location of the lake and the documented use of the Pend Oreille County area by Kalispel peoples, there is some probability of unknown archaeological resources occurring within the Chain Lake shoreline planning area.

There are no state or federally listed historic properties within the Chain Lake shoreline planning area (DAHP 2010).

Contaminated Sites

There are no Washington Department of Ecology listed facilities or sites within the Chain Lake shoreline planning area (Ecology, 2010).

2. DIAMOND LAKE

Physical and Biological Characterization

Drainage Basin, Tributary Streams, and Associated Wetlands

Diamond Lake is located in the southern part of Pend Oreille County, about 7 miles southwest of Newport. Diamond Lake appears to have formed by a dam of sand and gravel washed out from a glacier, blocking the valley in which the lake is found. The surface area of the lake is approximately 800 acres. Diamond Lake has Moon Creek as its outlet, which drains into Sacheen Lake and then into the West Branch of the Little Spokane River. A total of approximately 782 acres of seasonal wetlands are located upstream and downstream of the lake (Map 6). This includes approximately 670 acres of palustrine emergent, 84 acres of palustrine scrub-shrub, and 28 acres of palustrine forested seasonal wetlands (Appendix E).

Process and Channel Modification

The process modifications in the Diamond Lake watershed include:

- Residential and commercial development adjacent to the lake;
- Grazing and agriculture; and
- Logging.

Logs were skidded by horses to the lakes and tributaries of the West Branch Little Spokane River and were stockpiled in lakes and streams before being floated to mills operated near the outlets of Diamond and Eloika Lakes. These modifications have impaired the hydrological processes of Diamond Lake.

Geologic and Flood Hazards

In April 1997, a Presidential Disaster was declared for flooding occurring along the Pend Oreille River and Diamond Lake (Pend Oreille County, 2004). The designated FEMA 100-year floodplain encompasses the banks of Diamond Lake (Map 6). There are no severe erosion hazards or landslide hazards identified adjacent to Diamond Lake (Map 11 and Map 12). There may be seismic hazards downstream of the lake identified with low to moderate liquefaction hazards (Map 13).
Critical or Priority Habitat and Species Use

The presence of rainbow trout is documented in Diamond Lake (WDFW, 2009). The mapped priority habitat types associated with Diamond Lake are mature forest, wetlands with associated soughs and riparian areas, and waterfowl breeding areas (WDFW, 2009).

In-stream and Riparian Habitats

A large portion of the land surrounding Reaches 1 and 2 of Diamond Lake is mapped as Northern Rocky Mountain Dry-Mesic Montane Mixed Conifer Forest (USGS, 2010). This forest type provides habitat for a wide variety of amphibians, reptiles, mammals, and birds (Johnson and O’Neil, 2001). However, the majority of shoreline area within Reach 1 has been significantly altered by residential development. The shoreline of Reach 2 is more intact, but has sustained impacts from residential development and timber harvest/land clearing activities. These land use alterations have negatively affected the habitat value of these areas, as compared to predevelopment conditions. Percentages (and acreages) of the Level III landcover types from the GAP analysis within the SPA are provided in Appendix D.

There are significant wetland areas located within Reaches 1 and 2 that are associated with Diamond Lake. These areas appear to have been historically impacted by ditching, as well as past and ongoing agricultural activities. Despite these alterations, wetlands impacted by agricultural activities can provide significant stop-over and wintering habitat for migratory waterfowl (Johnson and O’Neil, 2001). In addition, if sufficient inundation is present in the spring months, these wetland areas can provide important breeding sites for amphibians and waterfowl.

The relatively high levels of habitat disturbance of the lands surrounding Diamond Lake has made the area susceptible to non-native, invasive plant invasions. Non-native plants that are documented as occurring within lakes and wetlands in the county include common reed, Eurasian watermilfoil, purple and wand loosestrife, knotweeds, reed canarygrass, and yellow flag iris (Pend Oreille County Noxious Weed Control Board, 2010). Invasive plants tend to form mono-specific stands, which compete with native species for moisture, nutrients, sunlight, and space (Cronk & Fennessy, 2001; FISRWG, 2001; Maurer et al., 2003). The replacement of native plants by mono-specific stands of invasive species can lead to a variety of negative effects in aquatic habitats, which include obstruction of water flow, fish and wildlife habitat loss, and an overall reduction in species richness (Antieau, 1998; Cronk & Fennessy, 2001).

Water Quality

According to the 2008 Washington State Water Quality Assessment (Ecology, 2008), Diamond Lake has one Category 4C listing for habitat impairment due to invasive exotic species. The water quality at Diamond Lake is moderately impaired due to this classification and potentially from runoff from adjacent roads and development.

Shoreline Use Patterns

Existing Land and Shoreline Use

Based on County Assessor’s data, the most common land use in the Diamond Lake SPA is natural resource lands. Other land uses include vacant lands, agriculture, and active recreation. The Boy Scouts of America own 6,000 feet of shoreline along Diamond Lake (POCD 2000). Based on a review of aerial photographs, most of the shorelines have been developed as single family and vacation homes. With the exception of the southern end of the lake that is undeveloped, the rest of the shoreline is characterized by
relatively high-density residential development. State Route 2 parallels the eastern shore of the lake as well.

**Shoreline Modifications - Docks, Piers, Buoys, Floats and Bridges**

Diamond Lake is heavily modified through residential development. There are 311 docks or piers and eight buoys or floats mapped on the lake. With the exception of the southern end of the lake, there are few areas without homes and docks.

**Shoreline Environment Designations, Zoning, and Other Applicable Regulations**

Most of the shoreline is currently designated as Urban. The undeveloped southern shoreline of the lake is designated as Conservancy (Map 3). The zoning around the lake is a combination of Rural (R5) and Natural Resource (N20) (Map 18).

**Existing and Potential Public Access Areas**

The only developed public access point in the Diamond Lake SPA is a concrete boat launch managed by the Washington State Department of Fish and Wildlife. In addition, there are 3 undeveloped access points totaling less than 1 acre which provide public access called Elu Beach, Tarbets Beach, and Tony A. Stanhope 1st Addition.

**Historic and Cultural Resources**

There are no recorded archeological or inventoried historic sites (DAHP 2010). However, due to the location of the lake near the Pend Oreille River valley and the documented use of the Pend Oreille County area by Kalispel peoples, there is some probability of unknown archaeological resources occurring within the Diamond Lake shoreline planning area.

There are no state or federally listed historic properties within the Diamond Lake shoreline planning area (DAHP 2010).

**Contaminated Sites**

Washington Department of Ecology has previously monitored one site within the Diamond Lake planning area – a Hazardous Waste Generator facility associated with a State Department of Transportation property. The site, located in the Reach 1 area, was actively tracked by Ecology during 1995 and was related to road construction activities. No other sites or facilities are within or near the lake’s shoreline area (Ecology, 2010).

### 3. FAN LAKE

**Physical and Biological Characterization**

**Drainage Basin, Tributary Streams, and Associated Wetlands**

Fan Lake is connected to the West Branch of the Little Spokane River – Reach 1 by a short tributary stream approximately 1 mile north of Eloika Lake. The drainage basin of the lake includes the Camp Reed Creek and adjacent hills. Approximately 25 acres of seasonal wetlands are located to the north and south, in areas of alluvial sediment (Map 6). This includes...
approximately 22 acres of palustrine emergent and 3 acres of palustrine forested seasonal wetlands (Appendix E).

**Process and Channel Modification**

The area adjacent to Fan Lake, part of the West Branch of the Little Spokane River watershed, is primarily undeveloped, but there is agricultural and residential development nearby and within the larger watershed. Fan Lake has a significant amount of eutrophication, partially from the nearby human development (Juul, 1990 as cited in Boise Cascade, 1997). Additionally, a splash dam on Fan Lake was created in the early 1900s and logging occurred in the area (Soltero et al., 1991 as cited in Boise Cascade 1997). These modifications have altered the natural hydrological processes.

**Geologic and Flood Hazards**

FEMA flood hazards are designated on the banks of the lake as well as in the low-lying areas to the north and south of the lake (Map 6). The designated floodplain connects Fan Lake to the West Branch of the Little Spokane River through the tributary stream and adjacent floodplain. The underlying geology is alluvium and extends to the north and south low-lying area (Map 8). Adjacent slopes are less than 20 percent and generally have a low erosion and landslide risk (Map 11 and Map 12). The seismic hazards are primarily designated as area of moderate to high liquefaction hazards and are located to the north and south of the lake (Map 13).

**Critical or Priority Habitat and Species Use**

There are no priority fish documented in Fan Lake (WDFW, 2009). The mapped priority habitats associated with the lake are white-tail deer winter range and riparian areas with associated wetlands.

**In-stream and Riparian Habitats**

The dominant vegetation community of the land surrounding Fan Lake is mapped as Northern Rocky Mountain Dry-Mesic Montane Mixed Conifer Forest (USGS, 2010). However, the southern portion of the lake shore is disturbed by a road and residential development. Percentages (and acreages) of the Level II landcover types from the GAP analysis within the SPA are provided in Appendix D.

**Water Quality**

According to the 2008 Washington State Water Quality Assessment (Ecology, 2008), Fan Lake has a Category 4C listing for habitat impairment due to invasive exotic species. The water quality at Fan Lake is moderately impaired due to this classification and potential runoff from adjacent roads and development.

**Shoreline Use Patterns**

**Existing Land and Shoreline Use**

Land use in the Fan Lake SPA is entirely classified as vacant lands.

**Shoreline Modifications - Docks, Piers, Buoys, Floats and Bridges**

Fan Lake Rd W is located along a short stretch of the lake. There is also one dock visible on aerial photographs on the lake associated with Camp Reed.
Shoreline Environment Designations, Zoning, and Other Applicable Regulations

The current SMP designation for Fan Lake is Conservancy (Map 3). The majority of the lake is zoned as Rural (Map 18).

Existing and Potential Public Access Areas

The YMCA owns Camp Reed on Fan Lake. The property consists of 460 acres of woodland in a variety of conditions and species compositions. The holdings surround the lake with the exception of the northern tip. The facility provides overnight camping for 180 youth and adult counselors. There is a Washington Department of Fish and Wildlife concrete boat launch that provides public access to the lake (POCD, 2000).

Historic and Cultural Resources

There are no recorded archeological or historic sites (DAHP 2010). However, due to the location of the lake and the documented use of the Pend Oreille County area by Kalispel peoples, there is some probability of unknown archaeological resources occurring within the Fan Lake shoreline planning area. The forested environment surrounding the lake, well removed from the Pend Oreille River valley, limits the likelihood of frequent occurrence or use by native peoples within the vicinity of the lake.

There are no state or federally listed historic properties within the Fan Lake shoreline planning area (DAHP 2010).

Contaminated Sites

There are no Washington Department of Ecology listed facilities or sites within the Fan Lake shoreline planning area (Ecology, 2010).

4. HORSESHOE LAKE

Physical and Biological Characterization

Drainage Basin, Tributary Streams, and Associated Wetlands

Among the four major lakes along the West Branch Little Spokane River, Horseshoe Lake has the greatest potential vulnerability to excess sediment because of its location within the drainage and its fish species composition. Horseshoe Lake is the first lake to receive runoff from the two largest tributary streams, Buck and Heel Creeks; therefore, it most likely traps the largest portion of sediment produced in the drainage. A total of approximately 60 acres of seasonal wetland extends along the inlet and outlet creeks (Map 6). This includes approximately 22 acres of palustrine emergent, 30 acres of palustrine scrub-shrub, and 8 acres of palustrine forested seasonal wetlands (Appendix E).

Process and Channel Modification

The primary process modifications at Horseshoe Lake include:

- Adjacent roads; and

- Logging.
Logs were moved downstream along the West Branch of the Little Spokane River during the spring snowmelt by construction of a series of splash dams on Horseshoe Lake, Fan Lake, and the mainstem West Branch of the Little Spokane River (Soltero et al. 1991 as cited in Boise Cascade 1997). The hydrological processes at Horseshoe Lake are impaired due to excess sediment being transported from Buck and Heel Creeks, as well as adjacent roads and logging.

**Geologic and Flood Hazards**

The identified FEMA flood zone extends along the inlet and outlet creeks (Map 6). The steep slopes east and southeast of Horseshoe Lake are composed of unconsolidated rock fragments at the base of a steep slope. This area is prone to failure if disturbed (Boise Cascade 1997). Alluvial materials are located to the north and south of the lake (Map 8). Adjacent slopes include some areas that are greater than 20 percent and may be associated with potential erosion and landslide hazards (Map 11 and Map 12). Seismic hazards occur around Horseshoe Lake. Potential liquefaction has been mapped as low to moderate west of the lake and moderate to high north and south of the lake (Map 13).

**Critical or Priority Habitat and Species Use**

The presence of kokanee salmon and rainbow trout is documented in Horseshoe Lake (WDFW, 2009). In addition, the lake provides documented kokanee spawning habitat. The mapped priority habitat type associated with the lake is white-tail deer winter range and riparian habitats with associated wetland areas.

**In-stream and Riparian Habitats**

The shorelines of Reaches 1 and 2 of Horseshoe Lake are mapped primarily as Northern Rocky Mountain Dry-Mesic Montane Mixed Conifer Forest, with patches of mapped Northern Rocky Mountain Lower Montane Riparian Woodland and Shrubland and Northern Rocky Mountain Ponderosa Pine Woodland and Savanna habitat. These vegetation community types provide habitat for a wide variety of amphibians, reptiles, mammals, and birds (Johnson and O’Neil, 2001). In particular, the terrestrial-aquatic interface within the intact riparian zones (both wetland and upland) of the lake likely contribute to a high degree of biological diversity for both fish and wildlife species.

The shoreline of Reach 2 is generally unaltered. However, the northwest portion of Reach 2 shoreline has been altered by low-density residential development and agriculture. These land use alterations have negatively affected the habitat value of these areas, as compared to pre-development conditions. Percentages (and acreages) of the Level III landcover types from the GAP analysis within the SPA are provided in Appendix D.

The presence of shoreline disturbance has made the Horseshoe Lake area more susceptible to non-native, invasive plant invasions. Non-native plants that are documented as occurring within lakes and wetlands in the county include common reed, Eurasian watermilfoil, purple and wand loosestrife, knotweeds, reed canarygrass, and yellow flag iris (Pend Oreille County Noxious Weed Control Board, 2010). Invasive plants tend to form mono-specific stands, which compete with native species for moisture, nutrients, sunlight, and space (Cronk & Fennessy, 2001; FISRWG, 2001; Maurer et al., 2003). The replacement of native plants by mono-specific stands of invasive species can lead to a variety of negative effects in aquatic habitats, which include obstruction of water flow, fish and wildlife habitat loss, and an overall reduction in species richness (Antieau, 1998; Cronk & Fennessy, 2001).
Water Quality

According to the 2008 Washington State Water Quality Assessment (Ecology, 2008), the water quality at Horseshoe Lake has been listed as an impaired water body. The 303(d) Category 5 designation is related to dissolved oxygen and temperature. Additionally, the lake has a Category 4C rating related to the presence of invasive species.

Shoreline Use Patterns

Existing Land and Shoreline Use

The main land use in the Horseshoe Lake SPA is vacant lands. Other land uses include natural resource lands and residential.

Shoreline Modifications - Docks, Piers, Buoys, Floats and Bridges

Although not mapped, there are several residential docks along the west shore of Horseshoe Lake.

Shoreline Environment Designations, Zoning, and Other Applicable Regulations

The western shore of the Horseshoe Lake is currently designated as Urban. The remainder of the shorelines is currently designated as Conservancy (Map 3). Zoning around the lake is a mix of Natural Resource and Rural with a small amount of Public Land zoning as well.

Existing and Potential Public Access Areas

Two public access sites are available within the Horseshoe Lake SPA. There is a Washington Department of Fish and Wildlife gravel boat launch and an undeveloped public access site called Deerhaven Subdivision. Both total less than 1 acre in size within the SPA.

Historic and Cultural Resources

There are no recorded archeological sites within the Horseshoe Lake shoreline area. There is one recorded historic site, a timber, rock and earth dam that was potentially built as part of timber land use practices, with the purpose being to convey logs between lake and stream areas (DAHP 2010). The dam structure, documented in 1985 as potentially eligible for state and national Historic Registry listing, is located on the southern end of the east lobe of the lake.

Due to the location of the lake and the documented use of the Pend Oreille County area by Kalispel peoples, there is some probability of unknown archaeological resources occurring within the Horseshoe Lake shoreline planning area.

There are no state or federally listed historic properties within the Horseshoe Lake shoreline planning area (DAHP 2010).

Contaminated Sites

Consistent with the largely undeveloped character of the shoreline area, there are no Washington Department of Ecology listed facilities or sites along the shoreline or within the vicinity of Horseshoe Lake (Ecology, 2010).
5. LITTLE SPOKANE RIVER

Physical and Biological Characterization

Drainage Basin, Tributary Streams, and Associated Wetlands

The Little Spokane River flows 48.6-miles from just south of Newport in Pend Oreille County, Washington to the confluence with the Spokane River, approximately five miles northwest of the City of Spokane in Spokane County. The southern portion of Pend Oreille County is contained within the Little Spokane Watershed, and is home to the headwaters of the Little Spokane River, where it gushes out of the ground at approximately 1,500 gallons per minute (POCD, 2000). The watershed then continues into Spokane County and a portion of Stevens County. The headwaters of the Little Spokane River are split approximately evenly between the West Branch of the Little Spokane River and the mainstem. A total of approximately 183 acres of seasonal wetlands are mapped adjacent to the Little Spokane River (Map 6). This includes approximately 93 acres of palustrine emergent, 80 acres of palustrine scrub-shrub, and 10 acres of palustrine forested seasonal wetlands (Appendix E).

Process and Channel Modification

The primary process and channel modifications include:

- The use of agricultural and residential wells;
- Roads adjacent to the River.

In-stream flows on the Little Spokane River and its tributaries have not been met in 21 of the past 32 years. This is in part due to the rapid population growth in the watershed and the increasing number of single domestic (“permit-exempt”) wells being constructed. Spokane County leads the state in the number of small wells drilled each year resulting in reduction of in-stream flows. Surface flow from gravel-surfaced forest and rural roads drains directly into the river and causes an increase in sedimentation. The hydrological processes along the Little Spokane River have been impaired by these modifications.

Geologic and Flood Hazards

The potential CMZ is mapped as low and medium, depending on the valley width (Map 6). Potential exists for the channel to meander to or through roads. FEMA has mapped a 100-year floodplain along the river (Map 6). For much of the upper reach of the Little Spokane River, a railroad track runs parallel to the river and serves as a berm. The geology is a combination of bedrock, sedimentary or rock, alluvium, and outburst flood deposits. The upper Little Spokane River watershed is nearly devoid of mass wasting features because it lacks extensive areas with steep topography. The gentle topography results from a long history of surface erosion from deeply weathered bedrock. Therefore, the landslide risk along the Little Spokane River is minimal (Map 12).

Critical or Priority Habitat and Species Use

The presence of kokanee salmon and rainbow trout is documented in the Little Spokane River (WDFW, 2009). The mapped priority habitats associated with the Little Spokane River are riparian areas with associated wetlands, and white-tailed deer winter ranges (WDFW, 2009).
In-stream and Riparian Habitats

The majority of the land surrounding Reaches 1 and 2 of the Little Spokane River is mapped as Northern Rocky Mountain Lower Montane Riparian Woodland and Shrubland, with some areas of Northern Rocky Mountain Ponderosa Pine Woodland and Savanna (USGS, 2010). These vegetation community types provide habitat for a wide variety of amphibians, reptiles, mammals, and birds (Johnson and O’Neil, 2001). In particular, the terrestrial-aquatic interface within the intact riparian zones (both wetland and upland) of Reaches 1 and 2 likely contribute to a high degree of biological diversity for both fish and wildlife species.

Portions of Reaches 1 and 2 have been altered by low-density residential development and timber harvest/land clearing activities. These land use alterations have negatively affected the habitat value of these areas, as compared to pre-development conditions. Percentages (and acreages) of the Level III landcover types from the GAP analysis within the SPA are provided in Appendix D.

The disturbed shoreline areas have made the Little Spokane River area susceptible to non-native, invasive plant invasions. Non-native plants that are documented as occurring within riparian and wetland habitats in the county include common reed, purple and wand loosestrife, knotweeds, and reed canarygrass (Pend Oreille County Noxious Weed Control Board, 2010). Invasive plants tend to form mono-specific stands, which compete with native species for moisture, nutrients, sunlight, and space (Cronk & Fennessy, 2001; FISRWG, 2001; Maurer et al., 2003). The replacement of native plants by mono-specific stands of invasive species can lead to a variety of negative effects in aquatic habitats, which include obstruction of water flow, fish and wildlife habitat loss, and an overall reduction in species richness (Antieau, 1998; Cronk & Fennessy, 2001).

Water Quality

The Little Spokane River has a 303(d) (Category 5) impaired water quality listing for dissolved oxygen. In addition, the river has a Category 4C listing for invasive exotic species and a Category 2 listing for mercury.

Temperatures on the Little Spokane River vary widely from 2°C in winter to more than 22°C in summer (Golder 2003). Dissolved oxygen (DO) levels have an inverse relationship to temperature: as temperature increases, gas solubility decreases. The Little Spokane River is most likely to violate standards during low-flow, summer periods. Locations where DO concentrations are below the state standard closely correlate with locations of higher summer temperatures. Major contributing factors to high temperatures include a general lack of shade-providing riparian vegetation, coupled with the increased surface area and associated warming the shallow lakes that drain to the river (POCD 2000).

To address the water quality problems in the Little Spokane River watershed, Ecology and the Spokane Conservation District are working together on a TMDL. A final plan is anticipated for approval in the summer 2010 (personal communication with Karen Baldwin, Ecology 12/18/09).

Shoreline Use Patterns

Existing Land and Shoreline Use

The predominant land use within the Little Spokane River SPA is natural resource lands. Other land uses include vacant lands, public lands, and residential.
Shoreline Modifications - Docks, Piers, Buoys, Floats and Bridges

The only mapped shoreline modification within the County’s Little Spokane River shoreline planning area is the bridge in Reach 2.

Shoreline Environment Designations, Zoning, and Other Applicable Regulations

The current shoreline designation of the Little Spokane River is mostly Conservancy. A small area (less than 10 percent) of the shoreline, located in the upper reaches of the river is designated Rural (Map 3). Zoning along the river is a mix of Natural Resource and Rural. There is very little zoned Public Land along the shoreline (Map 18).

Existing and Potential Public Access Areas

Washington Department of Fish and Wildlife has recently acquired 2,640 of land on the West Branch of the Little Spokane River.

Historic and Cultural Resources

There are no recorded archeological or inventoried historic sites (DAHP 2010). However, due to documented use of the Pend Oreille County area by Kalispel peoples, there is some probability of unknown archaeological resources occurring within the Little Spokane River shoreline planning area.

There are no state or federally listed historic properties within the Little Spokane River shoreline planning area (DAHP 2010).

Contaminated Sites

There are no other Ecology listed contaminated sites within the Little Spokane River shoreline planning area (Ecology, 2010).

6. LOST LAKE

Physical and Biological Characterization

Drainage Basin, Tributary Streams, and Associated Wetlands

Lost Lake is located in the West Branch – Little Spokane River watershed. The lake is located within Spring Heel Creek. One of the main tributaries to Spring Heel Creek is Hill Creek. Spring Hill Creek flows into the West Branch – Little Spokane River. Approximately 27 acres of seasonal wetlands are located around the lake and extend approximately 0.5 mile upstream and about 0.3 mile downstream along Spring Heel Creek (Map 6). This includes approximately 12 acres of palustrine emergent, 14 acres of palustrine scrub-shrub, and 1 acre of palustrine forested seasonal wetlands (Appendix E).

Process and Channel Modification

The primary process modifications at Lost Lake include:

- Nearby roads; and
• Logging.

Although the area around Lost Lake is primarily forested, logging occurred and roads were built near Lost Lake and may contribute to sedimentation in the lake. The hydrological processes are primarily intact at this lake.

**Geologic and Flood Hazards**

FEMA has identified the flood zone as narrow along Spring Heel Creek upstream and downstream of the lake (Map 6). Alluvial material is located upstream of the lake. Slopes adjacent to the lake include some areas that are greater than 20 percent and may be associated with potential erosion and landslide hazards (Map 11 and Map 12). Moderate to high liquefaction hazards have been identified upstream of the lake (Map 13). Therefore, there are seismic hazards in this area.

**Critical or Priority Habitat and Species Use**

The presence of rainbow trout is documented in Lost Lake (WDFW, 2009). The mapped priority habitats associated with the lake are riparian areas with associated wetlands, and white-tailed deer winter range (WDFW, 2009).

**In-stream and Riparian Habitats**

The majority of the land surrounding Lost Lake is mapped as Northern Rocky Mountain Dry-Mesic Montane Mixed Conifer Forest, with portions of Rocky Mountain Alpine-Montane Wet Meadow and Northern Rocky Mountain Lower Montane Riparian Woodland and Shrubland mapped near the northeast and southwest ends of the lake (USGS, 2010). These vegetation community types provide habitat for a wide variety of amphibians, reptiles, mammals, and birds (Johnson and O’Neil, 2001). In particular, the terrestrial-aquatic interface within the riparian habitat zones of Lost Lake (both wetland and upland) likely contribute to a high degree of biological diversity for both fish and wildlife species. Percentages (and acreages) of the Level III landcover types from the GAP analysis within the SPA are provided in Appendix D.

The shoreline of Lost Lake is generally unaltered; therefore, the lake has a generally low potential for non-native, invasive plant infestations.

**Water Quality**

Lost Lake has no listings for water quality impairment (Ecology, 2008). The majority of the area is intact forest and likely has good water quality.

**Shoreline Use Patterns**

**Existing Land and Shoreline Use**

Existing land use in the Lost Lake SPA is entirely composed of natural resource lands.

**Shoreline Modifications - Docks, Piers, Buoys, Floats and Bridges**

There are no shoreline modifications mapped along Lost Lake.
Shoreline Environment Designations, Zoning, and Other Applicable Regulations

The current shoreline designation of Lost Lake is Conservancy (Map 3). Current zoning around the Lake is all Natural Resource (NR20) (Map 18).

Existing and Potential Public Access Areas

There are no existing public access sites within the Lost Lake SPA.

Historic and Cultural Resources

There are no recorded archeological or historic sites (DAHP 2010). However, due to the location of the lake and the documented use of the Pend Oreille County area by Kalispel peoples, there is some probability of unknown archeological resources occurring within the Lost Lake shoreline planning area. The forested environment surrounding the lake, well removed from the Pend Oreille River valley, limits the likelihood of frequent occurrence or use by native peoples within the vicinity of the lake.

There are no state or federally listed historic properties within the Lost Lake shoreline planning area (DAHP 2010).

Contaminated Sites

Consistent with the undeveloped character of the shoreline area, there are no Ecology listed facilities or sites along the shoreline or within the vicinity of Lost Lake (Ecology, 2010).

7. MALLARD MARSH

Physical and Biological Characterization

Drainage Basin, Tributary Streams, and Associated Wetlands

Mallard Marsh is located in the West Branch Little Spokane River watershed, but not hydrologically connected with the river. There is a small stream that connects to the marsh on the west side. Panhandle Lake is located to the north and Diamond Lake is located to the south. Approximately 11 acres of seasonal wetlands extend to the south and along the small stream that connects to the marsh (Map 6). This includes approximately 10 acres of palustrine emergent and 1 acre of palustrine scrub-shrub seasonal wetlands (Appendix E).

Process and Channel Modification

The primary process modifications near Mallard Marsh include:

- Commercial development;
- Roads; and
- Agriculture development.

There is some agriculture and commercial development located near the lake. A major road is located west of the marsh. These modifications may result in increased runoff of pollutants into the marsh. The hydrological processes at Mallard Marsh are partially impaired.
**Geologic and Flood Hazards**

FEMA flood zones have not been identified near Mallard Marsh (Map 6). Adjacent slopes are less than 20 percent and generally have a low erosion and landslide risk (Map 11 and Map 12). Liquefaction hazards and seismic hazards have been mapped as minimal (Map 13).

**Critical or Priority Habitat and Species Use**

There are no documented priority fish species in Mallard Marsh (WDFW, 2009). The mapped priority habitat type associated with the marsh is riparian zones.

**In-stream and Riparian Habitats**

The dominant vegetation community of the land surrounding Mallard Marsh is mapped as Northern Rocky Mountain Dry-Mesic Montane Mixed Conifer Forest (USGS, 2010). However, the southern portion of the shoreline has been impacted by residential development and agricultural activities. Percentages (and acreages) of the Level III landcover types from the GAP analysis within the SPA are provided in Appendix D.

**Water Quality**

Mallard Marsh has no listings for water quality impairment (Ecology, 2008). The majority of the area is intact forest and likely has good water quality.

**Shoreline Use Patterns**

**Existing Land and Shoreline Use**

Existing land use in the Mallard Marsh SPA is almost entirely composed of recreational vehicle parks.

**Shoreline Modifications - Docks, Piers, Buoys, Floats and Bridges**

There are no shoreline modifications mapped on Mallard Marsh.

**Shoreline Environment Designations, Zoning, and Other Applicable Regulations**

The current shoreline designation of Mallard Marsh is Conservancy (Map 3). The current zoning around the lake is predominantly Rural (R10 and R40) (Map 18).

**Existing and Potential Public Access Areas**

There are no existing public access sites within the Mallard Marsh SPA.

**Historic and Cultural Resources**

There are no recorded archeological or inventoried historic sites (DAHP 2010). However, due to documented use of the Pend Oreille County area by Kalispel peoples, there is some probability of unknown archaeological resources occurring within the Mallard Marsh shoreline planning area. The lake is not within or immediately adjacent to the Pend Oreille River valley area, where most significant Kalispel Tribe use occurred; given the setting, any use of the lake’s shoreline area was likely limited to occasional hunting activities.
There are no state or federally listed historic properties within the Mallard Marsh shoreline planning area (DAHP 2010).

**Contaminated Sites**

Although listed by the database, the dam does not present a risk for contamination to the shoreline (Ecology, 2010).

**8. PANHANDLE LAKE**

**Physical and Biological Characterization**

**Drainage Basin, Tributary Streams, and Associated Wetlands**

Panhandle Lake is located in the West Branch Little Spokane River watershed, but not hydrologically connected with the river. Mallard Marsh is located to the south of Panhandle Lake. Approximately 3 acres of seasonal wetlands are located around the lake (Map 6). This includes approximately 1 acre of palustrine emergent, 1 acre of palustrine scrub-shrub, and 1 acre of palustrine forested seasonal wetlands (Appendix E).

**Process and Channel Modification**

The primary process modifications near Panhandle Lake include:

- Roads; and
- Agriculture development.

There is some agriculture development located near the lake. A major road is located west of the lake. Agriculture development and building roads can result in increased runoff of pollutants into the marsh. These modifications have resulted in some impairment of Panhandle Lake.

**Geologic and Flood Hazards**

FEMA flood zones have not been identified near Panhandle Lake (Map 6). Adjacent slopes are less than 20 percent and generally have a low erosion and landslide risk (Map 11 and Map 12). Liquefaction hazards and seismic hazards have been mapped as minimal (Map 13).

**Critical or Priority Habitat and Species Use**

There are no priority fish documented in Panhandle Lake (WDFW, 2009). In addition, there are no mapped priority habitats associated with the lake.

**In-stream and Riparian Habitats**

The dominant vegetation community of the land surrounding Panhandle Lake is mapped as Northern Rocky Mountain Dry-Mesic Montane Mixed Conifer Forest (USGS, 2010). However, the southern portion of the lake has been somewhat impacted by a road and residential development. Percentages (and acreages) of the Level III landcover types from the GAP analysis within the SPA are provided in Appendix D.
Water Quality

Panhandle Lake has no listings for water quality impairment (Ecology, 2008). There may be some impairment due to adjacent roads, but the majority of the area is intact forest and likely has good water quality.

**Shoreline Use Patterns**

*Existing Land and Shoreline Use*

Existing land use in the Panhandle Lake SPA is entirely composed of natural resource lands.

*Shoreline Modifications - Docks, Piers, Buoys, Floats and Bridges*

There are no shoreline modifications mapped on Panhandle Lake.

*Shoreline Environment Designations, Zoning, and Other Applicable Regulations*

The current shoreline designation of Panhandle Lake is Conservancy (Map 3). The lands around the lake are zoned as Natural Resource (NR20) (Map 18).

*Existing and Potential Public Access Areas*

There are no existing public access sites within the Panhandle Lake SPA.

*Historic and Cultural Resources*

There are no recorded archeological or historic sites (DAHP 2010). However, due to documented use of the Pend Oreille County area by Kalispel peoples, there is some probability of unknown archaeological resources occurring within the Panhandle Lake shoreline planning area. The lake is not within or immediately adjacent to the Pend Oreille River valley area, where most significant Kalispel Tribe use occurred; given the setting, any use of the lake shoreline was likely limited to overland hunting activities.

There are no state or federally listed historic properties within the Panhandle Lake shoreline planning area (DAHP 2010).

*Contaminated Sites*

There are no Ecology listed facilities or sites within the Panhandle Lake shoreline planning area (Ecology, 2010).

**9. SACHEEN LAKE**

*Physical and Biological Characterization*

*Drainage Basin, Tributary Streams, and Associated Wetlands*

Sacheen Lake is approximately 317 acres. Sacheen Lake is located in the West Branch of the Little Spokane River watershed. Moon Creek hydrologically links Diamond Lake to Sacheen Lake. Sacheen Lake is connected to the West Branch Little Spokane River to the southwest and Moon Creek to the southeast. Approximately 163 acres of seasonal wetlands are located around the lake and extend along
Moon Creek and the West Branch Little Spokane River (Map 6). This includes approximately 152 acres of palustrine emergent, 6 acres of palustrine scrub-shrub, and 3 acres of palustrine forested seasonal wetlands (Appendix E).

Process and Channel Modification

The primary process modifications around Sacheen Lake include:

- Livestock grazing;
- Beaver dams and vegetation restricting water flow;
- Roads;
- Logging; and
- Out-of-date or non-existent septic systems.

Beaver dams and vegetation are restricting water flow in the outlet of Sacheen Lake causing high water and demanding exhaustive maintenance efforts to prevent flooding and shoreline erosion. There are three beaver dams on the West Branch Little Spokane River that slow down the release of water from Sacheen Lake. The Sacheen Sewer and Water District has a permit from WDFW to maintain two 24” culverts in the dams to improve the flow of water. The beavers make it their business to plug these tubes. The beaver deceiver tubes must be cleared about every other week and startup beaver dams torn down to keep the lake at a reasonable water level.

Other modifications to the watershed include grazing and agriculture in Moon Creek, septic systems around Diamond and Sacheen Lakes, and sediment from forest practices upstream of Sacheen Lake. Out of date or nonexistent septic systems are causing nutrient loading and contamination of the lake. Numerous roads are located around Sacheen Lake and may result in an increase in runoff water and sediment into the lake. The hydrological processes at Sacheen Lake have been impaired.

Geologic and Flood Hazards

FEMA has identified flood hazards that are primarily located within the edge of the lake and extend along Moon Creek and the West Branch Little Spokane River (Map 6). The potential for channel migration along the reach of the West Branch Little Spokane River connected to Sacheen Lake has been determined to be high (Map 6). The underlying geology of the area extending 1.5 miles to the southeast of the lake, along Moon Creek, is alluvium (Map 8). Adjacent slopes are less than 20 percent and generally have a low erosion and landslide risk (Map 11 and Map 12). The liquefaction and seismic hazards are moderate to high along the alluvium area identified on Moon Creek (Map 13). The other areas around the lake are predominantly bedrock and have very low liquefaction and seismic hazards.

Critical or Priority Habitat and Species Use

The presence of rainbow trout is documented in Sacheen Lake (WDFW, 2009). The mapped priority habitat type associated with the lake is riparian areas.
In-stream and Riparian Habitats

The majority of the land surrounding Sacheen Lake is mapped as Northern Rocky Mountain Dry-Mesic Montane Mixed Conifer Forest, with a portion of Rocky Mountain Alpine-Montane Wet Meadow mapped near the southern portion of the lake (USGS, 2010). These vegetation community types provide habitat for a wide variety of amphibians, reptiles, mammals, and birds (Johnson and O’Neil, 2001). In particular, the terrestrial-aquatic interface within the remaining intact riparian zones (both wetland and upland) of Sacheen Lake likely contribute to a high degree of biological diversity for both fish and wildlife species.

The majority of the Sacheen Lake shoreline is significantly altered by adjacent roads and dense residential development. These land use alterations have negatively affected the habitat value of these areas, as compared to pre-development conditions. Percentages (and acreages) of the Level III landcover types from the GAP analysis within the SPA are provided in Appendix D.

The relatively high levels of habitat disturbance of the lands surrounding Sacheen Lake has made the area susceptible to non-native, invasive plant invasions. Non-native plants that are documented as occurring within lakes and wetlands in the county include common reed, Eurasian watermilfoil, purple and wand loosestrife, knotweeds, reed canarygrass, and yellow flag iris (Pend Oreille County Noxious Weed Control Board, 2010). Invasive plants tend to form mono-specific stands, which compete with native species for moisture, nutrients, sunlight, and space (Cronk & Fennessy, 2001; FISRWG, 2001; Maurer et al., 2003). The replacement of native plants by mono-specific stands of invasive species can lead to a variety of negative effects in aquatic habitats, which include obstruction of water flow, fish and wildlife habitat loss, and an overall reduction in species richness (Antieau, 1998; Cronk & Fennessy, 2001).

Water Quality

Because of the presence of exotic aquatic species, namely the highly invasive Eurasian watermilfoil, Sacheen Lake is listed as impaired by a non-pollutant (Category 4C; Ecology 2008). Dense growth of milfoil not only interferes with recreation; it also degrades habitat for trout and other native fish and displaces native aquatic plant populations.

Shoreline Use Patterns

Existing Land and Shoreline Use

Slightly more than half of the Sacheen Lake SPA is classified as vacant lands. The remaining land uses are residential and natural resource lands.

Shoreline Modifications - Docks, Piers, Buoys, Floats and Bridges

The shorelines of Sacheen Lake are heavily modified by single-family development and roadways. Although not mapped, there are numerous docks, piers and floats on the lake.

Shoreline Environment Designations, Zoning, and Other Applicable Regulations

The developed shorelines of Sacheen Lake are designated as Urban (approximately 80 percent). The undeveloped southern shores are designated Conservancy (Map 3). Current zoning around the lake is primarily Rural; R20, R10 and R5 comprise approximately 92 percent of the shoreline. The remainder is zoned as Natural Resource and Public Lands (Map 18).
Existing and Potential Public Access Areas

About 2 acres of public access is located within the Sacheen Lake SPA. The following table (Table 3) describes the facilities available. Each of the access points are less than 1 acre in size within the SPA.

Table 3 Sacheen Lake Park Facilities

<table>
<thead>
<tr>
<th>Park Name</th>
<th>Description of Facilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eastshore Subdivision Public Access</td>
<td>Undeveloped access point platted for access and walkway to the lake</td>
</tr>
<tr>
<td>Eisenbroths Subdivision Public Access</td>
<td>Undeveloped access point</td>
</tr>
<tr>
<td>Granite Shores Final Public Access</td>
<td>Undeveloped access point</td>
</tr>
<tr>
<td>Hatch’s Beach - Public Access</td>
<td>Undeveloped access point</td>
</tr>
<tr>
<td>Kohles Beach Subdivision Public Access</td>
<td>Undeveloped access point</td>
</tr>
<tr>
<td>Lakeshore Lots Public Access</td>
<td>Undeveloped access point</td>
</tr>
<tr>
<td>Poiriers Development</td>
<td>Undeveloped access point</td>
</tr>
<tr>
<td>Reed’s Shady Rest Add. - Public Access</td>
<td>Undeveloped access point</td>
</tr>
<tr>
<td>Sacheen Lake Access</td>
<td>Concrete plank boat launch managed by Washington Department of Fish and Wildlife</td>
</tr>
<tr>
<td>Sacheen Shores Public Access</td>
<td>Undeveloped access point</td>
</tr>
<tr>
<td>Schaefers Beach Add. - Public Access</td>
<td>Undeveloped access point</td>
</tr>
<tr>
<td>Sorenson’s Beach - Public Access</td>
<td>Undeveloped access point</td>
</tr>
</tbody>
</table>

Historic and Cultural Resources

Cultural resources within and in the vicinity of the Sacheen Lake shoreline planning area include pre-contact materials. Pre-contact materials in this area suggest seasonal use of the shoreline area as documented in a 1988 regional reconnaissance level survey (Thoms et al, 1988).

There are no state or federally listed historic properties within the lake’s shoreline planning area (DAHP 2010).

Contaminated Sites

There are no Washington Department of Ecology listed facilities or sites within the Sacheen Lake shoreline planning area (Ecology, 2010).

10. TROUT LAKE

Physical and Biological Characterization

Drainage Basin, Tributary Streams, and Associated Wetlands

Trout Lake is located in the West Branch Little Spokane River watershed. The lake is east of Lost Lake, 0.5 mile south of Wilderness Lake and southeast of Sacheen Lake. Trout Lake is located within the West Branch Little Spokane River. Approximately 17 acres of seasonal wetlands span the 0.5 mile between Wilderness Lake and Trout Lake (Map 6). This includes approximately 13 acres of palustrine emergent and 4 acres of palustrine scrub-shrub seasonal wetlands (Appendix E).
Process and Channel Modification

Trout Lake, owned by one large private landowner, remains mostly forestland with a single private residence. Consequently there is no public access to the lake (POCD 2000). The hydrological processes at Trout Lake are primarily intact.

Geologic and Flood Hazards

A 100-year floodplain has been identified around the lake (Map 6). This is primarily confined by the existing lake edge. Adjacent slopes are less than 20 percent and generally have a low erosion and landslide risk (Map 11 and Map 12). The seismic and liquefaction hazards are very low (Map 13).

Critical or Priority Habitat and Species Use

The presence of rainbow trout is documented in Trout Lake (WDFW, 2009). The mapped priority habitat type associated with the lake is riparian areas with associated beaver dams.

In-stream and Riparian Habitats

The majority of the land surrounding Trout Lake is mapped as Northern Rocky Mountain Dry-Mesic Montane Mixed Conifer Forest, with patches of Northern Rocky Mountain Lower Montane Riparian woodland and Shrubland and North American Arid West Emergent March (USGS, 2010). These vegetation community types provide habitat for a wide variety of amphibians, reptiles, mammals, and birds (Johnson and O’Neil, 2001). In particular, the terrestrial-aquatic interface within the riparian zone (both wetland and upland) of Trout Lake likely contribute to a high degree of biological diversity for both fish and wildlife species.

Relatively small portions of Trout Lake shoreline have been altered by low-density residential development. These land use alterations have negatively-affected the habitat value of these areas, as compared to pre-development conditions. Percentages (and acreages) of the Level III landcover types from the GAP analysis within the SPA are provided in Appendix D.

The presence of shoreline disturbance has made the Trout Lake area more susceptible to non-native, invasive plant invasions. Non-native plants that are documented as occurring within lakes and wetlands in the county include common reed, Eurasian watermilfoil, purple and wand loosestrife, knotweeds, reed canarygrass, and yellow flag iris (Pend Oreille County Noxious Weed Control Board, 2010). Invasive plants tend to form mono-specific stands, which compete with native species for moisture, nutrients, sunlight, and space (Cronk & Fennessy, 2001; FISRWG, 2001; Maurer et al., 2003). The replacement of native plants by mono-specific stands of invasive species can lead to a variety of negative effects in aquatic habitats, which include obstruction of water flow, fish and wildlife habitat loss, and an overall reduction in species richness (Antieau, 1998; Cronk & Fennessy, 2001).

Water Quality

Trout Lake has no listings for water quality impairment (Ecology, 2008). The majority of the area around the lake is intact forest. The lake likely has good water quality.
Shoreline Use Patterns

Existing Land and Shoreline Use

Existing land use in the Trout Lake SPA is entirely composed of natural resource lands. The lake shore is under single ownership. It remains mostly forestland with a single private residence (POCD, 2000).

Shoreline Modifications - Docks, Piers, Buoys, Floats and Bridges

There are two docks on Trout Lake. There are no other shoreline modifications mapped on the lake.

Shoreline Environment Designations, Zoning, and Other Applicable Regulations

The current shoreline designation of Trout Lake is Conservancy (Map 3). The lands surrounding the lake are zoned as Natural Resource (Map 18).

Existing and Potential Public Access Areas

Since there is one family that owns the properties adjacent to Trout Lake, there is no public access to the lake (POCD 2000).

Historic and Cultural Resources

There are no recorded archeological or historic sites (DAHP 2010). However, due to the location of the lake and the documented use of the Pend Oreille County area by Kalispel peoples, there is some probability of unknown archeological resources occurring within the Trout Lake shoreline planning area. The forested environment surrounding the lake, well removed from the Pend Oreille River valley, limits the likelihood of frequent occurrence or use by native peoples within the vicinity of the lake.

There are no state or federally listed historic properties within the Trout Lake shoreline planning area (DAHP 2010).

Contaminated Sites

There are no Washington Department of Ecology listed facilities or sites within the Trout Lake shoreline planning area (Ecology, 2010).

11. UNNAMED LAKE

Physical and Biological Characterization

Drainage Basin, Tributary Streams, and Associated Wetlands

Unnamed Lake is located approximately 2 miles upslope of the Little Spokane River. There is a seasonal drainage that transports water from the lake area to the Little Spokane River. Water flows into the Unnamed Lake from the adjacent hills and residential areas. Seasonal wetlands are located along the approximately 2 miles between the Unnamed Lake and the Little Spokane River (Map 6). Approximately 7 acres of seasonal wetlands are located adjacent to the Unnamed Lake. This includes approximately 4 acres of palustrine emergent and 3 acres of palustrine scrub-shrub seasonal wetlands (Appendix E).
Process and Channel Modification

The primary process modifications at the Unnamed Lake, southwest of Newport, include:

- Adjacent railroad and roads;
- Residential areas; and
- Agricultural areas.

These modifications have resulted in the hydrological processes at Unnamed Lake being partially impaired.

Geologic and Flood Hazards

A floodplain has been identified between the Unnamed Lake and the Little Spokane River, along the valley floor (Map 6). The underlying geology beneath the lake and surrounding wetlands is alluvium (Map 8). Slopes adjacent to Unnamed Lake are less than 20 percent and generally have a low erosion and landslide risk (Map 11 and Map 12). To the southwest of the lake, a historical landslide was identified. The liquefaction and seismic hazards are classified as medium to high around the lake and the drainage that connects Unnamed Lake and the Little Spokane River (Map 13).

Critical or Priority Habitat and Species Use

No priority fish are documented in the unnamed lake (WDFW, 2009). The mapped priority habitat type associated with the lake is riparian habitat with associated wetlands.

In-stream and Riparian Habitats

The majority of the land surrounding Unnamed Lake is mapped as Northern Rocky Mountain Dry-Mesic Montane Mixed Conifer Forest, with portions of North American Arid West Emergent March (USGS, 2010). These vegetation community types generally provide habitat for a wide variety of amphibians, reptiles, mammals, and birds (Johnson and O’Neil, 2001). However, a large portion of the Unnamed Lake shoreline has been altered by residential development and roads. These land use alterations have significantly decreased the habitat value of lake area, as compared to pre-development conditions. Percentages (and acreages) of the Level III landcover types from the GAP analysis within the SPA are provided in Appendix D.

The presence of shoreline disturbance has made the Unnamed Lake area more susceptible to non-native, invasive plant invasions. Non-native plants that are documented as occurring within lakes and wetlands in the county include common reed, Eurasian watermilfoil, purple and wand loosestrife, knotweeds, reed canarygrass, and yellow flag iris (Pend Oreille County Noxious Weed Control Board, 2010). Invasive plants tend to form mono-specific stands, which compete with native species for moisture, nutrients, sunlight, and space (Cronk & Fennessy, 2001; FISRWG, 2001; Maurer et al., 2003). The replacement of native plants by mono-specific stands of invasive species can lead to a variety of negative effects in aquatic habitats, which include obstruction of water flow, fish and wildlife habitat loss, and an overall reduction in species richness (Antieau, 1998; Cronk & Fennessy, 2001).
**Water Quality**

Unnamed Lake has no listings for water quality impairment (Ecology, 2008). There may be some impairment due to adjacent roads.

**Shoreline Use Patterns**

**Existing Land and Shoreline Use**

Existing land use in the Unnamed Lake SPA is predominantly vacant lands. Other land uses include residential and agriculture.

**Shoreline Modifications - Docks, Piers, Buoys, Floats and Bridges**

There are no shoreline modifications mapped on the Lake.

**Shoreline Environment Designations, Zoning, and Other Applicable Regulations**

The current shoreline designation of Unnamed Lake is Conservancy (Map 3). Current zoning around the lake is mostly Rural (R5) (88 percent). The remaining shorelines are a mix Natural Resource Lands (NR20) and lower-density Rural (R20) (Map 18).

**Existing and Potential Public Access Areas**

There are no existing public access sites within the Unnamed Lake SPA.

**Historic and Cultural Resources**

There are no recorded archeological or inventoried historic sites (DAHP 2010). However, due to proximity of the Pend Oreille River valley, the documented backbone of Kalispell Tribe use, and documented use throughout much of the Pend Oreille County area by native peoples, there is some probability of unknown archaeological resources occurring within the Unnamed Lake shoreline planning area.

There are no state or federally listed historic properties within the Unnamed Lake shoreline planning area (DAHP 2010).

**Contaminated Sites**

There are no Washington Department of Ecology listed facilities or sites within the Unnamed Lake shoreline planning area (Ecology, 2010).

### 12. LITTLE SPOKANE RIVER-WEST BRANCH

**Physical and Biological Characterization**

**Drainage Basin, Tributary Streams, and Associated Wetlands**

Beaver and Buck Creeks are two of the primary tributaries to the West Branch Little Spokane River. Some of the lakes that occur along the river include Trout, Horseshoe, Diamond, Fan, and Sacheen lakes. Approximately 352 acres of wetlands are located along the river (Map 6). This includes approximately
198 acres of palustrine emergent, 139 acres of palustrine scrub-shrub, and 15 acres of palustrine forested wetlands (Appendix E).

**Process and Channel Modification**

The primary process and channel modifications along the West Branch Little Spokane River include:

- Logging;
- Splash dams; and
- Roads.

The hydrological processes in the West Branch Little Spokane River have been impaired due to these modifications. Logs were skidded by horses to the lakes and tributaries of the West Branch Little Spokane River and were stockpiled in lakes and streams before being floated to mills operated near the outlets of Diamond and Eloika lakes. Logs were moved downstream during the spring snowmelt by construction of a series of splash dams on Horseshoe Lake, Fan Lake, and the mainstem West Branch of the Little Spokane River (Soltero et al. 1991 as cited in Boise Cascade 1997). Trucks began to replace splash damming in 1926. The last log drive down the Little Spokane River is believed to have occurred in 1929.

**Geologic and Flood Hazards**

A 100-year floodplain has been identified adjacent to the river (Map 6). The potential for channel migration has been mapped as medium and high for the West Branch Little Spokane River (Map 6; Appendix CMZ). The lakes along the river have been classified as low. High areas are dominated by peat or have clear movement from the 1930s. The underlying geology along the river includes bedrock, peat, outburst flood deposits, and alluvium (Map 8). The conditions necessary to initiate a debris avalanche appear to be confined to the inner stream channel gorges of Beaver and Buck creeks near their confluences with the West Branch Little Spokane River. Adjacent slopes include some areas that are greater than 20 percent and may be associated with potential erosion and landslide hazards (Map 11 and Map 12).

**Critical or Priority Habitat and Species Use**

The presence of rainbow trout is documented in the West Branch Little Spokane River (WDFW, 2009). In addition, there are three priority habitat types associated with the West Branch Little Spokane River. These habitats are listed below (WDFW, 2009):

- Riparian areas and associated wetlands;
- Wood duck nesting and brooding area; and
- White-tail deer winter range areas.

**In-stream and Riparian Habitats**

The majority of the land surrounding the West Branch Little Spokane River is mapped as either Northern Rocky Mountain Dry-Mesic Montane Mixed Conifer Forest or Columbia Basin Foothill Riparian Woodland and Shrubland (USGS, 2010). These vegetation community types provide habitat for a wide variety of amphibians, reptiles, mammals, and birds (Johnson and O’Neil, 2001). In particular, the
terrestrial-aquatic interface within the intact riparian zones (both wetland and upland) of the river likely contribute to a high degree of biological diversity for both fish and wildlife species.

Relatively small portions of the shoreline, particularly near the upstream portion of the river, have been altered by adjacent roads. This land disturbance has negatively-affected the habitat value of these areas, as compared to pre-development conditions. Percentages (and acreages) of the Level III landcover types from the GAP analysis within the SPA are provided in Appendix D.

The observed shoreline disturbance has made the West Branch Little Spokane River area more susceptible to non-native, invasive plant invasions. Non-native plants that are documented as occurring within riparian and wetland habitats in the county include common reed, purple and wand loosestrife, knotweeds, and reed canarygrass (Pend Oreille County Noxious Weed Control Board, 2010). Invasive plants tend to form mono-specific stands, which compete with native species for moisture, nutrients, sunlight, and space (Cronk & Fennessy, 2001; FISRWG, 2001; Maurer et al., 2003). The replacement of native plants by mono-specific stands of invasive species can lead to a variety of negative effects in aquatic habitats, which include obstruction of water flow, fish and wildlife habitat loss, and an overall reduction in species richness (Antieau, 1998; Cronk & Fennessy, 2001).

Water Quality

The West Branch Little Spokane River has 303(d) (Category 5) impaired water quality listings for dissolved oxygen and temperature. In addition, the river has two Category 2 listing for fecal coliform and pH.

Temperatures on the West Branch Little Spokane River vary widely from 2°C in winter to more than 22°C in summer (Golder 2003a). Dissolved oxygen (DO) levels have an inverse relationship to temperature: as temperature increases, gas solubility decreases. The West Branch Little Spokane River is most likely to violate standards during low-flow, summer periods. Locations where DO concentrations are below the state standard closely correlate with locations of higher summer temperatures.

To address the water quality problems in the Little Spokane River watershed, Ecology and the Spokane Conservation District are working together on a TMDL. A final plan is anticipated for approval in the summer 2010 (personal communication with Karen Baldwin, Ecology 12/18/09).

Shoreline Use Patterns

Existing Land and Shoreline Use

Existing land use in the West Branch Little Spokane River SPA is about an even mix of natural resource lands and vacant lands.

Shoreline Modifications - Docks, Piers, Buoys, Floats and Bridges

Other than the modifications listed above (splash dams and roads), there are no other shoreline modifications mapped.

Shoreline Environment Designations, Zoning, and Other Applicable Regulations

The West Branch of the Little Spokane River’s shorelines are mostly designated as Conservancy (97 percent). The remainder is designated as Urban (3 percent) (Map 3). The current zoning of the river’s
shoreline areas includes Public Land (13 percent), Natural Resource (56 percent) and Rural (30 percent) (Map 18).

Existing and Potential Public Access Areas

In 2007, the Washington Department of Fish and Wildlife (WDFW) acquired critical habitat along the West Branch Little Spokane River through a grant received from the Washington Wildlife and Recreation Program (WWRP) (WWRC 2007). WWRP is a state grant program that creates and conserves local and state parks, wildlife habitat and working farms. The Washington State Recreation and Conservation Office (RCO) administers WWRP grants, and the legislature funds the program. The West Branch Little Spokane Habitat Area – Phase I acquisition consists of 940 acres and Phase 2 is for the remaining 1,700 acres of 2,800 acres of highly diverse habitats. The property provides Pend Oreille County area residents and visitors with a wide variety of sustainable recreational opportunities including: large and small game hunting, watchable wildlife and photography, environmental education, hiking, horseback riding, cross country skiing, boating, kayaking, and canoeing. The property also provides access to fishing in the West Branch Little Spokane River, Horseshoe and Fan lakes. Acquisition of this property will help ensure the protection of fish and wildlife populations for future generations, while providing economic benefit for the local communities (WWRC 2007).

Historic and Cultural Resources

There are no recorded archeological or historic sites other than the registered historic road described below (DAHP 2010). However, due to the location of the lake and the documented use of the Pend Oreille County area by Kalispel peoples, there is some probability of unknown archeological resources occurring within the shoreline area. The original use of the historic road, which passes through the shoreline area and crosses the West Branch Little Spokane River near the headwaters, as a Kalispel trail suggests significant use of portions of the shoreline area.

The Callispel Trail Road crosses the West Branch Little Spokane River directly downstream of the outlet from Sacheen Lake. The road, built in 1888 and listed on the Washington State Historic Registry in 1972, is approximately 16 miles long and passes through the southwest portion of the County from the Davis Lake area to the southern boundary of the County approximately 1 mile east of Fan Lake. The road was constructed along the route of a Kalispel Tribe trail. From the registry nomination form (accessed from DAHP, 2010):

“This road as originally surveyed in 1888 followed an Indian Trail of unknown age that had been used by Indians travelling from the Pend Oreille River to Spokane Falls. At the Pend Oreille River the trail connected with the Kalispel Trail that came from East of the Rocky Mountains that led to the Salmon Fishing Camp at Kettle Falls on the Columbia River where the Hudson’s Bay Company had a Fort and Trading Post established in the 1820’s.”

There are no other registered historic properties within the West Branch Little Spokane River shoreline area.

Contaminated Sites

Consistent with the largely undeveloped land use, there are no Washington Department of Ecology listed facilities or sites within the West Branch Little Spokane River shoreline planning area (Ecology, 2010).
13. WILDERNESS LAKE

Physical and Biological Characterization

Drainage Basin, Tributary Streams, and Associated Wetlands

Wilderness Lake is located in the West Branch Little Spokane River watershed. Trout Lake is approximately 0.5 mile north of Wilderness Lake. Trout Lake is likely hydrologically connected to Wilderness Lake via surface and ground water flow. Seasonal wetlands span the 0.5 mile between Wilderness Lake and Trout Lake (Map 6). Approximately 2 acres of palustrine forested seasonally flooded wetlands are located adjacent to the lake (Appendix E).

Process and Channel Modification

Wilderness Lake has some process modifications. The area around Wilderness Lake is primarily forested, but there are some roads that contribute to runoff and contaminants into the lake. The hydrological process impairment is moderate.

Geologic and Flood Hazards

A 100-year floodplain has not been defined adjacent to Wilderness Lake (Map 6). Adjacent slopes are less than 20 percent and generally have a low erosion and landslide risk (Map 11 and Map 12). Liquefaction and seismic hazards are minimal in this area (Map 13).

Critical or Priority Habitat and Species Use

There are is no documented priority fish presence or mapped priority habitat types associated with Wilderness Lake.

In-stream and Riparian Habitats

The dominant vegetation community of the land surrounding Wilderness Lake is mapped as Northern Rocky Mountain Dry-Mesic Montane Mixed Conifer Forest (USGS, 2010). However, the shoreline of Wilderness Lake is altered by areas of residential development, and a road that encircles the entire lake. Percentages (and acreages) of the Level III landcover types from the GAP analysis within the SPA are provided in Appendix D.

Water Quality

Wilderness Lake has no listings for water quality impairment (Ecology, 2008). The majority of the area around Wilderness Lake is intact forest. The water quality of the lake is likely good.

Shoreline Use Patterns

Existing Land and Shoreline Use

Existing land use in the Wilderness Lake SPA is predominantly vacant lands. Other land uses include natural resource lands and residential.
Shoreline Modifications - Docks, Piers, Buoys, Floats and Bridges

There are no shoreline modifications mapped on Wilderness Lake.

Shoreline Environment Designations, Zoning, and Other Applicable Regulations

Wilderness Lake is not within the current SMP and does not have a designation. Current zoning around the lake is primarily Rural (80 percent), but also include Natural Resource (20 percent) (Map 18).

Existing and Potential Public Access Areas

There are no existing public access sites within the Wilderness Lake SPA.

Historic and Cultural Resources

There are no recorded archeological or historic sites (DAHP 2010). However, due to the location of the lake and the documented use of the Pend Oreille County area by Kalispel peoples, there is some probability of unknown archaeological resources occurring within the Wilderness Lake shoreline planning area. The forested environment surrounding the lake, well removed from the Pend Oreille River valley, limits the likelihood of frequent occurrence or use by native peoples within the vicinity of the shoreline.

There are no state or federally listed historic properties within the Wilderness Lake shoreline planning area (DAHP 2010).

Contaminated Sites

Consistent with the largely undeveloped land use, there are no Washington Department of Ecology listed facilities or sites within the Wilderness Lake shoreline planning area (Ecology, 2010).
14. TRASK POND

Physical and Biological Characterization

Drainage Basin, Tributary Streams, and Associated Wetlands

Trask Pond is located in the southeastern corner of Pend Oreille County. Elmer Creek is located at the northern end of Trask Pond. There are approximately 60 acres of seasonal wetlands surrounding the pond, especially to the north and south (Map 6). This includes approximately 26 acres of palustrine emergent, 11 acres of palustrine scrub-shrub, and 23 acres of palustrine forested seasonal wetlands (Appendix E).

Process and Channel Modification

The process modifications adjacent to Trask Pond include:

- Residential development; and
- Roads.

In the areas that include residential development and roads, there may be an excess sediment and runoff into the lake. The majority of the area around the lake is undeveloped and natural resource lands. The hydrological processes at Trask Pond are moderately impaired.

Geologic and Flood Hazards

A floodplain has been identified around the lake and along Elmer Creek (Map 6). The slopes adjacent to Trask Pond include some areas that are greater than 20 percent and may be associated with potential erosion and landslide hazards (Map 11 and Map 12). The liquefaction and seismic hazards are very low in and around Trask Pond (Map 13).

Critical or Priority Habitat and Species Use

No priority fish species are documented in Trask Pond (WDFW, 2009). The mapped priority habitat type associated with the pond is year-round moose use (and calving area).

In-stream and Riparian Habitats

The dominant vegetation community of the land surrounding Trask Pond is mapped as Northern Rocky Mountain Dry-Mesic Montane Mixed Conifer Forest (USGS, 2010). However, the northern portion of the pond shore is disturbed by roads, residential development, and agricultural activities. Percentages (and acreages) of the Level III landcover types from the GAP analysis within the SPA are provided in Appendix D.

Water Quality

Trask Pond has no listings for water quality impairment (Ecology, 2008). The majority of the area around the pond is intact forest. The pond likely has good water quality.
Shoreline Use Patterns

Existing Land and Shoreline Use

Existing land use in the Trask Pond SPA is mainly vacant lands. The remaining land use is natural resource lands.

Shoreline Modifications - Docks, Piers, Buoys, Floats and Bridges

There are no shoreline modifications mapped on Trask Pond.

Shoreline Environment Designations, Zoning, and Other Applicable Regulations

The current shoreline designation of Trask Pond is Rural (Map 3). Current zoning around the pond is mostly Natural Resource (79 percent) and Rural (Map 18).

Existing and Potential Public Access Areas

There are no existing public access sites within the Trask Pond SPA.

Historic and Cultural Resources

There are no recorded archeological or inventoried historic sites (DAHP 2010). However, due to documented use of the Pend Oreille County area by Kalispel peoples, there is some probability of unknown archaeological resources occurring within the Trask Pond shoreline planning area.

There are no state or federally listed historic properties within the Trask Pond shoreline planning area (DAHP 2010).

Contaminated Sites

There are no Washington Department of Ecology listed facilities or sites within the Trask Pond shoreline planning area (Ecology, 2010)
15. FRATER LAKE

Physical and Biological Characterization

Drainage Basin, Tributary Streams, and Associated Wetlands

Frater Lake is part of the Upper Little Pend Oreille River watershed. Frater Lake is located approximately 6.5 miles south of Ione, north of Highway 20. The lake has intermittent stream flows from Frater Lake to the Leo Lake part of the Pend Oreille Chain Lakes and eventually to the Little Pend Oreille River (WDFW, 2008). A total of approximately 8 acres of seasonal wetlands are located to the northeast and to the southwest of the lake, adjacent to Highway 20 (Map 6). This includes approximately 2 acres of palustrine emergent, 5 acres of palustrine scrub-shrub, and 1 acre of palustrine forested seasonal wetlands (Appendix E).

Process and Channel Modification

The process modifications at Frater Lake are primarily related to the adjacent highway. Runoff from the highway has probably resulted in an increase in runoff and sedimentation into the lake. The lake is located in the Colville National Forest in an area that is primarily forested. The hydrological processes are primarily intact.

Geologic and Flood Hazards

FEMA has not identified flood hazards at or adjacent to Frater Lake (Map 6). Adjacent slopes are less than 20 percent and generally have a low severe erosion and landslide risk (Map 11 and Map 12). There have been no liquefaction or seismic hazards identified at the lake (Map 13).

Critical or Priority Habitat and Species Use

There are no priority fish documented in Frater Lake (WDFW, 2009). The mapped priority habitats associated with the lake are cavity-nesting duck breeding ponds and a moose concentration.

In-stream and Riparian Habitats

The dominant vegetation community of the land surrounding Frater Lake is mapped as Northern Rocky Mountain Dry-Mesic Montane Mixed Conifer Forest (USGS, 2010). The shoreline of the lake is generally unaltered; however, a road disturbs the land bordering the eastern portion of the lake. Percentages (and acreages) of the Level III landcover types from the GAP analysis within the SPA are provided in Appendix D.

Water Quality

Frater Lake has no listings for water quality impairment and was not included in the 2008 Washington State Water Quality Assessment (Ecology, 2008). The area around the lake is primarily forested and water quality is likely intact.
Shoreline Use Patterns

Existing Land and Shoreline Use

Existing land use in the Frater Lake SPA is entirely composed of public lands.

Shoreline Modifications - Docks, Piers, Buoys, Floats and Bridges

The shoreline of Frater Lake is largely unmodified. There are no overwater structures mapped on the lake.

Shoreline Environment Designations, Zoning, and Other Applicable Regulations

The current shoreline designation of the lake’s shoreline is Conservancy (Map 3). The lakes shorelines are zoned Public Land (Map 18).

Existing and Potential Public Access Areas

USFS maintains a small facility within the Frater Lake SPA.

Historic and Cultural Resources

There are no recorded archeological or historic sites (DAHP 2010). However, due to the documented use of the Pend Oreille County area by Kalispel peoples, there is some probability of unknown archaeological resources occurring within the Frater Lake shoreline planning area.

There are no state or federally listed historic properties within the Frater Lake shoreline planning area (DAHP 2010).

Contaminated Sites

There are no Washington Department of Ecology listed facilities or sites within the Frater Lake shoreline planning area (Ecology, 2010).

16. LEO LAKE

Physical and Biological Characterization

Drainage Basin, Tributary Streams, and Associated Wetlands

Leo Lake is part of the Upper Little Pend Oreille River watershed, south of Highway 20. The lake is located less than half a mile southwest of Frater Lake. The southern end of Leo Lake is located in Stevens County. Approximately 14 acres of seasonal wetlands extend to the northeast and southwest (Map 6). This includes approximately 9 acres of palustrine emergent, 3 acres of palustrine scrub-shrub, and 2 acres of palustrine forested seasonal wetlands (Appendix E).

Process and Channel Modification

The process modifications at Leo Lake are primarily related to the adjacent highway. Although the lake is located in the Colville National Forest in an area that is primarily forested, runoff from the highway may have resulted in some increase in runoff and sedimentation into the lake. The hydrological processes at the lake are mostly intact.
Geologic and Flood Hazards

FEMA has not identified flood hazards at or adjacent to Leo Lake (Map 6). Adjacent slopes are less than 20 percent and generally have a low severe erosion and landslide risk (Map 11 and Map 12). There have been no liquefaction or seismic hazards identified at the lake (Map 13).

Critical or Priority Habitat and Species Use

The presence of westslope cutthroat is documented in the Leo Lake (WDFW, 2009). In addition, there are several priority habitats associated with the lake. These habitats are listed below:

- Cavity-nesting duck breeding ponds;
- A moose concentration;
- Riparian habitat with associated native vegetation; and
- Significant waterfowl production areas.

In-stream and Riparian Habitats

The dominant vegetation community of the land surrounding Leo Lake is mapped as Northern Rocky Mountain Dry-Mesic Montane Mixed Conifer Forest (USGS, 2010). The shoreline of Leo Lake is relatively unaltered (the exception is a non-motorized boat launch associated with a campground). Percentages (and acreages) of the Level III landcover types from the GAP analysis within the SPA are provided in Appendix D.

Water Quality

Leo Lake has no listings for water quality impairment (Ecology, 2008). The majority of the area is intact forest and likely has good water quality.

Shoreline Use Patterns

Existing Land and Shoreline Use

Most of the existing land use in the Leo Lake SPA is public lands with the remainder composed of vacant lands.

Shoreline Modifications - Docks, Piers, Buoys, Floats and Bridges

There are no shoreline modifications mapped on Leo Lake.

Shoreline Environment Designations, Zoning, and Other Applicable Regulations

The current shoreline designation of Leo Lake is Conservancy (Map 3). Most of the Leo Lake shorelines are zoned as Public Land. Approximately a quarter of the shoreline is zoned Natural Resource (Map 18).
Existing and Potential Public Access Areas

Public access is provided at the Leo Lake campground. The campground has a concrete plank boat launch and campsites.

Historic and Cultural Resources

There are no recorded archeological or historic sites (DAHP 2010). However, due to the documented use of the Pend Oreille County area by Kalispel peoples, there is some probability of unknown archaeological resources occurring within the Leo Lake shoreline planning area.

There are no state or federally listed historic properties within the Leo Lake shoreline planning area (DAHP 2010).

Contaminated Sites

There are no Washington Department of Ecology listed facilities or sites within the Leo Lake shoreline planning area (Ecology, 2010).
WRIA 61 UPPER LAKE ROOSEVELT

17. HEATHER/BIG MEADOW LAKE

Physical and Biological Characterization

Drainage Basin, Tributary Streams, and Associated Wetlands

Heather/Big Meadow Lake is located in the Alladin watershed. The water flows into the lake from the Alladin mountains. The lake outlet, west of the dam, is Meadow Creek. Approximately 31 acres of seasonal wetlands extend to the west along Meadow Creek (Map 6). This includes approximately 20 acres of palustrine emergent and 11 acres of palustrine scrub-shrub seasonal wetlands (Appendix E).

Process and Channel Modification

The primary modifications at Heather/Big Meadow Lake include:

- Heather Lake Dam;
- Logging; and
- Roads.

Heather Lake Dam controls the flow from is located at the west end of the lake. Dam operations, logging, and adjacent roads have changed the lake water quantity. The natural hydrological processes are impaired by the operation of the Heather Lake Dam and other modifications.

Geologic and Flood Hazards

FEMA has designated the 100-year floodplain adjacent to Heather/Big Meadow Lake (Map 6). The flow is controlled by the Heather Lake Dam. Adjacent slopes are less than 20 percent and generally have a low erosion and landslide risk (Map 11 and Map 12). There is no liquefaction or seismic hazards identified in or adjacent to this lake (Map 13).

Critical or Priority Habitat and Species Use

The presence of rainbow trout is documented in Heather/Big Meadow Lake (WDFW, 2009). The mapped priority habitat type associated with the lake is lynx range. Lynx are listed as “threatened” under ESA (Federal Register, 2009). However, the Heather/Big Meadow Lake area is not identified by USFWS as critical habitat for lynx.

In-stream and Riparian Habitats

The dominant vegetation community of the land surrounding Heather/Big Meadow Lake is mapped as Northern Rocky Mountain Dry-Mesic Montane Mixed Conifer Forest (USGS, 2010). However, the land bordering the north shore of the lake is disturbed by a road, and the western portion by a road/modified bank (dam). Percentages (and acreages) of the Level III landcover types from the GAP analysis within the SPA are provided in Appendix D.
Water Quality

Heather/Big Meadow Lake has no listings for water quality impairment (Ecology, 2008). The water quality may be somewhat impaired due to dam operations, logging, and runoff from adjacent roads.

Shoreline Use Patterns

Existing Land and Shoreline Use

Existing land use in the Heather Lake SPA is almost entirely composed of vacant lands.

Shoreline Modifications - Docks, Piers, Buoys, Floats and Bridges

Shoreline modifications include the Heather Lake Dam. There are no other modifications mapped.

Shoreline Environment Designations, Zoning, and Other Applicable Regulations

There are no current shoreline designations along Heather Lake. The shorelines are zoned as Public Lands (Map 18).

Existing and Potential Public Access Areas

Big Meadow Lake Campground provides public access to Heather Lake. The site has a concrete plank boat launch, campsites, fishing dock, trails, and a wildlife viewing tour. Within the SPA it is 3 acres in size.

Historic and Cultural Resources

There are no recorded archeological or historic sites (DAHP 2010). However, due to the documented use of the Pend Oreille County area by Kalispel peoples, and recorded sites within the vicinity of the lake used by homesteaders in the early 1900s, there is some probability of unknown archaeological resources occurring within the Heather/Big Meadow Lake shoreline planning area.

There are no state or federally listed historic properties within the Heather/Big Meadow Lake shoreline planning area (DAHP 2010).

Contaminated Sites

There are no Washington Department of Ecology listed facilities or sites within the shoreline planning area (Ecology, 2010).
WRJA 62 PEND OREILLE

18. ANDERSON LAKE

Physical and Biological Characterization

Drainage Basin, Tributary Streams, and Associated Wetlands

Anderson Lake is located approximately a half mile east of the Pend Oreille River. The lake has no surface water outlet or connection to the Pend Oreille River, but it is considered to be part of the Pend Oreille River sub-basin. The wetlands associated with this lake are confined by the existing banks (Map 6).

Process and Channel Modification

Process modifications at Anderson Lake are minimal. The lake is primarily surrounded by undeveloped forests and natural resource lands. The hydrological processes are primarily intact.

Geologic and Flood Hazards

The identified FEMA flood hazards in Anderson Lake are confined to the existing banks (Map 6). There are no areas adjacent to Anderson Lake that are mapped as 100-year flood hazards. The slopes adjacent to the lake are less than 20 percent (Map 12). There are no erosion hazards, landslide hazards, or seismic hazards adjacent to the lake (Map 12, Map 13, and Map 14).

Critical or Priority Habitat and Species Use

There are no priority fish documented in Anderson Lake (WDFW, 2009). The mapped priority habitats associated with the lake are elk winter range and riparian areas with associated wetlands.

In-stream and Riparian Habitats

The dominant vegetation community of the land surrounding Anderson Lake is mapped as Northern Rocky Mountain Mesic Montane Mixed Conifer Forest (USGS, 2010). The shoreline of Anderson Lake is unaltered, and significant LWD is present in the lake. Percentages (and acreages) of the Level III landcover types from the GAP analysis within the SPA are provided in Appendix D.

Water Quality

The water quality at Anderson Lake was not tested as part of the 2008 Washington State Water Quality Assessment (Ecology, 2008). The water quality at the lake is likely intact due in part to the surrounding forested area and limited human modifications.

Shoreline Use Patterns

Existing Land and Shoreline Use

The predominant land use in the Anderson Lake SPA is natural resource lands. Other land uses include vacant lands and residential.
Shoreline Modifications - Docks, Piers, Buoys, Floats and Bridges

There are no over-water structures mapped in the shoreline.

Shoreline Environment Designations, Zoning, and Other Applicable Regulations

Anderson Lake is not included in the current County SMP and does not have a shoreline designation. The Lake’s SPA is predominantly zoned Natural Resource and Rural (Map 18), with a small portion zoned as Public Land.

Existing and Potential Public Access Areas

There are no existing public access sites within the Anderson Lake SPA.

Historic and Cultural Resources

There are no recorded archeological or historic sites (DAHP 2010). However, due to the documented use of the Pend Oreille County area by Kalispel peoples, there is some probability of unknown archaeological resources occurring within the Anderson Lake shoreline planning area.

There are no state or federally listed historic properties within the Anderson Lake shoreline planning area (DAHP 2010).

Contaminated Sites

There are no Washington Department of Ecology listed facilities or sites within the Anderson Lake shoreline planning area (Ecology, 2010).

19. BEAD LAKE

Physical and Biological Characterization

Drainage Basin, Tributary Streams, and Associated Wetlands

Bead Lake is approximately 720 acres in size and is located 8 miles north of Newport, in the Kaniksu National Forest. Bead Lake is located in the southeast portion of Pend Oreille County and has no drainage outlet. Lodge Creek is located to the northeast of the lake and is the main stream that flows into the lake. Approximately 6 acres of seasonal wetlands are located around the lake. This includes approximately 2 acres of palustrine emergent and 4 acres of palustrine scrub-shrub seasonal wetlands (Appendix E).

Process and Channel Modification

The process modifications in the Bead Lake vicinity, within the Bead watershed, include:

- Rural residential development adjacent to the lake; and
- Deforestation in some areas.

The majority of Bead Lake is surrounded by United States Forest Service land that is undeveloped. There is some residential development along the west bank of the lake that may result in additional runoff and
pollutant from impervious surfaces. The hydrologic processes have been slightly modified from runoff and pollutants.

**Geologic and Flood Hazards**

FEMA has not designated 100-year floodplain areas around Bead Lake (Map 6). There are some erosion hazards on the north side of the lake, in areas that are steeper than 20 percent (Map 11). Landslide hazards and seismic hazards have not been identified adjacent to the lake (Map 12 and Map 13).

**Critical or Priority Habitat and Species Use**

The presence of kokanee salmon and pygmy whitefish is documented Bead Lake (WDFW, 2009). Additionally, the lake provides documented pygmy whitefish spawning habitat. Pygmy whitefish are listed as a “species of concern” under ESA; therefore, it presently does not have designated critical habitat.

Bead Lake provides elk winter range priority habitat (WDFW, 2009).

**In-stream and Riparian Habitats**

The dominant vegetation community of the land surrounding Bead Lake is mapped as Northern Rocky Mountain Dry-Mesic Montane Mixed Conifer Forest (USGS, 2010). Some of the forest land adjacent to the western portion of the lake is disturbed, due to residential development. Percentages (and acreages) of the Level III landcover types from the GAP analysis within the SPA are provided in Appendix D.

**Water Quality**

According to the 2008 Washington State Water Quality Assessment (Ecology, 2008), Bead Lake is identified as an impaired water body. The 303(d) listings for Bead Lake include a Category 5 listing for 2,3,7,8-TCDD and PCBs. The elevated levels of 2,3,7,8-TCDD and PCBs are likely due to polluted runoff of industrial chemicals. The water quality assessment category 5 was based on data from 2005 indicating an exceedance of total PCBs based on the sum of PCB aroclors in fillet samples of northern pikeminnow, peamouth, and kokanee salmon, and an exceedance of total PCBs based on the sum of PCB congeners in fillet samples of northern pikeminnow PCBs (Ecology, 2008). In addition, fillet samples of northern pikeminnow exceeded the National Toxics Rule criterion for 2,3,7,8-TCDD.

**Shoreline Use Patterns**

**Existing Land and Shoreline Use**

Existing land use in the Bead Lake SPA is mainly composed of public lands. Other uses include vacant lands and residential. Bead Lake is located within Kaniksu National Forest.

**Shoreline Modifications - Docks, Piers, Buoys, Floats and Bridges**

The east and north shores of the lake are within the Kaniksu National Forest and are unmodified. The west shoreline of the lake is more developed. There are numerous docks associated with the residential development.
Shoreline Environment Designations, Zoning, and Other Applicable Regulations

The majority of the Bead Lake SPA is currently designated as Conservancy. The residential area on the west shore of the Lake is designated Urban (Map 3). The majority of the land surrounding the lake is zoned as Public Land, with a small amount of the shoreline area zoned as Rural (Map 18).

Existing and Potential Public Access Areas

Public access in the Bead Lake SPA is potentially available at seven parcels in the Cunningham Homestead Addition and Diamond Match Company’s Bead Lake subdivisions. All sites are undeveloped properties that are less than one acre in size. There is also a USFS boat launch and parking area at the south end of the lake that can accommodate up to six boats and trailers. The lake is open to fishing year-round.

Historic and Cultural Resources

There are no recorded archeological sites (DAHP 2010). However, due to documented use throughout much of the Pend Oreille Valley and surrounding area by the Kalispel Tribe, there is some probability of unknown archeological resources occurring within the Bead Lake shoreline planning area. The Bead Lake Trail (Trail #127), first constructed in the 1930s along the shoreline of the eastern half of the lake, was inventoried in 1984, however determined not eligible for listing on the National Register.

There are no state or federally listed historic properties within the Bead Lake shoreline planning area (DAHP 2010).

Contaminated Sites

There are no Washington Department of Ecology listed facilities or sites within the Bead Lake shoreline planning area (Ecology, 2010). Ecology 303(d) Category 5 listing for 2,3,7,8-TCDD and PCBs, as detailed in the Water Quality section, indicate polluted runoff with industrial chemicals. The source of polluted runoff, however is not from any recorded facility or site within or in the vicinity of the lake’s shoreline area.

20. BROWNS LAKE - MIDDLE COUNTY

Physical and Biological Characterization

Drainage Basin, Tributary Streams, and Associated Wetlands

Browns Lake, which lies in the Selkirk Mountains, is located near the headwaters of Skookum Creek (flowing southwest) and Goose Creek (flowing east). Browns Lake is 88 acres in size and 23 feet at maximum depth at high water. Upper Brown’s Creek flow into Brown’s Lake, while the lower segment of Brown’s Creek begins from springs below Brown’s Lake and flows into Cee Cee Ah Creek. Browns Lake formed behind a glacial outwash terrace and has no surface outflow. Approximately 12 acres of temporarily/seasonally flooded wetlands are located at the east end of the lake and approximately 1 acre of temporarily flooded wetlands are located at the west end (Map 6).

Process and Channel Modification

The process modifications in the Browns Lake – Middle County vicinity, within the Cee Cee Ah watershed, include:
Deforestation in some areas around the lake;
Campgrounds adjacent to lake; and
Paved road and gravel roads adjacent to lake results in excess siltation.

Browns Lake is one of the most heavily used recreation sites of the Newport Ranger District and includes a USFS campground and shoreline trails. Significant dispersed camping areas also occur along Browns Creek. Paved roads and gravel roads are prevalent. Due to these modifications, the hydrological processes at Browns Lake are moderately impaired.

The outlet from Browns Lake goes subsurface due to the underlying geology at about Browns Creek RM 3.0 (USFS 1999ab as cited in WCC 2003). Water levels in Browns Lake fluctuate significantly, virtually draining the entire lake at times. In the winter of 1993, the lake nearly went dry (USFS 1996 as cited in WCC 2003). This has limited the establishment of aquatic vegetation on the steeper portions (north and south shorelines) of the lake and has left woody material within a dry zone much of the year. The fluctuation level of the water in these areas also limits riparian vegetation. The campground on the south side of the lake has reduced the amount of riparian vegetation in this small area. A wetland area exists on the east end of the lake. The broad silt flats on the east side of the lake may be the result of siltation from harvest and roads in the watershed above the lake (USFS 1996b as cited in Entrix 2002).

Geologic and Flood Hazards

FEMA has not identified flood hazards adjacent to Browns Lake Middle County (Map 6). The lake contributes a significant amount of water to groundwater and during large rainfall event the water levels generally stay within the banks of the lake. A large area to the east and two small areas to the north include alluvium as the underlying geology (Map 8). There are some severe erosion hazards and landslide hazards adjacent to the lake, with slopes greater than 20 percent (Map 11 and Map 12). The alluvial areas adjacent to the lake are associated with moderate to high liquefaction potential and may be areas of high seismic hazards (Map 13).

Critical or Priority Habitat and Species Use

Browns Lake – Middle County provides habitat for westslope cutthroat (WDFW, 2009). Mapped priority habitats associated with the lake are lynx range, a moose concentration, and riparian habitat with associated wetland areas. Lynx are listed as “threatened” under ESA (Federal Register, 2009). However, the Browns Lake – Middle County area is not identified by USFWS as critical habitat for lynx.

In-stream and Riparian Habitats

The dominant vegetation community of the land surrounding Browns Lake – Middle County is mapped as Northern Rocky Mountain Mesic Montane Mixed Conifer Forest (USGS, 2010). However, portions of the land bordering the shoreline have been impacted by roads and campgrounds. Percentages (and acreages) of the Level III landcover types from the GAP analysis within the SPA are provided in Appendix D.

Water Quality

According to the 2008 Washington State Water Quality Assessment (Ecology, 2008), Browns Lake – Middle County is not listed as an impaired 303(d) water body. The lake has a Category 2 listing for low
dissolved oxygen. According to Washington Department of Ecology, the dissolved oxygen will be closely monitored.

**Shoreline Use Patterns**

*Existing Land and Shoreline Use*

The main land use in the Browns Lake Middle County SPA is public lands. There are also some natural resource lands.

*Shoreline Modifications - Docks, Piers, Buoys, Floats and Bridges*

There are no shoreline modifications mapped or observed along the lake.

*Shoreline Environment Designations, Zoning, and Other Applicable Regulations*

The current shoreline designation of Brown’s Lake is Conservancy. Zoning is primarily Public Land with slightly more than ten percent of the SPA located on a northern tip of the lake zoned as Natural Resource (Map 18).

*Existing and Potential Public Access Areas*

Browns Lake is one of the most heavily used recreation sites of the Newport Ranger District and includes a USFS campground and shoreline trails. Significant dispersed camping areas also occur along Browns Creek. Paved roads and gravel roads are prevalent.

*Historic and Cultural Resources*

There are no recorded archeological sites (DAHP 2010). However, due to documented use throughout much of the Pend Oreille Valley and surrounding area by the Kalispel Tribe, there is some probability of unknown archaeological resources occurring within the Browns Lake – Middle County shoreline planning area. Mine sites, constructed and used between 1900 and 1940, are located along the lake’s southern shoreline. Two mine shaft tunnel openings were documented, both with slag pushed out to the lakeshore. The mine sites were determined not eligible for the National Register when documented in 2000. (DAHP, 2010)

There are no state or federally listed historic properties within the Browns Lake – Middle County shoreline area (DAHP 2010).

*Contaminated Sites*

There are no Washington Department of Ecology listed facilities or sites within the Browns Lake – Middle County shoreline planning area (Ecology, 2010).
21. BROWNS LAKE – NORTH COUNTY

Physical and Biological Characterization

Drainage Basin, Tributary Streams, and Associated Wetlands

Brown’s Lake-North County is located within the Ruby Creek watershed. Brown’s Lake connects with Lost Creek through a reach of stream known as Brown’s Outlet Creek. Approximately 9 acres of seasonal wetlands are located around the lake (Map 6). This includes approximately 8 acres of palustrine scrub-shrub and 1 acre of palustrine forested seasonal wetlands (Appendix E).

Process and Channel Modification

The process modifications in the Brown’s Lake – North County vicinity include some areas that were previously deforested and have logging roads. Most of these areas are not currently being logged. The area surrounding the lake is primarily part of the Colville National Forest. The hydrological processes are primarily intact.

Geologic and Flood Hazards

There are no identified FEMA flood hazards in this area (Map 6). During large storm events, the water would likely be confined to the existing wetland area adjacent to the lake. The slopes adjacent to the lake are gradual and no severe erosion hazards, landslide hazards, or seismic hazards have been identified (Map 12, Map 13, and Map 14).

Critical or Priority Habitat and Species Use

There are no priority fish species documented in Browns Lake – North County (WDFW, 2009). The mapped priority habitats associated with the lake are cavity-nesting duck breeding ponds, year-round elk range, and riparian habitat with associated wetlands.

In-stream and Riparian Habitats

The dominant vegetation community of the land surrounding Browns Lake – North County is mapped as Northern Rocky Mountain Dry-Mesic Montane Mixed Conifer Forest (USGS, 2010). The shoreline is generally unaltered. Percentages (and acreages) of the Level III landcover types from the GAP analysis within the SPA are provided in Appendix D.

Water Quality

According to the 2008 Washington State Water Quality Assessment (Ecology, 2008), Browns lake – North County has a Category 4a listing for temperature. The water body is classified as polluted, but has a defined TMDL.

Shoreline Use Patterns

Existing Land and Shoreline Use

Existing land use in the Browns Lake North County SPA is entirely composed of public lands.
Shoreline Modifications - Docks, Piers, Buoys, Floats and Bridges

There are no shoreline modifications mapped or observed along the lake.

Shoreline Environment Designations, Zoning, and Other Applicable Regulations

The current environment designation of the lake is Conservancy. The lake’s SPA is zoned as Public Lands.

Existing and Potential Public Access Areas

There are no existing public access sites within the Browns Lake-North County SPA.

Historic and Cultural Resources

There are no recorded archeological or historic sites (DAHP 2010). However, due to the documented use of the Pend Oreille County area by Kalispel peoples, there is some probability of unknown archeological resources occurring within the Browns Lake – North County shoreline planning area.

There are no state or federally listed historic properties within the Browns Lake-North County shoreline planning area (DAHP 2010).

Contaminated Sites

There are no Washington Department of Ecology listed facilities or sites within the Browns Lake – North County shoreline planning area (Ecology, 2010).

22. CALISPELL CREEK- MIDDLE FORK

Physical and Biological Characterization

Drainage Basin, Tributary Streams, and Associated Wetlands

The Middle Fork Calispell Creek is a tributary to the North Fork Calispell Creek. The headwaters of both of these streams are in higher elevations with moderate to steep terrain and are heavily forested. These areas are actively logged, both on private and public lands. Elevation and water availability also provide for hydroelectric generation from Power Lake, which drains the Middle and North Forks of Calispell Creek (D&ES 2000 as cited in WCC 2003). In the headwaters, the tributaries are characterized by relatively narrow high gradient flows with large substrate. There are two seasonal wetlands, totaling approximately 7 acres, mapped adjacent to the Middle Fork Calispell Creek SMP reach (Map 6). This includes approximately 4 acres of palustrine emergent and 3 acres of palustrine scrub-shrub seasonal wetlands (Appendix E). Additionally, there are approximately 30 acres of seasonal wetlands identified in the headwaters that are located upstream of the SMP reach.

Process and Channel Modification

The Calispell Creek, Middle Fork process modifications include:

- Mining and other industry;
- Dikes, culverts, and pumps;
- Timber harvest;
- Off-road vehicle use; and
- Agricultural development.

Middle Fork, North Fork, and South Fork, Calispell Creek all have relatively stable banks in the upper forested areas. Areas of active erosion from timber operations, cattle grazing and recreation can be found throughout the Calispell Creek watershed, but are generally located in isolated areas (Andersen and Maroney 2002 as cited in WCC 2003). Cattle grazing, off-road vehicle use and past timber harvests have left areas along the upper portions of the stream with eroding banks, little overhead canopy and reduced or destroyed streamside vegetation (KNRD 2001b as cited in WCC 2003). The USFS noted that reaches along the Middle Fork Creek were deficient of large woody debris (LWD) where dispersed recreational use was heavy (USFS 1999ad as cited in WCC 2003). The modifications in the Middle Fork Calispell Creek watershed have resulted in hydrological processes that are impaired.

Geologic and Flood Hazards

Flood hazards along the Middle Fork Calispell Creek have not been identified by FEMA (Map 6). The potential for channel migration has been classified as medium (Appendix CMZ; Map 6). Although the creek is partially constrained by valley walls, there is more erodible underlying geology and evidence of past movement (Map 6). There may be landslide hazards associated with the steep terrain in the headwaters. Seismic hazards have not been identified.

Critical or Priority Habitat and Species Use

The presence of rainbow trout and westslope cutthroat is documented in Middle Fork Creek (WDFW, 2009). The creek also has associated priority moose habitat.

In-stream and Riparian Habitats

The dominant vegetation community of the land surrounding Middle Fork Calispell Creek is mapped as Northern Rocky Mountain Dry-Mesic Montane Mixed Conifer Forest (USGS, 2010). Portions of the riparian zone have been impacted by roads and timber harvesting. Percentages (and acreages) of the Level III landcover types from the GAP analysis within the SPA are provided in Appendix D.

Water Quality

The Middle Fork of Calispell Creek has two 303(d) (Category 5) listings: dissolved oxygen and pH. In addition, the creek has Category 4A listing for temperature. Water quality impairment due to temperature on the Middle Fork of Calispell Creek is currently being addressed through the Colville National Forest Fecal Coliform Bacteria and Temperature TMDL.

Shoreline Use Patterns

Existing Land and Shoreline Use

More than half of the existing land use in Middle Fork Calispell Creek SPA is composed of public lands. The remaining is vacant lands.
Shoreline Modifications - Docks, Piers, Buoys, Floats and Bridges

There are no shoreline modifications mapped along the Middle Fork Calispell Creek.

Shoreline Environment Designations, Zoning, and Other Applicable Regulations

The Middle Fork Calispell Creek is not designated under the current SMP. The lake’s SPA is completely within the County’s Public Lands zone (Map 18).

Existing and Potential Public Access Areas

There are no existing public access sites within the Middle Fork Calispell Creek SPA.

Historic and Cultural Resources

There are numerous historic sites inventoried in the vicinity of the Middle Fork shoreline related to homesteading and/or logging historic land uses in the early 20th century, however all sites are out of the stream’s shoreline area. There are no recorded archaeological sites within the shoreline area; however, due to the location of the stream and the documented use of the Calispell Valley by the Kalispel Tribe, there is significant probability of unknown archaeological resources occurring within the shoreline planning area.

There are no state or federally listed historic properties within the Middle Fork Calispell Creek shoreline planning area (DAHP 2010).

Contaminated Sites

There are no Washington Department of Ecology listed facilities or sites within the Calispell Creek-Middle Fork shoreline planning area (Ecology, 2010).

23. CREEK- NORTH FORK

Physical and Biological Characterization

Drainage Basin, Tributary Streams, and Associated Wetlands

The North Fork Calispell Creek includes Power Lake and flows into Calispell Lake. Seasonally flooded wetlands, including agricultural lands, are extensive within the Calispell Valley, near Calispell Lake (Map 6). These approximately 84 acres of seasonal/temporarily flooded wetlands provide a variety of ecological functions including habitat for wildlife, water purification, streamflow maintenance, bank stabilization, groundwater recharge and flood protection. This includes approximately 1 acre of palustrine emergent, 37 acres of palustrine scrub-shrub, and 46 acres of palustrine forested seasonal wetlands (Appendix E).

Process and Channel Modification

The Calispell Creek- North Fork process modifications include:

- Mining and other industry;
- Dikes, culverts, and pumps;
• Timber harvest; and
• Agricultural development.

All branches of Calispell Creek have relatively stable banks in the upper forested areas. Areas of active erosion from timber operations, cattle grazing and recreation can be found throughout but are generally located in isolated areas (Andersen and Maroney 2002 as cited in WCC 2003). The North Fork Calispell Creek has undergone similar modifications as the Middle Fork Calispell Creek. The hydrological processes along North Fork Calispell Creek are impaired, especially in the reach downstream of Power Lake.

**Geologic and Flood Hazards**

The potential channel migration zone is limited along the North Fork Calispell Creek. Potential channel migration has been identified as low primarily due to the underlying geology and little evidence of recent movement (Appendix CMZ; Map 6). The underlying geology includes bedrock, sedimentary deposits or rocks, continental glacial outwash, and glacial till (Map 7). There is no alluvium identified along this creek and little evidence of channel migration since 1934-1935. At the downstream end of the N. Fork Calispell Creek, there is a moderate to high liquefaction hazard (Map 13). Along some of the creek, there are some slopes greater than 20 percent that could be associated with landslide hazards (Map 12).

**Critical or Priority Habitat and Species Use**

The presence of rainbow trout and westslope cutthroat is documented in North Fork Calispell Creek (WDFW, 2009). In addition, there are several priority habitats associated with the creek. These habitats are listed below (WDFW, 2009):

• Cavity-nesting ducks breeding and brooding area;
• Elk winter range; and
• Moose habitat.

**In-stream and Riparian Habitats**

The dominant vegetation community of the land surrounding North Fork Creek is mapped as Northern Rocky Mountain Mesic Montane Mixed Conifer Forest (USGS, 2010). Some portions of the riparian zone are impacted by roads and residential development. Percentages (and acreages) of the Level III landcover types from the GAP analysis within the SPA are provided in Appendix D.

**Water Quality**

The North Fork of Calispell Creek has three 303(d) (Category 5) listings: dissolved oxygen, pH, and temperature (Ecology 2008). In addition, the creek has a Category 4A listing for temperature and a Category 2 listing for pH. Water quality impairment due to temperature on the North Fork of Calispell Creek is currently being addressed through the Colville National Forest Fecal Coliform Bacteria and Temperature TMDL.
Shoreline Use Patterns

Existing Land and Shoreline Use

The predominant land use in the North Fork Calispell Creek SPA is public lands. Other land uses include vacant lands and natural resource lands.

Shoreline Modifications - Docks, Piers, Buoys, Floats and Bridges

Shoreline modifications are not mapped for the North Fork of Calispell Creek.

Shoreline Environment Designations, Zoning, and Other Applicable Regulations

Current environmental designations of the creek’s shorelines are Conservancy and Rural (Map 3). The Rural designation is along the portion of the creek closest to Lake. The majority of the Creeks’ SPA is zoned as Public lands, but small portions are zoned as Natural Resource and Rural lands, which allow a variety of uses (Map 18).

Existing and Potential Public Access Areas

There are no existing public access sites within the North Fork Creek SPA.

Historic and Cultural Resources

Cultural resources within the North Fork Creek shoreline area are limited to an inventoried saw mill site consisting of a concrete footing with iron bolts and rusted metal (associated with the mill’s smoke stack). The inventory site form prepared for the site suggests that the saw mill dates to between 1925 and 1930. According to the form, the surrounding area was heavily homesteaded in 1910-1920. Transected by numerous old roads, it is suggested that the site is reflective of the sale of homestead lands to lumbering and mill companies and a shift in use to lumbering in the late 1920's and early 1930's (DAHP, 2010). There are numerous other historic sites inventoried in the area of the stream, however outside of the shoreline area, linked to homesteading and/or logging historic land uses. Despite there being no recorded archaeological sites within the shoreline area, due to the location of the stream and the documented use of the Valley by Kalispel peoples, there is significant probability of unknown archaeological resources occurring within the shoreline planning area.

There are no state or federally listed historic properties within the North Fork Calispell Creek shoreline planning area (DAHP 2010).

Contaminated Sites

There are no Washington Department of Ecology listed facilities or sites within the Calispell Creek, North Fork shoreline planning area (Ecology, 2010).

24. CALISPELL CREEK
Physical and Biological Characterization

Drainage Basin, Tributary Streams, and Associated Wetlands

Calispell Creek and Lake is located at the downstream end of North Fork Calispell Creek. The North Fork Calispell Creek has a number of tributary streams that contribute to the flow within the creek and into the lake. Calispell Lake is surrounded by a large seasonally/temporarily/permanently flooded wetland complex, approximately 858 acres, that is considered part of the Box Canyon Reservoir portion of Pend Oreille River (Map 6; Appendix E). The lake drains into a stream that flows to a pumping station at Cusick, prior to entering Pend Oreille River.

Process and Channel Modification

The process modifications along Calispell Creek, including Calispell Lake, include:

- Diking;
- Agriculture
- Dam; and
- Rural residential development.

Calispell Creek, including Calispell Lake, has undergone modifications such as adding dikes and a dam. Additionally, there has been some rural development along the northern shore of the lake. The dam on Calispell Lake and dams along the Pend Oreille River have altered and impaired the natural hydrology of the Calispell Creek and Lake.

Geologic and Flood Hazards

The flood hazards identified by FEMA around Calispell Lake and Calispell Creek extend to the Pend Oreille River (Map 6). The flooding around the lake would be associated with dam operations, especially during high flow events during spring snowmelt. The slopes are less than 20 percent and no historical landslides have been identified around the lake, therefore the landslide hazards are minimal (Map 12). Liquefaction potential is moderate to high around the lake, resulting in some seismic hazards (Map 13).

Critical or Priority Habitat and Species Use

The presence of rainbow trout and westslope cutthroat is documented in Calispell Creek (WDFW, 2009). Bull trout presence is not mapped for Calispell Creek (WDFW, 2009); however, the creek is designated as critical habitat for bull trout by the USFWS (Federal Register, 2005). Bull trout are listed as “threatened” under ESA.

There are several priority habitats associated with Calispell Creek. These habitats are listed below (WDFW, 2009):

- Cavity-nesting ducks breeding and brooding area;
- Waterfowl concentrations; and
- Wetlands with associated ponds, sloughs, and riparian areas.
In-stream and Riparian Habitats

The dominant vegetation community of the land surrounding Calispell Creek is mapped as Rocky Mountain Alpine-Montane Wet Meadow (USGS, 2010). However, the riparian zone of Calispell Creek is significantly altered by past and ongoing agricultural activities. Given the lack of tree cover adjacent to the stream, LWD recruitment potential is very low. Percentages (and acreages) of the Level III landcover types from the GAP analysis within the SPA are provided in Appendix D.

Water Quality

Calispell Creek has three 303(d) (Category 5) listings: dissolved oxygen, pH, and temperature. In addition, the creek has Category 4A listings for fecal coliform and temperature, and a Category 2 listing for pH. Water quality impairment in Calispell Creek and its major tributaries is currently being addressed through the Colville National Forest Fecal Coliform Bacteria and Temperature TMDL.

Excess nitrogen and phosphorus were noted in Calispell Creek (EPA 1993 as cited in Geo-Ecology Research Group 2005). In fact, Calispell Creek is one of the three largest local nutrient input sources to the Pend Oreille River, contributing approximately 50% of the external nitrogen load and 18% of the external phosphorus load.

The major source of high organic content in the Calispell Creek system is Calispell Lake. Calispell Creek below the lake is organically rich. Although Calispell Lake is a naturally productive system, nonpoint runoff from agricultural land use in the area also contributes. Total organic phosphorous (in the creek) below the lake was usually double the concentration above the lake. The values for pH, nitrogen, TP, conductivity, DO, total suspended solids and turbidity were all highest at the lake outlet, indicating the waters of Calispell Lake are highly productive (KNRD 1994 as cited in Entrix 2002).

Sedimentation and eutrophication of Calispell Lake was not likely to be attributable to upstream sources of erosion or agricultural activities (PUD 1999 as cited in Entrix 2002). Natural eutrophication of Calispell Lake could explain accelerated sedimentation in the lake, but these processes have not been investigated (Entrix 2002). A large acreage of cattails grow and die each year along the lakes shorelines, and some suspect that this is the source of accelerated lake infilling (changes in wetland vegetation, primarily an increase in the prevalence of cattails, may have added organic sediments to the lake). Additionally, eutrophication could be attributed to changes in the natural flow characteristics through the lake due to downstream water regulation (PUD 1999 as cited in Entrix 2002).

Future water quality problems in the Calispell Creek watershed include the continued impacts of livestock to riparian areas, road construction and nonpoint runoff from agricultural land use.

Shoreline Use Patterns

Existing Land and Shoreline Use

Existing land use in the Calispell Creek SPA is mainly vacant lands. Other land uses include agriculture and residential. The Town of Cusick is located on the east side of the Calispell Creek. Portions of Calispell Creek are within Waters of the Kalispel Indian Reservation (see Pend Oreille River for more information).
Shoreline Modifications - Docks, Piers, Buoys, Floats and Bridges

There are no piers or docks mapped along the Creek or Calispell Lake. There are 3 bridges mapped within the shoreline.

Shoreline Environment Designations, Zoning, and Other Applicable Regulations

Nearly all of the Calispell Creek shorelines, which include Calispell Lake are designated Rural. The areas along the Creek in the Town of Cusick are designated Urban (Map3). County zoning along the Calispell Creek shoreline is a mix of Natural Resource and Rural Lands and a small amount of Public Land (Map 18). The mouth of the creek is located in the Town of Cusick, which is not included in this analysis.

Existing and Potential Public Access Areas

A private duck refuge, owned by the Calispell Lake Duck Club, is located adjacent to the Calispell Lake, southwest of the town of Usk.

Historic and Cultural Resources

Although the Calispell Creek shoreline is surrounded by the culturally-rich Pend Oreille River Valley (documented in detail in the Pend Oreille River section – see Box Canyon Reservoir – Reach 6), the shoreline area of the stream contains few inventoried archaeological or historic sites. Inventoried sites suggest seasonal use of short-term camp sites along the stream, although frequent use of the area during all seasons, and especially during the camas harvest season, is well documented. Pre-contact camp sites are characterized by fire-cracked rocks, lithic scatters, and other materials. (DAHP, 2010)

There are no state or federally listed historic properties or structures within the Calispell Creek shoreline planning area (DAHP 2010).

Contaminated Sites

Ecology has previously monitored one site within the Calispell Creek planning area – a Hazardous Waste Generator facility (listed as Littles Wood Specialty Plant) near Cusick. The site, located in the Reach 1 area, was actively tracked by Ecology during 1988. No other sites or facilities are within or near the shoreline area (Ecology, 2010).

25. CRESCENT LAKE

Physical and Biological Characterization

Drainage Basin, Tributary Streams, and Associated Wetlands

Crescent Lake is located in north Pend Oreille County, near the Canadian Border. Crescent Lake is part of the Slate Creek watershed and does not have an outlet to the Pend Oreille River. Approximately 2 acres of semi-permanently flooded palustrine emergent wetlands are located adjacent to the lake (Map 6; Appendix E).

Process and Channel Modification

The area around Crescent Lake is primarily forested. The process modifications around Crescent Lake, within the Slate Creek watershed, include:
Mining; and

Adjacent roads.

Lead and zinc have been mined in the Slate Creek watershed (USFS 1998; WCC 2003 as cited in SCL 2008c). The mining and adjacent roads have moderately impaired the natural hydrologic processes in the lake.

Geologic and Flood Hazards

FEMA has not identified any 100-year flood hazards around Crescent Lake (Map 6). Crescent Lake is bordered by some slopes greater than 20 percent that may be associated with severe erosion and landslide hazards (Map 11 and Map 12). Seismic hazards have not been identified around the lake (Map 13).

Critical or Priority Habitat and Species Use

There are no priority fish documented in Crescent Lake (WDFW, 2009). The mapped priority habitat associated with the lake is elk winter range.

In-stream and Riparian Habitats

The dominant vegetation community of the land surrounding Crescent Lake is mapped as Northern Rocky Mountain Dry-Mesic Montane Mixed Conifer Forest (USGS, 2010). However, most of the land adjacent to the lake edge is disturbed by an unpaved road. Percentages (and acreages) of the Level III landcover types from the GAP analysis within the SPA are provided in Appendix D.

Water Quality

According to the 2008 Washington State Water Quality Assessment (Ecology, 2008), the water quality at Crescent Lake is not listed as an impaired water body. There may be some water quality impairments due to the nearby lead and zinc mining, as well as adjacent roads.

Shoreline Use Patterns

Existing Land and Shoreline Use

Existing land use in the Crescent Lake SPA is entirely composed of public lands.

Shoreline Modifications - Docks, Piers, Buoys, Floats and Bridges

There are no in-water modifications, such as piers or docks. The eastern shoreline is modified by SR 31 with is located adjacent to the Lake.

Shoreline Environment Designations, Zoning, and Other Applicable Regulations

Crescent Lake is not currently designated under the County’s SMP. County zoning around the lake is a mix of Natural Resource and Rural Land (Map 18).

Existing and Potential Public Access Areas

There are no existing public access sites within the Crescent Lake SPA.
Critical or Priority Habitat and Species Use

There are no priority fish documented in Crescent Lake (WDFW, 2009). The mapped priority habitat associated with the lake is elk winter range.

Contaminated Sites

There are no Washington Department of Ecology listed facilities or sites within the Crescent Lake shoreline planning area (Ecology, 2010).

26. DAVIS LAKE

Physical and Biological Characterization

Drainage Basin, Tributary Streams, and Associated Wetlands

Deer Creek is the primary inflow into Davis Lake and Davis Creek is the primary outflow from the lake. Davis Creek flows into the Pend Oreille River. Davis Creek, with a drainage basin of approximately 15,350 acres, flows north from the headwaters near Davis Lake, at about 3000 feet in elevation, before emptying into the Box Canyon Reservoir portion of the Pend Oreille River at around 2100 feet in elevation (POCD 2001c as cited in WCC 2003). Approximately 43 acres of seasonal wetlands are located adjacent to the lake (Map 6). This includes approximately 32 acres of palustrine emergent and 21 acres of palustrine scrub-shrub seasonal wetlands (Appendix E).

Process and Channel Modification

The process modifications around Davis Lake include:

- Residential and commercial development adjacent to the lake;
- Roads; and
- Deforestation in some areas.

Runoff from adjacent roads, logging, and development has impaired the natural hydrological processes.

Geologic and Flood Hazards

The 100-year flood zone is located primarily within the wetlands adjacent to the lake (Map 6). The area immediately downstream, to the north, of the lake has a much wider floodplain, then at the upstream area, to the south. There are some slopes greater than 20 percent adjacent to the lake that are associated with potential severe erosion and landslide hazards (Map 11 and Map 12). The underlying geology of the area to the south of the lake is alluvium and designated as having a moderate to high potential for liquefaction (Map 13). Therefore, there are some seismic hazards associated with the southern end of the lake.

Critical or Priority Habitat and Species Use

The presence of kokanee salmon, rainbow trout, and westslope cutthroat is documented in Davis Lake (WDFW, 2009). The mapped priority habitat type associated with the lake is riparian habitat with associated wetland areas.
In-stream and Riparian Habitats

The majority of the land surrounding Davis Lake is mapped as Northern Rocky Mountain Ponderosa Pine Woodland and Savanna, with portions of Northern Rocky Mountain Lower Montane Riparian Woodland and Shrubland and Rocky Mountain Alpine-Montane Wet Meadow mapped near the northern portion of the lake (USGS, 2010). These vegetation community types provide habitat for a wide variety of amphibians, reptiles, mammals, and birds (Johnson and O’Neil, 2001). In particular, the terrestrial-aquatic interface within the intact riparian habitat zones (both wetland and upland) of Chain Lake likely contribute to a high degree of biological diversity for both fish and wildlife species.

The northern and eastern portions of the Davis Lake shorelines are significantly altered by adjacent roads and dense residential development. These land use alterations have negatively-affected the habitat value of these areas, as compared to pre-development conditions. Percentages (and acreages) of the Level III landcover types from the GAP analysis within the SPA are provided in Appendix D.

The relatively high levels of disturbance adjacent to the northern and eastern shorelines of Davis Lake have made the areas susceptible to non-native, invasive plant invasions. Non-native plants that are documented as occurring within lakes and wetlands in the county include common reed, Eurasian watermilfoil, purple and wand loosestrife, knotweeds, reed canarygrass, and yellow flag iris (Pend Oreille County Noxious Weed Control Board, 2010). Invasive plants tend to form mono-specific stands, which compete with native species for moisture, nutrients, sunlight, and space (Cronk & Fennessy, 2001; FISRWG, 2001; Maurer et al., 2003). The replacement of native plants by mono-specific stands of invasive species can lead to a variety of negative effects in aquatic habitats, which include obstruction of water flow, fish and wildlife habitat loss, and an overall reduction in species richness (Antieau, 1998; Cronk & Fennessy, 2001).

Water Quality

The water quality in Davis Lake is classified as Category 4C for an excessive amount of invasive exotic species. This was determined as part of the 2008 Washington State Water Quality Assessment (Ecology, 2008). The water quality at Davis Lake is moderately impaired due to this classification and potential runoff from adjacent roads and development.

Shoreline Use Patterns

Existing Land and Shoreline Use

The main land uses in the Davis Lake SPA are residential and vacant lands. Other land uses include natural resource lands and active recreation.

Shoreline Modifications - Docks, Piers, Buoys, Floats and Bridges

The lakeshore of Davis Lake is modified by SR 211, which constitutes the lake’s western shore. There are no over-water structures mapped on the Lake. Based on review of aerial photographs, there are approximately 3 docks in the southern half of the lake and approximately 28 docks along the north shore where residential development is relatively dense.

Shoreline Environment Designations, Zoning, and Other Applicable Regulations

The current shoreline designation of the lake is mix of Conservancy, Natural, and Urban along the north shore (Map 3). Zoning around the lake consists of Natural Resource and Rural (Map 18).
Existing and Potential Public Access Areas

The only developed access point in Davis Lake SPA is a 1 acre site that has a concrete and gravel boat launch managed by the Washington State Department of Fish and Wildlife. In addition, there are 4 undeveloped access points totaling less than 1 acre which could provide public access in the future.

Historic and Cultural Resources

There are no recorded archeological or inventoried historic sites (DAHP 2010). However, due to documented use of the Pend Oreille County area by Kalispel peoples, there is some probability of unknown archaeological resources occurring within the Davis Lake shoreline planning area.

There are no state or federally listed historic properties within the Davis Lake shoreline planning area (DAHP 2010).

Contaminated Sites

There are no E Washington Department of cology listed facilities or sites within the Davis Lake shoreline planning area (Ecology, 2010).

27. GRANITE CREEK-NORTH FORK

Physical and Biological Characterization

Drainage Basin, Tributary Streams, and Associated Wetlands

North Fork Granite Creek is part of the Granite Creek watershed. The headwaters of the North Fork Granite Creek originate in high mountainous areas of Pend Oreille County from 5,700 to 6,500 feet. Tillicum Creek and North Fork Tillicum Creek are the primary tributaries to the North Fork Granite Creek. Approximately 26 acres of seasonal wetlands are located along the main reach of the North Fork Granite Creek (Map 6). This includes approximately 26 acres of palustrine emergent and 1 acre of palustrine forested seasonal wetlands (Appendix E).

Process and Channel Modification

The primary process and channel modifications near the North Fork Granite Creek include:

- Road development; and
- Timber harvesting.

The area adjacent to North Fork Granite Creek is primarily forested and owned by the USFS. There is some road development and timber harvesting near, but not directly adjacent to the creek. The hydrological processes in the creek are primarily intact.

Geologic and Flood Hazards

FEMA has not identified a floodplain along North Fork Granite Creek (Map 6). The underlying geology is glacial drift (Map 8). The creek is partially constrained by the valley width and has a moderate sinuosity. The potential for channel migration has been mapped as medium (Map 6; Appendix CMZ).
Adjacent slopes are less than 20 percent and generally have a low erosion and landslide risk (Map 11 and Map 12). The potential liquefaction and seismic hazards are very low (Map 13).

**Critical or Priority Habitat and Species Use**

The presence of bull trout and westslope cutthroat is documented in North Fork Granite Creek (WDFW, 2009). Additionally, fish distribution maps indicate that the creek provides spawning habitat for bull trout. Bull trout are listed as “threatened” under ESA, and have designated critical habitat within Granite Creek (Federal Register, 2005).

The mapped priority habitats associated with North Fork Granite Creek are a harlequin duck nesting and brooding area, and riparian habitats with associated wetlands and ponds.

**In-stream and Riparian Habitats**

The dominant vegetation community of the land surrounding North Fork Granite Creek is mapped as Northern Rocky Mountain Mesic Montane Mixed Conifer Forest (USGS, 2010). However, a road parallels the northern/eastern bank of the creek. Percentages (and acreages) of the Level III landcover types from the GAP analysis within the SPA are provided in Appendix D.

**Water Quality**

North Fork Granite Creek has no listings for water quality impairment and was not included in the 2008 Washington State Water Quality Assessment (Ecology, 2008). The area around the creek is primarily forested and water quality is likely intact.

**Shoreline Use Patterns**

**Existing Land and Shoreline Use**

Existing land use in the North Fork Granite Creek SPA is entirely composed of public lands.

**Shoreline Modifications - Docks, Piers, Buoys, Floats and Bridges**

There are no shoreline modifications mapped along the North Fork of Granite Creek.

**Shoreline Environment Designations, Zoning, and Other Applicable Regulations**

North Fork Granite Creek is not currently designated under the County’s SMP. The creek’s shorelines are zoned as Public Lands (Map 18).

**Existing and Potential Public Access Areas**

There are no existing public access sites within the North Fork Granite Creek SPA.

**Historic and Cultural Resources**

There are no recorded archeological or inventoried historic sites (DAHP 2010). However, due to documented use of the Pend Oreille County area by Kalispel peoples, there is some probability of unknown archaeological resources occurring within the North Fork Granite Creek shoreline planning area.
There are no state or federally listed historic properties within the North Fork Granite Creek shoreline planning area (DAHP 2010).

**Contaminated Sites**

There are no Washington Department of Ecology listed facilities or sites within the North Fork Granite Creek shoreline planning area (Ecology, 2010).

### 28. GRANITE CREEK- SOUTH FORK

**Physical and Biological Characterization**

**Drainage Basin, Tributary Streams, and Associated Wetlands**

South Fork Granite Creek is part of the Granite Creek watershed. The headwaters of the South Fork Granite Creek originate in high mountainous areas of Pend Oreille County from 5,700 to 6,500 feet. The main tributaries to the South Fork Granite Creek include Cache Creek and Sema Creek. The wetlands associated with this creek, approximately 45 acres, are primarily located between the confluence with Sema Creek and the confluence with Cache Creek (Map 6). This includes approximately 6 acres of palustrine emergent, 4 acres of palustrine scrub-shrub, and 35 acres of palustrine forested seasonal wetlands (Appendix E).

**Process and Channel Modification**

The primary process and channel modifications near the South Fork Granite Creek include:

- Road development; and
- Timber harvesting.

The area adjacent to South Fork Granite Creek is primarily forested and owned by the USFS. There is some road development and timber harvesting near, but not directly adjacent to the creek. The hydrological processes in the creek are primarily intact.

**Geologic and Flood Hazards**

FEMA has not identified a floodplain along South Fork Granite Creek (Map 6). The underlying geology is glacial drift (Map 8). The creek is partially constrained by the valley width and has a moderate sinuosity. The potential for channel migration has been mapped as medium (Map 6; Appendix CMZ). Adjacent slopes are less than 20 percent and generally have a low erosion and landslide risk (Map 11 and Map 12). The potential liquefaction and seismic hazards are very low (Map 13).

**Critical or Priority Habitat and Species Use**

The presence of bull trout and westslope cutthroat is documented in South Fork Granite Creek (WDFW, 2009). Additionally, fish distribution maps indicate that the creek provides spawning habitat for bull trout. Bull trout are listed as “threatened” under ESA, and have designated critical habitat within Granite Creek (Federal Register, 2005).

The mapped priority habitats associated with South Fork Granite Creek are a harlequin duck nesting and brooding area, and riparian habitats with associated wetlands and ponds.
In-stream and Riparian Habitats

The dominant vegetation community of the land surrounding South Fork Granite Creek is mapped as Northern Rocky Mountain Dry-Mesic Montane Mixed Conifer Forest (USGS, 2010). Some portions of the riparian zone are disturbed by roads (unpaved). Percentages (and acreages) of the Level III landcover types from the GAP analysis within the SPA are provided in Appendix D.

Water Quality

South Fork Granite Creek has no listings for water quality impairment and was not included in the 2008 Washington State Water Quality Assessment (Ecology, 2008). The area around the creek is primarily forested and water quality is likely intact.

Shoreline Use Patterns

Existing Land and Shoreline Use

Existing land use in the South Fork Granite Creek SPA is entirely composed of public lands.

Shoreline Modifications - Docks, Piers, Buoys, Floats and Bridges

There are no shoreline modifications mapped along the North Fork of Granite Creek.

Shoreline Environment Designations, Zoning, and Other Applicable Regulations

There are no current shoreline designations because Granite Creek is not included in the County’s current SMP. The shorelines are zoned as Public Lands (Map 18).

Existing and Potential Public Access Areas

There are no existing public access sites within the South Fork Granite Creek SPA.

Historic and Cultural Resources

There are no recorded archeological or inventoried historic sites (DAHP 2010). However, due to documented use of the Pend Oreille County area by Kalispel peoples, there is some probability of unknown archaeological resources occurring within the South Fork Granite Creek shoreline planning area.

There are no state or federally listed historic properties within the South Fork Granite Creek shoreline planning area (DAHP 2010).

Contaminated Sites

There are no Washington Department of Ecology listed facilities or sites within the South Fork Granite Creek shoreline planning area (Ecology, 2010).

29. HARVEY CREEK
Physical and Biological Characterization

Drainage Basin, Tributary Streams, and Associated Wetlands

Harvey Creek is part of the Sullivan Creek watershed. Harvey Creek drains the area south and southeast of Sullivan Lake, a total drainage area of approximately 52 square miles. Harvey Creek flows approximately 15 miles north-northwesterly from its headwaters before flowing into Sullivan Lake. Approximately 40 acres of seasonally/temporarily flooded wetlands are located along Harvey Creek. Approximately 34 acres of these wetlands are located near the confluence with Sullivan Lake.

Process and Channel Modification

The process modifications along Harvey Creek include:

- Sullivan Lake dam located at the downstream end of Harvey Creek; and
- Logging and roads.

The Sullivan Lake Dam has changed the amount of sediment and migration that occurs at the downstream end of Harvey Creek. The riparian areas along Harvey Creek have been historically harvested and have roads located within some of the riparian areas that could result in increased sediment loading. The hydrological processes at Harvey Creek are impaired due to the change in sediment and flow regime caused by the dam and runoff from logging and roads.

Geologic and Flood Hazards

Flood hazards have not been identified by FEMA along Harvey Creek (Map 6). The potential channel migration has been classified as low in the upper reach and medium in the lower reach, upstream of Sullivan Lake (Appendix CMZ; Map 6). The underlying geology is bedrock, glacial drift, and glaciolacustrine (Map 8). The overall valley slope is approximately 4 percent. Some of the adjacent slopes are greater than 20 percent and associated with some landslide risk (Map 12). There are no liquefaction hazards identified and most of the sediment is consolidated; therefore, the seismic hazards are likely low (Map 13).

Critical or Priority Habitat and Species Use

The presence of kokanee salmon, pygmy whitefish, rainbow trout, and westslope cutthroat is documented in Harvey Creek (WDFW, 2009). Additionally, fish distribution maps indicate that the creek provides spawning habitat for kokanee. Pygmy whitefish are listed as a “species of concern” under ESA; therefore, it does not presently have designated critical habitat.

The mapped priority habitats associated with Harvey Creek are a common loon breeding area, elk winter range, and riparian areas with associated wetlands.

In-stream and Riparian Habitats

The dominant vegetation community of the land surrounding Harvey Creek is mapped as Northern Rocky Mountain Dry-Mesic Montane Mixed Conifer Forest (USGS, 2010). However, portions of the riparian zone are disturbed by roads and a residential development. Percentages (and acreages) of the Level III landcover types from the GAP analysis within the SPA are provided in Appendix D.
Water Quality

According to the 2008 Washington State Water Quality Assessment (Ecology, 2008), the water body is impaired and includes a 303(d) Category 5 rating for dissolved oxygen. Additionally, pH in the creek is listed as Category 2.

Shoreline Use Patterns

Existing Land and Shoreline Use

The main land use in the Harvey Creek SPA is public lands. Other land uses include vacant lands and natural resource lands.

Shoreline Modifications - Docks, Piers, Buoys, Floats and Bridges

There are no shoreline modifications mapped along Harvey Creek. A bridge spans the creek at the mouth to Sullivan Lake.

Shoreline Environment Designations, Zoning, and Other Applicable Regulations

The Harvey Creek shorelines are currently designated as Conservancy (Map 3). The majority of the shoreline is zoned as Public Lands. There are also smaller amounts of Natural Resource and Rural zoning along the creek (Map 18).

Existing and Potential Public Access Areas

There are no existing public access sites within the Harvey Creek SPA.

Historic and Cultural Resources

There are no recorded archeological sites (DAHP 2010). However, due to documented use of the Pend Oreille County area by Kalispel peoples, there is some probability of unknown archaeological resources occurring within the Harvey Creek shoreline planning area. There is one inventoried site from the historic period located at the outlet from the stream into Sullivan Lake. The site is described as historical alterations to the outlet channel itself, with a dike system constructed. The date of channel modification is and purpose is not documented, however the site was determined not eligible for listing on the National Register.

There are no state or federally listed historic properties within the Harvey Creek shoreline planning area (DAHP 2010).

Contaminated Sites

Consistent with the largely undeveloped character of the shoreline area, there are no Washington Department of Ecology listed facilities or sites along or within the vicinity of Harvey Creek (Ecology, 2010).

30. IONE MILLPOND
Physical and Biological Characterization

Drainage Basin, Tributary Streams, and Associated Wetlands

Ione Millpond is located within the Muddy Creek watershed. Big Muddy Creek and Little Muddy Creek flow into the Ione Millpond. The Ione Millpond flows into the Box Canyon Reservoir section of the Pend Oreille River. There are approximately 7 acres of palustrine emergent seasonally flooded wetlands associated with the Ione Millpond are connected to the wetlands of the Box Canyon Reservoir (Map 6; Appendix E).

Process and Channel Modification

The process modifications in the Ione Millpond include:

- Grazing and agricultural practices;
- Railroads; and
- Roads and annual County road maintenance.

Cattle-use has led to erosion in Muddy Creek, a tributary to Ione Millpond and is contributing sediment to downstream reaches (USFS 2001b as cited in WCC 2003). The hydrological processes in the pond have changed due to the increased sediment load in the lake.

Geologic and Flood Hazards

FEMA has mapped the floodplain around this lake and included an approximately 1.5 mile reach of the two tributaries (Map 6). Adjacent slopes are less than 20 percent and generally have a low severe erosion and landslide risk (Map 11 and Map 12). The potential for liquefaction in this area is very low and seismic hazards are minimal (Map 13).

Critical or Priority Habitat and Species Use

The presence of rainbow trout is documented in Ione Millpond (WDFW, 2009). The mapped priority habitats associated with the pond are white-tailed deer winter range, and significant riparian habitats with associated wetlands and ponds.

In-stream and Riparian Habitats

The dominant vegetation community of the land surrounding by Ione Millpond consists of roads, residential development, and cleared land. A thin (approx. 20 foot) strip of forest habitat borders the southern portion of the lake, which is mapped as Northern Rocky Mountain Dry-Mesic Montane Mixed Conifer Forest. Percentages (and acreages) of the Level III landcover types from the GAP analysis within the SPA are provided in Appendix D.

Water Quality

According to the 2008 Washington State Water Quality Assessment (Ecology, 2008), Ione Millpond has 303(d) Category 5 listings for dissolved oxygen and temperature. Additionally pH has been identified as a Category 2 water of concern.
Shoreline Use Patterns

Existing Land and Shoreline Use

The predominant land use in the Ione Millpond SPA is sawmills. Other land uses include vacant lands and residential. Ione Millpond SPA is entirely located within the Town of Ione city limits and UGA boundary.

Shoreline Modifications - Docks, Piers, Buoys, Floats and Bridges

There are no shoreline modifications mapped in the shorelines of Ione Millpond, although roadways flank the southern and eastern shores.

Shoreline Environment Designations, Zoning, and Other Applicable Regulations

The shorelines of Ione Millpond are currently designated Urban (Map 3). Approximately three quarters of the Ione Millpond’s shorelines are within the Town of Ione. Zoning data is not available for the Town. The shoreline outside of the Town’s boundaries are a mix of Natural Resource and Rural zoning (Map 18).

Existing and Potential Public Access Areas

There are no existing public access sites within the Ione Millpond SPA.

Historic and Cultural Resources

There are no recorded archeological or historic sites (DAHP 2010). However, due to the documented intensive use of the Pend Oreille Valley and Pend Oreille River shoreline area by Kalispel peoples, there is some probability of unknown archaeological resources occurring within the Ione Millpond shoreline planning area.

There are no state or federally listed historic properties within the Ione Millpond shoreline planning area (DAHP 2010).

Contaminated Sites

There are no Washington Department of Ecology listed facilities or sites within the shoreline planning area (Ecology, 2010).

31. KINGS LAKE

Physical and Biological Characterization

Drainage Basin, Tributary Streams, and Associated Wetlands

Kings Lake is part of the Skookum watershed. The lake is located in between Skookum Creek and North Fork Skookum Creek. Kings Lake Road (County Rd. 3389) is located north of the lake. King’s Lake is 53 acres in size with a maximum depth of 51 feet. The lake level is very constant. There is no significant
stream or creek entering into or out of the lake. Approximately 7 acres of palustrine seasonal wetlands are located around the lake and extend to the northeast and east of the lake (Map 6; Appendix E).

**Process and Channel Modification**

The primary process modification at Kings Lake is building of roads. The lake is adjacent to the Kaniksu National Forest and surrounding area, with the exception of roads has had little disturbance (USFS 1996b as cited in Entrix 2002). Although some of these roads are surfaced with gravel, they have a relatively high level of use and are suspected to be a significant source of sediment in the Skookum Creek watershed. Large pulses of sediment may be delivered from roads during storm events. Sediment delivery and movement through the system is currently elevated. Hydrological processes in Kings Lake are impaired.

**Geologic and Flood Hazards**

The flood hazards mapped by FEMA are confined to the banks of the lake. During large storm events, there could be a slight elevation of lake levels. Adjacent slopes include some areas that are greater than 20 percent and may be associated with potential erosion and landslide hazards (Map 11 and Map 12). Liquefaction hazards and seismic hazards have not been identified at this lake (Map 13).

**Critical or Priority Habitat and Species Use**

There are no priority fish documented in Kings Lake (WDFW, 2009). However, there are several priority habitats associated with the lake. These habitats are listed below (WDFW, 2009):

- Common loon habitat;
- Lynx range;
- Elk winter range; and
- Riparian habitat with associated wetland areas.

Lynx are listed as “threatened” under ESA (Federal Register, 2009). However, the Kings Lake area is not identified by USFWS as critical habitat for lynx.

**In-stream and Riparian Habitats**

The dominant vegetation community of the land surrounding Kings Lake is mapped as Northern Rocky Mountain Dry-Mesic Montane Mixed Conifer Forest (USGS, 2010). Portions of the surrounding forest have been impacted by roads. Percentages (and acreages) of the Level III landcover types from the GAP analysis within the SPA are provided in Appendix D.

**Water Quality**

Kings Lake has no listings for water quality impairment (Ecology, 2008). There may be some impairment due to runoff from adjacent roads, but the majority of the area is intact forest and likely has good water quality.
**Shoreline Use Patterns**

*Existing Land and Shoreline Use*

The main land use in the Kings Lake SPA is public lands. Other land uses include natural resource lands, residential, and vacant lands.

*Shoreline Modifications - Docks, Piers, Buoys, Floats and Bridges*

There are no shoreline modifications or overwater structures mapped on Kings Lake.

*Shoreline Environment Designations, Zoning, and Other Applicable Regulations*

The current shoreline designation of the Kings Lake shoreline is Conservancy (Map 3). Approximately half of the lake is zoned as Public Land, a quarter is zoned Natural Resources and a quarter is designated as Rural (Map 18).

*Existing and Potential Public Access Areas*

There are no existing public access sites within the Kings Lake SPA.

*Historic and Cultural Resources*

There are no recorded archeological or historic sites (DAHP 2010). However, due to documented use of the Pend Oreille Valley and surrounding area by Kalispel peoples, there is some probability of unknown archaeological resources occurring within the Kings Lake shoreline planning area.

There are no state or federally listed historic properties within the Kings Lake shoreline planning area (DAHP 2010).

*Contaminated Sites*

There are no Washington Department of Ecology listed facilities or sites within the Kings Lake shoreline planning area (Ecology, 2010).

### 32. LECLERC CREEK

**Physical and Biological Characterization**

*Drainage Basin, Tributary Streams, and Associated Wetlands*

The LeClerc Creek drainage system consists of three primary tributaries. The West Branch LeClerc Creek flows south from steep headwaters on 6,784 foot Molybdenite Mountain. The Middle Branch also flows generally south, but originates from gentler granitic hills at an elevation of about 4,700 feet. The East Branch flows southwest from 5,700 foot Monumental Mountain.

Approximately 14 acres of seasonal wetland areas occur in the upper reaches of the West Branch LeClerc Creek, particularly in the Red/White Man and Upper West Branch sub-basins (Map 6; Appendix E). These broad, wet valley bottoms are located on small tributaries and bounded by higher gradient, more confined channels both upstream and downstream. These numerous ponds and wetlands dampen peak flows, in a similar fashion to a lake. Beavers once constructed a series of dams and ponds in several of
these basins. The beaver ponds are large and deep, with cover provided by fallen trees and overhanging brush along the margins. The ponds provide salmonids with abundant rearing habitat and offer low velocity refuge areas during high flows (WDNR 1997).

Process and Channel Modification

The modifications within the LeClerc Creek watershed are minimal, but include:

- Timber harvest;
- Rural development;
- Cattle grazing; and
- Agricultural pastures.

All of these modifications have contributed to elevated in-stream sediment level (USFS 2000 as cited in WCC 2003). Although 95 percent of the watershed is still forested, timber harvest has historically accounted for the majority of process and channel modifications. The LeClerc Creek watershed is owned predominantly by Stimson Lumber Company or managed by the USFS. Additionally, there is some privately owned, non-agency, and non-industrial parcels where private, rural homes have been built and increased sedimentation within the adjacent creek has occurred. The hydrological processes in this creek have been impaired due to this increased sedimentation and runoff.

Geologic and Flood Hazards

The potential CMZ hazards are low in the constrained upper and lower reaches and medium in the less constrained portion in “Dry Canyon” (Appendix CMZ; Map 6). The floodplain is constrained by the valley width for most of the creek and has been mapped by FEMA with a relatively narrow floodplain. The floodplain is slightly wider in the “Dry Canyon” area. The areas adjacent to the creek include slopes greater than 20 percent and areas of historical landslide associated with potential landslide hazards (Map 12). Additionally, the West Branch and mainstem LeClerc Creek may have erosion hazards due to the steep slopes. There have been no liquefaction hazards identified and sediment is primarily consolidated (Map 13). Therefore, the seismic hazards are minimal

Critical or Priority Habitat and Species Use

The presence of bull trout, rainbow trout, and westslope cutthroat is documented in LeClerc Creek (WDFW, 2009). Bull trout are listed as “threatened” under ESA, and have designated critical habitat within LeClerc Creek (Federal Register, 2005).

There are several priority habitats associated with LeClerc Creek. These habitats are listed below (WDFW, 2009):

- Waterfowl concentration area;
- Migratory waterfowl resting area;
- Elk winter range area;
- Riparian areas, wetlands, and ponds along LeClerc Creek; and
- White-tail deer winter range area.

**In-stream and Riparian Habitats**

The dominant vegetation community of the land surrounding LeClerc Creek is mapped as Northern Rocky Mountain Dry-Mesic Montane Mixed Conifer Forest (USGS, 2010). However, the riparian zone is disturbed at the upstream and downstream ends of the creek by lawns and residential development, and to the east by a road. Percentages (and acreages) of the Level III landcover types from the GAP analysis within the SPA are provided in Appendix D.LeClerc.

**Water Quality**

LeClerc Creek has 303(d) listings (Category 5 listings) for dissolved oxygen and temperature. In addition, the creek has two Category 2 listings for pH and dissolved oxygen.

Water temperatures during the summer months generally exceed State water quality standards of 16°C. Water quality impairment for the LeClerc Creek system is currently being addressed through the Colville National Forest Fecal Coliform Bacteria and Temperature TMDL. High in-stream temperatures appear to be directly related to the cumulative effects of the elimination and reduction of riparian habitat functions. Impaired riparian functions in the drainage include thermal regulation and filtration of sediment delivered by surface erosion to the stream system. An exception to this pattern of elevated stream temperatures resulting from degraded riparian habitat can be found where groundwater in-flow actually lowers stream temperatures. Another exception to elevated stream temperatures being tied to human impacts are beaver pond impoundments. Beaver ponds can act as temperature sinks so that water temperatures in the beaver impoundment and downstream of the pond may be elevated regardless of presence of adjacent riparian habitat (USFS 2000 as cited in WCC 2003). Water temperature exceedances occurred at some sites monitored by WDNR despite relatively high canopy closure. Based on analysis of the limited number of sites monitored (seven), it appears that there may be a relationship between water temperatures and elevation to where Class AA water temperatures criteria may not be meet below 5,300 feet except where cool groundwater inflow governs the diurnal temperature range. This condition is aggravated by reductions in canopy closure (WDNR 1997 as cited in WCC 2003).

High fecal coliform counts have been reported in areas where cattle have direct access to the stream (Entrix 2002). In the past, overgrazing has caused riparian degradation and streambank erosion, resulting in turn in high levels of sedimentation. In addition, gravel roads that cross or parallel many stream reaches have eliminated riparian vegetation and resulted in extensive erosion steep sandy streambanks (Entrix 2002). Although turbidity levels have not been reported to exceed State standards, sedimentation from streambank erosion has resulted in pool filling and fining of spawning gravels.

Baseline water quality data collected by the Pend Oreille Conservation District during 2002-2004 for the Pend Oreille Watershed Ranking Grant provided by Ecology found that the LeClerc Creek watershed exceeded EPA standard for phosphorus 22 of the 35 sampling events or 63%. The EPA sets the limitations of phosphorus in surface water at 0.1mg/l. The frequency of exceedances indicates a significant violation of the federal standard. Phosphorus contamination is generally related to agricultural practices however the natural geologic matrix may suggest a natural occurrence may be responsible for the standard violations. According to Jean Parodi, Washington Department of Ecology, Spokane Office, “Since there are no State Standards for phosphorus, Ecology would probably only list the creek if the phosphorus levels are: 1) Human caused and not a result of native geology or; 2) Causing a significant impairment of a beneficial use such as algal blooms harming fish habitat” (POCD 2004).
According to the same aforementioned study, the LeClerc Creek watershed exceeded EPA standard for nitrite of the 37 sampling events or 3%. Nitrite violations are generally related to runoff and agricultural practices (POCD 2004).

**Shoreline Use Patterns**

*Existing Land and Shoreline Use*

The main uses in the LeClerc Creek SPA are residential and public lands. Other uses include natural resource lands and vacant lands.

*Shoreline Modifications - Docks, Piers, Buoys, Floats and Bridges*

There are no shoreline modifications or overwater structures mapped along LeClerc Creek. The creek is crossed by at least one bridge.

*Shoreline Environment Designations, Zoning, and Other Applicable Regulations*

The current shoreline designation of the Creek’s shorelines is Conservancy (Map 3). The zoning is a mix of Public Lands, Natural Resource, and Rural (Map 18).

*Existing and Potential Public Access Areas*

There are no existing public access sites within the LeClerc Creek SPA.

*Historic and Cultural Resources*

There are no recorded archeological sites in the LeClerc Creek shoreline area (DAHP 2010). However, due to documented use throughout much of Pend Oreille County by the Kalispel Tribe, there is some probability of unknown archaeological resources occurring within the vicinity of the stream.

One structure from the historical period has been inventoried along LeClerc Creek – the West Branch LeClerc Creek Railroad. The railroad is no longer uses, with the ties moved to the side of the grade. The narrow gauge railroad was constructed around 1924 by the Panhandle Lumber Company, and was used between 1924 and 1935. Other historic sites near the railroad, upstream of the LeClerc Creek reach, are recorded (see the West Branch and East Branch sections). (DAHP, 2010)

There are no state or federally listed historic properties within the LeClerc Creek shoreline planning area (DAHP 2010).

*Contaminated Sites*

There are no Washington Department of Ecology listed facilities or sites within the LeClerc Creek shoreline planning area (Ecology, 2010).

**33. LECLERC CREEK- EAST BRANCH**
Physical and Biological Characterization

Drainage Basin, Tributary Streams, and Associated Wetlands

The tributaries to the East Branch LeClerc Creek within or immediately upstream of the SMP area include Fourth of July Creek and Middle Branch LeClerc Creek, respectively. The drainage basin includes small streams upstream, groundwater, and runoff from adjacent steep slopes. There are approximately 44 acres of palustrine scrub-shrub seasonal wetlands identified adjacent to the creek and in areas nearby (Map 6; Appendix E).

Process and Channel Modification

The process modifications along the East Branch LeClerc Creek are similar to the modifications along the mainstem and West Branch LeClerc Creek. These modifications include:

- Timber harvest;
- Rural development;
- Cattle grazing; and
- Agricultural pastures.

The East Branch LeClerc Creek provides sediment to the Middle Branch and mainstem LeClerc Creek. The sediment load has been influenced by human modifications such as agricultural, rural, and logging. The hydrological processes in this creek have been impaired due to this increased sedimentation.

Geologic and Flood Hazards

The flood hazards identified by FEMA are narrow and confined by the adjacent steep slopes and valley. The valley slope along this reach is approximately 4.5 percent (Appendix CMZ). The potential for channel migration and CMZ width has been identified as low (Appendix CMZ; Map 6). The underlying geology is bedrock, glaciolacustrine, and glacial drift (Map 8). The areas adjacent to the creek include slopes greater than 20 percent and areas of historical landslide associated with potential landslide hazards (Map 12). Additionally, the East Branch and mainstem LeClerc Creek may have erosion hazards due to the steep slopes. There have been no liquefaction hazards identified and sediment is primarily consolidated (Map 13). Therefore, the seismic hazards are minimal.

Critical or Priority Habitat and Species Use

The presence of bull trout, rainbow trout, and westslope cutthroat is documented in the East Branch of LeClerc Creek (WDFW, 2009). Additionally, fish distribution maps indicate that the creek provides rearing habitat for bull trout. Bull trout are listed as “threatened” under ESA, and have designated critical habitat within the East Branch of LeClerc Creek (Federal Register, 2005).

There are several priority habitats associated with the East Branch of LeClerc Creek. These habitats are listed below (WDFW, 2009):

- Elk winter range area;
- Riparian areas, wetlands, and ponds along LeClerc Creek; and
• White-tail deer winter range area.

**In-stream and Riparian Habitats**

The dominant vegetation community of the land surrounding the East Branch of LeClerc Creek is mapped as Northern Rocky Mountain Dry-Mesic Montane Mixed Conifer Forest. However, this habitat is disturbed by a road that borders the creek for most of its length. Percentages (and acreages) of the Level III landcover types from the GAP analysis within the SPA are provided in Appendix D.

**LeClerc Water Quality**

The East Branch of LeClerc Creek has 303(d) listings (Category 5 listings) for dissolved oxygen and temperature. In addition, the creek has a Category 4A listing for temperature and two Category 2 listings for pH and dissolved oxygen.

Water temperatures during the summer months generally exceed State water quality standards of 16°C. As described above, water quality impairment for the LeClerc Creek system is currently being addressed through the Colville National Forest Fecal Coliform Bacteria and Temperature TMDL.

**Shoreline Use Patterns**

**Existing Land and Shoreline Use**

Land use within the East Branch LeClerc Creek SPA is undeveloped land or forestry. There are small areas of low-density residential development. A forest road parallels the creek.

**Shoreline Modifications - Docks, Piers, Buoys, Floats and Bridges**

The creek is crossed by minor roadways. There are no other shoreline modifications mapped along the creek.

**Shoreline Environment Designations, Zoning, and Other Applicable Regulations**

The current shoreline designation off the East Branch LeClerc Creek is Conservancy. Close to 70 percent of the creek’s shorelines are zoned as Public Lands and approximately 30 percent is zoned as Natural Resource lands.

**Existing and Potential Public Access Areas**

There are no existing public access sites within the East Branch LeClerc Creek.

**Historic and Cultural Resources**

There are no recorded archeological sites in the East Branch LeClere Creek shoreline area (DAHP 2010). However, due to documented use throughout much of Pend Oreille County by the Kalispel Tribe, there is some probability of unknown archeological resources occurring within the vicinity of the stream.

Several structures from the historical period have been inventoried along the East Branch LeClerc Creek, including a portion of the West Branch LeClerc Creek Railroad (discussed in the LeClerc Creek section). Other sites within the shoreline area are related to timber harvest activities during the 1920s and 1930s, as
with the railroad. Sites include a flume structures, a dam directly downstream from the Fourth of July Creek convergence, and historic cabins that housed loggers. The dam was built of unpeeled logs criss-crossed into a crib fashion and filled with earth and large rock, and was documented in 1981 as in-place, but rotting and partially collapsed. The historic structures and sites along the stream were inventoried as potentially eligible for the National Registry, however are not listed. (DAHP, 2010)

There are no state or federally listed historic properties within the East Branch LeClerc Creek shoreline planning area (DAHP 2010).

Contaminated Sites

There are no Washington Department of Ecology listed facilities or sites within the East Branch LeClerc Creek shoreline planning area (Ecology, 2010).

34. LEAD KING LAKE

Physical and Biological Characterization

Drainage Basin, Tributary Streams, and Associated Wetlands

Lead King Lake consists of two lakes, which are separated by a wetland; and is part of the Slate Creek watershed in north Pend Oreille County. The area is part of the Colville National Forest. There are no named streams connected to the lake. Approximately 8 acres of seasonally/semi-permanently flooded wetlands have been identified around and between the two smaller lakes (Map 6; Appendix E).

Process and Channel Modification

The major modifications adjacent to Lead King Lake include:

- Roads; and
- Deforestation.

Lead King Lake is adjacent to an unnamed logging road on the west and major road on the east. Some trees were cut down adjacent to these roads. The roads and deforestation may result in additional runoff and sediment into the lake. The increased sedimentation may result in the lake being impaired.

Geologic and Flood Hazards

FEMA flood hazards have not been identified in this area (Map 6). Adjacent slopes are less than 20 percent and generally have a low erosion and landslide risk (Map 11 and Map 12). Liquefaction and seismic hazards have not been identified adjacent to the lake (Map 13).

Critical or Priority Habitat and Species Use

There are no priority fish documented in Lead King Lake (WDFW, 2009). The mapped priority habitats associated with the lake are elk winter range, white-tailed deer winter range, and beaver ponds with high habitat value.
In-stream and Riparian Habitats

The dominant vegetation community of the land surrounding Lead King Lake is mapped as Northern Rocky Mountain Lower Montane Riparian Woodland and Shrubland (USGS, 2010). However, the land bordering the lake to the west is a maintained power transmission corridor. The eastern portion of the shoreline is disturbed by a road. Percentages (and acreages) of the Level III landcover types from the GAP analysis within the SPA are provided in Appendix D.

Water Quality

Lead King Lake has no listings for water quality impairment (Ecology, 2008). There may be some impairment due to adjacent roads, but the majority of the area is intact forest and likely has good water quality.

Shoreline Use Patterns

Existing Land and Shoreline Use

Most of the land use in the Lead King Lake SPA is natural resource lands. The rest of the planning area is composed of public lands.

Shoreline Modifications - Docks, Piers, Buoys, Floats and Bridges

There are no shoreline modifications mapped on Lead King Lake. Part of the shoreline is within a modified utility corridor.

Shoreline Environment Designations, Zoning, and Other Applicable Regulations

There is no current SMP designation for Lead King Lake because it is not included in the current SMP. Approximately three quarters of the shoreline area is zoned Natural Resource. The remaining quarter is zoned as Public Land.

Existing and Potential Public Access Areas

There are no existing public access sites within the Lead King Lake SPA.

Historic and Cultural Resources

There are no recorded archeological sites in the Lead King Lake shoreline area (DAHP 2010). However, due to documented use throughout much of Pend Oreille County by the Kalispel Tribe, there is some probability of unknown archaeological resources occurring within the vicinity of the stream.

One site from the historical period has been inventoried near the northern edge of the shoreline area, the remains of a mining operation. The sites includes the remains of razed buildings, several mining shafts (one with remaining wooden shoring and tramway structures), and tailing piles. The historic and site was inventoried as potentially eligible for the National Registry, however is not listed. (DAHP, 2010)

There are no state or federally listed historic properties within the Lead King Lake shoreline planning area (DAHP 2010).
Contaminated Sites

There are no Washington Department of Ecology listed facilities or sites within the Lead King Lake shoreline planning area (Ecology, 2010).

35. LECLERC CREEK- WEST BRANCH

Physical and Biological Characterization

Drainage Basin, Tributary Streams, and Associated Wetlands

The mainstem of LeClerc Creek includes the West Branch LeClerc Creek. The West Branch LeClerc Creek flows south from steep headwaters on 6,784 foot Molybdenite Mountain. The Middle Branch also flows generally south, but originates from gentler granitic hills at an elevation of about 4,700 feet. The East Branch flows southwest from 5,700 foot Monumental Mountain and joins with the West Branch to form LeClerc Creek, approximately 0.5 mile from the Pend Oreille River.

Approximately 92 acres of palustrine seasonal wetlands occur in the upper reaches of the West Branch LeClerc Creek, particularly in the Red/White Man and Upper West Branch subbasins (Map 6; Appendix E). These broad, wet valley bottoms are located on small tributaries and bounded by higher gradient, more confined channels both upstream and downstream. These numerous ponds and wetlands dampen peak flows, in a similar fashion to a lake. Beavers once constructed a series of dams and ponds in several of these basins. The beaver ponds are large and deep, with cover provided by fallen trees and overhanging brush along the margins. The ponds provide salmonids with abundant rearing habitat and offer low velocity refuge areas during high flows (WDNR 1997).

Process and Channel Modification

The modifications within the West Branch LeClerc Creek are minimal, but include:

- Timber harvest;
- Rural development;
- Cattle grazing; and
- Agricultural pastures.

All of these modifications have contributed to elevated in-stream sediment level (USFS 2000 as cited in WCC 2003). The hydrological processes in this creek have been impaired due to this increased sedimentation.

Geologic and Flood Hazards

The potential CMZ hazards are low in the constrained upper and lower reaches and medium in the less constrained portion in “Dry Canyon” (Map 6). The floodplain is constrained by the valley width for most of the creek and has been mapped by FEMA with a relatively narrow floodplain. The floodplain is slightly wider in the “Dry Canyon” area. The areas adjacent to the creek include slopes greater than 20 percent and areas of historical landslide associated with potential landslide hazards (Map 12). Additionally, the West Branch and mainstem LeClerc Creek may have erosion hazards due to the steep
slopes. There have been no liquefaction hazards identified and sediment is primarily consolidated (Map 13). Therefore, the seismic hazards are minimal

**Critical or Priority Habitat and Species Use**

The presence of bull trout, rainbow trout, and westslope cutthroat is documented in the West Branch of LeClerc Creek (WDFW, 2009). Additionally, fish distribution maps indicate that the creek provides rearing and spawning habitat for bull trout. Bull trout are listed as “threatened” under ESA, and have designated critical habitat within West Branch of LeClerc Creek (Federal Register, 2005).

There are several priority habitats associated with the West Branch of LeClerc Creek. These habitats are listed below (WDFW, 2009):

- Elk winter range area;
- Riparian areas, wetlands, and ponds along LeClerc Creek; and
- White-tail deer winter range area.

**In-stream and Riparian Habitats**

The dominant vegetation community of the land surrounding the West Branch of LeClerc Creek is mapped as Northern Rocky Mountain Dry-Mesic Montane Mixed Conifer Forest (USGS, 2010). However, this habitat is disturbed in several areas by roads. Percentages (and acreages) of the Level III landcover types from the GAP analysis within the SPA are provided in Appendix D.

**LeClerc Water Quality**

The West Branch of LeClerc Creek has 303(d) listings (Category 5 listings) for dissolved oxygen, pH, and temperature. In addition, the creek has a Category 4A listing for temperature and three Category 2 listings for pH, temperature, and dissolved oxygen.

Water temperatures during the summer months generally exceed State water quality standards of 16°C. As described above, water quality impairment for the LeClerc Creek system is currently being addressed through the Colville National Forest Fecal Coliform Bacteria and Temperature TMDL.

**Shoreline Use Patterns**

**Existing Land and Shoreline Use**

Land use within the West Branch LeClerc Creek SPA is primarily forestry. There are small areas of low-density residential development in Reach 2.

**Shoreline Modifications - Docks, Piers, Buoys, Floats and Bridges**

There are no shoreline modifications mapped on the West Branch of LeClerc Creek, although the creek is crossed by several roadways.
Shoreline Environment Designations, Zoning, and Other Applicable Regulations

The current shoreline designation of the creek is Conservancy (Map 3). Most of the creek’s shorelines are zoned as Public Lands. Most of the remainder is zoned as Natural Resource lands. A small residential development in Reach 2 is zoned as Rural (Map 18).

Existing and Potential Public Access Areas

There are no existing public access sites within the Lake’s SPA.

Historic and Cultural Resources

There are no recorded archeological sites in the West Branch LeClerc Creek shoreline area (DAHP 2010). However, due to documented use throughout much of Pend Oreille County by the Kalispel Tribe, there is some probability of unknown archeological resources occurring within the vicinity of the stream.

Two structures from the historical period have been inventoried along the West Branch LeClerc Creek, including a long segment of the West Branch LeClerc Creek Railroad (discussed in the LeClerc Creek section). The other site within the shoreline area is located along the railroad, and is noted as a historic dump site. The historic dump site was inventoried as not eligible for the National Registry. (DAHP, 2010)

There are no state or federally listed historic properties within the West Branch LeClerc Creek shoreline planning area (DAHP 2010).

Contaminated Sites

There are no Washington Department of Ecology listed facilities or sites within the West Branch LeClerc Creek shoreline planning area (Ecology, 2010).

36. LEDBETTER LAKE

Physical and Biological Characterization

Drainage Basin, Tributary Streams, and Associated Wetlands

Ledbetter Lake is part of the Slate Creek watershed in north Pend Oreille County. The area is part of the Colville National Forest. There are no named streams connected to the lake. Approximately 13 acres of palustrine seasonal wetlands are located at the lake and to the north of the lake (Map 6; Appendix E).

Process and Channel Modification

The major modifications adjacent to Ledbetter Lake include:

- Roads; and
- Deforestation.

Ledbetter Lake is adjacent to an unnamed logging road and major road to the west. Some trees were cut down adjacent to these roads. The roads and deforestation may result in additional runoff and sediment into the lake. Despite these modifications, the hydrological processes at the lake are mostly intact.
Geologic and Flood Hazards

FEMA flood hazards have not been identified in this area (Map 6). Adjacent slopes are less than 20 percent and generally have a low erosion and landslide risk (Map 11 and Map 12). Liquefaction and seismic hazards have not been identified adjacent to the lake (Map 13).

Critical or Priority Habitat and Species Use

There are no priority fish documented in Ledbetter Lake (WDFW, 2009). The mapped priority habitats associated with the lake are elk winter range, white-tailed deer winter range, and riparian areas with associated wetlands.

In-stream and Riparian Habitats

The dominant vegetation community of the land surrounding Ledbetter Lake is Northern Rocky Mountain Mesic Montane Mixed Conifer Forest (USGS, 2010). Percentages (and acreages) of the Level III landcover types from the GAP analysis within the SPA are provided in Appendix D.

Water Quality

Ledbetter Lake has no listings for water quality impairment (Ecology, 2008). The majority of the area is intact forest and likely has good water quality.

Shoreline Use Patterns

Existing Land and Shoreline Use

More than half of the existing land use in the Ledbetter Lake SPA is vacant lands. The remainder is natural resource lands.

Shoreline Modifications - Docks, Piers, Buoys, Floats and Bridges

There are no shoreline modifications mapped on Ledbetter Lake.

Shoreline Environment Designations, Zoning, and Other Applicable Regulations

The current shoreline designation of Ledbetter Lake is Conservancy (Map 3). Current zoning around the lake is a mix of Natural Resource Lands and Rural (R5) (Map 18).

Existing and Potential Public Access Areas

There are no existing public access sites within the Ledbetter Lake SPA.

Historic and Cultural Resources

There are no recorded archeological or historic sites within the lakes’ nearby vicinity (DAHP 2010). However, due to documented use of the Pend Oreille Valley and surrounding area by Kalispel peoples, there is significant probability of unknown archaeological resources occurring within the Ledbetter Lake shoreline area.
There are no state or federally listed historic properties within the Ledbetter Lake shoreline area (DAHP 2010).

**Contaminated Sites**

There are no Washington Department of Ecology listed facilities or sites within the Ledbetter Lake shoreline planning area (Ecology, 2010).

### 37. MARSHALL LAKE

**Physical and Biological Characterization**

*Drainage Basin, Tributary Streams, and Associated Wetlands*

Marshall Lake is within the Skookum watershed. The two main tributaries to Marshall Lake are Burnt Creek and Marshall Creek. Marshall Creek appears to be functioning at risk due to elevated levels of scouring and filling in certain reaches, but is noted as having resilience to disturbance. The active erosion and subsequent deposition may be a result of historical, intense fires in the headwaters. Burnt Creek is properly functioning; headwaters are stable and the watershed appears to have recovered from past wildfires. Approximately 3 acres of seasonal wetlands exist around the lake and are located at the inlet creeks and outlet creek (Map 6; Appendix E).

*Process and Channel Modification*

The primary process modifications at Marshall Lake include:

- Marshall Lake Dam; and
- Roads.

There is a man-made stabilizing dam at the outlet of Marshall Lake. The outlet from Marshall Lake, which forms Marshall Creek, goes subsurface in the summer and the fall (USFS 1999ac as cited in WCC 2003). There is speculation that Marshall Lake hydrology influences Char Springs, which is along the mainstem Pend Oreille River, and is a known source of ground water for the Pend Oreille River. The natural hydrological processes have been impaired by the dam operations and runoff from the road.

*Geologic and Flood Hazards*

The 100-year floodplain identified by FEMA is primarily confined to the banks of the lake (Map 6). Adjacent slopes include some areas that are greater than 20 percent and may be associated with potential erosion and landslide hazards (Map 11 and Map 12). There is no liquefaction or seismic hazards identified at Marshall Lake (Map 13).

*Critical or Priority Habitat and Species Use*

The presence of westslope cutthroat is documented in Marshall Lake (WDFW, 2009). The mapped priority habitat associated with the lake is elk winter range.
In-stream and Riparian Habitats

The dominant vegetation community of the land surrounding Marshall Lake is mapped as Northern Rocky Mountain Dry-Mesic Montane Mixed Conifer Forest (USGS, 2010). However, a portion of the shoreline is altered by residential development and land clearing. Percentages (and acreages) of the Level III landcover types from the GAP analysis within the SPA are provided in Appendix D.

Water Quality

Because of the presence of exotic aquatic species, namely the highly invasive Eurasian watermilfoil, Marshall Lake is listed as impaired by a non-pollutant (Category 4C; Ecology 2008). Dense growth of milfoil not only interferes with recreation; it also degrades habitat for trout and other native fish and displaces native aquatic plant populations.

Shoreline Use Patterns

Existing Land and Shoreline Use

Existing land use in the Marshall Lake SPA is mainly composed of vacant lands and public lands. Other land uses include residential.

Shoreline Modifications - Docks, Piers, Buoys, Floats and Bridges

There are several small docks along the southern shore of the lake associated with a campground. There are no additional shoreline modifications mapped on Marshall Lake.

Shoreline Environment Designations, Zoning, and Other Applicable Regulations

Most of Marshall Lake’s shorelines are currently designated Conservancy and Urban. The southern shoreline of the lake is designated as Urban. The zoning around the lake is a mostly (approximately 60 percent) Public Lands. The remainder of the lake is zoned Rural (Map 18).

Existing and Potential Public Access Areas

There are two public access sites in the Marshall Lake SPA. One is a Washington Department of Fish and Wildlife gravel boat launch. The other is an undeveloped site called Marshall Lake Hill Addition. Both total less than 1 acre in size within the SPA.

Historic and Cultural Resources

There are no recorded archeological sites (DAHP 2010). However, due to documented use throughout much of the Pend Oreille Valley and surrounding area by the Kalispel Tribe, there is some probability of unknown archaeological resources occurring within the Bead Lake shoreline planning area. The Marshall Lake Trail (Trail #149), first constructed in the 1930s along the west shoreline of the lake, was inventoried in 1984 however determined not eligible for listing on the National Register.

There are no state or federally listed historic properties within the Marshall Lake shoreline planning area (DAHP 2010).
Contaminated Sites

There are no Washington Department of Ecology listed facilities or sites within the shoreline planning area (Ecology, 2010).

### 38. METCALF AND BROWNIE LAKES

#### Physical and Biological Characterization

**Drainage Basin, Tributary Streams, and Associated Wetlands**

Metcalf and Brownie Lakes are also known as Locke Lake. The lake is located within the Cee Cee Ah Creek watershed. Locke Creek is the primary outlet from the lake. Approximately 29 acres of palustrine emergent temporarily/semi-permanently flooded wetlands are located around the lake and between the two main lake areas (Map 6; Appendix E).

#### Process and Channel Modification

The primary process modifications include:

- Roads;
- Agriculture; and
- Locke Dam.

Historically, combined outflow from lakes, such as Metcalf and Brownie Lakes, backed Locke Creek floodwaters onto the floodplain, damaging crops and motivating local property owners to form Diking District 3. Flood control measures recommended in a 1965 report for the diking district eventually led to the construction of Locke Dam, a floodwater storage dam at the outlet of Metcalf and Brownie Lakes (also known as Locke Lake) (Northrop et al. 1996 as cited in WCC 2003) west of Highway 20. An associated pumping plant, the Seven Devils Pump house, is located downstream on Locke Creek near its confluence with Cusick Creek. Diking District No. 3 still exists, however the PUD has assumed responsibility for the pumping plant (Northrop, Devine & Tarbell, Inc. 1996 as cited in Entrix 2002). The dam and other modifications have impacted the natural hydrological processes.

#### Geologic and Flood Hazards

The 100-year floodplain has been mapped to include the lakes and the wetland in between these lakes (Map 6). Adjacent slopes are less than 20 percent and generally have a low erosion and landslide risk (Map 11 and Map 12). The potential for liquefaction and seismic hazards is mapped as very low (Map 13).

#### Critical or Priority Habitat and Species Use

There are no documented priority fish in Metcalf and Brownie Lakes (WDFW, 2009). The mapped priority habitats associated with the lake are riparian areas with associated wetlands, year-round elk range, and white-tailed deer winter range.
**In-stream and Riparian Habitats**

The dominant vegetation community of the land surrounding Metcalf and Brownie Lakes is mapped as Northern Rocky Mountain Dry-Mesic Montane Mixed Conifer Forest (USGS, 2010). However, portions of the shoreline are altered with roads and residential development. Percentages (and acreages) of the Level III landcover types from the GAP analysis within the SPA are provided in Appendix D.

**Water Quality**

Metcalf and Brownie Lakes has no listings for water quality impairment (Ecology, 2008). There may be some impairment due to adjacent roads, but the majority of the area is intact forest and likely has good water quality.

**Shoreline Use Patterns**

**Existing Land and Shoreline Use**

Existing land use in the Metcalf and Brownie Lakes SPA is entirely composed of natural resource lands.

**Shoreline Modifications - Docks, Piers, Buoys, Floats and Bridges**

Shoreline modifications on the lake include Locke Dam located at the outlet of Metcalf and Brownie Lakes. There appear to be approximately three other docks on the lake, which may be associated with the PUD.

**Shoreline Environment Designations, Zoning, and Other Applicable Regulations**

The current shoreline designation of Metcalf and Brownie Lakes is Conservancy (Map 3). The lakes’ shoreline are zoned Natural Resource (Map 18).

**Existing and Potential Public Access Areas**

There are no existing public access sites within the Metcalf and Brownie Lakes SPAs.

**Historic and Cultural Resources**

There are no recorded archeological or historic sites within the linked lakes’ nearby vicinity (DAHP 2010). However, due to documented use of the Pend Oreille Valley and surrounding area by Kalispel peoples, there is significant probability of unknown archaeological resources occurring within the Metcalf & Brownie Lakes shoreline areas.

There are no state or federally listed historic properties within the Metcalf & Brownie Lakes shoreline areas (DAHP 2010).

**Contaminated Sites**

Ecology lists an active General Industrial Permit for a sand and gravel operation within the lakes’ shoreline area. The permit was issued by Ecology’s Water Quality program to Rosevero Property Acquisition, LLC in 2005.
39. **MOUNTAIN MEADOWS LAKE**

**Physical and Biological Characterization**

*Drainage Basin, Tributary Streams, and Associated Wetlands*

Mountain Meadows Lake is located in the Pend Oreille/Deer Creek watershed. The water flowing out of the lake into Kent Creek is controlled by the dam. The in-flow into the lake comes from small unnamed drainages. Approximately 33 acres of palustrine seasonal wetlands are located around the lake and extend further at the southwest corner of the lake (Map 6).

**Process and Channel Modification**

The primary process modifications at Mountain Meadows Lake include:

- Dam at the outlet of the lake; and
- Roads.

There is an earthen dam at the outlet of Kent/Mountain Meadows Lake. Drainage from the area upstream of Mountain Meadows Lake only reaches Kent Creek when water levels in the dammed lake are high enough to reach the lake’s overflow pipe, primarily during March and April (POCD 2001c as cited in WCC 2003). The hydrological processes at Mountain Meadows Lake have been impaired due to the dam and other modifications.

**Geologic and Flood Hazards**

FEMA has identified a floodplain that is confined to the banks of the lake (Map 6). Adjacent slopes are less than 20 percent and generally have a low erosion and landslide risk (Map 11 and Map 12). There is a very low potential for liquefaction or seismic hazards adjacent to the lake (Map 13).

**Critical or Priority Habitat and Species Use**

The presence of westslope cutthroat is documented in Mountain Meadows Lake (WDFW, 2009). The mapped priority habitat type associated with the lake is riparian habitat with associated wetlands.

**In-stream and Riparian Habitats**

The dominant vegetation community of the land surrounding Mountain Meadows Lake is mapped as Northern Rocky Mountain Dry-Mesic Montane Mixed Conifer Forest (USGS, 2010). However, this habitat is disturbed by roads in several areas. Percentages (and acreages) of the Level III landcover types from the GAP analysis within the SPA are provided in Appendix D.

**Water Quality**

Mountain Meadows Lake has no listings for water quality impairment (Ecology, 2008). There may be some impairment due to adjacent roads, but the majority of the area is intact forest and likely has good water quality.
Shoreline Use Patterns

Existing Land and Shoreline Use

Existing land use in the Mountain Meadows Lake SPA is entirely composed of natural resource lands.

Shoreline Modifications - Docks, Piers, Buoys, Floats and Bridges

Mountain Meadow Lake’s shorelines have been modified by the earthen dam at the outlet of the Lake. Deeter Road which runs along and forms the eastern shore of the lake is also a modification. There are no additional modifications mapped on the lake.

Shoreline Environment Designations, Zoning, and Other Applicable Regulations

Mountain Meadow Lake is not within the current SMP and does not have a designation. Current zoning around the lake is Natural Resource (N20) (Map 18).

Existing and Potential Public Access Areas

There are no existing public access sites within the Mountain Meadows Lake SPA.

Historic and Cultural Resources

There are no recorded archeological or historic sites (DAHP 2010). However, due to documented use of the Pend Oreille County area by Kalispel peoples, there is some probability of unknown archaeological resources occurring within the Mountain Meadows Lake shoreline planning area. The lake is not within or immediately adjacent to the Pend Oreille River valley area, where most significant Kalispel Tribe use occurred; given the setting, any use of the lake shoreline was likely limited to overland hunting activities and other seasonal use.

There are no state or federally listed historic properties within the Mountain Meadows Lake shoreline planning area (DAHP 2010).

Contaminated Sites

There are no Washington Department of Ecology listed facilities or sites within the shoreline planning area (Ecology, 2010).

40. Nile Lake

Physical and Biological Characterization

Drainage Basin, Tributary Streams, and Associated Wetlands

Nile Lake is located approximately 0.5 mile east of Frater Lake and southeast of Highway 20. Nile Lake connects to Lost Creek at the inlet and outlet and is within the Ruby Creek watershed. Approximately 103 acres of palustrine seasonal wetlands extend from the lake to approximately one mile north of the lake (Map 6; Appendix E).
Process and Channel Modification

The process modifications at Nile Lake include:

- Logging; and
- Roads.

The lake is located in the Colville National Forest in an area that is primarily forested. The area north of the lake, adjacent to Highway 20 was previously logged. Runoff from the highway has probably resulted in an increase in runoff and sedimentation into the lake. The hydrological processes at Nile Lake have been moderately impaired due to these modifications.

Geologic and Flood Hazards

Flood hazards have not been identified in this area (Map 6). Adjacent slopes are less than 20 percent and generally have a low erosion and landslide risk (Map 11 and Map 12). There is a very low potential for liquefaction or seismic hazards adjacent to the lake (Map 13).

Critical or Priority Habitat and Species Use

The presence of rainbow trout and westslope cutthroat is documented in Nile Lake (WDFW, 2009). The mapped priority habitats associated with the lake are cavity-nesting duck breeding ponds, and riparian areas with associated wetlands.

In-stream and Riparian Habitats

The dominant vegetation community of the land surrounding Nile Lake is mapped as Rocky Mountain Alpine-Montane Wet Meadow (USGS, 2010). However, the large wetland associated with the lake has been significantly altered by agricultural activities. Percentages (and acreages) of the Level III landcover types from the GAP analysis within the SPA are provided in Appendix D.

Water Quality

According to the 2008 Washington State Water Quality Assessment (Ecology, 2008), Nile Lake does not have any 303(d) (Category 5) listings. The lake has the following water quality listings: Category 2 for dissolved oxygen, Category 4a for temperature, and Category 4C for invasive species. Dissolved oxygen violations are generally related to high levels of primary productivity and/or high water temperatures. Because of the presence of exotic aquatic species, namely the highly invasive Eurasian watermilfoil, Nile Lake is listed as impaired by a non-pollutant (Category 4C; Ecology 2008). Dense growth of milfoil not only interferes with recreation; it also degrades habitat for trout and other native fish and displaces native aquatic plant populations.

Shoreline Use Patterns

Existing Land and Shoreline Use

Existing land use in the Nile Lake SPA is entirely composed of public lands.
Shoreline Modifications - Docks, Piers, Buoys, Floats and Bridges

There are no shoreline modifications mapped on Nile Lake.

Shoreline Environment Designations, Zoning, and Other Applicable Regulations

The current shoreline designation of Nile Lake is Conservancy (Map 3). The lake’s shorelines are zoned as Public Lands (Map 18).

Existing and Potential Public Access Areas

There are no existing public access sites within the Nile Lake SPA.

Historic and Cultural Resources

There are no recorded archeological sites (DAHP 2010). However, due to documented use of the Pend Oreille County area by Kalispel peoples, there is some probability of unknown archaeological resources occurring within the Nile Lake shoreline planning area. There is one inventoried site from the historic period – the Nile Lake Homestead. The homestead is located near the lake’s northwestern shoreline; however all that remains are the foundations from four structures and a cellar structure. The site was determined not eligible for the National Register when inventoried in 1989.

There are no state or federally listed historic properties within the Nile Lake shoreline planning area (DAHP 2010).

Contaminated Sites

There are no Washington Department of Ecology listed facilities or sites within the Nile Lake shoreline planning area (Ecology, 2010).

41. NORTH SKOOKUM LAKE

Physical and Biological Characterization

Drainage Basin, Tributary Streams, and Associated Wetlands

North Skookum Lake is approximately 39 acres in size with a maximum depth of 20 feet. The water level at the lake stays fairly constant. In-flow into the lake primarily is from Split Creek and outfall is into the North Fork Skookum Creek, which connects with South Skookum Lake. Approximately 43 acres of palustrine seasonal wetlands are identified around the lake, but primarily located to the north and east (Map 6; Appendix E).

Process and Channel Modification

The primary process modifications include:

- Campground and recreational uses;
- Roads; and
- Grazing.
Large woody material amount and distribution is good on the northwest bay, but lacking along the remaining shoreline. This is attributed to the wide riparian zone along eastern shoreline and the campground on the southwest edge. The riparian vegetation on the south half of the lake is in poor to fair condition due to high recreation use and past grazing (USFS et al 1996 as cited in Entrix 2002). The hydrological processes are impaired, especially in the southern part of North Skookum Lake.

Geologic and Flood Hazards

FEMA has not mapped flood hazards at North Skookum Lake (Map 6). The underlying geology of the area to the north and east of the lake is alluvium (Map 8). Slopes adjacent to the lake are less than 20 percent and generally have a low erosion and landslide risk (Map 11 and Map 12). There are moderate to high liquefaction and seismic hazards associated with the alluvium located to the north and east of the lake (Map 13).

Critical or Priority Habitat and Species Use

The presence of rainbow trout and westslope cutthroat is documented in North Skookum Lake (WDFW, 2009). The mapped priority habitats associated with the lake are riparian habitat with associated wetland areas, a moose concentration, and lynx range. Lynx are listed as “threatened” under ESA (Federal Register, 2009). However, the North Skookum Lake area is not identified by USFWS as critical habitat for lynx.

In-stream and Riparian Habitats

The dominant vegetation community of the land surrounding North Skookum Lake is mapped as Northern Rocky Mountain Dry-Mesic Montane Mixed Conifer Forest (USGS, 2010). Some minor alteration from roads and campgrounds is present. Percentages (and acreages) of the Level I II landcover types from the GAP analysis within the SPA are provided in Appendix D.

Water Quality

The water quality at North Skookum Lake is primarily intact. According to the 2008 Washington State Water Quality Assessment (Ecology, 2008), the lake met standards for clean water.

Shoreline Use Patterns

Existing Land and Shoreline Use

Existing land use in the North Skookum Lake SPA is entirely composed of public lands, owned by the State.

Shoreline Modifications - Docks, Piers, Buoys, Floats and Bridges

There are two non-motorized boat launches on the lake. There are no additional shoreline modifications mapped on the lake although there are forest roads within the shoreline planning area.

Shoreline Environment Designations, Zoning, and Other Applicable Regulations

The current shoreline designation of North Skookum Lake is Conservancy (Map 3). The lake’s shorelines are zoned as Public Lands (Map 18).
Existing and Potential Public Access Areas

There are two public access sites in the North Skookum Lake SPA. The North Skookum Boat Ramp is a gravel boat launch managed by Washington Department of Natural Resources. North Skookum Resort has a natural boat launch, loading float launches, and campsites.

Historic and Cultural Resources

There are no recorded archeological or historic sites (DAHP 2010). However, due to documented use of the Pend Oreille Valley and surrounding area by Kalispel peoples, there is some probability of unknown archeological resources occurring within the North Skookum Lake shoreline planning area.

There are no state or federally listed historic properties within the North Skookum Lake shoreline planning area (DAHP 2010).

Contaminated Sites

There are no Washington Department of Ecology listed facilities or sites within the North Skookum Lake shoreline planning area (Ecology, 2010).

42. OUTLET/HARVEY CREEK

Physical and Biological Characterization

Drainage Basin, Tributary Streams, and Associated Wetlands

The 0.5-mile reach of stream from the outlet of Sullivan Lake at Sullivan Lake Dam to its confluence with Sullivan Creek is called Outlet Creek. Outlet Creek is formed by the outflow from Sullivan Lake and is essentially the lower reach of the Harvey Creek drainage (Entrix 2002). Outlet Creek joins Sullivan Creek approximately 0.5 miles downstream of Sullivan Lake Dam (USFS 2008). The flow regime in Outlet Creek is governed by releases at Sullivan Lake Dam; maximum flows typically occur in the fall – starting about October and ending before December. Approximately 3 acres of palustrine wetlands are located adjacent to Outlet Creek (Map 6; Appendix E).

Process and Channel Modification

The process and channel modifications at Outlet Creek include:

- Sullivan Lake Dam, upstream of the creek and Mill Pond Dam, downstream of the creek;
- Rural residential development; and
- Adjacent roads and logging.

Sullivan Lake Dam controls the flow along Outlet Creek. Alterations within the riparian zone of Outlet Creek (i.e. home development, stream gauging station placement) have a small negative impact on riparian habitat (TAG 2002 as cited in WCC 2003). There are unstable banks along Outlet Creek (J. Blum, Framatome ANP, pers. comm., 2002 as cited in WCC 2003). The hydrologic processes along Outlet Creek are impaired due to the dam operations and other modifications to the system.
Geologic and Flood Hazards

FEMA has not identified flood hazards along Outlet Creek (Map 6). The flooding on this creek is primarily controlled by releases from Sullivan Lake Dam. The potential for channel migration has been classified as low (Appendix CMZ; Map 6). The adjacent slopes are less than 20 percent and the landslide hazards are likely minimal along Outlet Creek (Map 12). There are no liquefaction zones identified in this area (Map 13).

Critical or Priority Habitat and Species Use

The presence of kokanee salmon, rainbow trout, and westslope cutthroat is documented in Outlet/Harvey Creek (WDFW, 2009). There are no mapped priority habitats associated with the creek.

In-stream and Riparian Habitats

The dominant vegetation community of the land surrounding Outlet/Harvey Creek is mapped as Northern Rocky Mountain Mesic Montane Mixed Conifer Forest. Portions of the zone are disturbed by roads and residential development. Percentages (and acreages) of the Level III landcover types from the GAP analysis within the SPA are provided in Appendix D.

Water Quality

According to the 2008 Washington State Water Quality Assessment (Ecology, 2008), the water quality at Outlet/Harvey Creek is impaired for dissolved oxygen and likely impaired for temperature. The creek is listed as a 303(d) Category 5 for dissolved oxygen and Category 2 for temperature.

Shoreline Use Patterns

Existing Land and Shoreline Use

Existing land use in the SPA is entirely composed of public lands.

Shoreline Modifications - Docks, Piers, Buoys, Floats and Bridges

The creek’s shorelines are modified by the Sullivan Lake Dam, upstream of the creek and Mill Pond Dam, downstream of the creek. There are no other modifications mapped on the creek.

Shoreline Environment Designations, Zoning, and Other Applicable Regulations

The current shoreline designation of Outlet Creek is Conservancy (Map 3). The creek’s shorelines are zoned as Public Lands (Map 18).

Existing and Potential Public Access Areas

There are no existing public access sites within the Creek’s SPA.

Historic and Cultural Resources

There are no recorded archeological sites (DAHP 2010). However, due to documented use of the Pend Oreille Valley and surrounding area by Kalispel peoples, there is some probability of unknown archaeological resources occurring within the Outlet/Harvey Creek shoreline planning area. There is one
inventoried site from the historic period – the Sullivan Lake Dam. Built in 1921, the dam was constructed to maintain seasonal levels in Lake Sullivan and provide hydroelectric power. When inventoried in 1979 the dam was determined not eligible for the National Register.

There are no state or federally listed historic properties within the Outlet/Harvey Creek shoreline planning area (DAHP 2010).

**Contaminated Sites**

There are no Washington Department of Ecology listed facilities or sites within the Outlet/Harvey Creek shoreline planning area (Ecology, 2010).

### 43. PARKER LAKE

**Physical and Biological Characterization**

**Drainage Basin, Tributary Streams, and Associated Wetlands**

Parker Lake is located within the Cee Cee Ah Creek watershed. Parker Lake is a 22-acre lake with a maximum depth of 18 feet. Cusick Creek flows through Parker Lake before emptying into the Pend Oreille River. Approximately 49 acres of palustrine wetlands are located along the north and south of Parker Lake, along Cusick Creek (Map 6; Appendix E).

**Process and Channel Modification**

The process modifications at Parker Lake include:

- Cattle grazing; and
- Roads.

Cusick Creek upstream of Parker Lake has been degraded as a result of grazing. The degradation is from past cattle grazing in the one-mile meadow reach immediately upstream of Parker Lake (K. Honeycutt, USFS, pers. comm., 2002 as cited in WCC 2003). The riparian area of this location is now fenced to exclude cattle grazing (R. Fletcher, POCD, pers. comm., 2002 as cited in WCC 2003). Overall, grazing will continue to maintain a minor point source of sediment into the watershed from access points that are being over-utilized by livestock. Cusick Creek Road is located adjacent to the lake and may contribute runoff and sediment into the lake, especially during storm events. The hydrological processes at Parker Lake are impaired by the excess sediment discharge into the lake.

**Geologic and Flood Hazards**

The 100-year floodplain has not been identified by FEMA for this water body (Map 6). The underlying geology to the north and south of the lake, along the Cusick Creek, is alluvium (Map 8). Adjacent slopes are less than 20 percent and generally have a low erosion and landslide risk (Map 11 and Map 12). The liquefaction and seismic hazards are moderate to high to the north and south, and low to the west and east (Map 13).
Critical or Priority Habitat and Species Use

The presence of rainbow trout and westslope cutthroat is documented in Parker Lake (WDFW, 2009). The mapped priority habitats associated with the lake are year-round elk range and a moose concentration.

In-stream and Riparian Habitats

The dominant vegetation community of the land surrounding Parker Lake is mapped as Northern Rocky Mountain Mesic Montane Mixed Conifer Forest (USGS, 2010). Portions of the land bordering the lake are disturbed by a roads, and land clearing activities at the north end of the lake. Percentages (and acreages) of the Level III landcover types from the GAP analysis within the SPA are provided in Appendix D.

Water Quality

According to the 2008 Washington State Water Quality Assessment (Ecology, 2008), Parker Lake has a Category 2 listing for dissolved oxygen. Grazing, particularly in meadows upstream of Parker Lake, has changed the characteristics of the riparian vegetation and decreased the amount of brush and trees that shade the stream and moderate summer temperatures. The water body is likely impaired and is being monitored further.

Shoreline Use Patterns

Existing Land and Shoreline Use

Existing land use in the Parker Lake SPA is entirely composed of public lands.

Shoreline Modifications - Docks, Piers, Buoys, Floats and Bridges

There are no shoreline modifications mapped on Parker Lake.

Shoreline Environment Designations, Zoning, and Other Applicable Regulations

The current shoreline designation of Parker Lake is Conservancy (Map 3). The Lake’s shorelines are zoned as Public Lands (Map 18).

Existing and Potential Public Access Areas

The USFS has a facility in or near the Parker Lake SPA.

Historic and Cultural Resources

There are no recorded archeological or historic sites within the Parker Lake shoreline area (DAHP 2010). However, due to documented use of the Pend Oreille Valley and surrounding area by Kalispel peoples, there is significant probability of unknown archaeological resources occurring within the Parker Lake shoreline planning area. In addition, several nearby sites with refuse and remnants of historic mining activities in the early 1900s are documented. (DAHP, 2010)

There are no state or federally listed historic properties within the Parker Lake shoreline planning area (DAHP 2010).
Contaminated Sites

There are no Washington Department of Ecology listed facilities or sites within the Parker Lake shoreline planning area (Ecology, 2010).

44. PEND OREILLE RIVER

Physical and Biological Characterization

Drainage Basin, Tributary Streams, and Associated Wetlands

Due to the extensive modification along the Pend Oreille River, the mainstem Pend Oreille River is referred to as the following two reservoirs:

- Box Canyon Reservoir flowing from Box Canyon Dam (RM 34.4) upstream to Albeni Falls Dam (RM 90.1), near Newport, WA.; and
- Boundary Reservoir flowing from Boundary Dam (RM 17.0) upstream to Box Canyon Dam.

The river originates as the only outlet of Lake Pend Oreille in Bonner County, Idaho. The river flows west through Idaho and enters Washington at Newport, in southeastern Pend Oreille County. One of the major tributaries to the river, upstream of the three major dams, is Priest River. The river enters Washington approximately 2 miles downstream of Albeni Falls Dam (RM 90.1) at Newport and flows north through two hydroelectric dams (Box Canyon at RM 34.4 and Boundary Dam at RM 17.0) within WRIA 62. The river flows along the eastern side of the Selkirk Mountains and flows through the Colville National Forest, past a number of small tributaries and waterfalls. The Sullivan is the largest drainage, draining 142 mi². Other major tributaries, typically 30 to 100 mi², include the Calispell, LeClerc, Lost, Skookum, Slate and Tacoma Creek drainages.

The river eventually drains into the Columbia River, after passing through Washington and into British Columbia. Peak flows generally occur in May and June as a result of snowmelt, and typically range between 50,000 and 90,000 cfs at the Newport USGS stream gage (NPCC 2004). On June 4, 2008 the peak daily flow at the Newport USGS stream gage was 96,300 cfs, significantly higher than the average peak flow (USGS 2008).

Process and Channel Modification

The mainstem of the Pend Oreille River has been highly altered and regulated by a system of dams and levees. The primary process modifications include:

- Three Dams along the river;
- Levees adjacent to the river that are associated with transportation corridors;
- Deforestation;
- Rural residential development; and
- Numerous dikes.
The Albeni Falls, Box Canyon, and Boundary Dams, as well as an extensive levying system (primarily associated with the railroad) have altered the Pend Oreille River's natural flow within the Pend Oreille SMP boundaries. These modifications greatly influence channel morphology and change areas of natural scour and deposition (Entrix, 2002). The floodplain has been further modified by levees and culverts associated with the three diking districts and private dikes along the Box Canyon Reservoir. Constriction of the channel and floodplain results in greater channel scour during high flow events, as well as the elimination of potential off-channel habitat (Entrix, 2002). The natural hydrological processes have been extensively modified in the Pend Oreille River.

**Wetlands**

**Box Canyon Reservoir**

Wetlands are extensive and relatively diverse along the Box Canyon Reservoir (Map 6; Appendix E). Wetland types include seasonally flooded fields, scrub-shrub, and forests; persistently flooded, emergent wetlands; persistently flooded, shallow riverine sloughs; old sloughs that are presently connected to the river only during flood conditions; and ponds not evidently connected by hydrology to the river. Seasonally flooded wetlands, including agricultural lands, are particularly extensive between Pend Oreille River Mile 63 to 78. Semi-permanently to permanently flooded wetlands occur on the shallow margins of the river, in shallow sloughs, and around river islands.

Approximately 6,617 acres of wetlands were inundated by Albeni Falls Dam, destroying associated riparian habitat and plant communities (Entz 1999 as cited in Entrix 2002). In 1992, the Bonneville Power Administration purchased and transferred the Flying Goose Ranch, located north of the Kalispel Indian Reservation, to the Tribe as mitigation for this loss. A 10-year restoration plan is being implemented by the Tribe to restore lost riparian forests and wetlands and enhance existing uplands. In addition, a major contiguous reach of floodplain, riparian, and wetland habitat (over 1,700 acres) is protected along the Box Canyon Reservoir at the mouths of Tacoma and Trimble Creeks. This area consists of property acquired by the Kalispel Tribe as mitigation for the Albeni Falls Project, combined with USFWS and Pend Oreille Public Utility District properties.

**Boundary Reservoir**

Wetlands are extensive and relatively diverse along the Boundary Reservoir (Map 6; Appendix E). Ebasco Environmental (1992 as cited in Entrix 2002) discusses wetlands found within the Boundary Wildlife Preserve. Water enters the wetlands from rainfall and snowmelt, groundwater seepage from the terrace and valley side slopes, and backwater from the reservoir. These lead to distinctly different management options for the resultant wetlands. Ebasco concludes that reservoir water level fluctuation caused by the operations of the Boundary Hydroelectric project adversely affects shoreline wildlife habitat in the Boundary Preserve and is the likely cause of scant wetland vegetation. Erosion and fluctuating water levels impact the effectiveness of the waterfowl habitat the preserve is intended to provide. The shoreline and side channels were originally created by the natural deposition of river alluvium during annual floods. These floods and the upstream sediment supply are now greatly reduced by upstream regulation. Erosion of the reservoir shoreline and side channel outlet is caused by the daily cycling of the reservoir. Erosion rates are probably greatest when reservoir level at the wildlife preserve is dropping. Wave erosion appears to be of secondary importance to pool level changes.

**Geologic and Flood Hazards**

Channel migration is limited due to dam operation and levees. Erosion hazards exist throughout the mainstem of the Pend Oreille River. Bank erosion coincides with high flows and flooding along saturated
riverbanks and is magnified as a result of channel and floodplain constriction as well as rapid reduction in river levels induced by the dams. Natural bank erosion along the mainstem has been modified and accelerated by a number of interacting factors, including the alteration of the natural flow and sediment transport of the Pend Oreille River by mainstem dams and diking, road run-off/use, railroad build-out, disturbance and runoff from industrial, mine and timber sites, private development, recreational trampling and boat wave-related erosion (Entrix 2002; WCC 2003; NPCC 2004).

Flood hazards have been mapped by FEMA along the Pend Oreille River and are primarily related to high flows associated with snowmelt. There have been a number of diking projects built to reduce flooding in the Pend Oreille floodplain between Jared and Cusick. Although the extent and location of dikes is available, a quantitative evaluation of the extent of lost floodplain has not been conducted to date. As of March 2001, none of these flood control systems had been certified by FEMA and it was determined the 100-year flood would overtop the majority of the dikes and railroad embankments (FEMA 2001 as cited in WCC 2003).

**Critical or Priority Habitat and Species Use**

The presence of bull trout, kokanee salmon, rainbow trout, and westslope cutthroat is documented in the Pend Oreille River, within the shoreline planning area (WDFW, 2009). Bull trout are listed as “threatened” under ESA, and have designated critical habitat within the Pend Oreille River (Federal Register, 2005).

There are multiple priority habitats associated with the Pend Oreille River. These habitats are listed below (WDFW, 2009):

- Waterfowl concentration areas;
- Elk winter range areas;
- Year-round elk range areas;
- Pend Oreille River riparian and wetland areas;
- River islands with multilayered forest stands; and
- White-tail deer winter range areas.

In addition, a great blue heron rookery has been recorded along the river.

**In-stream and Riparian Habitats**

The Pend Oreille River within WRIA 62 was historically a free flowing river that supported a healthy trout fishery, including bull trout and steelhead. The construction of Albeni Falls, Box Canyon and Boundary Dams altered habitat-forming processes and converted the river into a slow flowing, constricted reservoir system (KNRD, 2007). Additionally, none of the dams along the Pend Oreille River have fish passage facilities. Construction and operation of hydroelectric facilities have eliminated connectivity thereby eliminating genetic interchange among fish populations in the lower Pend Oreille River and decreasing the quantity of accessible salmonid spawning, rearing and overwintering habitat (WCC 2003).

Cottonwood forests were likely abundant in the Pend Oreille Valley prior to European settlement, but conversion of forests to other lands uses (timber harvest, agriculture, recreation and urban and residential
development) reduced their abundance and distribution (PUD 2004, NPCC 2004). However, significant portions of riparian forest still exist in the riparian zone, particularly in the northern portion of the county (KNRD 1994 as cited in Entrix 2002).

The majority of the habitat surrounding the river is mapped as Northern Rocky Mountain Dry-Mesic Montane Mixed Conifer Forest, Northern Rocky Mountain Ponderosa Pine Woodland and Savanna, and Rocky Mountain Alpine-Montane Wet Meadow (USGS, 2010). However, riparian habitat in the southern portion of the county has been significantly altered by roads, residential/urban development, and agricultural activities. Percentages (and acreages) of the Level III landcover types from the GAP analysis within the SPA are provided in Appendix D.

**Water Quality**

The mainstem Pend Oreille River has four 303(d) listings (Category 5 listings) for: Aldrin (pesticide), PCBs (industrial chemicals), pH, and temperature (Ecology 2008). An Ecology fish tissue verification study conducted in 2002 found Aldrin and PCBs above the recommended health standard for human consumption of fish (SCL 2006). In addition, the river has one Category 4C listing for invasive exotic species; two Category 4A listings for temperature, fecal coliform, and total dissolved gas (TDG); and four Category 2 listings for temperature, pH, fecal coliform, and dissolved oxygen.

Mid-to-late summer water temperatures are chronically higher than the state’s criterion of 20°C or lower. Although high water temperatures may be affected by warm-water releases from Lake Pend Oreille upstream (in Idaho), high temperatures have also been noted in several tributaries to the Pend Oreille River. A joint Temperature TMDL (water quality improvement plan) to address temperature impairment in the mainstem is currently being developed by Idaho Department of Environmental Quality, Washington Department of Ecology (Ecology), the Kalispel Tribe, and others.

A segment of Pend Oreille River upstream of the confluence with Calispell Creek has received a Category 2 listing for fecal coliform bacteria on at least one occasion (Ecology 2008). This water quality exceedance has not occurred continuously and therefore does not warrant a TMDL at this time; however, this does indicate that fecal coliform may be cause for concern on the mainstem in the future. Several tributaries have exhibited elevated counts of fecal coliform. In Pend Oreille County, fecal coliform exceedances are generally a result of cattle grazing near waterbodies (Entrix 2002).

Ecology and the Colville National Forest completed a TMDL in 2005 for fecal coliform bacteria and temperature on tributary streams where they flow across federal forestlands. TMDLs to cover other significant infractions of the state’s standards in the Pend Oreille watershed will be scheduled and completed by 2013 (EPA 2007).

During the spring freshet, TDG created by the operation of hydroelectric dams on the Pend Oreille River is often supersaturated and significantly higher than the state’s standard of 110% (EPA 2007). Gas bubble trauma can be a major source of mortality for salmonids for several miles downstream of dams (Entrix 2002). The Pend Oreille River was on the 2002/2004 303(d) list for TDG and since has been addressed by Ecology in a TMDL that was completed in 2007.

Suspended solids and turbidity levels in the river are occasionally somewhat high, in the moderate quality range, especially during spring runoff (EPA 2007). Bank erosion along the Pend Oreille River and sediment input from tributaries are cause for concern. The soils along much of the river are susceptible to erosion; however, natural causes of bank erosion along the river are accelerated by anthropogenic activities (e.g., operation of dams, vegetation removal, boat wave-related erosion). Agricultural and
forest practices, along the river and within the contributing watersheds, expose soils to erosion and are a major determinant of sediment load.

The Pend Oreille River has been characterized as nutrient-limited; however, the associated sloughs are mesotrophic (moderate nutrients) to eutrophic (high nutrients) with nutrient levels generally two to three times higher than the concurrent river levels (Falter et al. 1991 as cited in PUD 2000). Roughly 75 percent of the external nitrogen and phosphorus loading to the Pend Oreille River in Washington comes from the City of Newport Wastewater Treatment Plant, and Calispell and Trimble Creeks where livestock grazing and hay production are predominant (EPA 1993). It should also be noted that inputs of nutrients to the Pend Oreille River from tributaries account for less than 4% of the total river loading (Pelletier and Coots 1990 as cited in PUD 2000).

The Pend Oreille River is not currently impaired by metals; however, five abandoned mines have been identified by the EPA as potential sources and pathways of contamination to the River: Blue Bucket Mine, Oriole Mine, Grandview Mine/Mill, Pend Oreille Mine and Josephine Mine (EPA 2002 as cited in SCL 2006). Seattle City Light (SCL) conducted a Toxics Inventory and Screen Review for the Boundary Hydroelectric Pre-application for Relicensing, and determined that cadmium, lead and mercury were of medium concern based on past mining activities in the River vicinity (SCL 2006).

Potential threats to water quality in the basin include future population growth and its associated shoreline development including increased boat traffic, domestic water and sewage problems, agricultural practices, timber harvest, and habitat alteration (Entrix 2002). Pollution sources affecting the river (within WRIA 62) include hydropower (Albeni Falls, Box Canyon and Boundary Dams); agriculture (livestock grazing and hay production along floodplains of Pend Oreille river valley); timber harvesting (extensive in Box Canyon drainage area from private landowners, state agencies and the US Forest Service); and urban development (runoff from roofs and pavement). Wastewater treatment facilities (City of Newport, Town of Cusick) and many industries (e.g., Ponderay Newsprint Mill) discharge effluent into the river (Entrix 2002). Abandoned mines are also a source of potential contamination (SCL 2006, EPA 2007).

**Shoreline Use Patterns**

**Existing Land and Shoreline Use**

The dominant land use in the Pend Oreille River SPA is agriculture. Vacant lands rank as the second most common land use followed by natural resource lands, public lands and residential.

Agriculture in the watershed consists primarily of livestock grazing (mostly cattle, some horses, and bison on the Kalispel Reservation) and hay production (Cascades Environmental Services, Inc. and Northrop, Devine and Tarbell Inc. 1997 as cited in Entrix 2002). The largest areas of agricultural lands are within the southern reaches of the Pend Oreille River.

There are several small incorporated and unincorporated towns located along the Pend Oreille River with populations of less than 500. These include Dalkena (west side of the River within Box Canyon Reservoir Reach 6), Usk and Cusick (both located on the west side of the River within Box Canyon Reservoir Reaches 3 and 6), Tiger (located on the west side of the River within Box Canyon Reservoir Reach 1), Ione (located on the west side of the River within Box Canyon Reservoir Reach 1), Metaline (located on the west of the river within Boundary Reservoir Upper Reach), and Metaline Falls (located on the east side of the river within Boundary Reservoir Upper Reach and Canyon Reach). Also along the Pend Oreille River is the Kalispel Indian Reservation.
Numerous residential developments are located along the Pend Oreille River. Residential, recreation and retirement-home development along the Box Canyon Reservoir has increased in recent years; numerous subdivisions exist or are under development. Forest, agricultural and open lands along the river are being replaced by the growth of residential subdivisions.

The Kalispel Indian Reservation occupies about 4,600 acres along the Pend Oreille River with nearly 1,000 additional acres in trust. Portions of the Pend Oreille River are within Waters of the Kalispel Indian Reservation. The 2000 census counts 206 residents of the Kalispel Indian Reservation of which 180 are Native American. The Kalispel Indian Reservation lies primarily in the lowlands bordering the Pend Oreille River with the bulk of the Reservation on the River’s east side. A smaller piece on the River’s west side just north of Cusick includes the confluence of Calispell Creek and the Pend Oreille River. This area on the west side consists of approximately 160 acres and is occupied by a small industrial development. The Kalispel Indian Reservation has isolated residential development, grazing, some timber harvesting, hay production, and sites for collection of the camas plant. North of the Reservation, along the east side of the river, are lands known as the Flying Goose Ranch. In 1992, the Bonneville Power Administration purchased the Flying Goose Ranch for transfer to the Tribe as mitigation for the loss of land from the construction and operation of the Albeni Falls Dam.

Shoreline Modifications - Docks, Piers, Buoys, Floats and Bridges

The shorelines of the Pend Oreille River have been heavily modified. As described above, there are three dams along the river; levees adjacent to the river; and numerous dikes. In addition, there are numerous bridges, dock/piers, and buoys/floats on the river. Table 4 shows where these overwater structures are located.

### Table 4 Over-water Structure on Pend Oreille River

<table>
<thead>
<tr>
<th>Reach name</th>
<th>Bridges</th>
<th>Docks/Piers</th>
<th>Buoys/Floats</th>
<th>Other*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boundary Reservoir - Canyon Reach</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boundary Reservoir – Upper Reach</td>
<td>1</td>
<td>2</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Boundary Reservoir – Forebay Reach</td>
<td></td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Boundary Reservoir – Tailrace Reach</td>
<td></td>
<td></td>
<td></td>
<td>7</td>
</tr>
<tr>
<td>Box Canyon Reservoir – Reach 1</td>
<td>2</td>
<td>149</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>Box Canyon Reservoir – Reach 2</td>
<td>2</td>
<td>238</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Box Canyon Reservoir – Reach 3</td>
<td>1</td>
<td>184</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Box Canyon Reservoir – Reach 4</td>
<td></td>
<td>85</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>7</strong></td>
<td><strong>659</strong></td>
<td><strong>4</strong></td>
<td><strong>18</strong></td>
</tr>
</tbody>
</table>

* “Other” includes all over-water structures that are not defined as bridges, docks, piers, buoys, or floats.

Shoreline Environment Designations, Zoning, and Other Applicable Regulations

Current shoreline designations along the Pend Oreille River include Rural (61 percent), Conservancy (24 percent) and Urban (12 percent) (Map 3). The Pend Oreille River shorelines pass through the incorporated areas of Cusick, Ione, Metaline, Metaline Falls, and Newport. These incorporated areas comprise slightly
less than one percent of the river’s shoreline. Zoning data is not available for these areas. County zoning of the river’s shoreline is a mix of Public, Natural Resource, Rural, and Tribal Land. Approximately half (48.82 percent) of the shoreline is zoned as Natural Resource. Public Lands, Rural, and Tribal lands each comprise approximately 17 percent of the shorelines (Map 18).

Existing and Potential Public Access Areas

Numerous public-recreation and public access sites are located along the Pend Oreille River. A total of approximately 90 acres of public access is located within the Pend Oreille River SPA. The following tables (Tables 4 through 11) describe the facilities available at various access points.

Table 5 Boundary Reservoir - Upper Reach

<table>
<thead>
<tr>
<th>Park Name (Acres in Planning Area)</th>
<th>Description of Facilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Campbell Park (9 acres)</td>
<td>Gravel boat launch, Campsites, Swimming Area, Picnic Area</td>
</tr>
<tr>
<td>Metaline Waterfront Park (6 acres)</td>
<td>Concrete boat launch, picnic shelters, lawn area, play equipment, softball field</td>
</tr>
</tbody>
</table>

Table 6 Boundary Reservoir - Forebay Reach

<table>
<thead>
<tr>
<th>Park Name (Acres in Planning Area)</th>
<th>Description of Facilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boundary Dam Boat Launch (5 acres)</td>
<td>Concrete boat launch, campsites, lawn areas, historical landmarks</td>
</tr>
</tbody>
</table>

Table 7 Box Canyon Reservoir Reach 1

<table>
<thead>
<tr>
<th>Park Name (Acres in Planning Area)</th>
<th>Description of Facilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aspen Reflections Landing Public Access (less than 1 acre)</td>
<td>No information available</td>
</tr>
<tr>
<td>Box Canyon Viewpoint (less than 1 acre)</td>
<td>Viewpoint for Box Canyon Dam</td>
</tr>
<tr>
<td>Edgewater Campground (18 acres)</td>
<td>Concrete plank boat ramp, picnic area, campsites</td>
</tr>
<tr>
<td>Edgewater Estates Replat Public Access (1 acre)</td>
<td>Undeveloped access point</td>
</tr>
<tr>
<td>Ione City Park (3 acres)</td>
<td>Concrete plank boat launch, loading float launch, swimming pool, picnic tables, play equipment</td>
</tr>
<tr>
<td>Lorne Reed River Lots-Public Access (less than 1 acre)</td>
<td>Undeveloped access point</td>
</tr>
<tr>
<td>Street ends/right-of-ways that provide public access (3 acres total)</td>
<td>Undeveloped right-of-ways and street-ends.</td>
</tr>
<tr>
<td>Loren Street</td>
<td></td>
</tr>
<tr>
<td>--------------</td>
<td></td>
</tr>
<tr>
<td>Pine Street</td>
<td></td>
</tr>
<tr>
<td>Sunvale Lane</td>
<td></td>
</tr>
</tbody>
</table>
Table 8 Box Canyon Reservoir Reach 2

<table>
<thead>
<tr>
<th>Park Name (Acres in Planning Area)</th>
<th>Description of Facilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arthur's Tranquil Acres Public Access (less than 1 acre)</td>
<td>Undeveloped access point</td>
</tr>
<tr>
<td>Birchwood Homes (less than 1 acre)</td>
<td>Undeveloped access point</td>
</tr>
<tr>
<td>Blueslide Resort (4 acres)</td>
<td>Concrete boat launch, loading float launches, boat moorage, full hookup RV sites, tent sites, cabins, motel rooms, meeting hall, pool, picnic area, play equipment</td>
</tr>
<tr>
<td>Grear's Riverside Public Access (less than 1 acre)</td>
<td>Undeveloped access point</td>
</tr>
<tr>
<td>Lazy River Farmettes (2 acres)</td>
<td>Boat launch</td>
</tr>
<tr>
<td>O’leary’s Add. to Pend Oreille Paradise Public Access (less than 1 acre)</td>
<td>Undeveloped access point</td>
</tr>
<tr>
<td>Panhandle Campground (9 acres)</td>
<td>Concrete plank boat launch, campsites, lawn area, riverfront beach access</td>
</tr>
<tr>
<td>Pioneer Acres 1st (less than 1 acre)</td>
<td>Undeveloped access point</td>
</tr>
<tr>
<td>Ruby Ferry (less than 1 acre)</td>
<td>Concrete plank boat launch</td>
</tr>
<tr>
<td>Taylor's Riverside Lots - Public Access (less than 1 acre)</td>
<td>End of road access</td>
</tr>
<tr>
<td>Old Ruby Ferry East (less than 1 acre)</td>
<td>Natural boat launch</td>
</tr>
<tr>
<td>Street ends/right-of-ways that provide public access (1 acre total)</td>
<td>Undeveloped right-of-ways and street-ends.</td>
</tr>
<tr>
<td>Alaska Lane North</td>
<td></td>
</tr>
<tr>
<td>Dilling Drive</td>
<td></td>
</tr>
<tr>
<td>Hazel Street (2 access points)</td>
<td></td>
</tr>
<tr>
<td>Wagon Wheel Avenue</td>
<td></td>
</tr>
</tbody>
</table>

Table 9 Box Canyon Reservoir - Reach 3

<table>
<thead>
<tr>
<th>Park Name (Acres in Planning Area)</th>
<th>Description of Facilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cusick Town Park (3 acres)</td>
<td>V-grooved concrete boat launch, loading float launch</td>
</tr>
<tr>
<td>Green Water Estates (less than 1 acre)</td>
<td>Undeveloped access point</td>
</tr>
<tr>
<td>Gregg's Addition (less than 1 acre)</td>
<td>Undeveloped access point</td>
</tr>
<tr>
<td>Kalispel Riverside Park (1 acre)</td>
<td>Concrete boat launch</td>
</tr>
<tr>
<td>Keo's Korner (Usk General Store) (3 acres)</td>
<td>Gravel boat launch, primitive campsites</td>
</tr>
<tr>
<td>Manresa Grotto Beach (less than 1 acre)</td>
<td>No information is available</td>
</tr>
<tr>
<td>River Bend Estates 1st (2 acres)</td>
<td>Boat launch</td>
</tr>
<tr>
<td>Schwab Division (less than 1 acre)</td>
<td>No information is available</td>
</tr>
</tbody>
</table>
Table 10 Box Canyon Reservoir - Reach 4

<table>
<thead>
<tr>
<th>Park Name</th>
<th>Description of Facilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Char Springs (less than 1 acre)</td>
<td>Undeveloped access point</td>
</tr>
<tr>
<td>Green Ridge Estates 1st (less than 1 acre)</td>
<td>Developed access point</td>
</tr>
<tr>
<td>Old America Kampground (less than 1 acre)</td>
<td>Membership only campground with a gravel boat launch, loading float launch, full hookup RV sites</td>
</tr>
<tr>
<td>Phinney's Riverview Homes (less than 1 acre)</td>
<td>Undeveloped access point</td>
</tr>
<tr>
<td>Pioneer Park (6 acres)</td>
<td>Concrete plank boat launch, picnic area, RV sites, tent sites</td>
</tr>
<tr>
<td>River Shores Public Access (less than 1 acre)</td>
<td>Undeveloped access point</td>
</tr>
<tr>
<td>Sandy Shores (less than 1 acre)</td>
<td>Concrete boat launch</td>
</tr>
<tr>
<td>Spring Haven (less than 1 acre)</td>
<td>Undeveloped access point</td>
</tr>
<tr>
<td>Water Addition (less than 1 acre)</td>
<td>Undeveloped access point</td>
</tr>
<tr>
<td>Street ends/right-of-ways that provide public access (less than 1 acre total)</td>
<td>Undeveloped right-of-ways and street-ends.</td>
</tr>
<tr>
<td>Patriel Dr.</td>
<td></td>
</tr>
<tr>
<td>Yergens Road (3 access points)</td>
<td></td>
</tr>
</tbody>
</table>

Table 11 Box Canyon Reservoir - Reach 5

<table>
<thead>
<tr>
<th>Park Name</th>
<th>Description of Facilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green Ridge Estates (less than 1 acre)</td>
<td>Undeveloped access point</td>
</tr>
</tbody>
</table>

Cultural Resources

The first people in the Pend Oreille Valley region potentially entered the area following large, migratory mammals that were sources of food (Olson 1987). The archaeological record for the period after about 5,000 years ago is more understood from the Calispell Valley Archaeological Project (CVAP), completed in the late 1980s in the vicinity of the present day Kalispel Tribe Reservation (Thoms and Burchard, eds. 1986; Thoms 1989). Analysis of data from excavations suggests a shift 4,000 to 5,000 years ago from...
broader based foraging, with fewer site types, to a collector strategy marked by intensified use of camas. A subsistence system based on stored camas, deer, fish, and fowl and similar to the ethnographic pattern appears to have been in place for the last 2,000 years.

The Kalispel Tribe, skilled fishermen and river travelers first occupied the Pend Oreille Valley. Archeological evidence of possibly hundreds of camp and village sites occurs up and down the river valley, some dating back thousands of years (Figure 1). The Pend Oreille River Valley was historically occupied by the Lower Pend d'Oreille or Kalispel, speakers of a dialect of Interior Salish. The Kalispel were divided into upper and lower with respect to position on the Pend Oreille River. The Lower Kalispel centered on the Calispell Valley, within the south-central portion of the County, although they also occupied and used sites along the Pend Oreille River between present day Sandpoint and Newport. Descendants of these people live today on the Kalispel Reservation near Usk, Washington (Figure 1).

Figure 1 Native and accustomed lands (aboriginal lands) of the Kalispel Tribe and current Kalispel Tribe reservation (figure courtesy of the Kalispel Tribe, accessed March 2010 from Kalispel, 2010)

Bamonte and Schaeffer’s (1996 as cited in Entrix 2002) History of Pend Oreille County describes European and American settlement and historical land use of the county and vicinity. Between 1809 and 1812, David Thompson led three exploratory journeys on the Pend Oreille River in search of a shorter route to the Columbia. The Thompson party members were the first Europeans known to have canoed down the Pend Oreille River.
Euro-American settlement of the Pend Oreille River valley was accompanied by natural and man-made fires, forest clearing, agricultural development, timber harvest, introduction of nonnative species, mining, road/railroad construction, hydroelectric projects, and general urbanization (Entz and Maroney 2001 as cited in NPCC 2004). These activities have heavily influenced the landscape in WRIA 62.

Livestock ranchers and farmers settled the Calispell Valley of the lower Pend Oreille River in the 1880s and chose the fertile sites on the river where flooding frequently occurred (Bamonte 1996 as cited in NPCC 2004). Industry also began to develop in the area during this time.

Mining in Metaline Falls encouraged the Idaho and Washington Railroad to construct a railroad from Spokane to Metaline Falls between 1909 and 1913 (Bamonte 1996 as cited in NPCC 2004). Local farmers on the west side of the valley agreed to have the railroad built on their land, which resulted in the construction of the embankment (ballast) for the railroad that also served as a dike during flood conditions. By 1921, three diking districts had been established to protect haying and grazing land from floodwaters of the Pend Oreille River (Northrop, Devine & Tarbell, Inc. 1996 as cited in Entrix 2002).

Large-scale commercial mining began in 1904 in the Metaline Mining District and was followed by the development of several lead zinc mines. While the north and south ends of Pend Oreille County contained some of the best lead and zinc deposits in the Pacific Northwest, access to the Metaline area was difficult. In 1906, the river channel at Box Canyon was blasted to make the river navigable downstream to Metaline Falls. Commercial drilling and mining in the area expanded rapidly through the 1930s, during which time the largest limestone mine in the state was established in the district to supply the growing cement industry (EPA 2002 as cited in SCL 2006). None of the 21 mines that have operated historically in the district are active today;

Inventoried and assessed archaeological and historic sites are discussed for each reach of the Pend Oreille River in Table 12. The Table also documents inventoried sites from the historic period as well as state and national registered historic properties and structure. Registered properties and structures are summarized at greater length below the table.

**Table 12 Reach Summary of Cultural Resources from the Pre-contact and Historic Periods within the Pend Oreille River SPA**

<table>
<thead>
<tr>
<th>Reach Number</th>
<th>Cultural Resources - Prehistoric</th>
<th>Cultural Resources – Historic Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>BoundRez_canyon</td>
<td>There are several inventoried pre-contact sites within the shoreline planning area. Recorded sites include: seasonal camp sites (characterized by pre-contact tool scatters, pre-contact fire-cracked rock scatters, and pre-contact pit sites). DAHP 2010.</td>
<td>Potential and un-eligible historic mining sites located on both sides of the river. No registered properties or structures</td>
</tr>
<tr>
<td>Reach Number</td>
<td>Cultural Resources - Prehistoric</td>
<td>Cultural Resources – Historic Period</td>
</tr>
<tr>
<td>-------------------</td>
<td>------------------------------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>BoundRez_Upper</td>
<td>There are several inventoried pre-contact sites within the shoreline planning area. Recorded sites include: seasonal camp sites (characterized by pre-contact tool scatters, pre-contact fire-cracked rock scatters, and pre-contact pit sites). DAHP 2010.</td>
<td>Some potentially eligible historical sites have been inventoried, including mining sites, buildings and structures (focused primarily around Metaline Falls). Two registered properties are both located in Metaline Falls, and include: Lewis P. Larson House, built 1911 (National and State historic registries) Metaline Falls School, built 1912 ((National and State historic registries)</td>
</tr>
<tr>
<td>BoundRez_Forebay</td>
<td>There are several inventoried pre-contact sites within the shoreline planning area. Recorded sites include: seasonal camp sites (characterized by pre-contact tool scatters, pre-contact fire-cracked rock scatters, and pre-contact pit sites). DAHP 2010.</td>
<td>Potential and un-eligible historic properties are not listed. No registered properties or structures.</td>
</tr>
<tr>
<td>BoundRez_Tailrace</td>
<td>There are several inventoried pre-contact sites within the shoreline planning area. Recorded sites include: seasonal camp sites (characterized by pre-contact tool scatters, pre-contact fire-cracked rock scatters, and pre-contact pit sites). DAHP 2010.</td>
<td>Inventoried properties include sites with evidence of mining, some non-eligible mine/homestead sites. No registered properties or structures.</td>
</tr>
<tr>
<td>BoxCanRez01</td>
<td>There are numerous inventoried pre-contact sites within the shoreline planning area. Recorded sites include: winter village sites and seasonal camp sites (many of which are characterized by pre-contact oven middens, prehistoric tool scatters, prehistoric fire-cracked rock scatters, and pre-contact pit sites). DAHP 2010.</td>
<td>Some potentially eligible historical sites are inventoried along the shoreline (i.e. mining, buildings, homesteads, etc....) Two registered properties are both located in Metaline Falls, and include: Idaho and Washington Northern Railroad Bridge, built 1911 (National and State historic registries) Phillip Mellott Barn, built 1912 (State Historic Barn Registry)</td>
</tr>
<tr>
<td>BoxCanRez02</td>
<td>There are numerous inventoried pre-contact sites within the shoreline planning area. Recorded sites include: winter village sites and seasonal camp sites (many of which are characterized by pre-contact oven middens, prehistoric tool scatters, prehistoric fire-cracked rock scatters, and pre-contact pit sites). DAHP 2010.</td>
<td>Some potentially eligible historical sites are inventoried along the shoreline (i.e. mining, buildings, homesteads, etc....) No registered properties or structures.</td>
</tr>
<tr>
<td>Reach Number</td>
<td>Cultural Resources - Prehistoric</td>
<td>Cultural Resources – Historic Period</td>
</tr>
<tr>
<td>--------------</td>
<td>----------------------------------</td>
<td>-------------------------------------</td>
</tr>
<tr>
<td>BoxCanRez03</td>
<td>Prehistoric sites within the shoreline planning area are numerous. Recorded sites include: winter village and camp sites, prehistoric habitation sites, tool scatters, prehistoric fire-cracked rock scatters, prehistoric pit sites, and prehistoric oven middens (Kalispel Natural Resource Department, 2001; DAHP 2010). Excavations sponsored by the Colville National Forest occurred in 1988 and 1990 at Pioneer Park Campground. Excavation sites showed a history of prehistoric use between 1600 and 200 years ago, with recent activity consisted with seasonal Camas Harvest (NWI, 1996).</td>
<td>Some potentially eligible historical sites are inventoried along the shoreline (i.e. mining, buildings, homesteads, etc....) State Registered Historical Aboriginal site, located on Tribal land. No other registered properties or structures.</td>
</tr>
<tr>
<td>BoxCanRez04</td>
<td>Prehistoric sites within the shoreline planning area are numerous. Recorded sites include: winter village and camp sites, prehistoric tool scatters, prehistoric fire-cracked rock scatters, prehistoric pit sites, and prehistoric oven middens (Transect Archaeology, 2005). Some potentially eligible historical sites are inventoried along the shoreline (i.e. mining, buildings, homesteads, etc....) No registered properties or structures.</td>
<td></td>
</tr>
<tr>
<td>BoxCanRez05</td>
<td>Inventoried pre-contact sites within the shoreline planning area are numerous. Recorded sites include: winter village sites and seasonal camp sites (many of which are characterized by pre-contact oven middens, prehistoric tool scatters, prehistoric fire-cracked rock scatters, and pre-contact pit sites). DAHP 2010. Some potentially eligible historical sites are inventoried along the shoreline (i.e. mining, buildings, homesteads, etc....) No registered properties or structures.</td>
<td></td>
</tr>
<tr>
<td>BoxCanRez06</td>
<td>Inventoried pre-contact sites within the shoreline planning area are numerous. Recorded sites include: winter village sites and seasonal camp sites (many of which are characterized by pre-contact oven middens, prehistoric tool scatters, prehistoric fire-cracked rock scatters, and pre-contact pit sites) (Thoms et al., 1988). A Calispell Valley Archaeology district is designated in a portion of the valley extending from the Pend Oreille River, with numerous pre-contact sites recorded, as well as two sites from the historical period. In total, more than 50 pre-contact sites are recorded within the Box Canyon Reach 6 area. This area, characterized as the wide floodplain valley extending from the Pend Oreille River, Calispell Creek, and around Calispell Lake, was a primary population center for the Lower Kalispell people (NWAA, 1996). Not only were the areas close to the Pend Oreille River and other significant waterbodies and waterways, the floodplain environment was also significant for subsistence harvest of the Camas root. The Kalispell Tribe Reservation is located partially within this reach, extending along the east bank of the river through Box Canyon Reservoir – Reach 3 into the adjacent narrow floodplain area. Calispell Canal, built from 1933 to 1936 – When recorded in 1984, this structure was determined eligible for the Nation Register and State Historic Register, however it is not listed. The canal includes concrete bridges, floodgates, levees and side canals. It is located on the eastern edge of the floodplain meadow area to the east of Calispell Lake, and was constructed to support agricultural land uses in the surrounding Pend Oreille / Calispell Valley (DAHP, 2010). Other historic remains related to agricultural land uses occur in the valley to the north of the Calispell Lake area, including inventoried levees and ditches. The remains of a lumber mill dating to the 1940s or early 1950s were recorded in 2001. This site is located to the west of Highway 20 to the northeast of Cusick. Remnants of several historic homestead have been inventoried in</td>
<td></td>
</tr>
<tr>
<td>Reach Number</td>
<td>Cultural Resources - Prehistoric</td>
<td>Cultural Resources – Historic Period</td>
</tr>
<tr>
<td>--------------</td>
<td>----------------------------------</td>
<td>--------------------------------------</td>
</tr>
<tr>
<td></td>
<td>and at the edges of the floodplain valley extending along the Pend Oreille River. Remenant materials recorded include: historic debris; a cast iron stove; lumber remains of structures, and historic foundations. These sites have generally been inventoried and determined potentially eligible for historic listing.</td>
<td>Source: (DAHP, 2010).</td>
</tr>
</tbody>
</table>
Inventory of Registered Historic Structures and Properties

Boundary Reservoir – Canyon Reach:

There are no State or National Historic Registry properties in the Canyon Reach.

Boundary Reservoir – Upper Reach:

Lewis P. Larson House (Figure 2). The house, built in 1910, is located in the City of Metaline Falls along Fifth Street and Pend Oreille Boulevard. The house, built in the Arts and Crafts style, was listed on the National and State historic registries in 1979. From the registry nomination form (accessed from DAHP, 2010):

The Larson House is notable as the home of L.P. Larson, founder of the town of Metaline Falls and an important industrialist, and as an example of the work of Kirtland Kelsey Cutter, the most eminent architect in Eastern Washington during the late 1800's and early 1900's.

Figure 2 Photo of the Larson House within the City of Metaline Falls, Built in 1910

Metline Falls School. The school, built in 1912, is located in the City of Metaline Falls along Park Street. The school, built in the Beaux Arts – American Renaissance style, was listed on the National and State Historic Registries in 1988.

Box Canyon Reservoir – Reach 1:

Idaho and Washington Northern Railroad Bridge (Figure 3). The bridge, built in 1911, spans the Pend Oreille River immediately upstream of the Box Canyon Dam. The bridge was listed on the National and State Historic Registries in 1982.
Phillip Mellott Barn (Figure 4). The farm, built in 1912, is located approximately 200 feet to the east of Box Canyon Reservoir off of LeClerc Rd. N approximately three miles south of Ione. The Barn is listed on the Washington State Heritage Barn Register. From the DAHP registry sheet (DAHP, 2010):

“In 1908, homesteader Phillip Mellott made a deal with Panhandle Lumber. Panhandle would build Mellott a handsome barn, if Mellott would give Panhandle right-of-way across Mellott's land to bring Panhandle's timber harvest to the banks of the Pend Oreille. The deal struck, the barn was built in 1912, without a foundation. Today, with the help of turnbuckles, cables, and some internal bracing using 2x material milled on-site, the barn still stands. Mellott's 1908 homestead burned to the ground in 1960, but the nearby barn escaped damage.”
Figure 4 Photo of the Mellot Barn, Built in 1912, Included on the State Heritage Barn Registry

Source: DAHP, 2010
45. PETIT LAKE

Physical and Biological Characterization

Drainage Basin, Tributary Streams, and Associated Wetlands

Petit Lake is part of the Granite Creek watershed. There are no named creeks flowing in or out of the lake. Tobasco Creek and Sema Creek are located approximately 1 mile to the north and 1.5 mile to the northwest, respectively. Approximately 18 acres of seasonal wetlands are located around the lake (Map 6; Appendix E).

Process and Channel Modification

The primary process and channel modifications near Petit Lake include:

- Road development; and
- Timber harvesting.

The area adjacent to Petit Lake is primarily forested and owned by the USFS. There is some road development and timber harvesting near, but not directly adjacent to the creek. The hydrological processes in Petit Lake are primarily intact.

Geologic and Flood Hazards

The 100-year floodplain has not been identified by FEMA for this water body (Map 6). The underlying geology is primarily bedrock (Map 8). Adjacent slopes are less than 20 percent and generally have a low erosion and landslide risk (Map 11 and Map 12). Liquefaction and seismic hazards are very low (Map 13).

Critical or Priority Habitat and Species Use

The presence of rainbow trout and westslope cutthroat is documented in Petit Lake (WDFW, 2009). The mapped priority habitats associated with the lake are riparian habitat with associated wetland areas, a moose concentration, and lynx range. Lynx are listed as “threatened” under ESA (Federal Register, 2009). However, the Petit Lake area is not identified by USFWS as critical habitat for lynx.

In-stream and Riparian Habitats

The dominant vegetation community of the land surrounding Petit Lake is mapped as Northern Rocky Mountain Mesic Montane Mixed Conifer Forest (USGS, 2010). The shoreline of the lake is unaltered. Percentages (and acreages) of the Level III landcover types from the GAP analysis within the SPA are provided in Appendix D.

Water Quality

Petit Lake has no listings for water quality impairment (Ecology, 2008). The area around Petit Lake is primarily forested and has not been modified. Therefore, the water quality is probably intact.
Shoreline Use Patterns

Existing Land and Shoreline Use
Existing land use in the Petit Lake SPA is entirely composed of public lands.

Shoreline Modifications - Docks, Piers, Buoys, Floats and Bridges
There are no shoreline modifications mapped on Petit Lake.

Shoreline Environment Designations, Zoning, and Other Applicable Regulations
Petit Lake is not within the current SMP and does not have a designation. The Petit Lake shoreline is zoned Public Lands (Map 18).

Existing and Potential Public Access Areas
The USFS has a facility in or near the Petit Lake SPA.

Historic and Cultural Resources
There are no recorded archeological or historic sites (DAHP 2010). However, due to the location of the lake and the documented use of the Pend Oreille County, especially the Pend Oreille Valley areas by Kalispel peoples, there is some probability of unknown archaeological resources occurring within the Petit Lake shoreline planning area.

There are no state or federally listed historic properties within the Petit Lake shoreline planning area (DAHP 2010).

Contaminated Sites
There are no Washington Department of Ecology listed facilities or sites within the Petit Lake shoreline planning area (Ecology, 2010).

46. POWER LAKE

Physical and Biological Characterization

Drainage Basin, Tributary Streams, and Associated Wetlands
Numerous creeks merge with the North Fork and Middle Fork of Calispell Creek to drain into Power Lake, which is located along the North Fork of Calispell Creek. Power Lake is a natural lake whose outlet was originally dammed in 1922 by the Delkenna Power Company for the purpose of hydropower generation. Power Lake is about 62 surface acres (Bennett and Liter 1991 as cited in WCC 2003). The lake is a small volume storage facility with a normal storage volume of 1000 acre feet (DOE Dam Safety Program). Elevation was increased approximately about 20 feet with the installation of the dam at the Power Lake outlet (P. Buckley, PUD, pers. comm., 2002 as cited in WCC 2003). In the late 1950s, the PUD purchased the Power Lake hydro-facility from an owner that had purchased the facility from Delkenna Power some time in the past. In the early 1990s, the PUD reinforced the dam and reconstructed the spillway to meet current safety standards (P. Buckley, PUD, pers. comm., 2002 as cited in WCC
2003). Approximately 10 acres of palustrine seasonal wetlands are located throughout the lake area and the upstream reach of the North Fork of Calispell Creek (Map 6; Appendix E).

**Process and Channel Modification**

The primary process modifications at Power Lake include:

- Hydroelectric generating facility; and
- Dam.

The outlet of Power Lake contains a hydroelectric generating facility owned and operated by Pend Oreille County Public Utility District #1 (PUD). The hydrologic processes at the lake and downstream along North Fork Calispell Creek are impaired due to the dam operations.

**Geologic and Flood Hazards**

FEMA has identified a 100-year floodplain confined to Power Lake (Map 6). The flooding at Power Lake is controlled and confined by hydroelectric operations. The underlying geology at the lake is primarily bedrock (Map 8). Some of the slopes adjacent to Power Lake are greater than 20 percent and may be associated with some erosion and landslide hazards (Map 11 and Map 12). There are no seismic or liquefaction hazards identified adjacent to the lake (Map 13).

**Critical or Priority Habitat and Species Use**

The presence of westslope cutthroat is documented in Power Lake (WDFW, 2009). The mapped priority habitat type associated with the lake is elk winter range.

**In-stream and Riparian Habitats**

The dominant vegetation community of the land surrounding Power Lake is mapped as Northern Rocky Mountain Dry-Mesic Montane Mixed Conifer Forest (USGS, 2010). A portion of the surrounding forest is disturbed by a road. Percentages (and acreages) of the Level III landcover types from the GAP analysis within the SPA are provided in Appendix D.

**Water Quality**

Power Lake has no listings for water quality impairment (Ecology, 2008). There may be some impairment due to adjacent roads, but the majority of the area is intact forest and likely has good water quality.

**Shoreline Use Patterns**

**Existing Land and Shoreline Use**

Existing land use in the Power Lake SPA is entirely composed of vacant lands.

**Shoreline Modifications - Docks, Piers, Buoys, Floats and Bridges**

Power Lake’s shorelines are modified by the Power Lake Dam. No other modifications are mapped on the lake.
Shoreline Environment Designations, Zoning, and Other Applicable Regulations

The current shoreline designation of Power Lake is Conservancy (Map 3). The creek’s shorelines are zoned as Public Lands (Map 18).

Existing and Potential Public Access Areas

There are no existing public access sites within the Power Lake SPA.

Historic and Cultural Resources

There are no recorded archeological or historic sites (DAHP 2010). However, due to the location of the lake and the documented use of the Pend Oreille County, especially the Pend Oreille and Calispell Valley areas by Kalispel peoples, there is some probability of unknown archaeological resources occurring within the Power Lake shoreline planning area.

There are no state or federally listed historic properties within the Power Lake shoreline planning area (DAHP 2010).

Contaminated Sites

There are no Washington Department of Ecology listed facilities or sites within the Power Lake shoreline planning area (Ecology, 2010).

47. PRIEST RIVER- UPPER WEST BRANCH

Physical and Biological Characterization

Drainage Basin, Tributary Streams, and Associated Wetlands

The Upper West Branch of Priest River flows southeast 22.3 miles to discharge into the lower Priest River (RM 35.3). It drains approximately 44,623 acres and there are approximately 112 miles of perennial streams within the drainage. Goose Creek is a major tributary to the Upper West Branch at the south end of the drainage. The creek valley is partially constrained in upper reach and partially constrained in the lower reach. Approximately 130 acres of palustrine seasonal wetlands are located along the Upper West Branch Priest River (Map 6; Appendix E).

Process and Channel Modification

The primary process and channel modifications near the Upper West Branch Priest River include:

- Cattle grazing;
- Roads;
- Rerouting water into ditches; and
- Timber harvesting.

Bank erosion is common due to vegetation changes as a result of cattle grazing. Banks have also eroded as a result of cattle trampling while accessing water (USFS 2002e as cited in WCC 2003). Runoff
patterns and sediment yields within the headwaters of the Upper West Branch drainage have been altered due to past disturbances. The frequency and magnitudes of frequently occurring peak flows have likely been increased in the past due mainly to changes in evapo-transpiration rates, canopy cover and road development (USFS 1999af as cited in WCC 2003). Timber harvesting in this basin has been minimal in the past 10 years and it appears from field observations that streamflows are normalizing in the basin as the forest regenerates. Still those areas that are ditched are accelerating the movement of water through the system because the floodplains are not accessible. Until the summer of 2001, the USFS Rd. 312 was encroaching on the mainstem of the Upper West Branch. The USFS relocated USFS Rd. 312 and restored connectivity of the Upper West Branch to its floodplains and wetlands for about 0.6 miles (J. Cobb, M. Davis, USFS, pers. comm., 2002 as cited in WCC 2003). The hydrological processes of the Upper West Branch Priest River are impaired.

**Geologic and Flood Hazards**

A 100-year floodplain has not been identified along the Upper West Branch. The underlying geology along the Upper West Branch includes sedimentary deposits or rocks and glacial drift (Map 8). The potential for channel migration has been determined to be medium in upper, less sinuous reach and high in lower, less constrained reach (Map 6; Appendix CMZ). Adjacent slopes are less than 20 percent and generally have a low erosion and landslide risk (Map 11 and Map 12). Liquefaction and seismic hazards have not been identified adjacent to the creek (Map 13).

**Critical or Priority Habitat and Species Use**

The presence of westslope cutthroat is documented in the Upper West Branch Priest River (WDFW, 2009). The mapped priority habitat type associated with the river is a moose concentration.

**In-stream and Riparian Habitats**

The dominant vegetation community of the land surrounding the Upper West Branch Priest River is mapped as Northern Rocky Mountain Lower Montane Riparian Woodland and Shrubland (USGS, 2010). The riparian zone is partially disturbed in some areas by roads. Percentages (and acreages) of the Level III landcover types from the GAP analysis within the SPA are provided in Appendix D.

**Water Quality**

Priest River, Upper West Branch, has no listings for water quality impairment (Ecology, 2008). There may be some impairment due to adjacent roads, but the majority of the area is intact forest and likely has good water quality.

**Shoreline Use Patterns**

**Existing Land and Shoreline Use**

Existing land use in the Upper West Branch Priest River SPA is mainly public lands. The remaining is vacant lands. There are private holdings associated with USFS grazing allotments.

**Shoreline Modifications - Docks, Piers, Buoys, Floats and Bridges**

There are no shoreline modifications mapped on Upper West Branch Priest River.
Shoreline Environment Designations, Zoning, and Other Applicable Regulations

Upper West Branch Priest River is not within the current SMP and does not have a designation. The Rivers are zoned as Public Lands and Rural (Map 18).

Existing and Potential Public Access Areas

There are no existing public access sites within the Upper West Branch Priest River SPA.

Historic and Cultural Resources

There are no recorded archeological sites in the Upper West Branch Priest River shoreline area (DAHP 2010). However, due to documented use throughout much of Pend Oreille County by the Kalispel Tribe, there is some probability of unknown archaeological resources occurring within the vicinity of the stream.

Several sites and structures from the historical period have been inventoried along or near Upper West Branch Priest River. Sites were assessed in the late 1970s as being potentially eligible for the National Registry, however have not been registered. Two sites are associated with timber harvest activities during the 1920s, and include the remains of two timber bridges over the stream and a wooden outhouse. The area was logged in that period by the Dalkena Lumber Company. The other site within the shoreline area is related to historic agricultural uses, and includes the remains of a corral structure. (DAHP, 2010)

There are no state or federally listed historic properties within the Upper West Branch Priest River shoreline planning area (DAHP 2010).

Contaminated Sites

There are no Washington Department of Ecology listed facilities or sites within the Upper West Branch Priest River shoreline planning area (Ecology, 2010).

48. SCOTCHMAN LAKE

Physical and Biological Characterization

Drainage Basin, Tributary Streams, and Associated Wetlands

Scotchman Lake is located within the LeClerc watershed and is approximately 1.5 miles east of the Pend Oreille River and 1 mile east of Anderson Lake. Small, steep tributaries from the east and west flanks of the LeClerc watershed flow south through the valley bottom into a series of lakes, one of which being Scotchman Lake. Scotchman Lake is mapped as lacustrine open water wetland (Map 6; Appendix E).

Process and Channel Modification

Process modifications at Scotchman Lake include:

- Roads; and
- Logging.

The lake is bordered by a road on the east side that may contribute to polluted runoff and sediment. Historically, there has been some logging in the area. Many areas around the lake are surrounded by
undeveloped forests and natural resource lands. The natural hydrological processes at Scotchman Lake are primarily intact.

**Geologic and Flood Hazards**

FEMA has identified a 100-year flood zone within the lake that is confined to the edge of the lake (Map 6). Adjacent slopes include some areas that are greater than 20 percent and may be associated with potential erosion and landslide hazards (Map 11 and Map 12). The seismic and liquefaction hazard is low (Map 13).

**Critical or Priority Habitat and Species Use**

There are no priority fish species documented in Scotchman Lake (WDFW, 2009). The mapped priority habitat types associated with the lake are elk winter range and riparian habitat with associated wetland areas.

**In-stream and Riparian Habitats**

The dominant vegetation community of the land surrounding Scotchman Lake is mapped as Northern Rocky Mountain Dry-Mesic Montane Mixed Conifer Forest (USGS, 2010). The shoreline of the lake is unaltered, but a portion of this habitat at the north end of the lake is disturbed by an unpaved road. Percentages (and acreages) of the Level III landcover types from the GAP analysis within the SPA are provided in Appendix D.

**Water Quality**

Scotchman Lake has no listings for water quality impairment (Ecology, 2008). The majority of the area around the lake is intact forest and the lake likely has good water quality.

**Shoreline Use Patterns**

**Existing Land and Shoreline Use**

Existing land use in the Scotchman Lake SPA is mainly vacant and public lands.

**Shoreline Modifications - Docks, Piers, Buoys, Floats and Bridges**

There are no shoreline modifications mapped on Scotchman Lake.

**Shoreline Environment Designations, Zoning, and Other Applicable Regulations**

The current shoreline designation of Scotchman Lake is Conservancy (Map 3). Current zoning around the Lake is a mix of Public Lands (30 percent) and Rural (64 percent). There is a small amount of the shoreline zoned as Natural Resources (Map 18).

**Existing and Potential Public Access Areas**

There are no existing public access sites within the Scotchman Lake SPA.
Historic and Cultural Resources

There are no recorded archeological or historic sites (DAHP 2010). However, due to the documented use of the Pend Oreille County area by Kalispel peoples, there is some probability of unknown archaeological resources occurring within the Scotchman Lake shoreline planning area.

There are no state or federally listed historic properties within the Scotchman Lake shoreline planning area (DAHP 2010).

Contaminated Sites

There are no Washington Department of Ecology listed facilities or sites within the Scotchman Lake shoreline planning area (Ecology, 2010).

49. SHEARER LAKE

Physical and Biological Characterization

Drainage Basin, Tributary Streams, and Associated Wetlands

Shearer Lake is located in the southern part of the Skookum Creek watershed. The lake is approximately 1 mile northeast of the Pend Oreille River. There is no named stream or creek connected to this lake. One acre of palustrine scrub-shrub seasonal wetland is located around the lake (Map 6; Appendix E).

Process and Channel Modification

The process modifications at Shearer Lake are minimal. The area surrounding the lake is designated forest land and there are no major roads that are adjacent to this lake. The natural hydrological processes at Shearer Lake are primarily intact.

Geologic and Flood Hazards

FEMA has identified flood hazards within the lake that extend a little, less than 0.2 mile, to the north and south (Map 6). The underlying geology to the north includes alluvial material (Map 8). Adjacent slopes include some areas to the west that are greater than 20 percent and may be associated with potential erosion and landslide hazards (Map 11 and Map 12). Liquefaction and seismic hazards are located north of the lake in the area with alluvial material (Map 13). The other areas around the lake are primarily bedrock and have minimal liquefaction and seismic hazards.

Critical or Priority Habitat and Species Use

There are no priority fish species documented in Shearer Lake (WDFW, 2009). The mapped priority habitat types associated with the lake are elk winter range, white-tailed deer winter range, and riparian habitat with associated wetlands (WDFW, 2009).

In-stream and Riparian Habitats

The dominant vegetation community of the land surrounding Shearer Lake is mapped as Northern Rocky Mountain Mesic Montane Mixed Conifer Forest (USGS, 2010). The majority of the shoreline is unaltered; however, a significant portion of land adjacent to the south shore of the lake has been impacted.
by a residential development and associated land clearing. Percentages (and acreages) of the Level III landcover types from the USGS GAP analysis (2010) within the SPA are provided in Appendix D.

**Water Quality**

Shearer Lake has no listings for water quality impairment (Ecology, 2008). The majority of the area around the lake is intact forest and the lake likely has good water quality.

**Shoreline Use Patterns**

*Existing Land and Shoreline Use*

Existing land use in the Shearer Lake SPA is entirely composed of natural resource lands.

*Shoreline Modifications - Docks, Piers, Buoys, Floats and Bridges*

There is one dock on Shearer Lake. There are no mapped modifications on the Lake.

*Shoreline Environment Designations, Zoning, and Other Applicable Regulations*

The current shoreline designation of Shearer Lake is Conservancy (Map 3). The lake’s shorelines are zoned as Natural Resource (NR20) (Map 18).

*Existing and Potential Public Access Areas*

There are no existing public access sites within the Shearer Lake SPA.

*Historic and Cultural Resources*

Although the Shearer Lake shoreline is located less than 1.5 miles north of the culturally-rich Pend Oreille River shoreline (documented in detail in the Pend Oreille River section – see Box Canyon Reservoir – Reach 4), the shoreline area of the lake does not contain inventoried archaeological or historic sites. (DAHP, 2010)

There are no state or federally listed historic properties or structures within the Shearer Lake shoreline planning area (DAHP 2010).

*Contaminated Sites*

There are no Washington Department of Ecology listed facilities or sites within the Shearer Lake shoreline planning area (Ecology, 2010).

### 50. SKOOKUM CREEK

**Physical and Biological Characterization**

*Drainage Basin, Tributary Streams, and Associated Wetlands*

Skookum Creek is approximately 8 miles long, with two major tributaries, the North and South Fork Creeks. The drainage basin ranges from approximately 5,800 ft in its headwaters to 2,040 ft at its mouth. The headwaters of Skookum Creek lie in ponds in a broad, flat-bottomed valley. These ponds discharge
into a wide and shallow stream channel with a 2 percent gradient. Stream discharge increases as it is joined by three spring-fed tributaries, which contribute approximately 25 percent of the flow to Skookum Creek. Skookum Creek has approximately 55 acres of seasonal wetlands associated with it (Map 6; Appendix E).

**Process and Channel Modification**

The major process and channel modifications near Skookum Creek include:

- Roads;
- Agriculture; and
- Logging.

Kings Lake Road (County Rd. 3389) and USFS Rd. 5030 follow Skookum Creek for most of its length. While both of these roads are surfaced with gravel, both roads have a relatively high level of use and are suspected to be a significant source of sediment in the Skookum Creek tributary drainage, with large pulses of sediment being delivered from roads to the stream during storm events. The area within the Pend Oreille River floodplain is largely agricultural, consisting of mainly rangelands and hayfields (KNRD 1994 as cited in Entrix 2002). Sediment delivery and movement through the system is currently elevated and hydrological processes are impaired.

**Geologic and Flood Hazards**

FEMA has identified an extensive floodplain adjacent to the lower reach of Skookum Creek and Pend Oreille River (Map 6). The potential for channel migration has been identified as high for the reach from the confluence with North Fork Skookum Creek to LeClere Road., and low for the lower reach (Map 6; Appendix CMZ). The sinuosity in the upper reach is very high and valley width is unconstrained. In the lower portion the channel appears to have been straightened. The underlying geology for much of this creek is alluvial and lacustrine (Map 8). The slopes adjacent to the creek are less than 20 percent and generally have a low erosion and landslide risk (Map 11 and Map 12). Moderate to high liquefaction and seismic hazards are located adjacent to the creek (Map 13).

**Critical or Priority Habitat and Species Use**

The presence of rainbow trout and westslope cutthroat is documented in Skookum Creek (WDFW, 2009). The mapped priority habitat types associated with the creek are white-tailed deer winter ranges, elk winter range, and riparian habitat with associated wetlands.

**In-stream and Riparian Habitats**

The dominant vegetation community of the land surrounding Skookum Creek is mapped as Rocky Mountain Alpine-Montane Wet Meadow (USGS, 2010). However, the riparian zone of Skookum Creek is highly altered by agricultural activities. Some patches of forest and shrub lands are present, but the majority of the riparian zone is bare of woody vegetation. Percentages (and acreages) of the Level III landcover types from the GAP analysis within the SPA are provided in Appendix D..
Water Quality

According to the 2008 Washington State Water Quality Assessment (Ecology, 2008), Skookum Creek has a 303(d) Category 5 listing for fecal coliform. Additionally, the creek has a Category 2 listing for dissolved oxygen and pH. Stream reaches exhibiting the highest levels of fecal coliform were located near cattle ranches on private lands surrounding Skookum Creek and the North Fork of Skookum Creek. Runoff was concluded to be the most significant mechanism of fecal coliform transport (POCD 1996b as cited in Entrix 2002). To address the problem of high fecal coliform levels, the POCD recommends that landowners in the Skookum Creek watershed establish riparian vegetation to filter runoff entering the creek, and limit contact by animals with the creek (POCD 1996b as cited in Entrix 2002).

Shoreline Use Patterns

Existing Land and Shoreline Use

Existing land use in the Skookum Creek SPA is mainly agriculture and natural resource lands. Other land uses include vacant lands and residential. Agriculture mainly consists of rangelands and hayfields (KNRD 1994 as cited in Entrix 2002)

Shoreline Modifications - Docks, Piers, Buoys, Floats and Bridges

Skookum Creek is crossed by at least one roadway. There are no other shoreline modifications mapped on the creek.

Shoreline Environment Designations, Zoning, and Other Applicable Regulations

The current shoreline designation of Skookum Creek is Conservancy (Map 3). Approximately 80 percent of the creek’s shorelines are zoned as Natural Resource and the balance as Public Lands (Map 18).

Existing and Potential Public Access Areas

The Department of Natural Resources maintains a facility in or near the Skookum Creek SPA.

Historic and Cultural Resources

Although the Skookum Creek shoreline extends immediately east from the culturally-rich Pend Oreille River shoreline (documented in detail in the Pend Oreille River section – see Box Canyon Reservoir – Reaches 3 and 6), the shoreline area of the stream contains only one inventoried site. The inventoried site suggests seasonal use of the stream and shoreline area during the pre-contact period, and is also documented as containing historic-period components. (DAHP, 2010)

There are no state or federally listed historic properties or structures within the Skookum Creek shoreline planning area (DAHP 2010).

Contaminated Sites

There are no Washington Department of Ecology listed facilities or sites within the Skookum Creek shoreline planning area (Ecology, 2010).
51. SLATE CREEK

Physical and Biological Characterization

Drainage Basin, Tributary Streams, and Associated Wetlands

Slate Creek is located in the northern section of Pend Oreille County. Slate Creek has four main tributaries and two forks: Slumber Creek, Uncas Gulch, Styx Creek, an unnamed creek, and North and South Fork Slate Creek. Slumber Creek enters Slate Creek north of USFS Road 3155, near State Highway 31. Uncas Gulch flows into Slate Creek south of USFS Road 3155. Styx Creek enters Slate Creek just west of Lead Hill Mountain, near the junction of USFS Road 3155 and USFS Road 3160. The unnamed tributary enters Slate Creek west of the Lead Hill Mine and south of USFS Road 3155. USFS Road 3155 runs northerly along North Fork Slate Creek. South Fork Slate Creek and North Fork Slate Creek join at RM 6.2 to form the Slate Creek mainstem (SLC 2008c). There have been no wetlands associated with Slate Creek (Map 6).

Process and Channel Modification

The process and channel modifications near Slate Creek include:

- Highways and roads; and
- Logging.

The primary erosional processes occurring in this area are streambank erosion and landslides (USFS 1998a as cited in WCC 2003). Although surface erosion from roads is not a significant problem in all areas of the watershed, there are a few unmaintained road crossings at Slate Creek and associated tributaries. Road failures are recommended to be reconstructed to improve drainage and stabilize exposed cuts (USFS 1998a as cited in Entrix 2002).

The riparian areas are continuous in nature with few road crossings. A majority of the road system and past timber harvest is located outside of the riparian areas. The USFS Rd. 3155 has few riparian segments and most of the road is more than 200 feet from the creek (USFS 1998a as cited in WCC 2003). The hydrological processes along Slate Creek are partially impaired due to increase in sediment caused by adjacent highways, roads, and logging.

Geologic and Flood Hazards

A floodplain has been mapped at the confluence of Slate Creek with Pend Oreille River (Map 6). A floodplain has not been identified along the majority of Slate Creek. The potential for channel migration has been determined to be low (Map 6, Appendix CMZ). The underlying geology is glaciolacustrine sediments (Map 8). The valley is constrained and the valley slope is extremely slope, approximately 17 percent, and the sinuosity of the creek is low (Appendix CMZ). Some of the slopes adjacent to the creek are greater than 20 percent and may have a severe erosion and landslide risk (Map 11 and Map 12). Liquefaction and seismic hazards have not been identified adjacent to the creek (Map 13).

Critical or Priority Habitat and Species Use

The presence of rainbow trout and westslope cutthroat is documented in Slate Creek (WDFW, 2009). The mapped priority habitat type associated with the creek is year-round elk range.
In-stream and Riparian Habitats

The dominant vegetation community of the land surrounding Slate Creek is mapped as Northern Rocky Mountain Mesic Montane Mixed Conifer Forest (USGS, 2010). Except for a road crossing, the riparian zone of the creek is unaltered. Percentages (and acreages) of the Level III landcover types from the GAP analysis within the SPA are provided in Appendix D.

Water Quality

Washington Department of Ecology has identified Slate Creek as water quality impaired due to dissolved oxygen (Category 5/303(d) list; Ecology 2008). Slate Creek is also listed as a water of concern (Category 2) for excursions in pH and fecal coliform (Ecology 2008). The fecal bacteria listing was determined by one exceedance of the fecal coliform percent criteria in 2003. Fecal coliform bacteria violations are generally related to agricultural practices or residential development, however, there are no USFS grazing allotments in the Slate Creek watershed and residential development is limited. Elevated fecal coliform levels are also the result of high concentrations of wildlife (Entrix 2002). A combination of the natural soil matrix and decomposing organic material may be responsible for pH excursions. The temperatures measured as part of the 2008 Washington State Water Quality Assessment at Slate Creek met water quality standards.

Shoreline Use Patterns

Existing Land and Shoreline Use

Existing land use in the Slate Creek SPA is entirely composed of public lands.

Shoreline Modifications - Docks, Piers, Buoys, Floats and Bridges

There are no shoreline modifications mapped on Slate Creek.

Shoreline Environment Designations, Zoning, and Other Applicable Regulations

Slate Creek is not within the current SMP and does not have a shoreline designation. The creek’s shorelines are zoned as Public Lands (Map 18).

Existing and Potential Public Access Areas

There are no existing public access sites within the Slate Creek SPA.

Historic and Cultural Resources

There are no recorded archeological or historic sites (DAHP 2010). However, due to the documented use of the Pend Oreille County area by Kalispel peoples, there is some probability of unknown archaeological resources occurring within the Slate Creek shoreline planning area.

There are no state or federally listed historic properties within the Slate Creek shoreline planning area (DAHP 2010).
Contaminated Sites

There are no Washington Department of Ecology listed facilities or sites within the Slate Creek shoreline planning area (Ecology, 2010).

52. SALMO RIVER-SOUTH FORK

Physical and Biological Characterization

Drainage Basin, Tributary Streams, and Associated Wetlands

The South Salmo River watershed contains that portion of the South Salmo River that flows within Washington (RM 8.8 – 13.5). The South Salmo River flows west into Washington State from Idaho at RM 13.5, continuing downstream to RM 8.8 where it crosses the international border into British Columbia, Canada. The South Salmo River then joins the Salmo River 7.4 miles upstream from the Salmo River/Pend Oreille River confluence. The Salmo River is a tributary to the Seven Mile Reservoir reach of the Pend Oreille River entering the Pend Oreille River 13.3 miles upstream from the confluence with the Columbia River. The South Salmo River watershed does have approximately 18 acres of seasonal wetland habitat located along the stream margins and some side channel habitat due to braiding initiated by large collections of wood debris jam (2 to 6 side channels per mile depending upon the reach) (Map 6; Appendix E).

Process and Channel Modification

The riparian areas along the South Fork of the Salmo River and its tributaries are remarkably intact. Although a catastrophic wildfire in the 1970s has removed some of the larger components of the riparian stands on a portion of the South Fork, the remaining vegetation is composed of species expected of the natural community. The riparian areas are also continuous in nature with no road crossings, a few trail crossings and dispersed camping areas. All of the road system and past timber harvest are located outside of riparian areas. The hydrological processes along South Salmo River are primarily intact.

Geologic and Flood Hazards

A 100-year floodplain has not been identified adjacent to the South Salmo River (Map 6). The South Salmo River has been classified as having a low potential channel migration (Map 6; Appendix CMZ). The underlying geology is primarily glacial drift and bedrock. The overall valley slope is approximately 4 percent (Map 8). The valley width is constrained and has low sinuosity (Appendix CMZ). Adjacent slopes include some areas that are greater than 20 percent and may be associated with potential erosion and landslide hazards (Map 11 and Map 12). Liquefaction and seismic hazards have not been identified (Map 13).

Critical or Priority Habitat and Species Use

The presence of bull trout, rainbow trout, and westslope cutthroat is documented in the South Salmo River (WDFW, 2009). Additionally, fish distribution maps indicate that the river provides spawning habitat for bull trout. Bull trout are listed as “threatened” under ESA; however, the USFWS has not designated the South Salmo River as critical habitat for bull trout (Federal Register, 2005).
The mapped priority habitat type associated with the river is lynx range (WDFW, 2009). Lynx are listed as “threatened” under ESA (Federal Register, 2009). However, the South Salmo River area is not identified by USFWS as critical habitat for lynx.

**In-stream and Riparian Habitats**

The dominant vegetation community of the land surrounding the South Salmo River is mapped as Northern Rocky Mountain Mesic Montane Mixed Conifer Forest (USGS, 2010). The majority of the riparian zone is unaltered. Percentages (and acreages) of the Level III landcover types from the GAP analysis within the SPA are provided in Appendix D.

**Water Quality**

According to the 2008 Washington State Water Quality Assessment (Ecology, 2008), South Salmo River is listed as a Category 2, likely impaired, water body. The listing for South Salmo River is for PH. A combination of the natural soil matrix and decomposing organic material may be responsible for pH excursions.

**Shoreline Use Patterns**

**Existing Land and Shoreline Use**

Existing land use in the South Salmo River SPA is entirely composed of public lands.

**Shoreline Modifications - Docks, Piers, Buoys, Floats and Bridges**

There are no shoreline modifications mapped on South Salmo River.

**Shoreline Environment Designations, Zoning, and Other Applicable Regulations**

South Salmo River is not within the current SMP and does not have a shoreline designation. Current zoning around the Lake is Public Lands (Map 18).

**Existing and Potential Public Access Areas**

There are no existing public access sites within the South Salmo River SPA.

**Historic and Cultural Resources**

There are no recorded archeological or historic sites (DAHP 2010). However, due to documented use of the Pend Oreille Valley and surrounding area by Kalispel peoples, there is some probability of unknown archaeological resources occurring within the South Salmo River shoreline planning area.

There are no state or federally listed historic properties within the river’s shoreline planning area (DAHP 2010).

**Contaminated Sites**

There are no Washington Department of Ecology listed facilities or sites within the South Salmo River shoreline planning area (Ecology, 2010).
53. SOUTH SKOOKUM LAKE

Physical and Biological Characterization

Drainage Basin, Tributary Streams, and Associated Wetlands

South Skookum Lake is 32 acres in size with a maximum depth of 15 feet. The lake level is fairly constant. Water temperatures measured in the stream between North and South Skookum Lake in July of 1995 was between 68 and 72 F (USFS et al 1996 as cited in Entrix 2002). Flow from South Skookum Creek flows from North Skookum Lake to South Skookum Lake. Wetlands have been identified around the lake (Map 6).

Process and Channel Modification

The primary process modifications at South Skookum Lake include:

- Campground and recreational uses;
- Roads; and
- Grazing.

Aquatic vegetation is well established on the north end. Riparian vegetation is in excellent condition except in very limited areas around the campground and boat launch. Despite human modifications, the hydrological processes at South Skookum Lake are primarily intact.

Geologic and Flood Hazards

FEMA has mapped flood hazards at South Skookum Lake (Map 6). The underlying geology of the area is bedrock (Map 8). Slopes adjacent to the lake are less than 20 percent and generally have a low erosion and landslide risk (Map 11 and Map 12). There are very low liquefaction and seismic hazards around the lake (Map 13).

Critical or Priority Habitat and Species Use

The presence of rainbow trout is documented in South Skookum Lake (WDFW, 2009). The mapped priority habitat types associated with the river are lynx range and riparian habitat with associated wetland areas. Lynx are listed as “threatened” under ESA (Federal Register, 2009). However, the South Skookum Lake area is not identified by USFWS as critical habitat for lynx.

In-stream and Riparian Habitats

The dominant vegetation community of the land surrounding South Skookum Lake is mapped as Northern Rocky Mountain Mesic Montane Mixed Conifer Forest (USGS, 2010). Aside from a small residential area, the shoreline of South Skookum Lake is unaltered. Percentages (and acreages) of the Level III landcover types from the GAP analysis within the SPA are provided in Appendix D.
Water Quality

South Skookum Lake has no listings for water quality impairment (Ecology, 2008). The majority of the area around the lake is intact forest and the lake likely has good water quality.

Shoreline Use Patterns

Existing Land and Shoreline Use

Existing land use in the South Skookum Lake SPA is entirely composed of public lands.

Shoreline Modifications - Docks, Piers, Buoys, Floats and Bridges

There are two docks on South Skookum Lake that are associated with recreational uses. There are no other shoreline modifications mapped on the lake.

Shoreline Environment Designations, Zoning, and Other Applicable Regulations

The current shoreline designation of South Skookum Lake is Conservancy (Map 3). The lake’s shorelines are zoned as Public Lands (Map 18).

Existing and Potential Public Access Areas

There is one public access site in the South Skookum Lake SPA. The South Skookum Lake Campground has a gravel boat launch, loading float launch, campsites, and trail access. The campground is managed by the U.S. Forest Service. Within the SPA it is about 5 acres in size.

Historic and Cultural Resources

There are no recorded archeological or historic sites (DAHP 2010). However, due to documented use of the Pend Oreille Valley and surrounding area by Kalispel peoples, there is some probability of unknown archaeological resources occurring within the South Skookum Lake shoreline planning area.

There are no state or federally listed historic properties within the South Skookum Lake shoreline planning area (DAHP 2010).

Contaminated Sites

There are no Washington Department of Ecology listed facilities or sites within the South Skookum Lake shoreline planning area (Ecology, 2010).

54. SULLIVAN CREEK

Physical and Biological Characterization

Drainage Basin, Tributary Streams, and Associated Wetlands

The Sullivan Creek watershed (91,455 acres; WCC 2003) contains two primary drainages: Harvey Creek, which is tributary to Sullivan Lake, and Sullivan Creek, which is free flowing and tributary to the Pend Oreille River. Sullivan Creek and Harvey Creek originate at the peaks of Salmo and Monumental Mountains at elevation 6,400 and 5,711 feet, respectively. Sullivan Creek drains the area east and
northeast of Sullivan Lake, a total drainage basin area of approximately 70 square miles. A number of small tributaries flow into Sullivan Creek. Approximately 85 acres of palustrine and riverine wetlands are located along Sullivan Creek (Map 6; Appendix E). The identified wetlands along Sullivan Creek are primarily in the vicinity of the confluences with Outlet Creek and Pend Oreille River.

Process and Channel Modification

Some of the major process and channel modifications in the Sullivan Creek watershed include:

- The Sullivan Lake and Mill Pond dams;
- Development of a sawmill and cement plant;
- Buildings within floodplain;
- Logging;
- Channel straightening, rip-rapping, and gabion placement; and
- Erosion from roads adjacent to the creek transports fine sediment.

The hydrological processes at Sullivan Creek have been impaired by these modifications. The Sullivan Lake and Mill Pond dams were built as part of the Sullivan Creek Hydroelectric Project (SCH). The SCH is located at Sullivan Lake and along Sullivan Creek approximately 3 miles east of the town of Metaline Falls. After building the dams, a sawmill and flume were constructed. The 2.5 mile flume channeled the water from the Mill Pond dam down to a reservoir and from there the water dropped 450 feet through a three-foot pipe to a generating plant on Sullivan Creek that was located just upstream from the confluence with the Pend Oreille River (Bamonte 1996 as cited in WCC 2003).

From the mouth of Sullivan Creek upstream to Sullivan Lake dam, flows have been moderated from natural levels by the artificial raising and lowering water levels in Sullivan Lake behind Sullivan Lake Dam (USFS 1999ce as cited in WCC 2003). Sullivan Dam operations have changed the magnitude of the peak flow event in Outlet Creek and downstream in Sullivan Creek. Prior to the dam, peak flows would occur in the spring in both Outlet and Sullivan Creek. The two streams may well have peaked at or near the same time. With dam operations, the spring flows from Outlet Creek are significantly reduced so the overall peak flow is perhaps half of what occurred prior to the building of the dams. It is possible the reduction in peak flows has reduced the extent, size and frequency of landslides on lower Sullivan Creek (USFS 2008).

Channel straightening, rip-rapping and gabion placement was undertaken along Sullivan Creek as far back as the 1950s to mid-1960s; evidence was found of one section of Sullivan Creek being straightened in 1962 under a federal work program. This has resulted in increased erosion in some areas. Debris torrents, triggered by road systems associated with extensive jammer logging from 1955 through the mid-1970s, put a lot of bedload and organic debris into Sullivan Creek (combined with probably surface erosion from the jammer logging).

Geologic and Flood Hazards

FEMA has identified flood hazards in the lower reach of Sullivan Creek (Map 6). The floodplain is generally narrow and confined by the steep slopes adjacent to the creek. The underlying geology of Sullivan Creek is bedrock, glacial drift, and glaciaolacustrine sediments. The potential migration zone has
been identified as low and medium, depending on the valley width, sinuosity, and geology (Appendix CMZ; Map 6). In some areas of the upper reach, the adjacent slopes are greater than 40 percent. The number of landslides has decreased since the mid-seventies. The jammer roads that are prone to failure have apparently failed and the practice has been discontinued. The trend for human-caused debris torrents is decreasing because fewer roads are being constructed and larger culverts are being installed in streams (USFS 1996 as cited in WCC 2003). Although there are some extremely steep slopes adjacent to the creek, the banks are generally in pretty stable condition (USFS 1996 as cited in WCC 2003). Given the background of landslides in this terrain, it is unclear to what extent the placement of the dams may have increased down cutting or lateral cutting – thereby increasing the amount or size of landslides (USFS, 2008). There may be some landslide hazard associated with the steep areas, down cutting, and/or lateral cutting (Map 12). There are no areas of liquefaction identified along this creek and probably minimal seismic hazards (Map 13).

Critical or Priority Habitat and Species Use

The presence of bull trout, kokanee salmon, rainbow trout, and westslope cutthroat is documented in Sullivan Creek (WDFW, 2009). Bull trout are listed as “threatened” under ESA, and have designated critical habitat within Sullivan Creek (Federal Register, 2005).

There are several priority habitats associated with Sullivan Creek. These habitats are listed below (WDFW, 2009):

- Harlequin duck breeding area;
- Year-round elk range;
- Pend Oreille River riparian and wetland areas; and
- Lynx range.

Lynx are listed as “threatened” under ESA (Federal Register, 2009). However, the Sullivan Creek area is not identified by USFWS as critical habitat for lynx.

In-stream and Riparian Habitats

The dominant vegetation community of the land surrounding Sullivan Creek is mapped as Northern Rocky Mountain Mesic Montane Mixed Conifer Forest (USGS, 2010). The riparian zone of the creek is generally intact, but is disturbed in some areas by roads. At the confluence with the Pend Oreille River, the stream and its riparian area is significantly disturbed by residential/urban development at the City of Metaline Falls. Percentages (and acreages) of the Level III landcover types from the GAP analysis within the SPA are provided in Appendix D.

Water Quality

Sullivan Creek has a 303(d) (Category 5) listing for dissolved oxygen (Ecology, 2008). In addition, the creek has a Category 4A listing for temperature and two Category 2 listings for dissolved oxygen and temperature.

In 2004, there were 12 occurrences in which the 7-day mean of daily maximum values exceeded the temperature criterion (criterion = 17.5°C) for lower Sullivan Creek; the maximum exceedance during this period was 18.89°C for the 7-day period ending August 19, 2004 (Ecology 2008). Water quality
impairment due to temperature on lower Sullivan Creek is currently being addressed through the Colville National Forest Fecal Coliform Bacteria and Temperature TMDL. Temperature violations are generally related to timber harvesting or removal of riparian vegetation or groundwater influences (groundwater usually cools streams in the summer) (POCD 2004). However, high temperatures on lower Sullivan Creek are likely the result of Sullivan Lake and Mill Pond warming inflow (Entrix 2002).

Fecal coliform bacteria violations are generally related to agricultural practices or residential development, however, there are no USFS grazing allotments in the Sullivan Creek watershed and residential development is limited. Elevated fecal coliform levels may be the result of high concentrations of wildlife (Entrix 2002).

Baseline water quality data collected by the Pend Oreille Conservation District during 2002-2004 for the Pend Oreille Watershed Ranking Grant provided by Ecology found that the Sullivan Creek watershed exceeded EPA standard for phosphorus 16 of the 36 sampling events or 44% (POCD 2004). The EPA sets the limitation of phosphorus in surface water at 0.1mg/l. The frequency of exceedences indicates a significant violation of the federal standard. Phosphorus contamination is generally related to agricultural practices however the natural geologic matrix may suggest a natural occurrence may be responsible for the standard violations.

During the aforementioned baseline water quality study, the Sullivan Creek watershed exceeded EPA standard for nitrite 3 of the 36 sampling events or 8% (POCD 2004). The geometric mean of 0.011mg/l was well below the federal standard of 0.06mg/l. Nitrite violations are generally related to runoff and agricultural practices.

The Sullivan Creek watershed exceeded Washington State standard for turbidity 5 of the 35 sampling events or 14% (POCD 2004). Most samples recorded turbidity levels well below the State Class A and AA Waters Standard of 5NTU over background, when background is 50 NTU or less. Background is figured by an established baseline. Baseline would vary season by season with levels generally higher during the spring freshet. Turbidity violations are generally related to runoff processes.

Future water quality problems in the Sullivan Creek watershed include potential contamination of lower Sullivan Creek by a kiln dust pile with alkaline leachate. Depending on the terms of agreement for the Sullivan Creek Hydroelectric project surrender of license, turbidity resulting from flooding, erosion from roads and landslide activity may be cause for concern.

**Shoreline Use Patterns**

**Existing Land and Shoreline Use**

Existing land use in the Sullivan Creek SPA is mainly public lands. Other land uses include natural resource lands, residential, and vacant. The Town of Metaline Falls is located at the confluence of Sullivan Creek (Reach 4) and Pend Oreille River.

**Shoreline Modifications - Docks, Piers, Buoys, Floats and Bridges**

Modifications of the Sullivan Creek shorelines are noted above. They include the Sullivan Lake and Mill Pond Dams; rip-rapping, and gabion placement; and adjacent roadways.
Shoreline Environment Designations, Zoning, and Other Applicable Regulations

The current shoreline designation of Sullivan Creek is Conservancy (Map 3). Current zoning around the lake is a mix primarily Public Land (92 percent) with smaller areas of Natural Resource (Map 18).

Existing and Potential Public Access Areas

The US Forest Service maintains a facility within the Sullivan Creek SPA.

Historic and Cultural Resources

There are no recorded archeological or historic sites (DAHP 2010). However, due to documented use of the Pend Oreille Valley and surrounding area by Kalispel peoples, there is some probability of unknown archaeological resources occurring within the Sullivan Creek shoreline planning area.

There are no state or federally listed historic properties within the Sullivan Creek shoreline planning area (DAHP 2010).

Contaminated Sites

There are no Washington Department of Ecology listed facilities or sites within the Sullivan Creek shoreline planning area (Ecology, 2010).

55. SULLIVAN LAKE

Physical and Biological Characterization

Drainage Basin, Tributary Streams, and Associated Wetlands

Sullivan Lake is a natural lake formed by a glacial moraine, which is increased in size by the presence of Sullivan Lake Dam. Harvey Creek flows into the lake and Outlet Creek flows out of the lake and into Sullivan Creek. Where Harvey Creek enters Sullivan Lake, the lake seasonally floods the depositional zone area.

The Sullivan Creek Dam maintains, to the extent possible, a constant lake elevation of approximately 2,589 feet msl during the summer to accommodate recreation (PUD 2008a). When water is released beginning in October there is over a 20 foot drawdown on Sullivan Lake to near its natural level of approximately 2565 feet msl. Approximately 21 acres of seasonally inundated wetland area is located at the south end of the lake, near the confluence with Harvey Creek (Map 6; Appendix E).

Process and Channel Modification

The process modifications at Sullivan Lake include:

- Building the Sullivan Dam enlarged Sullivan Lake; and
- Adjacent logging and roads.

The water holding capacity of Sullivan Lake was increased by the construction of Sullivan Lake Dam about 0.5 miles upstream of the confluence with Sullivan Creek. When water is released from the dam,
beginning in October, there can be a drawdown of the lake by more than 20 feet. The natural flow regime has been altered significantly and impaired by dam operations.

**Geologic and Flood Hazards**

FEMA has not mapped floodplains around the lake (Map 6). The flooding of the lake is controlled by dam operations. There are some areas around the lake with slopes greater than 20 percent that could have some associated landslide hazards (Map 12). Liquefaction areas have not been identified and seismic hazards are probably minimal (Map 13).

**Critical or Priority Habitat and Species Use**

The presence of kokanee salmon and pygmy whitefish, rainbow trout, and westslope cutthroat is documented in Sullivan Lake (WDFW, 2009). Additionally, the lake provides documented kokanee and pygmy whitefish spawning habitat. Pygmy whitefish are listed as a “species of concern” under ESA; therefore, it does not presently have designated critical habitat.

The priority habitats associated with Sullivan Lake are significant stream riparian area and associated wetlands (WDFW, 2009).

**In-stream and Riparian Habitats**

The dominant vegetation community of the land surrounding Sullivan Lake is mapped as Northern Rocky Mountain Dry-Mesic Montane Mixed Conifer Forest (USGS, 2010). The shoreline of the lake is relatively unaltered; however, the connection between the lake and surrounding forest is disturbed by a road that encircles the lake. In addition, there is some development and land clearing near the dam at the northwest corner of the lake. Percentages (and acreages) of the Level III landcover types from the GAP analysis within the SPA are provided in Appendix D.

**Water Quality**

According to the 2008 Washington State Water Quality Assessment (Ecology, 2008), Sullivan Lake has Category 2 water quality impairment listings for fecal coliform and pH. Fecal coliform bacteria violations are generally related to agricultural practices or residential development, however, there are no USFS grazing allotments in the Sullivan Creek watershed and residential development is limited. Elevated fecal coliform levels in the lake may be the result of high concentrations of wildlife (Entrix 2002). A combination of the natural soil matrix and decomposing organic material may be responsible for the pH excursions.

**Shoreline Use Patterns**

**Existing Land and Shoreline Use**

Existing land use in the Sullivan Lake SPA is almost entirely public lands.

**Shoreline Modifications - Docks, Piers, Buoys, Floats and Bridges**

Shoreline modifications of the lake include the Sullivan Dam and Sullivan Lake Road Bridge. There are 16 docks or piers and three buoys or floats mapped on the lake.
Shoreline Environment Designations, Zoning, and Other Applicable Regulations

The current shoreline designation of Sullivan Lake is Conservancy (Map 3). The lake’s shorelines are zoned as Public Lands (Map 18).

Existing and Potential Public Access Areas

There are two public access sites in the Sullivan Lake SPA. The East Sullivan Lake Campground has a paved and v-grooved boat launch, loading float launch, tent, RV and group campsites, picnic area, hiking trails, and a swimming area. Within the SPA it is about 10 acres in size. The Noisy Creek Campground has a concrete boat launch, campsites, swimming area and hiking trails. Within the SPA it is about 24 acres in size. Both are managed by the U.S. Forest Service.

The current U.S. Forest Service Forest Plan allocates the National Forest System (NFS) lands surrounding Sullivan Lake as a “Scenic Viewshed” with high scenic integrity due to its natural appearance (USFS 1988 as cited in USFS 2008).

Historic and Cultural Resources

There are no recorded archeological or historic sites (DAHP 2010). However, due to documented use of the Pend Oreille Valley and surrounding area by Kalispel peoples, there is some probability of unknown archaeological resources occurring within the Sullivan Lake shoreline planning area.

There are no state or federally listed historic properties within the Sullivan Lake shoreline planning area (DAHP 2010).

Contaminated Sites

There are no Washington Department of Ecology listed facilities or sites within the Sullivan Lake shoreline planning area (Ecology, 2010).

56. SULLIVAN MILL POND

Physical and Biological Characterization

Drainage Basin, Tributary Streams, and Associated Wetlands

Sullivan Mill Pond is a small reservoir created by the damming of lower Sullivan Creek. Sullivan and Outlet Creeks are the primary water-sources flowing into Mill Pond. The impoundment occurs in a low gradient segment of Sullivan Creek. Sullivan Mill Pond is kept at a relatively constant 2,506 feet msl. Mill Pond Dam has a fixed concrete overflow weir at its outlet, and thus it has no capability to store water behind the dam in the event of a flood. The largest wetland in the Sullivan Creek watershed is a permanently flooded site located southeast of Mill Pond (USFS 2008). Additionally, approximately 21 acres of seasonal wetland is located around the lake (Map 6; Appendix E).

Process and Channel Modification

Sullivan Mill Pond was created by damming the Sullivan Creek. The process modifications at the Sullivan Mill Pond are primarily related to the creation of the Mill Pond Dam. The presence of the dam at Mill Pond has undoubtedly changed the amount of sediment and bedload downstream of the pond. The natural hydrological processes along Sullivan Creek were modified by creating Mill Pond.
Flood impacts would be the same with or without Mill Pond dam (PUD 2008a). Mill Pond Dam provides little if any flood control; however, all bedload sediment, and most of the suspended sediment that enters Mill Pond is deposited and trapped there. Thus, Sullivan Creek below Mill Pond is sediment-starved, and consequently the lowest reach of Sullivan Creek is a rock-dominated channel (USFS 1996 as cited in Entrix 2002). If the dam at Mill Pond were removed the pond would drain re-exposing Sullivan Creek (PUD 2008a).

**Geologic and Flood Hazards**

The flood hazards at Sullivan Mill Pond have not been mapped by FEMA (Map 6). The flooding would be primarily affected by releases at Sullivan Dam and the upper reaches of Sullivan Creek. There are some slopes around Mill Pond that are greater than 20 percent and could be associated with some erosion and landslide hazards (Map 11 and Map 12). Liquefaction areas have not been identified and seismic hazards are likely minimal (Map 13).

**Critical or Priority Habitat and Species Use**

The presence of kokanee salmon, rainbow trout, and westslope cutthroat is documented in the Sullivan Mill Pond (WDFW, 2009). The pond has no mapped, associated priority habitats.

**In-stream and Riparian Habitats**

The dominant vegetation community of the land surrounding the Sullivan Mill Pond is mapped as Northern Rocky Mountain Mesic Montane Mixed Conifer Forest (USGS, 2010). However, this habitat is disturbed in some areas by roads. Percentages (and acreages) of the Level III landcover types from the GAP analysis within the SPA are provided in Appendix D.

**Water Quality**

The Sullivan Mill Pond has a 303(d) (Category 5) impaired water quality listing for dissolved oxygen. Water quality impairment due to temperature on Sullivan Creek (including the pond) is currently being addressed through the Colville National Forest Fecal Coliform Bacteria and Temperature TMDL. Temperature violations are generally related to timber harvesting or removal of riparian vegetation or groundwater influences (groundwater usually cools streams in the summer) (POCD 2004). However, the water impoundment in the pond itself may be the chief cause of high temperatures (Entrix 2002).

**Shoreline Use Patterns**

**Existing Land and Shoreline Use**

Existing land use in the Sullivan Mill Pond SPA is entirely composed of public lands.

**Shoreline Modifications - Docks, Piers, Buoys, Floats and Bridges**

Shoreline modifications include the Mill Pond Dam. There are no other modifications mapped on the Sullivan Millpond.

**Shoreline Environment Designations, Zoning, and Other Applicable Regulations**

The current shoreline designation of Sullivan Mill Pond is Conservancy (Map 3). The pond’s shorelines are zoned as Public Lands (Map 18).
Existing and Potential Public Access Areas

Sullivan Mill Pond has at least two access points and a trail surrounds it. The current U.S. Forest Service Forest Plan allocates the National Forest System (NFS) lands surrounding Sullivan Lake and Mill Pond as a “Scenic Viewshed” with high scenic integrity due to its natural appearance (USFS 1988 as cited in USFS 2008).

Historic and Cultural Resources

There are no recorded archeological or historic sites (DAHP 2010). However, due to documented use of the Pend Oreille Valley and surrounding area by Kalispel peoples, there is some limited probability of unknown archaeological resources occurring within the Sullivan Mill Pond shoreline planning area.

There are no state or federally listed historic properties within the Sullivan Mill Pond shoreline planning area (DAHP 2010).

Contaminated Sites

There are no Washington Department of Ecology listed facilities or sites within the Sullivan Mill Pond shoreline planning area (Ecology, 2010).

57. TACOMA CREEK

Physical and Biological Characterization Drainage Basin, Tributary Streams, and Associated Wetlands

Tacoma Creek, with a drainage basin area of 61.6 square miles (39,424 acres), flows southwesterly approximately 21.4 miles before it empties into the Pend Oreille River at RM 66.3; Cusick Creek, with a drainage basin area of 9.6 square miles (6,144 acres), flows west/southwesterly about 7 miles before it empties into the Pend Oreille at RM 61.6 (Williams et al. 1975 as cited in WCC 2003). The Cusick and Tacoma Creek drainages feed into the Box Canyon Reservoir portion of the Pend Oreille River entering from the west. The highest elevation in the Tacoma Creek watershed is Calispell Peak at 6,855 feet.

Off-channel habitat for stream reaches on USFS land tends to be low energy areas created by braiding around old beaver dams. The Tacoma Creek drainage has a preponderance of old beaver dams that act as slow water habitat for juveniles and fry (USFS 1999ac, USFS 1999c as cited in WCC 2003). Approximately 101 acres of seasonal wetlands are located along Tacoma Creek, primarily on the lower reach of Tacoma Creek (Map 6; Appendix E).

Process and Channel Modification

The primary process and channel modifications in the Tacoma Creek watershed include:

- Timber harvest;
- High density of roads adjacent to waterbodies;
- Rural development; and
- Agricultural development.
These process modifications have contributed to increased sediment loading in the Tacoma Creek watershed. Many log mills and log camps were established in the area about 1910 through 1950. In many areas, logs were transported with flumes, chutes and splash dams. There was a major flume system along Tacoma Creek. More recently, a considerable amount of timber harvest has occurred since the 1950s with the majority of that harvest occurring in the last 15 years (WCC 2003). In the Pend Oreille valley bottom, timber land was cleared for agriculture starting about 1900. Grazing and haying are extensive on the agricultural lands in this area (USFS 1998 as cited in WCC 2003). Homesteading of this area had a significant impact on the landscape we see today. Between 1900 and 1940, communities were established at Tacoma Creek and Boulder Mountain – communities with schools and community centers. Lands were cleared, and many of these cleared homestead meadows persist today. Much of the land was logged and burned during this homestead era. Many trails and roads were developed linking communities, homes and logging camps (USFS 1998 as cited in WCC 2003). The hydrological processes along Tacoma Creek were impaired by these modifications.

**Geologic and Flood Hazards**

The potential for channel migration within the Tacoma Creek CMZ is classified as predominately medium potential, with some low potential in constrained areas (Map 6, Appendix CMZ) Although the lower reach is very sinuous, the CMZ appears to be limited due to the lacustrine deposits. The floodplain is very narrow and has only been mapped by FEMA in a couple of areas (Map 6). The flood hazards due to high streamflow are minimal.

The Tacoma Creek watershed appears to have unstable natural processes, specifically soil erosion. The underlying geology tends to be dominated by decomposed granitic material that is highly erodible (Map 8). Catastrophic events, such as wildfire and debris torrents, appear to be infrequent watershed (USFS 1999c as cited in WCC 2003). The underlying geology is mostly granite and metamorphic rock covered by glacial materials and volcanic ash. Most of the area was covered under the continental glaciers of the last ice ages, but a small are Calispell Peak extended above the glaciers. As the glaciers retreated, they left a series of remnant terraces. There are some areas adjacent to the creek with slopes greater than 15 percent (Map 12). Landslides are rare, but have occurred on the margins of the ancient terraces at the interface of till and bedrock. Seismic and liquefaction hazards are very low (Map 13).

**Critical or Priority Habitat and Species Use**

The presence of rainbow trout and westslope cutthroat is documented in Tacoma Creek (WDFW, 2009). Two priority habitats (year-round elk range and white-tail deer winter range) are associated with Tacoma Creek (WDFW, 2009).

**In-stream and Riparian Habitats**

The dominant vegetation community of the land surrounding Tacoma Creek is mapped as Northern Rocky Mountain Dry-Mesic Montane Mixed Conifer Forest (USGS, 2010). However, the riparian zone is disturbed in some areas by roads and an electric transmission corridor. Percentages (and acreages) of the Level III landcover types from the GAP analysis within the SPA are provided in Appendix D.

**Water Quality**

Tacoma Creek has two 303(d) listings (Category 5) for impaired water quality: dissolved oxygen and pH (Ecology 2008). In addition, the creek has a Category 4A listing for temperature and two Category 2 listings for DO and pH.
The lower reaches of Tacoma Creek may act as a thermal barrier to fish passage during summer months (Bennett and Garrett 1994 as cited in WCC 2003). During 2005 there were 3 occurrences in which the 7-day mean of daily maximum value exceeded the temperature criterion for this waterbody (criterion = 17.5°C). Water quality impairment due to temperature on Tacoma Creek is currently being addressed through the Colville National Forest Fecal Coliform Bacteria and Temperature TMDL. The USFS has determined that the primary factor raising water temperatures above desired appears to be the effect of solar radiation on the stream proper and on pools behind old and new beaver dams within the reaches of Tacoma Creek. Road construction originally changed the characteristics of the riparian vegetation and decreased the amount of brush and trees that shade the stream and moderate summer temperatures. Maintenance of road segments located within the RHCA continues to limit the ability of the adjacent riparian vegetation to provide shade.

**Shoreline Use Patterns**

**Existing Land and Shoreline Use**

The main land use in the Tacoma Creek SPA is public lands. Other land uses include vacant lands, natural resource lands, and residential. A major contiguous reach of floodplain, riparian, and wetland habitat (over 1,700 acres) is protected along the Box Canyon Reservoir at the mouth of Tacoma Creek. This area consists of property acquired by the Kalispel Tribe as mitigation for the Albeni Falls Project, combined with USFWS and Pend Oreille Public Utility District properties.

**Shoreline Modifications - Docks, Piers, Buoys, Floats and Bridges**

Tacoma creek is crossed by several roadways. No other shoreline modifications are mapped.

**Shoreline Environment Designations, Zoning, and Other Applicable Regulations**

The current shoreline designation of Tacoma Creek is Conservancy (Map 3). Much of the Tacoma Creek shoreline is zoned Public Lands (65 percent). The zoning also includes smaller amounts of Natural Resource (10 percent) and Rural (25 percent) (Map 18).

**Existing and Potential Public Access Areas**

There are no existing public access sites within the Tacoma Creek SPA.

**Historic and Cultural Resources**

There are no recorded archeological sites (DAHP 2010). However, due to documented use throughout much of the Pend Oreille Valley and surrounding area by the Kalispel Tribe, there is significant probability of unknown archaeological resources occurring within the Tacoma Creek shoreline planning area. Several sites and structures from the historical period have been inventoried along or near Tacoma Creek. A tin container and refuse dump site (about 90 percent tin cans) was documented along Reach 2 in 2000; the site was documented as being related to Civilian Conservation Corps activities, which occurred between 1933 and 1943. Nearby the tin dump site are several other sites, including a water cistern system and two structure pad / tent sites. Nearby upstream from these Civilian Conservation Corps sites there are remnants of two log bridges built over a tributary stream along Batey Road (documented as being constructed around 1913). Other historic artifacts, refuse, and dump sites occur within the Reach 1 and 2 shoreline areas, including artifacts such as a shallow cellar, wash tub, graniteware pots, and tin and metal scraps. These sites are located along the length of a large historic site – the Diamond Match Company Flumes and Log Crib extending down Reach 1 into Reach 2. The system was used for transport of logs down the stream corridor. Remnants of the flume system, thought to be built in the 1920s, extend over a
long reach of the stream, with pilings, ditches, wooden V-shaped supports, and sheathing documented. One mostly intact segment was approximately 5 miles long when documented in 1990. The large majority of historic sites along Tacoma Creek have been determined potentially eligible for listing on the National Register, however have not been registered.

There are no state or federally listed historic properties within the Tacoma Creek shoreline planning area (DAHP 2010).

**Contaminated Sites**

There are no *Washington Department of Ecology* listed facilities or sites within the shoreline planning area (Ecology, 2010).

### 58. UNNAMED WETLAND

**Physical and Biological Characterization**

*Drainage Basin, Tributary Streams, and Associated Wetlands*

The Unnamed Wetland is located approximately 0.5 mile west of the Indian Creek headwaters. The Unnamed Wetland includes 21 acres of lacustrine permanently flooded wetlands and 4 acres of palustrine seasonally flooded wetlands (Map 6; Appendix E).

**Process and Channel Modification**

The process modifications adjacent to the Unnamed Wetland include:

- Roads; and
- Logging.

The Unnamed Wetland is located on public land that is near areas where there was logging. There is a road that is located adjacent to the wetland that could result in excess sediment and runoff into the Unnamed Wetland. The natural hydrological processes may be partially impaired due to excess sediment entering the wetland.

**Geologic and Flood Hazards**

The 100-year floodplain has not been identified by FEMA (Map 6). Adjacent slopes include some areas that are greater than 20 percent and may be associated with potential erosion and landslide hazards (Map 11 and Map 12). Liquefaction and seismic hazards are minimal (Map 13).

**Critical or Priority Habitat and Species Use**

No priority fish are documented in the unnamed wetland (WDFW, 2009). The mapped priority habitat types associated with the wetland are white-tailed deer winter range and riparian habitat with associated wetland areas.
In-stream and Riparian Habitats

The dominant vegetation community of the land surrounding the unnamed wetland is mapped as Northern Rocky Mountain Mesic Montane Mixed Conifer Forest (USGS, 2010). The shoreline of the unnamed wetland is unaltered. Percentages (and acreages) of the Level III landcover types from the USGS GAP analysis (2010) within the SPA are provided in Appendix D.

Water Quality

Unnamed Wetland has no listings for water quality impairment (Ecology, 2008). There may be some impairment due to adjacent roads, but the majority of the water body likely has good water quality.

Shoreline Use Patterns

Existing Land and Shoreline Use

Existing land use in the Unnamed Wetland SPA is entirely composed of public lands.

Shoreline Modifications - Docks, Piers, Buoys, Floats and Bridges

There are no shoreline modifications mapped on this waterbody.

Shoreline Environment Designations, Zoning, and Other Applicable Regulations

This unnamed wetland is not within the current SMP and does not have a designation. Current zoning around the wetland is Public Lands (Map 18).

Existing and Potential Public Access Areas

There are no existing public access sites within the Unnamed Wetland SPA.

Historic and Cultural Resources

There are no recorded archeological or inventoried historic sites (DAHP 2010). However, due to documented use throughout much of the Pend Oreille Valley by the Kalispel Tribe, there is some probability of unknown archaeological resources occurring within the Unnamed Wetland shoreline planning area.

There are no state or federally listed historic properties within the Unnamed Wetland shoreline planning area (DAHP 2010).

Contaminated Sites

There are no Washington Department of Ecology listed facilities or sites within the Unnamed Wetland shoreline planning area (Ecology, 2010).

59. YOCUM LAKE
Physical and Biological Characterization

Drainage Basin, Tributary Streams, and Associated Wetlands

Yocum Lake is in the Pend Oreille watershed. Yocum drains into the Pend Oreille River through an unnamed stream. This stream dries up in the summer. Approximately 0.3 acre of seasonal wetland is identified around the lake (Map 6; Appendix E).

Process and Channel Modification

The primary process modification at Yocum Lake is an adjacent road. There may be excess runoff and sediment from the road into the lake. Large deposits of coarse sediment from mass wasting events which may be associated with poorly constructed roads on steep slopes, may increase the extent and duration of subsurface flow (WDNR 1997 as cited in WCC 2003). But, overall the surrounding area is forested and the hydrological functions are intact.

Geologic and Flood Hazards

A 100-year floodplain has been identified within the lake (Map 6). Adjacent slopes include some areas that are greater than 20 percent and may be associated with potential erosion and landslide hazards (Map 11 and Map 12). Liquefaction and seismic hazards have not been identified within the lake (Map 13).

Critical or Priority Habitat and Species Use

The presence of westslope cutthroat is documented in Yocum Lake (WDFW, 2009). The mapped priority habitats associated with the lake are elk winter range, riparian habitat with associated wetland areas, and common loon breeding areas.

In-stream and Riparian Habitats

The dominant vegetation community of the land surrounding Yocum Lake is mapped as Northern Rocky Mountain Dry-Mesic Montane Mixed Conifer Forest (USGS, 2010). The surrounding land is somewhat disturbed in some areas by roads. Percentages (and acreages) of the Level III landcover types from the GAP analysis within the SPA are provided in Appendix D.

Water Quality

Yocum Lake has no listings for water quality impairment (Ecology, 2008). The majority of the area around Yocum Lake is intact forest. The water quality of the lake is likely good.

Shoreline Use Patterns

Existing Land and Shoreline Use

Existing land use in the Yocum Lake SPA is mainly vacant lands and public lands. Remaining land use is natural resource lands.

Shoreline Modifications - Docks, Piers, Buoys, Floats and Bridges

There are no shoreline modifications mapped on Yocum Lake.
Shoreline Environment Designations, Zoning, and Other Applicable Regulations

The current shoreline designation of Yocum Lake is Conservancy (Map 3). Current zoning around the lake is primarily Public Land (88 percent) with the remaining shorelines zoned Natural Resource (12 percent) (Map 18).

Existing and Potential Public Access Areas

There is a US Forest Service facility within the Yocum Lake SPA.

Historic and Cultural Resources

There are no recorded archeological or historic sites (DAHP 2010). However, due to the documented use of the Pend Oreille County area by Kalispel peoples, there is some probability of unknown archaeological resources occurring within the Yocum Lake shoreline planning area.

There are no state or federally listed historic properties within the Yocum Lake shoreline planning area (DAHP 2010).

Contaminated Sites

Consistent with the largely undeveloped land use, there are no Washington Department of Ecology listed facilities or sites within the Yocum Lake shoreline planning area (Ecology, 2010).
REFERENCES


Washington Department of Fish and Wildlife. 2009. Priority Habitats and Species Inquiry for Pend Oreille County, prepared by the Washington Department of Fish and Wildlife.

Washington Department of Natural Resources (WDNR). 1997. LeClere Creek Watershed Analysis. Olympia, WA.


## APPENDIX A

Reach-scale Assessment Summary Table

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<th>Column 3</th>
</tr>
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<td>Data 2</td>
<td>Data 3</td>
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<tr>
<td>Data 4</td>
<td>Data 5</td>
<td>Data 6</td>
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<tr>
<td>Data 7</td>
<td>Data 8</td>
<td>Data 9</td>
</tr>
</tbody>
</table>
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Reach-scale Land Use, Shoreline Designations, and Zoning/Comprehensive Plan
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## Appendix A
**Pend Oreille Shoreline Update**
**Reach Scale Assessment of Shoreline Functions**

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<tr>
<th>Reach</th>
<th>Land Use Description</th>
<th>Level of Impairment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Hydrology</td>
</tr>
<tr>
<td><strong>COLVILLE (WRIA 59)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frater Lake</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reach 1 (45.38 acres)</td>
<td>The entire reach is composed of public lands.</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The surrounding area is primarily forested and the hydrological modifications in Frater Lake are minimal.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The water quality of Frater Lake has not been tested by Ecology. However, due to the unaltered condition of the surrounding land, the water quality of the lake is likely intact.</td>
</tr>
<tr>
<td>Leo Lake</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reach 1 (66.22 acres)</td>
<td>The predominant land use is public lands (77 percent). The rest of the reach is composed of vacant lands.</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The surrounding area is primarily forested and the hydrological modifications in Leo Lake are minimal.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Leo Lake has no listings for water quality impairment.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The shoreline of Leo Lake is generally unaltered and surrounded primarily by forest habitat.</td>
</tr>
<tr>
<td><strong>LITTLE SPOKANE (WRIA 55)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chain Lake</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reach 1 (200.42 acres)</td>
<td>Approximately half of the Chain Lake reach is vacant lands (50 percent). The other half is a mix of natural resource lands, residential, and public lands.</td>
<td>Moderate</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The use of agricultural and residential wells has reduced the amount of groundwater flowing into Chain Lake.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Chain Lake is surrounded by forest and shrub habitat. However, the northern portion of the lake shoreline is impacted by roads and residential development.</td>
</tr>
<tr>
<td>Diamond Lake</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

“Low” impairment indicates that the shoreline functions are generally intact. “Moderate” represents some level of impairment. “High” indicates that the shoreline functions have been significantly altered.
### Appendix A

#### Pend Oreille Shoreline Update

**Reach Scale Assessment of Shoreline Functions**

<table>
<thead>
<tr>
<th>Reach</th>
<th>Land Use Description</th>
<th>Level of Impairment</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td><strong>Hydrology</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Water Quality</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Habitat</strong></td>
</tr>
<tr>
<td>Reach 1 (1,232.76 acres)</td>
<td>The main land uses in this reach are natural resource lands (37 percent) and agriculture (33 percent). Remaining land uses include vacant lands and residential.</td>
<td>High</td>
</tr>
<tr>
<td></td>
<td>Hydrological process modifications at Diamond Lake Reach 1 include increased sedimentation and polluted runoff due to development.</td>
<td>Water Quality</td>
</tr>
<tr>
<td></td>
<td>Habitat of the reach has been impacted by residential development and agricultural activities. However, some remnant forested areas remain.</td>
<td>Habitat</td>
</tr>
<tr>
<td>Reach 2 (449.37 acres)</td>
<td>The main land uses in this reach are active recreation (52 percent) and vacant lands (39 percent). Remaining land uses are natural resource lands and public lands.</td>
<td>High</td>
</tr>
<tr>
<td></td>
<td>Hydrological process modifications at Diamond Lake Reach 2 include increased sedimentation and polluted runoff due to development.</td>
<td>Water Quality</td>
</tr>
<tr>
<td></td>
<td>The shoreline of the reach has been impacted by logging and agricultural activities. However, some remnant forested areas remain.</td>
<td>Habitat</td>
</tr>
<tr>
<td>Fan Lake</td>
<td>The entire reach is composed of vacant lands.</td>
<td>High</td>
</tr>
<tr>
<td></td>
<td>A splash dam on Fan Lake resulted in a change in the flow of water out of the lake. Additionally, the adjacent development may result in increased sediment and polluted runoff due to development at the southern end of the lake.</td>
<td>Water Quality</td>
</tr>
</tbody>
</table>

“Low” impairment indicates that the shoreline functions are generally intact. “Moderate” represents some level of impairment. “High” indicates that the shoreline functions have been significantly altered.
<table>
<thead>
<tr>
<th>Reach</th>
<th>Land Use Description</th>
<th>Hydrology</th>
<th>Water Quality</th>
<th>Habitat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reach 1 (269.56 acres)</td>
<td>More than half of the reach is composed of vacant lands (54 percent). Other land uses include natural resource lands, single-family residential, and mobile homes</td>
<td>High</td>
<td>High Horseshoe Lake has Category 5 (polluted water) listings for dissolved oxygen and temperature.</td>
<td>Moderate The western edge of the reach has been impacted by residential development, but the eastern portion consists primarily of forest and shrub land.</td>
</tr>
<tr>
<td>Reach 2 (20.07 acres)</td>
<td>The entire reach is composed of vacant lands.</td>
<td>High</td>
<td>High Horseshoe Lake has Category 5 (polluted water) listings for dissolved oxygen and temperature.</td>
<td>Moderate The north western portion of the reach has been impacted by residential development and agriculture, but the remainder of the shoreline consists primarily of forest and shrub land.</td>
</tr>
<tr>
<td>Little Spokane River</td>
<td></td>
<td>High</td>
<td>High The Little Spokane River has a Category 5 (polluted water) listing for dissolved oxygen.</td>
<td>Moderate The riparian zone of Reach 1 consists primarily of forest habitat. Significant portions of the river’s riparian zone are disturbed with roads, residential development, and past and ongoing agricultural activities.</td>
</tr>
</tbody>
</table>

“Low” impairment indicates that the shoreline functions are generally intact. “Moderate” represents some level of impairment. “High” indicates that the shoreline functions have been significantly altered.
### Appendix A

**Pend Oreille Shoreline Update**

**Reach Scale Assessment of Shoreline Functions**

<table>
<thead>
<tr>
<th>Reach</th>
<th>Land Use Description</th>
<th>Level of Impairment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td><strong>Hydrology</strong></td>
</tr>
<tr>
<td>Reach 2 (204.46 acres)</td>
<td>The predominant land use is natural resource lands (68 percent). Other land uses include vacant lands and public lands</td>
<td>High</td>
</tr>
<tr>
<td></td>
<td></td>
<td>In-stream flows within the reach are impaired in part due to the number of single domestic wells being constructed. The proliferation of wells is driven by population growth. Additionally, surface flow and sediment from roads drains directly into the river.</td>
</tr>
<tr>
<td>Lost Lake</td>
<td></td>
<td>Low</td>
</tr>
<tr>
<td>Reach 1 (84.08 acres)</td>
<td>The entire reach is composed of natural resource lands.</td>
<td>Low</td>
</tr>
<tr>
<td>Mallard Marsh</td>
<td>Almost the entire reach is composed of recreational vehicle parks.</td>
<td>Moderate</td>
</tr>
<tr>
<td>Reach 1 (80.28 acres)</td>
<td></td>
<td>Although the majority of the shoreline consists of forested land, the hydrological processes in the lake have been adversely affected due to adjacent roads and development that have resulted in increased runoff of pollutants into the marsh</td>
</tr>
<tr>
<td>Panhandle Lake</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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<th>Hydrology</th>
<th>Water Quality</th>
<th>Habitat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reach 1 (40.56 acres)</td>
<td>The entire reach is composed of natural resource lands.</td>
<td>Moderate</td>
<td>Low</td>
<td>Low</td>
<td>Low (Panhandle Lake)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Although the majority of the shoreline consists of forested land, the hydrological process in Panhandle Lake have been adversely affected due to adjacent roads and agriculture that have resulted in increased runoff of pollutants into the lake.</td>
<td></td>
<td></td>
<td>The shoreline of Panhandle Lake consists primarily of forest habitat.</td>
</tr>
<tr>
<td>Sacheen Lake</td>
<td></td>
<td>High</td>
<td>Moderate</td>
<td>High</td>
<td>High (Sacheen Lake)</td>
</tr>
<tr>
<td>Reach 1 (644.76 acres)</td>
<td>Land use is mainly vacant lands (55 percent) and residential (35 percent).</td>
<td>The hydrological processes in Sacheen Lake have been modified by increased runoff, nutrient loading, and contamination due to livestock grazing, beaver dams and choking vegetation, roads, logging and septic systems.</td>
<td></td>
<td>Sacheen Lake has a Category 4c listing for exotic aquatic vegetation.</td>
<td>The shoreline of Sacheen Lake has been significantly impacted by dense residential development. Some remnant patches of forest habitat are present.</td>
</tr>
<tr>
<td>Trout Lake</td>
<td></td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low (Trout Lake)</td>
</tr>
<tr>
<td>Reach 1 (160.92 acres)</td>
<td>The entire reach is composed of natural resource lands.</td>
<td>The surrounding area is primarily forested and the hydrological modifications in Trout Lake are minimal.</td>
<td></td>
<td>Trout Lake has no listings for water quality impairment.</td>
<td>The shoreline of Trout Lake consists primarily of forest habitat, with some patches of shrub land. Relatively small portions of the shoreline have been altered by low-density residential development.</td>
</tr>
<tr>
<td>UnNamed Lake</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
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<td></td>
<td>Hydrology</td>
<td>Water Quality</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reach 1 (86.28 acres)</td>
<td>The predominant land use is vacant lands (83 percent).</td>
<td>High</td>
</tr>
<tr>
<td>Little Spokane River-West Branch</td>
<td>Land use is almost evenly split between natural resource lands (49 percent) and vacant lands (48 percent).</td>
<td>High</td>
</tr>
<tr>
<td>Wilderness Lake</td>
<td>The predominant land use is vacant lands (70 percent). Other land uses include natural resource lands and residential.</td>
<td>Moderate</td>
</tr>
<tr>
<td>Reach 1 (677.76 acres)</td>
<td>The predominant land use is vacant lands (83 percent).</td>
<td>High</td>
</tr>
<tr>
<td>Reach 1 (84.92 acres)</td>
<td>The predominant land use is vacant lands (70 percent). Other land uses include natural resource lands and residential.</td>
<td>Moderate</td>
</tr>
</tbody>
</table>

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<th>Habitat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reach 1 (191.84 acres)</td>
<td>The main land use is single-family residential (60 percent). Other land uses include vacant lands and natural resource lands.</td>
<td>Moderate</td>
<td>Although the majority of the shoreline consists of forested land, the hydrological processes in Reach 1 of Bead Lake have been adversely affected due to adjacent roads and residential development that have resulted in increased runoff of pollutants into Reach 1.</td>
<td>High</td>
<td>Bead Lake has Category 5 (polluted water) listings for 2,3,7,8-TCDD and PCBs.</td>
</tr>
<tr>
<td>Reach 2 (773.26 acres)</td>
<td>The predominant land use is public lands (79 percent). There are also vacant lands in this reach.</td>
<td>Moderate</td>
<td>Although the majority of the shoreline consists of forested land and is unaltered, the hydrological processes in Reach 2 of Bead Lake have been adversely affected due to increased runoff of pollutants into the lake from the land adjacent to Reach 1.</td>
<td>High</td>
<td>Bead Lake has Category 5 (polluted water) listings for 2,3,7,8-TCDD and PCBs.</td>
</tr>
<tr>
<td>Browns Lake- Middle County</td>
<td>The entire reach is composed of natural resource lands (100 percent)</td>
<td>Moderate</td>
<td>Although the majority of the shoreline consists of forested land, the hydrological processes in Reach 1 of Browns Lake Middle Co. have been adversely affected due to adjacent roads and campgrounds that have resulted in increased runoff of pollutants into the lake.</td>
<td>Moderate</td>
<td>Browns Lake Middle County has a Category 2 (water of concern) listings for dissolved oxygen.</td>
</tr>
</tbody>
</table>

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Pend Oreille Shoreline Update  
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<th>Hydrology</th>
<th>Water Quality</th>
<th>Habitat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reach 2 (152.52 acres)</td>
<td>Almost the entire reach is public lands (95 percent)</td>
<td>Low</td>
<td>Moderate</td>
<td>Although the majority of the shoreline consists of forested land, the hydrological processes in Reach 2 of Browns Lake Middle Co. have been adversely affected due to adjacent roads and campgrounds that have resulted in increased runoff of pollutants into the lake.</td>
<td>Moderate</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Browns Lake Middle County has a Category 2 (water of concern) listings for dissolved oxygen.</td>
<td></td>
<td>The shoreline of Reach 2 is generally unaltered and surrounded by forest.</td>
</tr>
<tr>
<td>Browns Lake- North County</td>
<td></td>
<td></td>
<td>Moderate</td>
<td>Browns Lake North County has a Category 4a (polluted water with an approved TMDL) for temperature.</td>
<td>Low</td>
</tr>
<tr>
<td>Reach 1 (50.81 acres)</td>
<td>The entire reach is composed of public lands (100 percent).</td>
<td>Low</td>
<td></td>
<td></td>
<td>The shoreline of this reach is unaltered and surrounded by forest.</td>
</tr>
<tr>
<td>Calispell Creek</td>
<td>The predominant land use is vacant lands (73 percent). Other land uses include agriculture, single-family residential, and natural resource lands.</td>
<td>High</td>
<td></td>
<td>High</td>
<td></td>
</tr>
<tr>
<td>Reach 1 (1,533.22 acres)</td>
<td></td>
<td></td>
<td>High</td>
<td>Calispell Creek has Category 5 (polluted water) listings for dissolved oxygen, pH, and temperature.</td>
<td>High</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>The riparian zone of Calispell Creek is significantly altered by past and ongoing agricultural activities.</td>
</tr>
<tr>
<td>Crescent Lake</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Hydrology</td>
</tr>
<tr>
<td>Reach 1 (47.19 acres)</td>
<td>The entire reach is composed of public lands.</td>
<td>Moderate</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Moderate</td>
</tr>
<tr>
<td></td>
<td>Although the majority of the shoreline consists of forested land, the hydrological processes in Crescent Lake have been adversely affected due to adjacent roads that have resulted in increased runoff of pollutants into the lake.</td>
<td>Moderate</td>
</tr>
<tr>
<td></td>
<td>Crescent Lake is not listed as an impaired waterbody by Ecology. However, its water quality is likely somewhat impaired due to adjacent roads and nearby lead and zinc mining.</td>
<td>Moderate</td>
</tr>
<tr>
<td>Davis Lake</td>
<td>The Davis Lake reach is mainly composed of single-family residential (46 percent) and vacant lands (21 percent). Other land uses include active recreation and natural resource land uses.</td>
<td>High</td>
</tr>
<tr>
<td>Reach 1 (274.75 acres)</td>
<td></td>
<td>High</td>
</tr>
<tr>
<td></td>
<td>The hydrological processes in Davis Lake have been modified by increased runoff and contaminants due to adjacent roads, residential development, agriculture, and logging.</td>
<td>Moderate</td>
</tr>
<tr>
<td>LeClerc Creek-East Branch</td>
<td>Land use in this reach is split between natural resource lands and public lands.</td>
<td>High</td>
</tr>
<tr>
<td>Reach 1 (121.24 acres)</td>
<td></td>
<td>High</td>
</tr>
<tr>
<td></td>
<td>The hydrologic modifications in Reach 1 of the East Branch LeClerc Creek include increased sediment loading due to human modifications such as agriculture, rural residential development, and roads.</td>
<td>High</td>
</tr>
<tr>
<td></td>
<td>The East Branch of LeClerc Creek has Category 5 (polluted water) listings for dissolved oxygen and temperature.</td>
<td>High</td>
</tr>
</tbody>
</table>

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### Reach Scale Assessment of Shoreline Functions

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<th>Water Quality</th>
<th>Habitat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reach 2 (98.11 acres)</td>
<td>Public land is the predominant land use (89 percent).</td>
<td>High</td>
<td>High</td>
<td>Moderate</td>
</tr>
<tr>
<td></td>
<td>The hydrologic modifications in Reach 2 of the East Branch</td>
<td></td>
<td></td>
<td>The riparian zone of this reach consists</td>
</tr>
<tr>
<td></td>
<td>LeClerc Creek include increased sediment loading due to</td>
<td></td>
<td></td>
<td>primarily of forest habitat.</td>
</tr>
<tr>
<td></td>
<td>human modifications such as agriculture, rural residence</td>
<td></td>
<td></td>
<td>However, this habitat is disturbed by a</td>
</tr>
<tr>
<td></td>
<td>development, and roads.</td>
<td></td>
<td></td>
<td>road that borders the creek for most of its</td>
</tr>
<tr>
<td></td>
<td>High</td>
<td></td>
<td></td>
<td>length.</td>
</tr>
<tr>
<td>Harvey Creek</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reach 1 (79.31 acres)</td>
<td>Land use is mainly vacant lands (77 percent). Other land uses</td>
<td>High</td>
<td>High</td>
<td>Moderate</td>
</tr>
<tr>
<td></td>
<td>include single-family residential, public lands, and natural</td>
<td></td>
<td></td>
<td>This reach consists primarily of forest</td>
</tr>
<tr>
<td></td>
<td>resource lands</td>
<td></td>
<td></td>
<td>and habitat. However, portions of the</td>
</tr>
<tr>
<td></td>
<td>High</td>
<td></td>
<td></td>
<td>riparian zone are significantly altered by</td>
</tr>
<tr>
<td></td>
<td>The hydrological process modifications in Reach 1 of</td>
<td></td>
<td></td>
<td>roads and residential development.</td>
</tr>
<tr>
<td></td>
<td>LeClerc Creek include increased sedimentation due to seasonal</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>runoff from logging areas and roads.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reach 2 (232.10 acres)</td>
<td>The reach is almost entirely composed of public lands (91</td>
<td>High</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>percent).</td>
<td></td>
<td></td>
<td>This reach consists primarily of forest</td>
</tr>
<tr>
<td></td>
<td>High</td>
<td></td>
<td></td>
<td>habitat, which is disturbed in some areas by</td>
</tr>
<tr>
<td></td>
<td>The hydrological process modifications in Reach 1 of</td>
<td></td>
<td></td>
<td>a road.</td>
</tr>
<tr>
<td></td>
<td>LeClerc Creek include increased sedimentation due to seasonal</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>runoff from logging areas and roads.</td>
<td></td>
<td></td>
<td></td>
</tr>
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<tbody>
<tr>
<td></td>
<td></td>
<td>Hydrology</td>
</tr>
<tr>
<td>Reach 1 (68.57 acres)</td>
<td>Most of the reach is composed of sawmills (70%). Other land uses include vacant lands, single-family residential, and natural resource lands.</td>
<td>High</td>
</tr>
<tr>
<td>Kings Lake</td>
<td></td>
<td>Moderate</td>
</tr>
<tr>
<td>Reach 1 (55.52 acres)</td>
<td>Land use in this reach is mainly a mix of natural resource lands (39 percent) and single-family residential (39 percent). Other land uses include public lands and vacant lands.</td>
<td>Moderate</td>
</tr>
<tr>
<td>Reach 2 (35.70 acres)</td>
<td>The entire reach is composed of public lands.</td>
<td>Moderate</td>
</tr>
</tbody>
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</tr>
</thead>
<tbody>
<tr>
<td>Reach 1 (55.60 acres)</td>
<td>Almost the entire reach is composed of natural resource lands.</td>
<td>High</td>
<td>The hydrological process modifications in Reach 1 of Lead King Lake include increased sedimentation due to seasonal runoff from logging areas and roads.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Moderate</td>
<td>Lead King Lake has no listings for water quality impairment. However, the adjacent roads have likely negatively affected the water quality of the lake.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>High</td>
<td>The shoreline is this reach is altered by an electric transmission corridor.</td>
</tr>
<tr>
<td>Reach 2 (19.48 acres)</td>
<td>The entire reach is composed of public lands.</td>
<td>High</td>
<td>The hydrological process modifications in Reach 2 of Lead King Lake include increased sedimentation due to seasonal runoff from logging areas and roads.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Moderate</td>
<td>Lead King Lake has no listings for water quality impairment. However, the adjacent roads have likely negatively affected the water quality of the lake.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>High</td>
<td>The entire reach shoreline is altered by a road. Some portions of remnant shrub habitat are present.</td>
</tr>
<tr>
<td>LeClerc Creek</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reach 1 (47.75 acres)</td>
<td>Land uses are a mix of single-family residential (40 percent) and public lands (29 percent). Other land uses include natural resource lands and vacant lands.</td>
<td>High</td>
<td>The hydrological process modifications in LeClerc Creek include increased sedimentation due to seasonal runoff from logging areas, rural residential development, cattle grazing, and agricultural pastures, and roads.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>High</td>
<td>LeClerc Creek has Category 5 (polluted water) listings for dissolved oxygen and temperature.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Moderate</td>
<td>LeClerc Creek consists of forest habitat. Portions of the riparian zone are disturbed by roads and residential development.</td>
</tr>
<tr>
<td>Ledbetter Lake</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
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<td></td>
<td></td>
<td>Hydrology</td>
</tr>
<tr>
<td>Reach 1 (70.08 acres)</td>
<td>Almost the entire reach is composed of vacant lands (67 percent). The rest of the reach is made up of natural resource lands (33 percent).</td>
<td>Low</td>
</tr>
<tr>
<td>Marshall Lake</td>
<td>The surrounding area is primarily forested and the hydrological modifications in Ledbetter Lake are minimal.</td>
<td>Low</td>
</tr>
<tr>
<td>Reach 1 (144.34 acres)</td>
<td>The natural hydrological processes in Reach 1 of Marshall Lake have been extensively modified by the dam operations and runoff from adjacent roads.</td>
<td>Moderate</td>
</tr>
<tr>
<td>Metcalf and Brownie Lakes</td>
<td>The natural hydrological processes in Reach 2 of Marshall Lake have been extensively modified by Marshall Lake dam operations and runoff from adjacent roads.</td>
<td>Moderate</td>
</tr>
<tr>
<td>Reach 1 (180.55 acres)</td>
<td>The entire reach is composed of natural resource lands.</td>
<td>High</td>
</tr>
</tbody>
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<th>Habitat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calispell Creek-Middle Fork</td>
<td>Land use is public lands (63 percent) and vacant lands (37 percent).</td>
<td>High</td>
<td>The hydrological process modifications in the Middle Fork Calispell Creek include a lack of large woody debris and canopy, as well as sedimentation in the creek, due to increased runoff and erosion due to timber harvest, off-road vehicle use, and roads.</td>
<td>High The Middle Fork of Calispell Creek has Category 5 (polluted water) listings for dissolved oxygen and pH.</td>
<td>Low The majority of Middle Fork Calispell Creek is surrounded by forest. However, portions of the riparian zone have been impacted by roads and timber harvest.</td>
</tr>
<tr>
<td>Reach 1 (67.22 acres)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mountain Meadows Lake</td>
<td>The entire reach is composed of natural resource lands.</td>
<td>High</td>
<td>The natural hydrological processes in Mountain Meadows Lake have been extensively modified by dam operations and runoff from adjacent roads.</td>
<td>Moderate Mountain Meadows Lake has no listings for water quality impairment. However, the adjacent roads have likely negatively affected the water quality of the lake.</td>
<td>Moderate The shoreline of Mountain Meadows Lake is generally unaltered, and consists primarily of forest habitat. However, this habitat is disturbed by roads in several areas.</td>
</tr>
<tr>
<td>Reach 1 (224.48 acres)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nile Lake</td>
<td>The entire reach is composed of public lands.</td>
<td>Moderate</td>
<td>Although the majority of the shoreline consists of forested land, the hydrological processes in Nile Lake have been adversely affected due to adjacent roads and logging that has resulted in increased runoff of pollutants into the lake.</td>
<td>Moderate Nile Lake has a Category 4a (approved TMDL in place) listing for temperature, and a Category 4c listing for invasive aquatic vegetation.</td>
<td>Moderate The shoreline of Nile Lake is generally unaltered, and consists of meadow and forest habitat. However, the large wetland associated with the lake has been significantly altered by agricultural activities.</td>
</tr>
<tr>
<td>Reach 1 (139.22 acres)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td><strong>Hydrology</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Moderate</td>
</tr>
<tr>
<td>Calispell Creek-North Fork</td>
<td>The predominant land use is public lands (84 percent). Almost the rest of the reach is natural resource lands (15 percent).</td>
<td>Although the majority of the shoreline consists of forested land, the hydrological processes in Reach 1 of the North Fork of Calispell Creek have been adversely affected due to adjacent roads and logging that have resulted in increased runoff of pollutants in the creek.</td>
</tr>
<tr>
<td>Reach 1 (139.15 acres)</td>
<td></td>
<td>Moderate</td>
</tr>
<tr>
<td></td>
<td>Land use is a mix of public lands (66 percent) and vacant lands (34 percent).</td>
<td>Although the majority of the shoreline consists of forested land, the hydrological processes in Reach 2 of the North Fork of Calispell Creek have been adversely affected due to adjacent roads and logging that have resulted in increased runoff of pollutants in the creek.</td>
</tr>
</tbody>
</table>

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<tbody>
<tr>
<td></td>
<td></td>
<td>Hydrology</td>
</tr>
</tbody>
</table>
| Reach 3 (99.19 acres)  | The predominant land use is vacant lands (70 percent). The remainder of the reach is natural resource lands. | High  
Although the majority of the shoreline consists of forested land, the hydrological processes in Reach 3 of the North Fork of Calispell Creek have been adversely affected due to adjacent roads and residential development that have resulted in increased runoff of pollutants in the creek. The dam upstream of this reach, at Power Lake, has resulted in a change in the natural hydrology. | High  
The North Fork of Calispell Creek has Category 5 (polluted water) listings for dissolved oxygen, pH, and temperature. | Moderate  
The riparian zone of this reach consists primarily of forest land, but portions of the zone have been altered by roads and residential development. |
| Granite Creek-North Fork |                                                                                      |                                                                                   |                                                                                   |                                                                                   |
| Reach 1 (130.40 acres) | The entire reach is composed of public lands.                                       | Moderate  
Although the majority of the shoreline consists of forested land, the hydrological processes in the creek have been adversely affected due to adjacent roads and logging that has resulted in increased runoff of pollutants into the lake. | Moderate  
The North Fork of Granite Creek has no listings for water quality impairment. However, the adjacent roads have likely negatively affected the water quality of the creek. | Moderate  
The riparian zone of the North Fork of Granite Creek consists primarily of forest habitat. However, the zone is disturbed by a road that parallels the creek. |
| North Skookum Lake      |                                                                                      |                                                                                   |                                                                                   |                                                                                   |

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<th>Habitat</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reach 1 (119.52 acres)</td>
<td>The entire reach is composed of public lands.</td>
<td>Moderate</td>
<td>Although the majority of the shoreline consists of forested land, the hydrological processes in North Skookum Lake have been adversely affected due to adjacent roads, grazing, and campgrounds that have resulted in increased runoff of pollutants into the lake.</td>
<td>Low</td>
<td>North Skookum Lake has no listings for water quality impairment.</td>
</tr>
<tr>
<td>Outlet/Harvey Creek</td>
<td>The entire reach is composed of public lands.</td>
<td>High</td>
<td>Although the majority of the shoreline consists of forested land, the hydrological processes in Outlet/Harvey Creek have been adversely affected due to adjacent roads and logging that has resulted in increased runoff of pollutants into the lake. The Sullivan Lake dam, upstream of this reach, has modified the natural flow regime.</td>
<td>High</td>
<td>Outlet/Harvey Creek has a Category 5 (polluted water) listing for dissolved oxygen.</td>
</tr>
</tbody>
</table>

Parker Lake

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<tbody>
<tr>
<td></td>
<td>Hydrology</td>
<td>Water Quality</td>
</tr>
<tr>
<td>Reach 1 (111.17 acres)</td>
<td>The entire reach is composed of public lands.</td>
<td>High</td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>Parker Lake has a Category 2 (water of concern) listing for dissolved oxygen.</td>
</tr>
<tr>
<td></td>
<td>Although the majority of the shoreline consists of forested land, the hydrological processes in Parker Lake have been adversely affected due to adjacent roads and agriculture development that has resulted in increased runoff of pollutants into the lake.</td>
<td>Moderate</td>
</tr>
<tr>
<td></td>
<td>The shoreline of Parker Lake is unaltered, and the lake and its associated wetlands are surrounded primarily by forest habitat. Portions of the land bordering Parker Lake are disturbed by a roads and land clearing activities.</td>
<td>Moderate</td>
</tr>
<tr>
<td>Pend Oreille River</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
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<th>Habitat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boundary Reservoir – Canyon (1,033.91 acres)</td>
<td>The predominant use in the reach is public lands (71 percent). Remaining uses include a mix of vacant and natural resource lands.</td>
<td>High</td>
<td></td>
<td>High</td>
<td>Moderate</td>
</tr>
<tr>
<td></td>
<td>High Although the majority of the shoreline consists of forested land, the hydrological processes in the Boundary Reservoir Canyon reach of the Pend Oreille River have been adversely affected due to adjacent roads and agriculture development that has resulted in increased runoff of pollutants into the reach. The natural hydrologic processes in the reach have been extensively modified by the Box Canyon Dam, located upstream, and Boundary Dam, located downstream.</td>
<td></td>
<td></td>
<td>High The Pend Oreille River has Category 5 (polluted water) listings for Aldrin, PCBs, pH, and temperature.</td>
<td>The riparian zone of this reach consists primarily of forest habitat. Some areas are disturbed by prior land clearing/logging activities.</td>
</tr>
<tr>
<td>Boundary Reservoir – Upper (1,241.69 acres)</td>
<td>The reach is mainly vacant (44 percent) or public lands (25 percent) Remaining uses include residential and natural resource lands</td>
<td>High</td>
<td></td>
<td>High</td>
<td></td>
</tr>
<tr>
<td></td>
<td>High Although some of the shoreline consists of forested land, the hydrological processes in the Boundary Reservoir Upper reach of the Pend Oreille River have been adversely affected due to adjacent roads and urban development that has resulted in increased runoff of pollutants into the reach. The natural hydrologic processes in the reach have been extensively modified by the Box Canyon Dam, located upstream, and Boundary Dam, located downstream.</td>
<td></td>
<td></td>
<td>High The Pend Oreille River has Category 5 (polluted water) listings for Aldrin, PCBs, pH, and temperature.</td>
<td>High Some forest cover is present in riparian zone, but significant portions of zone are impacted by roads and urban development.</td>
</tr>
</tbody>
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<tr>
<td></td>
<td></td>
<td>Hydrology</td>
</tr>
<tr>
<td>Boundary Reservoir – Forebay</td>
<td>The predominant use in the reach is public lands (68 percent). Much of the remaining reach is vacant with some natural resource lands</td>
<td>High</td>
</tr>
<tr>
<td>(305.83 acres)</td>
<td></td>
<td>Although most of the shoreline consists of forested land, the hydrological processes in the Boundary Reservoir Forebay reach of the Pend Oreille River have been adversely affected due to adjacent roads and urban development that has resulted in increased runoff of pollutants into the reach. The natural hydrologic processes in the reach have been extensively modified by the Box Canyon Dam located upstream and Boundary Dam located downstream.</td>
</tr>
<tr>
<td>Boundary Reservoir – Tailrace</td>
<td>The predominant land use in the reach is vacant lands (69 percent). The remaining reach is composed of public lands.</td>
<td>High</td>
</tr>
<tr>
<td>(108.97 acres)</td>
<td></td>
<td>Although some of the shoreline consists of forested land, the hydrological processes in the Boundary Reservoir Tailrace reach of the Pend Oreille River have been adversely affected due to adjacent roads and land clearing activities that has resulted in increased runoff of pollutants into the reach. The natural hydrologic processes in the reach have been extensively modified by the Boundary Dam, upstream of the reach.</td>
</tr>
</tbody>
</table>

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</tr>
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<tbody>
<tr>
<td>Box Canyon 1 (1,696.55 acres)</td>
<td>The reach is a mix of vacant lands (32 percent), residential (28 percent) or public lands (17 percent). Remaining uses are a mix of natural resource lands and agriculture.</td>
<td>High</td>
<td>Some patches of remnant forest land border the river; however, large portions of the riparian zone are disturbed by roads, urban/residential development, and agricultural activities.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Box Canyon 2 (2,637.56 acres)</td>
<td>The reach is mainly vacant (38 percent) or residential (31 percent). The remaining land uses are public lands and natural resource lands.</td>
<td>High</td>
<td>Some patches of remnant forest land border the river; however, large portions of the riparian zone are disturbed by roads, urban/residential development, and agricultural activities.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Hydrology: High</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Water Quality: High</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Habitat: High</td>
</tr>
<tr>
<td>Box Canyon 3 (7,328.23 acres)</td>
<td>The reach is a mix of vacant (34 percent), public lands (19 percent) and natural resource lands (15 percent). Remaining land uses include agriculture and residential.</td>
<td>High Although some of the shoreline consists of forested land, the hydrological processes in the Box Canyon 3 reach of the Pend Oreille River have been adversely affected due to adjacent roads, urban development, and agricultural activities that have resulted in increased runoff of pollutants into the reach. The natural hydrologic processes in the reach have been extensively modified by the Albeni Falls Dam located upstream and the Box Canyon Dam located downstream.</td>
</tr>
<tr>
<td>Box Canyon 4 (2,051.34 acres)</td>
<td>The reach is mainly vacant (36 percent) with some agriculture use (26 percent). Remaining uses include residential, public lands and natural resource lands</td>
<td>High Although some of the shoreline consists of forested land, the hydrological processes in the Box Canyon 4 reach of the Pend Oreille River have been adversely affected due to adjacent roads, development, and agricultural activities that have resulted in increased runoff of pollutants into the reach. The natural hydrologic processes in the reach have been extensively modified by the Albeni Falls Dam located upstream and the Box Canyon Dam located downstream.</td>
</tr>
</tbody>
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</tr>
</thead>
<tbody>
<tr>
<td>Box Canyon 5 (185.64 acres)</td>
<td>The main use in this reach is agriculture (62 percent) with some vacant land (23 percent). Remaining land use is natural resource lands.</td>
<td>High</td>
<td>Although some of the shoreline consists of forested land, the hydrological processes in the Box Canyon 5 reach of the Pend Oreille River have been adversely affected due to adjacent roads, development, and agricultural activities that have resulted in increased runoff of pollutants into the reach. The natural hydrologic processes in the reach have been extensively modified by the Albeni Falls Dam located upstream and the Box Canyon Dam located downstream.</td>
<td>High. The Pend Oreille River has Category 5 (polluted water) listings for Aldrin, PCBs, pH, and temperature.</td>
<td>High. Reach 5 consists of a series of wetlands associated with Reach 4. The majority of these wetlands are highly disturbed by agricultural activities.</td>
</tr>
<tr>
<td>Box Canyon 6 (14,997.81 acres)</td>
<td>The main use in this reach is agriculture (47 percent) with some vacant land (21 percent). The remainder of the reach is dominated with natural resource lands.</td>
<td>High</td>
<td>Although some of the shoreline consists of forested land, the hydrological processes in the Box Canyon 6 reach of the Pend Oreille River have been adversely affected due to adjacent roads, development, and agricultural activities that have resulted in increased runoff of pollutants into the reach. The natural hydrologic processes in the reach have been extensively modified by the Albeni Falls Dam located upstream and the Box Canyon Dam located downstream.</td>
<td>High. The Pend Oreille River has Category 5 (polluted water) listings for Aldrin, PCBs, pH, and temperature.</td>
<td>High. Reach 6 consists of a series of wetlands associated with Reach 3. The majority of these wetlands are highly disturbed by agricultural activities.</td>
</tr>
</tbody>
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</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>Reach 1 (43.64 acres)</td>
<td>The entire reach is composed of public lands.</td>
<td>Low</td>
<td>Low</td>
<td>The shoreline of Petit Lake is unaltered and bordered by forest habitat.</td>
</tr>
<tr>
<td><strong>Power Lake</strong></td>
<td></td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>Reach 1 (123.95 acres)</td>
<td>The entire reach is composed of vacant lands.</td>
<td>High</td>
<td>Moderate</td>
<td>Moderate</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>The shoreline of Power Lake is generally unaltered and surrounded by forest land. Portions of the surrounding forest are disturbed by a road.</td>
</tr>
<tr>
<td><strong>Scotchman Lake</strong></td>
<td></td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>Reach 1 (61.94 acres)</td>
<td>Almost the entire reach is composed of vacant lands (95 percent).</td>
<td>Low</td>
<td>Low</td>
<td>The shoreline of this reach is unaltered, and consists primarily of forest habitat.</td>
</tr>
</tbody>
</table>

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<td></td>
<td>Hydrology</td>
</tr>
<tr>
<td>Reach 2 (25.73 acres)</td>
<td>Almost the entire reach is composed of public lands (84 percent). The rest of the reach is natural resource lands.</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>The surrounding area is primarily forested and the hydrological modifications in Reach 2 of Scotchman Lake are minimal.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Scotchman Lake has no listings for water quality impairment.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td></td>
</tr>
<tr>
<td>Shearer Lake</td>
<td></td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>The surrounding area is primarily forested and the hydrological modifications in Shearer Lake are minimal.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Shearer Lake has no listings for water quality impairment.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td></td>
</tr>
<tr>
<td>Skookum Creek</td>
<td></td>
<td>High</td>
</tr>
<tr>
<td></td>
<td>Land uses are mainly a mix of agriculture (42 percent) and natural resource lands (36 percent). Other land uses include vacant lands and single-family residential.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>The natural hydrological processes in Skookum Creek have been extensively modified by agriculture activities and runoff from adjacent roads.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Skookum Creek has a Category 5 (polluted water) listing for fecal coliform.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>High</td>
<td></td>
</tr>
<tr>
<td>Slate Creek</td>
<td></td>
<td></td>
</tr>
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<td></td>
<td><strong>Hydrology</strong></td>
</tr>
<tr>
<td>Reach 1 (91.63 acres)</td>
<td>The entire reach is composed of public lands.</td>
<td>Moderate</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Although the riparian area is generally intact, the natural hydrological processes in Skookum Creek have been modified by agriculture activities, logging, and runoff from adjacent roads.</td>
</tr>
<tr>
<td>Granite Creek-South Fork</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reach 1 (112.79 acres)</td>
<td>The entire reach is composed of public lands.</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>The surrounding area is primarily forested and the hydrological modifications in Reach 1 of South Fork Granite Creek are minimal.</td>
<td>The water quality of South Fork Granite Creek has not been tested by Ecology. However, due to the unaltered condition of the surrounding land, the water quality of the stream is likely intact.</td>
</tr>
<tr>
<td>Reach 2 (117.01 acres)</td>
<td>The entire reach is composed of public lands.</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>The surrounding area is primarily forested and the hydrological modifications in Reach 2 of South Fork Granite Creek are minimal.</td>
<td>The water quality of South Fork Granite Creek has not been tested by Ecology. However, due to the unaltered condition of the surrounding land, the water quality of the stream is likely intact.</td>
</tr>
<tr>
<td>South Salmo River</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reach 1 (270.17 acres)</td>
<td>The entire reach is composed of public lands.</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>The surrounding area is primarily forested and the hydrological modifications in South Salmo River are minimal.</td>
<td>The South Salmo River has a Category 2 (water of concern) listings for pH.</td>
</tr>
</tbody>
</table>

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<td></td>
<td>Hydrology</td>
</tr>
<tr>
<td>South Skookum Lake</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reach 1 (69.09 acres)</td>
<td>The entire reach is composed of public lands.</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Low</td>
</tr>
<tr>
<td>Sullivan Creek</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reach 1 (444.63 acres)</td>
<td>The entire reach is composed of public lands.</td>
<td>Moderate</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Moderate</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Moderate</td>
</tr>
<tr>
<td>Reach 2 (195.34 acres)</td>
<td>The entire reach is composed of public lands.</td>
<td>Moderate</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Moderate</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Moderate</td>
</tr>
</tbody>
</table>

“Low” impairment indicates that the shoreline functions are generally intact. “Moderate” represents some level of impairment. “High” indicates that the shoreline functions have been significantly altered.
### Reach Scale Assessment of Shoreline Functions

<table>
<thead>
<tr>
<th>Reach</th>
<th>Land Use Description</th>
<th>Level of Impairment</th>
<th>Hydrology</th>
<th>Water Quality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reach 3 (124.40 acres)</td>
<td>Almost the entire reach is in public  lands (95 percent).</td>
<td>High</td>
<td>The natural hydrological processes in Reach 3 of Sullivan Creek have been modified by runoff from adjacent roads, rural residential development, and logging. The Mill Pond and Sullivan Lake dams have changed the natural hydrology in this reach.</td>
<td>High The lower portion of Sullivan Creek has a Category 5 (polluted water) listing for dissolved oxygen.</td>
</tr>
<tr>
<td>Reach 4 (129.00 acres)</td>
<td>Most of the reach is natural resource lands (72 percent). Other land uses include public lands and vacant lands.</td>
<td>High</td>
<td>The natural hydrological processes in Reach 4 of Sullivan Creek have been modified by runoff from adjacent roads, rural residential development, and logging. The Mill Pond dam has changed the natural hydrology in this reach.</td>
<td>High The lower portion of Sullivan Creek has a Category 5 (polluted water) listing for dissolved oxygen.</td>
</tr>
<tr>
<td>Sullivan Lake</td>
<td></td>
<td></td>
<td></td>
<td>Moderate The riparian zone of this reach is dominated by forest land; however, several areas have been disturbed by roads and residential development.</td>
</tr>
<tr>
<td>Reach 1 (1,509.20 acres)</td>
<td>Almost the entire reach is public lands.</td>
<td></td>
<td></td>
<td>Moderate The majority of this reach consists of forest land; however, the downstream end is significantly altered by roads and residential/urban development.</td>
</tr>
<tr>
<td>Sullivan Mill Pond</td>
<td></td>
<td></td>
<td></td>
<td>Moderate The shoreline of Sullivan Lake is relatively unaltered, and is surrounded by forest land. However, the connection between the lake and surrounding forest is disturbed by a road that encircles the lake. In addition, there is some development and land clearing near the dam, at the northwest corner of the lake.</td>
</tr>
</tbody>
</table>

“Low” impairment indicates that the shoreline functions are generally intact. “Moderate” represents some level of impairment. “High” indicates that the shoreline functions have been significantly altered.
Appendix A
Pend Oreille Shoreline Update
Reach Scale Assessment of Shoreline Functions

<table>
<thead>
<tr>
<th>Reach</th>
<th>Land Use Description</th>
<th>Level of Impairment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Hydrology</td>
</tr>
<tr>
<td>Reach 1 (99.64 acres)</td>
<td>The entire reach is composed of public lands.</td>
<td>High</td>
</tr>
<tr>
<td>Tacoma Creek</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reach 1 (116.68 acres)</td>
<td>Almost the entire reach is composed of public lands.</td>
<td>High</td>
</tr>
<tr>
<td>Reach 2 (180.28 acres)</td>
<td>Land use is a mix of public lands (43 percent) and vacant lands (29 percent) Other land uses include natural resource lands and residential.</td>
<td>High</td>
</tr>
<tr>
<td>UnNamed Wetland</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

“Low” impairment indicates that the shoreline functions are generally intact. “Moderate” represents some level of impairment. “High” indicates that the shoreline functions have been significantly altered.
Appendix A  
Pend Oreille Shoreline Update  
Reach Scale Assessment of Shoreline Functions

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<tr>
<th>Reach</th>
<th>Land Use Description</th>
<th>Level of Impairment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Hydrology</td>
<td>Water Quality</td>
</tr>
<tr>
<td>Reach 1 (61.25 acres)</td>
<td>The entire reach is composed of public lands.</td>
<td>Moderate After the majority of the shoreline consists of forested land, the hydrological processes in UnNamed Wetland have been adversely affected due to adjacent roads and logging that has resulted in increased runoff of pollutants into the wetland.</td>
</tr>
</tbody>
</table>

Priest River-Upper West Branch

| Reach 1 (110.51 acres)         | Land use is a mix of public lands (60 percent) and vacant lands (40 percent).         | High The natural hydrological processes in Reach 1 of the Upper West Branch Priest River have been extensively modified by agriculture activities, logging, rerouting water into ditches, and runoff from adjacent roads. | Moderate The Upper West Branch of the Priest River has no listings for water quality impairment. However, the water quality of the river is likely negatively affected by the roads in its watershed. Low This reach is dominated by shrub and forest habitat, and exhibits little human alteration. |

| Reach 2 (92.10 acres)          | Land use is a mix of public lands (58 percent) and vacant lands (42 percent).          | High The natural hydrological processes in Reach 2 of the Upper West Branch Priest River have been extensively modified by agriculture activities, logging, rerouting water into ditches, and runoff from adjacent roads. | Moderate The Upper West Branch of the Priest River has no listings for water quality impairment. However, the water quality of the river is likely negatively affected by the roads in its watershed. Low This reach is dominated by shrub and forest habitat. Portions of the riparian zone are disturbed by roads. |

LeClerc Creek-West Branch

“Low” impairment indicates that the shoreline functions are generally intact. “Moderate” represents some level of impairment. “High” indicates that the shoreline functions have been significantly altered.
# Appendix A
## Pend Oreille Shoreline Update
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<table>
<thead>
<tr>
<th>Reach</th>
<th>Land Use Description</th>
<th>Level of Impairment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Hydrology: High</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Water Quality: High</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Habitat: Low</td>
</tr>
<tr>
<td>Reach 1 (125.36 acres)</td>
<td>Land use is a mix of public lands (65 percent) and natural resource lands (35 percent).</td>
<td>The natural hydrological processes in Reach 1 of the West Branch LeClerc Creek have been modified by agriculture activities, logging, and runoff from adjacent roads.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>This reach is dominated by forest habitat, and exhibits low human disturbance.</td>
</tr>
<tr>
<td>Reach 2 (164.79 acres)</td>
<td>More than half of the land use is public lands (54 percent). Almost the entire rest of the reach is composed of natural resource lands (39 percent).</td>
<td>The natural hydrological processes in Reach 2 of the West Branch LeClerc Creek have been modified by agriculture activities, logging, and runoff from adjacent roads.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>This reach is dominated by forest habitat, and exhibits relatively low human disturbance.</td>
</tr>
<tr>
<td>Reach 3 (170.91 acres)</td>
<td>The predominant land use is public lands (87 percent). Other land uses include natural resource lands and vacant lands.</td>
<td>The natural hydrological processes in Reach 3 of the West Branch LeClerc Creek have been modified by agriculture activities, logging, and runoff from adjacent roads.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>This reach is dominated by forest habitat. However, the riparian zone is disturbed by a road that parallels the creek.</td>
</tr>
<tr>
<td>Yocum Lake</td>
<td></td>
<td>Low</td>
</tr>
<tr>
<td>Reach1 (8.37 acres)</td>
<td>The entire reach is composed of natural resource lands.</td>
<td>Low The surrounding area is primarily forested and the hydrological modifications in Reach 1 of Yocum Lake are minimal.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The shoreline of this reach is unaltered and dominated by forest habitat.</td>
</tr>
</tbody>
</table>

“Low” impairment indicates that the shoreline functions are generally intact. “Moderate” represents some level of impairment. “High” indicates that the shoreline functions have been significantly altered.
### Appendix A
Pend Oreille Shoreline Update
Reach Scale Assessment of Shoreline Functions

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<th>Land Use Description</th>
<th>Level of Impairment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Hydrology</td>
</tr>
<tr>
<td>Reach 2 (79.98 acres)</td>
<td>More than half of the reach is vacant lands (58 percent) with most of the remainder in public lands (39 percent).</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>The surrounding area is primarily forested and the hydrological modifications in Reach 2 of Yocum Lake are minimal.</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>Yocum Lake has no listings for water quality impairment.</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>The shoreline of this reach is unaltered and dominated by forest habitat. The forest is disturbed in some areas by roads.</td>
<td>Low</td>
</tr>
<tr>
<td>UPPER LAKE ROOSEVELT (WRIA 61)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heather/Big Meadow Lake</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reach 1 (171.15 acres)</td>
<td>Almost the entire reach is composed of vacant lands (98 percent).</td>
<td>High</td>
</tr>
<tr>
<td></td>
<td>The natural hydrological processes in Heather/Big Meadow Lake have been modified by agriculture activities, logging, and runoff from adjacent roads. Additionally, the Heather Lake Dam has changed the hydrology of the lake.</td>
<td>High</td>
</tr>
<tr>
<td></td>
<td>Heather/Big Meadow Lake has a Category 4a (approved TMDL in place) listing for temperature.</td>
<td>High</td>
</tr>
<tr>
<td></td>
<td>Heather/Big Meadow Lake is surrounded primarily by forest. However, the land bordering the north shore of the lake is disturbed by a road, and the western portion by a road/modified bank.</td>
<td>High</td>
</tr>
</tbody>
</table>
# Appendix B
## Pend Oreille Shoreline Update
### Reach Scale Land Use, Shoreline Designations and Zoning/Comprehensive Plan Land Use

<table>
<thead>
<tr>
<th>Reach Number</th>
<th>Existing Land Use</th>
<th>Zoning / Comprehensive Plan Designations</th>
<th>Current Shoreline Environment Designation</th>
<th>Proposed Shoreline Designation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>COLVILLE (WRIA 59)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frater Lake</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reach 1 (45.38 acres)</td>
<td>Public lands (100%)</td>
<td>Public Lands (100%)</td>
<td>Conservancy (100%)</td>
<td>Natural (60%) Aquatic (30%)</td>
</tr>
<tr>
<td>Leo Lake</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reach 1 (66.22 acres)</td>
<td>Public lands (77%)</td>
<td>Natural Resource-NR40 (23%)</td>
<td>Conservancy (100%)</td>
<td>Natural (42%) Aquatic (58%)</td>
</tr>
<tr>
<td><strong>LITTLE SPOKANE (WRIA 55)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chain Lake</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reach 1 (200.42 acres)</td>
<td>Vacant lands (50%)</td>
<td>Natural Resource-NR20 (30%)</td>
<td>Conservancy (100%)</td>
<td>Rural Conservancy (50%) Rural Residential (&lt;1%) Aquatic (~49%)</td>
</tr>
<tr>
<td><strong>Diamond Lake</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reach 1 (1,232.76 acres)</td>
<td>Natural resource lands (37%) Agriculture (33%) Mobile homes (4%)</td>
<td>Natural Resource-NR20 (66%)</td>
<td>Rural Conservancy (39%) Rural Residential (12%) Aquatic (49%)</td>
<td>Rural Conservancy (39%) Rural Residential (12%) Aquatic (49%)</td>
</tr>
</tbody>
</table>
## Appendix B
### Pend Oreille Shoreline Update
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<tr>
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<th>Existing Land Use</th>
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<th>Current Shoreline Environment Designation</th>
<th>Proposed Shoreline Designation</th>
</tr>
</thead>
</table>
| Reach 2 (449.37 acres) | Active recreation (52%)  
Vacant lands (39%)  
Natural resource lands (6%)  
Public lands (4%) | Natural Resource-NR20 (6%)  
Rural-R10 (<1%)  
Rural-R5 (94%) | Conservancy (77%)  
Urban (23%) | Rural Conservancy (68%)  
Aquatic (32%) |
| **Fan Lake** | | | | |
| Reach 1 (157.46) | Vacant lands (100%) | Natural Resource-NR20 (14%)  
Natural Resource-NR40 (<1%)  
Rural-R10 (63%)  
Rural-R40 (23%) | Conservancy (100%) | Natural (60%)  
Aquatic (40%) |
| **Horseshoe Lake** | | | | |
| Reach 1 (269.56 acres) | Vacant lands (54%)  
Natural resource lands (23%)  
Single-family residential (16%)  
Mobile homes (6%)  
Public lands (1%) | Natural Resource-NR20 (28%)  
Natural Resource-NR40 (11%)  
Rural-R10 (14%)  
Rural-R20 (17%)  
Rural-R40 (21%) | Conservancy (75%)  
Urban (25%) | Natural (13%)  
Rural Conservancy (31%)  
Rural Residential (7%)  
Aquatic (51%) |
| Reach 2 (20.07 acres) | Vacant lands (100%) | Public (100%) | Conservancy (43%)  
Urban (57%) | Natural (59%) |
| **Little Spokane River** | | | | |
| Reach 1 (293.54 acres) | Natural resource lands (53%)  
Vacant lands (19%)  
Single-family residential (9%)  
Mobile homes (8%)  
Agriculture (5%)  
Railroad ROW (4%)  
Public lands (2%) | Natural Resource-NR20 (61%)  
Natural Resource-NR40 (<1%)  
Public Lands (<1%)  
Rural-R10 (<1%)  
Rural-R20 (18%)  
Rural-R5 (20%) | Conservancy (84%)  
Rural (16%) | Rural Conservancy (100%) |
### Appendix B
**Pend Oreille Shoreline Update**
Reach Scale Land Use, Shoreline Designations and Zoning/Comprehensive Plan Land Use

<table>
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<tr>
<th>Reach Number</th>
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<th>Current Shoreline Environment Designation</th>
<th>Proposed Shoreline Designation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reach 2 (204.46)</td>
<td>Natural resource lands (68%) Vacant lands (17%) Public lands (10%) Single-family residential (2%) Mobile homes (2%) Railroad ROW (1%)</td>
<td>Natural Resource-NR20 (61%) Public Lands (10%) Rural-R10 (6%) Rural-R20 (15%) Rural-R40 (6%) Rural-R5 (1.5%)</td>
<td>Conservancy (100%)</td>
<td>Rural Conservancy (100%)</td>
</tr>
<tr>
<td><strong>Lost Lake</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reach 1 (84.08)</td>
<td>Natural resource lands (100%)</td>
<td>Natural Resource-NR20 (100%)</td>
<td>Conservancy (100%)</td>
<td>Rural Conservancy (66%) Aquatic (34%)</td>
</tr>
<tr>
<td><strong>Mallard Marsh</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reach 1 (80.28)</td>
<td>Recreational vehicle parks (97%) Vacant lands (2%)</td>
<td>Natural Resource-NR20 (&lt;1%) Natural Resource-NR40 (&lt;1%) Rural-R10 (69%) Rural-R20 (2%) Rural-R40 (28%)</td>
<td>Conservancy (100%)</td>
<td>Rural Conservancy (50%) Rural Residential (&lt;1%) Aquatic (~49%)</td>
</tr>
<tr>
<td><strong>Panhandle Lake</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reach 1 (40.56)</td>
<td>Natural resource lands (100%)</td>
<td>Natural Resource-NR20 (100%)</td>
<td>Conservancy (100%)</td>
<td>Rural Conservancy (60%) Aquatic (40%)</td>
</tr>
<tr>
<td><strong>Sacheen Lake</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Reach 1 (644.76 acres)</td>
<td>Vacant lands (55%)&lt;br&gt;Single-family residential (30%)&lt;br&gt;Natural resource lands (7%)&lt;br&gt;Mobile home and mobile home parks/courts (5%)&lt;br&gt;Public lands (2%)&lt;br&gt;Recreational activities (1%)</td>
<td>Natural Resource-NR20 (7%)&lt;br&gt;Natural Resource-NR40 (&lt;1%)&lt;br&gt;Public Lands (1%)&lt;br&gt;Rural-R10 (8%)&lt;br&gt;Rural-R20 (40%)&lt;br&gt;Rural-R40 (&lt;1%)&lt;br&gt;Rural-R5 (44%)</td>
<td>Conservancy (19%)&lt;br&gt;Urban (81%)</td>
<td>Rural Conservancy (34%)&lt;br&gt;Rural Residential (15%)&lt;br&gt;Aquatic (51%)</td>
</tr>
<tr>
<td>Trout Lake</td>
<td>Natural resource lands (100%)</td>
<td>Natural Resource-NR20 (99%)&lt;br&gt;Rural-R20 (&lt;1%)</td>
<td>Conservancy (100%)</td>
<td>Rural Conservancy (37%)&lt;br&gt;Aquatic (63%)</td>
</tr>
<tr>
<td>Reach 1 (160.92 acres)</td>
<td>Natural resource lands (100%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>UnNamed Lake</td>
<td>Vacant lands (83%)&lt;br&gt;Single-family residential (8%)&lt;br&gt;Agriculture (5%)&lt;br&gt;Religious Institution (2%)&lt;br&gt;Natural resource lands (2%)</td>
<td>Natural Resource-NR40 (7%)&lt;br&gt;Rural-R20 (5%)&lt;br&gt;Rural-R5 (88%)</td>
<td>Conservancy (100%)</td>
<td>Rural Conservancy (64%)&lt;br&gt;Aquatic (36%)</td>
</tr>
<tr>
<td>W Branch Little Spokane River</td>
<td>Natural resource lands (49%)&lt;br&gt;Vacant lands (48%)&lt;br&gt;Public lands (1%)&lt;br&gt;Single-family residential (1%)&lt;br&gt;Mobile homes (1%)</td>
<td>Natural Resource-NR20 (38%)&lt;br&gt;Natural Resource-NR40 (18%)&lt;br&gt;Public Lands (13%)&lt;br&gt;Rural-R10 (7%)&lt;br&gt;Rural-R20 (12%)&lt;br&gt;Rural-R40 (10%)&lt;br&gt;Rural-R5 (2%)</td>
<td>Conservancy (97%)&lt;br&gt;Urban (3%)</td>
<td>Natural (20%)&lt;br&gt;Rural Conservancy (80%)</td>
</tr>
</tbody>
</table>
### Appendix B

**Pend Oreille Shoreline Update**  
Reach Scale Land Use, Shoreline Designations and Zoning/Comprehensive Plan Land Use

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<tr>
<th>Reach Number</th>
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<th>Proposed Shoreline Designation</th>
</tr>
</thead>
</table>
| Wilderness Lake | Vacant lands (70%)  
Natural resource lands (20%)  
Single-family residential (6%)  
Mobile homes (4%) | Natural Resource-NR20 (20%)  
Rural-R20 (80%) | Rural Conservancy (54%)  
Aquatic (46%) | |
| Trask Pond | | | | |
| Reach 1 (132.20 acres) | Vacant lands (65%)  
Natural resource lands (34%) | Natural Resource-NR20 (79%)  
Rural-R20 (6%)  
Rural-R40 (15%) | Rural (100%) | Rural Conservancy (50%)  
Aquatic (50%) |
| PEND OREILLE (WRIA 62) | | | | |
| Anderson Lake | | | | |
| Reach 1 (55.85 acres) | Natural resource lands (63%)  
Vacant lands (24%)  
Single-family residential (12%) | Natural Resource-NR20 (62%)  
Natural Resource-NR40 (2%)  
Public Lands (5%)  
Rural-R20 (32%) | Rural Conservancy (58%)  
Aquatic (42%) | |
| Bead Lake | | | | |
| Reach 1 (191.84 acres) | Single-family residential (60%)  
Vacant lands (27%)  
Natural resource lands (12%) | Natural Resource-NR20 (13%)  
Public Lands (2%)  
Rural-R10 (71%)  
Rural-R20 (13%) | Conservancy (56%)  
Urban (47%)  
Aquatic (78%) | Rural Residential (22%)  
Aquatic (78%) |
<table>
<thead>
<tr>
<th>Reach Number</th>
<th>Existing Land Use</th>
<th>Zoning / Comprehensive Plan Designations</th>
<th>Current Shoreline Environment Designation</th>
<th>Proposed Shoreline Designation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reach 2 (773.26 acres)</td>
<td>Public lands (79%) Single-family residential (4%) Natural Resource Lands (4%) Vacant lands (13%)</td>
<td>Natural Resource-NR40 (&lt;1%) Public Lands (89%) Rural-R10 (4%) Rural-R20 (%) Rural-R40 (%) Tribal (%)</td>
<td>Conservancy (100%)</td>
<td>Natural (24%) Rural Conservancy (1%) Rural Residential (1%) Aquatic (74%)</td>
</tr>
<tr>
<td>Browns Lake-Middle County</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reach 1 (6.56 acres)</td>
<td>Natural resource lands (100%)</td>
<td>Natural Resource-NR40 (100%)</td>
<td></td>
<td>Natural (75%) Aquatic (25%)</td>
</tr>
<tr>
<td>Reach 2 (152.52 acres)</td>
<td>Public lands (95%) Natural resource lands (5%)</td>
<td>Natural Resource-NR40 (5%) Public Lands (95%)</td>
<td></td>
<td>Natural (39%) Aquatic (61%)</td>
</tr>
<tr>
<td>Browns Lake-North County</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reach 1 (50.81 acres)</td>
<td>Public lands (100 percent)</td>
<td>Public Lands (100%)</td>
<td>Conservancy (100%)</td>
<td>Natural (47%) Aquatic (53%)</td>
</tr>
<tr>
<td>Calispell Creek</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reach 1 (1,533.22 acres)</td>
<td>Vacant lands (73%) Agriculture (14%) Single-family residential (8%) Natural resource lands (4%)</td>
<td>Cusick (&lt;1%) Natural Resource-NR20 (16%) Natural Resource-NR40 (&lt;1%) Public Lands (9%) Rural-R5 (10%) Rural-R10 (20%) Rural-R40 (41%) Tribal (2%)</td>
<td>Rural (93%) Urban (3%)</td>
<td>Rural Conservancy (44%) Rural Residential (1%) Tribal (&lt;1%) Urban Conservancy (&lt;1%) Urban Residential (1%) Aquatic (~52)</td>
</tr>
<tr>
<td>Crescent Lake</td>
<td></td>
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</table>
## Appendix B
### Pend Oreille Shoreline Update
#### Reach Scale Land Use, Shoreline Designations and Zoning/Comprehensive Plan Land Use

<table>
<thead>
<tr>
<th>Reach Number</th>
<th>Existing Land Use</th>
<th>Zoning / Comprehensive Plan Designations</th>
<th>Current Shoreline Environment Designation</th>
<th>Proposed Shoreline Designation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reach 1 (47.19 acres)</td>
<td>Public lands (100%)</td>
<td>Public Lands (100%)</td>
<td>Natural (53%)</td>
<td>Natural (53%)</td>
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<tr>
<td>Davis Lake</td>
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<tr>
<td>Reach 1 (274.75 acres)</td>
<td>Single-family residential (46%)</td>
<td>Natural Resource-NR20 (16%)</td>
<td>Conservancy (62%)</td>
<td>Rural Conservancy (32%)</td>
</tr>
<tr>
<td></td>
<td>Vacant lands (21%)</td>
<td>Rural-R5 (57%)</td>
<td>Natural (19%)</td>
<td>Rural Residential (11%)</td>
</tr>
<tr>
<td></td>
<td>Natural resource lands (16%)</td>
<td>Rural-R10 (10%)</td>
<td>Urban (19%)</td>
<td>Aquatic (57%)</td>
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<tr>
<td></td>
<td>Active recreation (17%)</td>
<td>Rural-R20 (17%)</td>
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<tr>
<td>LeClerc Creek-East Branch</td>
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<td></td>
<td>Conservancy (100%)</td>
<td>Natural (50%)</td>
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<tr>
<td></td>
<td>Natural resource lands (50%)</td>
<td>Natural Resource-NR20 (50%)</td>
<td>Natural (50%)</td>
<td>Rural Conservancy (50%)</td>
</tr>
<tr>
<td></td>
<td>Public lands (50%)</td>
<td>Public Lands (50%)</td>
<td>Rural Conservancy (50%)</td>
<td>Natural (87%)</td>
</tr>
<tr>
<td>Reach 2 (98.11 acres)</td>
<td>Public lands (89%)</td>
<td>Natural Resource-NR20 (11%)</td>
<td>Conservancy (100%)</td>
<td>Natural (87%)</td>
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<td></td>
<td>Natural resource lands (11%)</td>
<td>Public Lands (89%)</td>
<td>Rural Conservancy (13%)</td>
<td>Rural Conservancy (13%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rural-R10 (&lt;1%)</td>
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<tr>
<td>Harvey Creek</td>
<td></td>
<td></td>
<td>Conservancy (100%)</td>
<td>Natural (19%)</td>
</tr>
<tr>
<td>Reach 1 (79.31 acres)</td>
<td>Vacant lands (77%)</td>
<td>Natural Resource-NR20 (13%)</td>
<td>Conservancy (100%)</td>
<td>Natural (19%)</td>
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<tr>
<td></td>
<td>Natural resource lands (13%)</td>
<td>Public Lands (17%)</td>
<td>Rural Conservancy (81%)</td>
<td>Rural Conservancy (81%)</td>
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<tr>
<td></td>
<td>Public lands (5%)</td>
<td>Rural-R10 (65%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Single-family residential (5%)</td>
<td>Rural-R20 (4%)</td>
<td></td>
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<tr>
<td>Reach 2 (232.10 acres)</td>
<td>Public lands (91%)</td>
<td>Natural Resource-NR20 (9%)</td>
<td>Conservancy (100%)</td>
<td>Natural (90%)</td>
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<tr>
<td></td>
<td>Natural resource lands (9%)</td>
<td>Public Lands (91%)</td>
<td>Rural Conservancy (10%)</td>
<td>Rural Conservancy (10%)</td>
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### Appendix B
Pend Oreille Shoreline Update
Reach Scale Land Use, Shoreline Designations and Zoning/Comprehensive Plan Land Use

<table>
<thead>
<tr>
<th>Reach Number</th>
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<th>Current Shoreline Environment Designation</th>
<th>Proposed Shoreline Designation</th>
</tr>
</thead>
</table>
| Reach 1 (68.57 acres) | Sawmills (70%)  
Vacant lands (9%)  
Single-family residential (9%)  
Natural resource lands (8%)  
Mobile homes (2%)  
Public lands (2%) | Ione (72%)  
Natural Resource-NR20 (8%)  
Public Lands (2%)  
Rural-R10 (14%)  
Rural-R20 (4%) | Urban (100%) | Urban Higher Intensity (53%)  
Aquatic (47%) |
| Kings Lake | | | |
| Reach 1 (55.52 acres) | Natural resource lands (39%)  
Single-family residential (39%)  
Public lands (14%)  
Vacant lands (8%) | Natural Resource-NR40 (39%)  
Public Lands (14%)  
Rural-R20 (39%)  
Rural-R40 (8%) | Conservancy (100%) | Rural Conservancy (41%)  
Aquatic (59%) |
| Reach 2 (35.70 acres) | Public lands (100%) | Natural Resource-NR40 (<1%)  
Public Lands (99%) | Conservancy (100%) | Natural (37%)  
Aquatic (63%) |
| Lead King Lake | | | |
| Reach 1 (55.60 acres) | Natural resource lands (99%)  
Vacant lands (1%) | Natural Resource-NR20 (99%)  
Public Lands (<1) | Rural Conservancy (48%)  
Aquatic (52%) |
| Reach 2 (19.48 acres) | Public lands (100%) | Public Lands (100%) | Rural Conservancy (76 %)  
Aquatic (24%) |
| LeClerc Creek | | | |
| Reach 1 (47.45 acres) | Single-family residential (40%)  
Public lands (29%)  
Natural resource lands (15%)  
Vacant lands (11%)  
Mobile homes (5%) | Natural Resource-NR20 (15%)  
Public Lands (35%)  
Rural-R5 (31%)  
Rural-R10 (20%) | Conservancy (100%) | Natural (36%)  
Rural Conservancy (17%)  
Rural Residential (46%) |
<table>
<thead>
<tr>
<th>Reach Number</th>
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<th>Proposed Shoreline Designation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ledbetter Lake</td>
<td>Vacant lands (67%)</td>
<td>Natural Resource-NR20 (33%) Rural-R5 (67%)</td>
<td>Conservancy (100%)</td>
<td>Rural Conservancy (42%) Aquatic (58%)</td>
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<tr>
<td>Reach 1 (70.08 acres)</td>
<td>Natural resource lands (33%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marshall Lake</td>
<td>Vacant lands (41%)</td>
<td>Natural Resource-NR20 (&lt;1%) Public Lands (1.5%) Rural-R10 (27%) Rural-R20 (50%) Rural-R40 (20.5%)</td>
<td>Conservancy (38%) Urban (62%)</td>
<td>Rural Conservancy (28%) Aquatic (72%)</td>
</tr>
<tr>
<td>Reach 1 (144.34 acres)</td>
<td>Mobile homes (27%) Single-family residential (15%) Vacation homes and cabins (14%) Public lands (2%) Natural resource land (1%)</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Reach 2 (143.82 acres)</td>
<td>Public lands (53%)</td>
<td>Public Lands (95%) Rural-R20 (5%)</td>
<td>Conservancy (94%) Urban (6%)</td>
<td>Natural (32%) Rural Conservancy (2%) Aquatic (66%)</td>
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<tr>
<td>Metcalf and Brownie Lakes</td>
<td>Vacation lands (46%)</td>
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<td></td>
<td></td>
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<tr>
<td>Reach 1 (180.55 acres)</td>
<td>Natural resource lands (100%)</td>
<td>Natural Resource-NR20 (100%)</td>
<td>Conservancy (100%)</td>
<td>Rural Conservancy (50%)</td>
</tr>
<tr>
<td>Calispell Creek-Middle Fork</td>
<td>Public lands (63%)</td>
<td>Public Lands (100%)</td>
<td></td>
<td>Natural (100%)</td>
</tr>
<tr>
<td>Reach 1 (67.22 acres)</td>
<td>Vacant lands (37%)</td>
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</tr>
<tr>
<td>Mountain Meadows Lake</td>
<td>Natural resource lands (100%)</td>
<td>Natural Resource-NR20 (100%)</td>
<td></td>
<td>Rural Conservancy (100%)</td>
</tr>
<tr>
<td>Nile Lake</td>
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</table>
# Appendix B

## Pend Oreille Shoreline Update

Reach Scale Land Use, Shoreline Designations and Zoning/Comprehensive Plan Land Use

<table>
<thead>
<tr>
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<th>Proposed Shoreline Designation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Reach 1 (139.22 acres)</strong></td>
<td>Public lands (100%)</td>
<td>Public Lands (100%)</td>
<td>Conservancy (100%)</td>
<td>Natural (80%) Aquatic (20%)</td>
</tr>
<tr>
<td><strong>Calispell Creek-North Fork</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reach 1 (139.15 acres)</td>
<td>Public lands (84%) Natural resource lands (15%) Vacant lands (1%)</td>
<td>Natural Resource-NR20 (15%) Public Lands (85%)</td>
<td></td>
<td>Natural (100%)</td>
</tr>
<tr>
<td>Reach 2 (129.50 acres)</td>
<td>Public lands (66%) Vacant lands (34%)</td>
<td>Public Lands (100%)</td>
<td>Conservancy (100%)</td>
<td>Natural (100%)</td>
</tr>
<tr>
<td>Reach 3 (99.19 acres)</td>
<td>Vacant lands (70%) Natural resource lands (30%)</td>
<td>Natural Resource-NR20 (30%) Public Lands (48%) Rural-R10 (21%) Rural-R40 (&lt;1%)</td>
<td>Conservancy (65%) Rural (35%)</td>
<td>Natural (31%) Rural Conservancy (69%)</td>
</tr>
<tr>
<td><strong>Granite Creek-North Fork</strong></td>
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<tr>
<td>Reach 1 (130.40 acres)</td>
<td>Public lands (100%)</td>
<td>Public Lands (100%)</td>
<td></td>
<td>Natural (100%)</td>
</tr>
<tr>
<td><strong>North Skookum Lake</strong></td>
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</tr>
<tr>
<td>Reach 1 (119.52 acres)</td>
<td>Public lands (100%)</td>
<td>Public Lands (100%)</td>
<td>Conservancy (100%)</td>
<td>Natural (53%) Aquatic (47%)</td>
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<tr>
<td><strong>Outlet/Harvey Creek</strong></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reach 1 (23.52 acres)</td>
<td>Public lands (100%)</td>
<td>Public Lands (100%)</td>
<td>Conservancy (100%)</td>
<td>Natural (100%)</td>
</tr>
<tr>
<td><strong>Parker Lake</strong></td>
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</tr>
<tr>
<td>Reach 1 (111.17 acres)</td>
<td>Public lands (100%)</td>
<td>Public Lands (100%)</td>
<td>Conservancy (100%)</td>
<td>Natural (40%) Aquatic (60%)</td>
</tr>
</tbody>
</table>
## Appendix B
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Reach Scale Land Use, Shoreline Designations and Zoning/Comprehensive Plan Land Use

<table>
<thead>
<tr>
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<th>Proposed Shoreline Designation</th>
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</thead>
<tbody>
<tr>
<td>Boundary Reservoir-Canyon</td>
<td>Public lands (71%)</td>
<td>Natural Resource-NR20 (14%)</td>
<td>Conservancy (100%)</td>
<td>Natural (40%)</td>
</tr>
<tr>
<td>(1,033.91 acres)</td>
<td>Vacant land (8%)</td>
<td>Natural Resource-NR40 (3%)</td>
<td></td>
<td>Rural Conservancy (5%)</td>
</tr>
<tr>
<td></td>
<td>Natural resource lands (21%)</td>
<td>Public Lands (87%)</td>
<td></td>
<td>Urban Conservancy (1%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Aquatic (54%)</td>
</tr>
<tr>
<td>Boundary Reservoir-Upper</td>
<td>Vacant (44%)</td>
<td>Metaline (7.5%)</td>
<td>Conservancy (85%)</td>
<td>Natural (10%)</td>
</tr>
<tr>
<td>(1,241.69 acres)</td>
<td>Public lands (25%)</td>
<td>Metaline Falls (3%)</td>
<td>Urban (15%)</td>
<td>Rural Conservancy (16%)</td>
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<tr>
<td></td>
<td>Single-family residential (13%)</td>
<td>Natural Resource-NR20 (11.1%)</td>
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<td>Rural High Intensity (2%)</td>
</tr>
<tr>
<td></td>
<td>Natural resource lands (12%)</td>
<td>Public Lands (39%)</td>
<td></td>
<td>Rural Residential (1%)</td>
</tr>
<tr>
<td></td>
<td>Educational facility (3%)</td>
<td>Rural-R5 (20%)</td>
<td></td>
<td>Urban Conservancy (4%)</td>
</tr>
<tr>
<td></td>
<td>Mobile homes (2%)</td>
<td>Rural-R10 (11%)</td>
<td></td>
<td>Urban Residential (2%)</td>
</tr>
<tr>
<td></td>
<td>Agriculture (2%)</td>
<td>Rural-R20 (8%)</td>
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<td>Aquatic (65%)</td>
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<tr>
<td></td>
<td></td>
<td>Rural-R40 (&lt;1%)</td>
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<td>Boundary Reservoir-Forebay</td>
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<td>Public Lands (100%)</td>
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<td>(305.83 acres)</td>
<td>Vacant (25%)</td>
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<td>Aquatic (74%)</td>
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<td>Boundary Reservoir-Tailrace</td>
<td>Vacant lands (69%)</td>
<td>Public Lands (100%)</td>
<td>Conservancy (100%)</td>
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<tr>
<td>(108.97 acres)</td>
<td>Public lands (31%)</td>
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<td>Rural High Intensity (28%)</td>
</tr>
<tr>
<td>Box Canyon 1</td>
<td>Vacant lands (32%)</td>
<td>Ione (2.5%)</td>
<td>Conservancy (73%)</td>
<td>Natural (7%)</td>
</tr>
<tr>
<td>(1,696.55 acres)</td>
<td>Single-family residential (23%)</td>
<td>Natural Resource-NR20 (18%)</td>
<td>Urban (27%)</td>
<td>Rural Conservancy (11%)</td>
</tr>
<tr>
<td></td>
<td>Mobile homes (5%)</td>
<td>Natural Resource-NR40 (1.5%)</td>
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<td></td>
<td>Public lands (17%)</td>
<td>Public Lands (25%)</td>
<td></td>
<td>Rural Residential (20%)</td>
</tr>
<tr>
<td></td>
<td>Natural resource lands (13%)</td>
<td>Rural-R5 (15%)</td>
<td></td>
<td>Urban Conservancy (2%)</td>
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<tr>
<td></td>
<td>Agriculture (8%)</td>
<td>Rural-R10 (25%)</td>
<td></td>
<td>Urban Higher Intensity (&lt;1%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rural-R20 (12%)</td>
<td></td>
<td>Urban Residential (1%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Aquatic (~59%)</td>
</tr>
</tbody>
</table>
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</tr>
</thead>
<tbody>
<tr>
<td>Box Canyon 2 (2,637.56 acres)</td>
<td>Vacant (38%)&lt;br&gt;Single-family residential (26%)&lt;br&gt;Mobile home (5%)&lt;br&gt;Public lands (16%)&lt;br&gt;Natural resource lands (13%)&lt;br&gt;Agriculture (2%)</td>
<td>Natural Resource-NR20 (15%)&lt;br&gt;Public Lands (24%)&lt;br&gt;Rural-R5 (34%)&lt;br&gt;Rural-R10 (14%)&lt;br&gt;Rural-R20 (12%)&lt;br&gt;Rural-R40 (&lt;1%)</td>
<td>Conservancy (44%)&lt;br&gt;Natural (4%)&lt;br&gt;Rural (10%)&lt;br&gt;Urban (42%)</td>
<td>Natural (6%)&lt;br&gt;Rural Conservancy (11%)&lt;br&gt;Rural Residential (17%)&lt;br&gt;Aquatic (66%)</td>
</tr>
<tr>
<td>Box Canyon 3 (7,328.23 acres)</td>
<td>Vacant (34%)&lt;br&gt;Public lands (19%)&lt;br&gt;Natural resource lands (15%)&lt;br&gt;Agriculture (14%)&lt;br&gt;Residential (12%)&lt;br&gt;Industrial (4%)</td>
<td>Cusick (&lt;1%)&lt;br&gt;Natural Resource-NR20 (25%)&lt;br&gt;Public Lands (21%)&lt;br&gt;Rural-R5 (13%)&lt;br&gt;Rural-R10 (5%)&lt;br&gt;Rural-R20 (10%)&lt;br&gt;Rural-R40 (3%)&lt;br&gt;TL (23%)</td>
<td>Conservancy (40%)&lt;br&gt;Rural (38%)&lt;br&gt;Urban (22%)</td>
<td>Natural (9%)&lt;br&gt;Rural Conservancy (16%)&lt;br&gt;Rural Residential (3%)&lt;br&gt;Tribal (9%)&lt;br&gt;Urban Conservancy (&lt;1%)&lt;br&gt;Urban Residential (1%)&lt;br&gt;Aquatic (~61%)</td>
</tr>
<tr>
<td>Box 4 (2,051.34 acres)</td>
<td>Vacant (36%)&lt;br&gt;Agriculture use (26%)&lt;br&gt;Single-family residential (14%)&lt;br&gt;Mobile home (4%)&lt;br&gt;Public lands (10%)&lt;br&gt;Natural resource lands (9%)</td>
<td>Newport (&lt;1%)&lt;br&gt;Natural Resource-NR20 (18%)&lt;br&gt;Natural Resource-NR40 (23%)&lt;br&gt;Public Lands (12%)&lt;br&gt;Rural-R5 (17%)&lt;br&gt;Rural-R10 (10%)&lt;br&gt;Rural-R20 (10%)&lt;br&gt;Rural-R40 (10%)</td>
<td>Conservancy (44%)&lt;br&gt;Natural (4%)&lt;br&gt;Urban (42%)</td>
<td>Natural (12%)&lt;br&gt;Rural Conservancy (8%)&lt;br&gt;Rural Residential (11%)&lt;br&gt;Urban Residential (1%)&lt;br&gt;Aquatic (67%)</td>
</tr>
</tbody>
</table>
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**Reach Scale Land Use, Shoreline Designations and Zoning/Comprehensive Plan Land Use**

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</tr>
</thead>
<tbody>
<tr>
<td>Box Canyon 5 (185.64 acres)</td>
<td>Agriculture (62%) Vacant land (23%) Natural resource lands (10%) Single-family residential (2%) Mobile homes (3%)</td>
<td>Natural Resource-NR20 (72%) Rural-R5 (26%) Rural-R10 (1.5%) Rural-R20 (&lt;1%)</td>
<td>Conservancy (&lt;1%) Urban (99%)</td>
<td>Natural (&lt;1%) Rural Conservancy (68%) Rural Residential (33%)</td>
</tr>
<tr>
<td>Box Canyon 6 (14,997.81 acres)</td>
<td>Agriculture (49%) Vacant land (21%) Natural resource lands (18%) Public lands (8%) Industrial (2%) Single-family residential (1%)</td>
<td>Cusick (&lt;1%) Natural Resource-NR20 (56%) Natural Resource-NR40 (3%) Public Lands (11%) Rural-R5 (4.5%) Rural-R10 (2%) Rural-R20 (1%) Rural-R40 (1.5%) Tribal (20%)</td>
<td>Conservancy (&lt;1%) Rural (97%) Urban (3%)</td>
<td>Natural (3%) Rural Conservancy (80%) Rural Residential (&lt;1%) Tribal (15%) Urban Conservancy (&lt;1%)</td>
</tr>
<tr>
<td>Petit Lake</td>
<td></td>
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</tr>
<tr>
<td>Reach 1 (43.64 acres)</td>
<td>Public lands (100%)</td>
<td>Public Lands (100%)</td>
<td></td>
<td>Natural (53%) Aquatic (47%)</td>
</tr>
<tr>
<td>Power Lake</td>
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</tr>
<tr>
<td>Reach 1 (123.95 acres)</td>
<td>Vacant lands (100%)</td>
<td>Public Lands (100%)</td>
<td>Conservancy (100%)</td>
<td>Natural (51%) Aquatic (49%)</td>
</tr>
<tr>
<td>Scotchman Lake</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reach 1 (61.94 acres)</td>
<td>Vacant lands (95%) Single-family residential (5%) Natural resource lands (1%)</td>
<td>Natural Resource-NR20 (&lt;1%) Rural-R10 (25%) Rural-R20 (74%)</td>
<td>Conservancy (100%)</td>
<td>Rural Conservancy (46%) Aquatic (54%)</td>
</tr>
</tbody>
</table>
## Reach Scale Land Use, Shoreline Designations and Zoning/Comprehensive Plan Land Use

<table>
<thead>
<tr>
<th>Reach Number</th>
<th>Existing Land Use</th>
<th>Zoning / Comprehensive Plan Designations</th>
<th>Current Shoreline Environment Designation</th>
<th>Proposed Shoreline Designation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reach 2 (25.73 acres)</td>
<td>Public lands (84%) Natural resource lands (16%)</td>
<td>Natural Resource-NR20 (16%) Public Lands (84%)</td>
<td>Conservancy (100%)</td>
<td>Natural (60%) Aquatic (40%)</td>
</tr>
</tbody>
</table>

**Shearer Lake**

| Reach 1 (93.62 acres) | Natural resource lands (100%) | Natural Resource-NR20 (100%) | Conservancy (100%) | Rural Conservancy (41%) Aquatic (59%) |

**Skookum Creek**

| Reach 1 (137.88 acres) | Agriculture (42%) Natural resource lands (36%) Vacant lands (15%) Single-family residential (5%) Mobile homes (2%) | Natural Resource-NR20 (79%) Rural-R5 (4%) Rural-R10 (17%) Rural-R40 (<1%) | Conservancy (100%) | Rural Conservancy (100%) |

**Slate Creek**

| Reach 1 (91.63 acres) | Public lands (100%) | Public Lands (100%) | Natural (100%) |

**Granite Creek-South Fork**

| Reach 1 (112.79 acres) | Public lands (100%) | Public Lands (100%) | Natural (100%) |
| Reach 2 (117.01 acres) | Public lands (100%) | Public Lands (100%) | Natural (100%) |

**South Salmo River**

| Reach 1 (270.17 acres) | Public lands (100%) | Public Lands (100%) | Natural (100%) |

**South Skookum Lake**

| Reach 1 (69.09 acres) | Public lands (100%) | Public Lands (100%) | Conservancy (100%) | Natural (47%) Aquatic (53%) |

**Sullivan Creek**

| Reach 1 (444.63 acres) | Public lands (100%) | Public Lands (100%) | Conservancy (100%) | Natural (100%) |
## Reach Scale Land Use, Shoreline Designations and Zoning/Comprehensive Plan Land Use

<table>
<thead>
<tr>
<th>Reach Number</th>
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<th>Current Shoreline Environment Designation</th>
<th>Proposed Shoreline Designation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reach 2 (195.34 acres)</td>
<td>Public lands (100%)</td>
<td>Public Lands (100%)</td>
<td>Conservancy (100%)</td>
<td>Natural (100%)</td>
</tr>
<tr>
<td>Reach 3 (124.40 acres)</td>
<td>Public lands (95%)&lt;br&gt;Natural resource lands (3%)&lt;br&gt;Vacant lands (1%)</td>
<td>Natural Resource-NR20 (3%)&lt;br&gt;Public Lands (95%)&lt;br&gt;Rural-R10 (&lt;1%)&lt;br&gt;Rural-R20 (&lt;1%)</td>
<td>Conservancy (100%)</td>
<td>Natural (100%)</td>
</tr>
<tr>
<td>Reach 4 (129.00)</td>
<td>Natural resource lands (72%)&lt;br&gt;Public lands (20%)&lt;br&gt;Vacant lands (7%)&lt;br&gt;Single-family residential (1%)</td>
<td>Metaline Falls (&lt;1%)&lt;br&gt;Natural Resource-NR20 (32%)&lt;br&gt;Natural Resource-NR40 (17%)&lt;br&gt;Public Lands (50%)</td>
<td>Conservancy (100%)</td>
<td>Natural (69%)&lt;br&gt;Urban Conservancy (31%)</td>
</tr>
<tr>
<td>Sullivan Lake</td>
<td>Public lands (99%)&lt;br&gt;Vacant lands (1%)</td>
<td>Public Lands (100%)</td>
<td>Conservancy (100%)</td>
<td>Natural (12%)&lt;br&gt;Rural Conservancy (3%)&lt;br&gt;Aquatic (85%)</td>
</tr>
<tr>
<td>Reach 1 (1,509.20 acres)</td>
<td>Public lands (99%)&lt;br&gt;Vacant lands (1%)</td>
<td>Public Lands (100%)</td>
<td>Conservancy (100%)</td>
<td>Natural (12%)&lt;br&gt;Rural Conservancy (3%)&lt;br&gt;Aquatic (85%)</td>
</tr>
<tr>
<td>Sullivan Mill Pond</td>
<td>Public lands (100%)</td>
<td>Public Lands (100%)</td>
<td>Conservancy (100%)</td>
<td>Natural (41%)</td>
</tr>
<tr>
<td>Tacoma Creek</td>
<td>Public lands (97%)&lt;br&gt;Vacant lands (3%)</td>
<td>Public Lands (100%)</td>
<td>Conservancy (100%)</td>
<td>Natural (100%)</td>
</tr>
<tr>
<td>Reach 2 (180.28 acres)</td>
<td>Public lands (43%)&lt;br&gt;Vacant lands (29%)&lt;br&gt;Natural resource lands (15%)&lt;br&gt;Single-family residential (11%)&lt;br&gt;Mobile homes (1%)</td>
<td>Natural Resource-NR20 (15%)&lt;br&gt;Public Lands (43%)&lt;br&gt;Rural-R10 (34%)&lt;br&gt;Rural-R20 (7%)</td>
<td>Conservancy (100%)</td>
<td>Natural (43%)&lt;br&gt;Rural Conservancy (57%)</td>
</tr>
<tr>
<td>UnNamed Wetland</td>
<td>Public lands (100%)</td>
<td>Public Lands (100%)</td>
<td>Conservancy (100%)</td>
<td>Natural (100%)</td>
</tr>
</tbody>
</table>
## Appendix B
### Pend Oreille Shoreline Update
### Reach Scale Land Use, Shoreline Designations and Zoning/Comprehensive Plan Land Use

<table>
<thead>
<tr>
<th>Reach Number</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Reach 1 (61.25 acres)</td>
<td>Public lands (100%)</td>
<td>Public Lands (100%)</td>
<td></td>
<td>Rural Conservancy (50%) Aquatic (50%)</td>
</tr>
<tr>
<td>Priest River-Upper West Branch</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reach 1 (110.51 acres)</td>
<td>Public lands (60%) Vacant lands (40%)</td>
<td>Public Lands (60%) Rural-R40 (40%)</td>
<td></td>
<td>Natural (100%)</td>
</tr>
<tr>
<td>Reach 2 (92.10 acres)</td>
<td>Public lands (58%) Vacant lands (42%)</td>
<td>Public Lands (58%) Rural-R40 (42%)</td>
<td></td>
<td>Natural (100%)</td>
</tr>
<tr>
<td>LeClerc Creek-West Branch</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reach 1 (125.36 acres)</td>
<td>Public lands (65%) Natural resource lands (35%)</td>
<td>Natural Resource-NR40 (35%) Public Lands (65%)</td>
<td></td>
<td>Natural (100%)</td>
</tr>
<tr>
<td>Reach 2 (164.79 acres)</td>
<td>Public lands (54%) Natural resource lands (39%) Vacant lands (5%) Single-family residential (1%)</td>
<td>Natural Resource-NR20 (40%) Public Lands (54%) Rural-R10 (6%)</td>
<td>Conservancy (100%)</td>
<td>Natural (53%) Rural Conservancy (47%)</td>
</tr>
<tr>
<td>Reach 3 (170.91 acres)</td>
<td>Public lands (87%) Natural resource lands (7%) Vacant lands (6%)</td>
<td>Natural Resource-NR20 (7%) Public Lands (93%)</td>
<td>Conservancy (100%)</td>
<td>Natural (93%) Rural Conservancy (7%)</td>
</tr>
<tr>
<td>Yocum Lake</td>
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<td></td>
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</tr>
<tr>
<td>Reach 1 (8.37 acres)</td>
<td>Natural resource lands (100%)</td>
<td>Natural Resource-NR20 (100%)</td>
<td>Conservancy (100%)</td>
<td>Natural (59%) Aquatic (41%)</td>
</tr>
<tr>
<td>Reach 2 (79.98 acres)</td>
<td>Vacant lands (58%) Public lands (39%) Natural resource lands (2%)</td>
<td>Natural Resource-NR40 (2%) Public Lands (98%)</td>
<td>Conservancy (100%)</td>
<td>Natural (48%) Aquatic (52%)</td>
</tr>
</tbody>
</table>

**UPPER LAKE ROOSEVELT (WRIA 61)**
## Reach Scale Land Use, Shoreline Designations and Zoning/Comprehensive Plan Land Use

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Heather/Big Meadow Lake</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reach 1 (171.15 acres)</td>
<td>Vacant lands (98%)</td>
<td>Public Lands (58%)</td>
<td></td>
<td>Natural (50%)</td>
</tr>
<tr>
<td></td>
<td>Public lands (2%)</td>
<td>Rural-R40 (42%)</td>
<td></td>
<td>Aquatic (50%)</td>
</tr>
</tbody>
</table>