

APPENDIX B
COLUMBIA RIVER REACH
CHARACTERIZATION TABLES AND
REACH MAPS

| Columbia River (Lake Roosevelt) – Reach 1 | | Ferry County |
|---|--|---------------------|
| Reach Description | | |
| Columbia River from the confluence with the Kettle River to the northeast (NE) ¼ of T35N_R37E_S31 near French Point Rocks | | |
| Shoreline Jurisdiction | | |
| 3,446 acres | | |
|   | | |
| Source: https://fortress.wa.gov/ecy/coastalatlantools/UICoastalAtlas/Tools/ShorePhotos.aspx | | |
| Subreaches (SRs); see Maps 10 and 11: | | |
| <ul style="list-style-type: none">• SR 1a – Begins at the confluence with the Kettle River and extends south to the NE ¼ of T36N_R37E_S02 past the mouth of Nancy Creek• SR 1b – Extends 1.9 miles to the south to the upstream side of U.S. Route 395 Bridge• SR 1c – Extends 1.1 miles to the south to the northern edge of the Sherman Creek Wildlife Area | | |

| Columbia River (Lake Roosevelt) – Reach 1 | Ferry County |
|---|---------------------|
| <ul style="list-style-type: none"> SR 1d – Extends 10.3 miles to the south to the NE ¼ of T35N_R37E_S31 near French Point Rocks | |
| Characteristics | |
| Ownership | |
| Reach 1 is mostly public (U.S. Bureau of Reclamation, Washington Department of Fish & Wildlife, and Ferry County) with a small amount (less than 10%) of private ownership. | |
| Land Use/Current Shoreline Management Program | |
| Land Use Designation: | |
| <ul style="list-style-type: none"> Current land uses are private ownership and public lands Rural and Rural Service Area | |
| Current Shoreline Management Program Environment Designation: | |
| <ul style="list-style-type: none"> Conservancy for Federal and State owned lands; for private ownership Conservancy for 50 feet from the ordinary high water mark (OHWM) Rural for the remaining 150 feet | |
| Existing Land Cover/Development | |
| SR 1a, 1b, and 1d consist mostly of publicly owned land, and there is little development except roads and railroads. SR 1c is developed with private residences. | |
| Geomorphic Character | |
| <p>Description – Throughout this reach, the Columbia River is controlled by the Grand Coulee Dam. The banks and shoreline consist of mostly of continental glacial outwash with local outcrops of bedrock. The shoreline consists of low banks to areas of moderately high banks. River levels can fluctuate based on downstream dam operations.</p> <p>Hardened Banks – Approximately 1,550 feet of hardened banks are present in Reach 1 and are associated with the railroad and US 395 alignments.</p> | |
| Flooding and Geological Hazard | |
| <p>Flooding – Flooding is regulated by Grand Coulee Dam operations and controls located downstream in addition to reservoirs located upstream in Canada that store floodwater in accordance with the Columbia River Treaty.</p> <p>Geological Hazards – Reach 1 has soils susceptible to moderate to severe erosion. SR 1a – 3a and 1d contain slopes that are greater than 15% and underlain by glacial continental drift (SR 1a – 1d) and mass-wasting deposits (SR 1d), which make them designated landslide hazard areas. No mine sites or areas susceptible to erosion are located within Reach 1.</p> | |
| Existing Public Access | |
| Reach 1 of the Columbia River has several formal public access sites and numerous informal ones. French Rocks Boat Launch is an improved, for-fee, boat launch managed by the National Park | |

| Columbia River (Lake Roosevelt) – Reach 1 | Ferry County |
|---|---------------------|
| <p>Service (NPS). There is a floating restroom and pump-out station for boaters in this reach. Haag Cove Campground is managed by the NPS and provides campground (tents/trailers), a picnic area, swimming, boating, fishing, and drinking water. Sherman Creek Wildlife Area, which is managed by Washington Department of Fish and Wildlife, is in this reach, providing trails, restrooms, and parking. U.S. Route 395 parallels most of the reach. Boaters can access the shoreline anywhere in the reach, as long as they are below the OHWM.</p> <p>Identified Public Access Improvements</p> <p>There are general public access improvements defined in NPS’s Lake Roosevelt National Recreation Area Shoreline Management Plan; however, there are no specific improvements identified for Reach 1 of the Columbia River.</p> <p>Public Access Opportunities</p> <p>Public access opportunities may be adequate for this reach.</p> | |
| Ecological Conditions | |
| <p>Water Quantity and Sediment</p> <p>The major tributary inflows to Reach 1 include Sherman, Nancy, Roger, and Martin creeks. Numerous unnamed tributaries flow into the river along its alignment. Throughout this reach, the Columbia River is controlled by the Grand Coulee Dam and is managed as a lake. No flow data are collected along this reach or in the tributary streams; however, flow data are collected downstream at Grand Coulee Dam.</p> <p>Sediments are likely accumulating throughout this reach because the river is managed as a lake impounded by the Grand Coulee Dam downstream. Sediment input sources likely include tributary inflow and landslide potential along steep slopes. In addition, the draft of Columbia River (Lake Roosevelt) levels may cause some movement of sediment.</p> | |
| <p>Water Quality</p> <p>In SR 1d, a total maximum daily load (TMDL) is in place for dioxin. Water quality is likely impacted from upstream historical industrial runoff.</p> | |
| <p>Habitat Characteristics and Priority Habitat Species Presence</p> <p>This reach is regularly used as wintering area (foraging and perching) for bald eagles. The shorelines in this reach are all under management by NPS as part of the Lake Roosevelt National Recreation Area. The Columbia River in this reach supports a number of fish species, as identified in the Inventory, Analysis, and Characterization (IAC) Report.</p> <ul style="list-style-type: none"> • SR 1a – This subreach is adjacent to the Kettle Falls arm and Kettle Falls area. The shoreline consists of a wide band of land bounded by U.S. Route 395 and/or railroad tracks in the uplands. There is some residential development within this area. Vegetation is a mixture of grasses, shrubs, and small trees forming patches along the shoreline and in the uplands. Due to site topography and geology, some areas of the shoreline lack vegetation in this subreach. • SR 1b – This subreach is adjacent to U.S. Route 395 along the entire subreach. The shoreline has been stabilized and only a minimal amount of riparian vegetation is present. | |

| Columbia River (Lake Roosevelt) – Reach 1 | Ferry County |
|--|---------------------|
| <ul style="list-style-type: none"> • SR 1c – This subreach is noted for large concentrations of white-tailed deer in winter. There is some residential development along the shoreline, but the shorelines are relatively steep. Vegetation includes deciduous forested areas in patches or bands along the shoreline mixed with maintained residential landscaping. There are small embayments along this subreach that may provide off-channel habitat for rearing fish and more gently sloping shorelines; these areas are accessible via boat, as well as from uplands. • SR 1d – This sub-reach is adjacent to areas identified to contain large concentrations of white-tailed deer in winter. This subreach includes a number of large and smaller coves, including around Sherman Creek and Haag Cove. These are all accessible to and used by boats, and some are accessible via uplands. There are other informal trails along the shoreline, which are accessible from roads in the uplands. The upland vegetation is forested with a mix of coniferous and deciduous trees, which extends to the water's edge along most of the subreach. There are residences and other structures located along the shoreline, and in these areas some upland forested habitat has been cleared. The shorelines are steep bluffs in some locations, appearing highly erodible. The subreach runs along Inchelium Highway for a significant portion of the southern end of the reach. The density of residential development increases as Inchelium Highway approaches the shoreline. | |
| Ecological Functions Analysis | |
| SR 1a | |
| Level of Existing Function | |
| SR 1a is designated as Partially Functioning, mostly based on transportation corridor impacts. | |
| Stressors | |
| Development: | |
| <ul style="list-style-type: none"> • River Bridge Road and railroad trestle channel crossing • Railroad corridor segments within jurisdiction boundary • Rural residential development, mostly outside of jurisdiction boundary • Informal access roads through shrub-steppe upland habitat • Log booms | |
| Recreational use: | |
| <ul style="list-style-type: none"> • Informal trails through shrub-steppe habitat | |
| Potential Restoration Opportunities | |
| Consolidate water access trails and replant degraded areas with native vegetation. | |
| Potential Protection Opportunities | |
| Protect native riparian and shrub-steppe vegetation to preserve and support re-establishment of this land-cover type. Limit recreation access within intact riparian and shrub-steppe areas. Make stormwater controls for new development consistent with Eastern Washington Stormwater Manual. | |

| Columbia River (Lake Roosevelt) – Reach 1 | Ferry County |
|---|---------------------|
| SR 1b | |
| Level of Existing Function | |
| SR 1b is designated as Partially Functioning, based on transportation corridor and recreation impacts. | |
| Stressors | |
| Development: | |
| <ul style="list-style-type: none"> • U.S. Route 395 and rail corridor, in some areas with associated armoring, limiting channel migration • Informal access roads through shrub-steppe upland habitat | |
| Recreational use: | |
| <ul style="list-style-type: none"> • Informal trails through shrub-steppe habitat • Possibly an informal boat ramp through riparian habitat | |
| Potential Restoration Opportunities | |
| Consolidate water access trails and replant degraded areas with native vegetation. Consider riparian planting projects to increase shading and nutrient inputs along U.S. Route 395 where little vegetation exists. | |
| Potential Protection Opportunities | |
| Protect native riparian and shrub-steppe vegetation to preserve and support re-establishment of this land-cover type. | |
| SR 1c | |
| Level of Existing Function | |
| SR 1c is designated as Impaired based on residential and transportation development. | |
| Stressors | |
| Upland development: | |
| <ul style="list-style-type: none"> • Residential development within uplands, relatively densely developed • Highway 20 and railroad trestle channel crossings | |
| Recreational use: | |
| <ul style="list-style-type: none"> • Informal road to water’s edge potentially used as boat launch | |
| Potential Restoration Opportunities | |
| Consider formalizing boat launch and incorporating riparian or aquatic structure complexity associated with these improvements. | |
| Potential Protection Opportunities | |
| Implement or retrofit stormwater controls consistent with the Eastern Washington Stormwater Manual. | |

| Columbia River (Lake Roosevelt) – Reach 1 | Ferry County |
|---|---------------------|
| SR 1d | |
| Level of Existing Function SR 1d is designated as Partially Functioning, based on recreation use and upland residential development. | |
| Stressors Upland development: <ul style="list-style-type: none">• Residential development communities within a few segments of the subreach Recreational use: <ul style="list-style-type: none">• Motorized boat use/boat camping | |
| Potential Restoration Opportunities Replant riparian areas degraded by recreation use. | |
| Potential Protection Opportunities Concentrate recreation water access and boat camping to limit fragmentation of upland and riparian habitat. Implement or retrofit stormwater controls consistent with the Eastern Washington Stormwater Manual. | |

| Columbia River (Lake Roosevelt) – Reach 2 Ferry County | |
|---|--|
| Reach Description | |
| Columbia River from to the NE ¼ of T35N_R37E_S31 near French Point Rocks to the NE ¼ of T29N_R35E_S27 | |
| Shoreline Jurisdiction | |
| 14,518 acres | |
|  | |
| Source: https://fortress.wa.gov/ecy/coastalatlus/UICoastalAtlas/Tools/ShorePhotos.aspx | |
| Subreaches (SRs); see Maps 12 and 13: | |
| <ul style="list-style-type: none"> • SR 2a – Begins at the NE ¼ of T35N_R37E_S31 near French Point Rocks and extends south to the to the NW ¼ of T34N_R36E_S36 • SR 2b – Extends 6.7 miles to south to the southwest (SW) ¼ of T33N_R37E_S31 near the mouth of Hall Creek • SR 2c – Extends 5.6 miles to south to the SE ¼ of T32N_R37E_S29 • SR 2d – Extends 29.1 miles to the SW to the NE ¼ of T29N_R35E_S27 | |
| Characteristics | |
| Ownership | |
| Reach 2 is about 85% public (U.S. Bureau of Reclamation, tribal, and Ferry County) and 15% private. | |

| Columbia River (Lake Roosevelt) – Reach 2 | Ferry County |
|--|---------------------|
| Land Use/Current Shoreline Management Program | |
| Land Use Designation: <ul style="list-style-type: none"> • Current land uses are private ownership, public lands, and Indian allotment trust lands • Rural Current Shoreline Management Program Environment Designation: Conservancy environment for Federal and State owned lands north of the boundary of the Colville Indian Reservation; for privately owned land, Conservancy environment for 50 feet from the OHWM, and Rural environment for the remaining 150 feet. Environment designation is unavailable for the remaining section of the reach. | |
| Existing Land Cover/Development | |
| Reach 2 includes forest, shrubland, and a small amount of developed lands. SR 2c includes a boat launch, campground, and parking. | |
| Geomorphic Character | |
| <p>Description – Throughout this reach, the Columbia River is controlled by the Grand Coulee Dam. The banks and shoreline consist of glacial sediments (as outwash, glaciolacustrine deposits, and till) and segments of a variety of bedrock types. Shoreline consists of low banks to areas of high, steep banks. River levels can fluctuate based on downstream dam operations.</p> <p>Hardened Banks – Approximately 1,425 feet of hardened banks along the shoreline are associated with the railroad and US 395 alignments.</p> | |
| Flooding and Geological Hazard | |
| <p>Flooding – Flooding is regulated by Grand Coulee Dam operations and controls located downstream in addition to reservoirs located upstream in Canada that store floodwater in accordance with the Columbia River Treaty.</p> <p>Geological Hazards – Reach 2 has soils susceptible to moderate to severe erosion. SR 2b – 2d contain slopes that are greater than 15% and underlain by glacial continental drift (SR 2b – 2d), outburst flood deposit (SR 2d), and mass-wasting deposits (SR 2d), which make them designated landslide hazard areas. A seismic hazard area, rated low to moderate, is located in SR 2d. No mine sites are located within Reach 2.</p> | |
| Existing Public Access | |
| Reach 2 of the Columbia River is a mix of private, public, and tribal ownership. There is formal and informal public access. Barnaby Island Campground is a primitive campground that can only be accessed by boat. There are no formal facilities at the campground. Barnaby Creek Campground is located on the main shore and is a primitive campground with an outhouse. There is a floating restroom and pump-out station in this reach. The Inchelium/Gifford Ferry is a free ferry service across the Columbia, managed by the Confederated Tribes of the Colville Reservation (CTCR). There is a restroom at the dock. AA Encampment is managed by the CTCR, available to non-members, and located near the ferry terminal. There is a primitive campground, outhouse, and boat launch. | |

| Columbia River (Lake Roosevelt) – Reach 2 | Ferry County |
|--|---------------------|
| <p>Roger’s Bar Campground is located in the reach. Road access to Roger’s Bar Campground is limited; most people access the site by boat. The campground is owned and managed by the CTCR, but is open to non-members and includes campsites, outhouse, and fire pits. Wilmont Creek Campground is owned and managed by the CTCR (open to non-members). The site includes camping, outhouses, picnic tables, and fire pits. Much of the shoreline in Reach 2 is sandy and provides boat access, as long as boaters stay below the OHWM.</p> | |
| <p>Identified Public Access Improvements</p> <p>There are general public access improvements defined in NPS’s Lake Roosevelt National Recreation Area Shoreline Management Plan; however, there are no specific improvements identified for Reach 2 of the Columbia River.</p> | |
| <p>Public Access Opportunities</p> <p>Public access opportunities may be adequate for this reach.</p> | |
| Ecological Conditions | |
| <p>Water Quantity and Sediment</p> <p>The major tributary inflows to Reach 2 include Halls, Stranger, and Ninemile creeks. Numerous named and unnamed tributaries flow into the river along its alignment. Throughout this reach, the Columbia River is controlled by the Grand Coulee Dam and is managed as a lake. No flow data are collected along this reach or in the tributary streams; however, flow data are collected downstream at Grand Coulee Dam.</p> <p>Sediments are likely accumulating throughout this reach because the river is managed as a lake impounded by the Grand Coulee Dam downstream. Sediment input sources likely include tributary inflow and landslide potential along steep slopes. In addition, the draft of Columbia River (Lake Roosevelt) levels may cause some movement of sediment.</p> | |
| <p>Water Quality</p> <p>SR 2c is listed as a water of concern for mercury on Washington Department of Ecology’s (Ecology’s) 305b list. Water quality is likely impacted from upstream historical industrial runoff that settles in sediment.</p> | |
| <p>Habitat Characteristics and Priority Habitat Species Presence</p> <p>This reach is noted as regular bald eagle wintering area, with roosting sites located in SR 2b and 2d. The Columbia River in this reach supports a number of fish species, as identified in the IAC Report. The shoreline along the entire reach is a mixture of federal and tribal government ownership.</p> <ul style="list-style-type: none"> • SR 2a – The uplands along this subreach are mountainous, and the shoreline is relatively steeply sloped. Inchelium Highway runs adjacent to the shoreline throughout this subreach, and there is generally very little shoreline landward of the road. The shoreline is hardened along this reach. There is some agricultural land use in the uplands outside of the shoreline jurisdiction, but most of the area is forested, and very few residences are apparent along this subreach. | |

| Columbia River (Lake Roosevelt) – Reach 2 | Ferry County |
|--|---------------------|
| <ul style="list-style-type: none"> • SR 2b – There is an inland wetland area included within this subreach and within tribal ownership. The entire remainder of the shoreline within this subreach is under federal ownership and managed as part of the recreational area. There may be informal trails along the shoreline in the uplands where recreational access is possible. The area between the road in the upland and the shoreline is predominantly forested with a mix of deciduous and coniferous community common to the upland hills. • SR 2c – This subreach is characterized by a number of bays and inlets related to tributaries, which are accessible via boat and from the uplands. There is a formal boat launch near the Gifford-Inchelium ferry. There are campgrounds and recreational use areas, but few residences apparent adjacent to this subreach aside from those around the Town of Inchelium. The uplands are relatively steeply sloped and forested with primarily coniferous trees. Riparian vegetation includes a mix of typical riparian trees for the region, as well as coniferous species. The vegetation along the shoreline is mostly patchy, with some areas featuring few trees and open grasslands along steeper slopes. • SR 2d – This reach is similar to SR 2c. The shoreline is undulating and a mix of forested areas and areas of open grassland. There is minimal development in this reach due to the steeply sloped shoreline. | |
| Ecological Functions Analysis | |
| SR 2a | |
| Level of Existing Function | |
| SR 2a is designated as Partially Functioning, mostly based on transportation corridor impacts. | |
| Stressors | |
| Upland development: | |
| <ul style="list-style-type: none"> • Inchelium Highway runs along shoreline throughout much of the subreach, limiting riparian corridor development • Rural residential development, though fairly limited • Informal access roads | |
| Recreational use: | |
| <ul style="list-style-type: none"> • Formal boat ramp near northern extent of subreach | |
| Potential Restoration Opportunities | |
| Consider riparian planting projects to increase shading and nutrient inputs along Inchelium Highway where little vegetation exists. | |
| Potential Protection Opportunities | |
| Protect native riparian vegetation to preserve and support re-establishment of this land-cover type. | |

| Columbia River (Lake Roosevelt) – Reach 2 | Ferry County |
|--|---------------------|
| SR 2b | |
| <p>Level of Existing Function</p> <p>SR 2b is designated as Partially Functioning, (borderline Functioning) based on recreation use impacts.</p> <p>Stressors</p> <p>Upland development:</p> <ul style="list-style-type: none"> • Agricultural field within jurisdiction boundary within north central portion of subreach <p>Recreational use:</p> <ul style="list-style-type: none"> • Recreation trails through upland and riparian forest, as well as accessing shoreline <p>Potential Restoration Opportunities</p> <p>Consider establishing riparian and/or grass buffer along irrigated agricultural fields.</p> <p>Potential Protection Opportunities</p> <p>Concentrate recreation water access to limit fragmentation of upland and riparian habitat. Implement or retrofit stormwater controls consistent with the Eastern Washington Stormwater Manual.</p> | |
| SR 2c | |
| <p>Level of Existing Function</p> <p>SR 2c is designated as Partially Functioning, mostly based on transportation corridor impacts.</p> <p>Stressors</p> <p>Upland development:</p> <ul style="list-style-type: none"> • Road fragmentation to provide development and recreation water access • Gifford-Inchelium ferry terminal • Rural residential development near ferry terminal <p>Recreational use:</p> <ul style="list-style-type: none"> • Formal boat ramp near ferry terminal • Recreation trails <p>Potential Restoration Opportunities</p> <p>Consider incorporating riparian or aquatic structure complexity during any improvements to ferry terminal and/or boat ramp.</p> <p>Potential Protection Opportunities</p> <p>Implement or retrofit stormwater controls consistent with the Eastern Washington Stormwater Manual.</p> | |

| Columbia River (Lake Roosevelt) – Reach 2 | Ferry County |
|---|---------------------|
| SR 2d | |
| Level of Existing Function SR 2d is designated as Functioning. | |
| Stressors Upland development: <ul style="list-style-type: none">• Limited road fragmentation within uplands, though mostly outside of jurisdiction boundary | |
| Potential Restoration Opportunities None | |
| Potential Protection Opportunities Protect intact riparian and upland forest vegetation. | |

| Columbia River (Lake Roosevelt) – Reach 3 | | Ferry County |
|---|--|--------------|
| Reach Description | | |
| Columbia River from the NE ¼ of T29N_R35E_S27 to the mouth of the Sanpoil River | | |
| Shoreline Jurisdiction | | |
| 10,253 acres | | |
|  | | |
| Source: https://fortress.wa.gov/ecy/coastalatlus/UICoastalAtlas/Tools/ShorePhotos.aspx | | |
| Subreaches (SRs); see Maps 19, 20, and 21: | | |
| <ul style="list-style-type: none"> • SR 2a – Begins at the NE ¼ of T29N_R35E_S27 and extends SW to the SW ¼ of T27N_R35E_S08 where steeper slope begins • SR 2b – Extends 6.1 miles to west to the SW ¼ of T28N_R34E_S35 where steeper slope ends • SR 2c – Extends 10.6 miles to the mouth of Sanpoil River | | |
| Characteristics | | |
| Ownership | | |
| Reach 3 is mostly public (NPS and tribal) with a small amount (less than 10%) of private ownership. | | |

| Columbia River (Lake Roosevelt) – Reach 3 | Ferry County |
|--|--------------|
| <p>Land Use/Current Shoreline Management Program</p> <p>Land Use Designation:</p> <ul style="list-style-type: none"> • Current land uses are private ownership, public lands, and Indian allotment trust lands • Rural <p>Current Shoreline Management Program Environment Designation:</p> <ul style="list-style-type: none"> • Unavailable – No data available | |
| <p>Existing Land Cover/Development</p> <p>Reach 3 is mostly undeveloped due to steep slopes and limited access. Existing land cover includes forest, shrublands, and patches of grasslands.</p> | |
| <p>Geomorphic Character</p> <p>Description – Throughout this reach, the Columbia River is controlled by the Grand Coulee Dam. The banks and shoreline consist of glacial sediments (as outwash, glaciolacustrine deposits, and till), outburst flood deposits, mass wasting deposits and segments consisting of a variety of bedrock types. Shoreline consists of areas of high, steep banks. River levels can fluctuate based on downstream dam operations.</p> <p>Hardened Banks – None identified. No artificial hardened banks appear to exist along the Reach 3 extent.</p> | |
| <p>Flooding and Geological Hazard</p> <p>Flooding – Flooding is regulated by Grand Coulee Dam operations and controls located downstream in addition to reservoirs located upstream in Canada that store floodwater in accordance with the Columbia River Treaty.</p> <p>Geological Hazards – Reach 3 has soils susceptible to moderate to severe erosion. SR 3a – 3c contain slopes that are greater than 15% and underlain by alluvial deposits (SR 3a), outburst flood deposit (SR 3a – 3c), and mass-wasting deposits (SR 3c), which make them designated landslide hazard areas. A seismic hazard area, rated low to moderate, is located in SR 3a and 3c. No mine sites are located within Reach 3.</p> | |
| <p>Existing Public Access</p> <p>Reach 3 of the Columbia River has no formal public access sites. There is only one Bureau of Indian Affairs (BIA) road into the reach. There is informal boat access below the OHWM.</p> <p>Identified Public Access Improvements</p> <p>There are no public access improvements identified for Reach 3 of the Columbia River.</p> <p>Public Access Opportunities</p> <p>There are general public access improvements defined in NPS’s Lake Roosevelt National Recreation Area Shoreline Management Plan; however, there are no specific improvements identified for Reach 3 of the Columbia River. The uplands adjacent to the reach are mostly owned by the CTCR and</p> | |

| Columbia River (Lake Roosevelt) – Reach 3 | Ferry County |
|---|---------------------|
| <p>are managed as a game reserve. There are few roads in to the area, so public access opportunities may be limited in Reach 3.</p> | |
| Ecological Conditions | |
| <p>Water Quantity and Sediment</p> <p>The major tributary inflows to Reach 3 include Sixmile, Cottonwood, Threemile, Louie, and George creeks. Numerous unnamed tributaries flow into the river along its alignment. Throughout this reach, the Columbia River is controlled by the Grand Coulee Dam and is managed as a lake. No flow data are collected along this reach or in the tributary streams; however, flow data are collected downstream at Grand Coulee Dam.</p> <p>Sediments are likely accumulating throughout this reach because the river is managed as a lake impounded by the Grand Coulee Dam downstream. Sediment input sources include tributary inflow and landslide potential along steep slopes. The mass wasting units present in SR 3a and 3c are a potential source of sediment as well. In addition, the draft of Columbia River (Lake Roosevelt) levels may cause some movement of sediment.</p> | |
| <p>Water Quality</p> <p>SR 3a is listed as a water of concern for sediment bioassay on Ecology’s 305b list. Water quality is likely impacted from upstream historical industrial runoff.</p> | |
| <p>Habitat Characteristics and Priority Habitat Species Presence</p> <p>The Columbia River in this reach supports a number of fish species, as identified in the IAC Report. Shoreline vegetation begins to diminish in this reach, becoming more characteristic of shrub-steppe habitat in the uplands and much less consistent riparian vegetation along the shoreline.</p> <ul style="list-style-type: none"> • SR 3a – This subreach has a number of bays and inlets associated with tributaries and small drainages from uplands. The shoreline along this subreach is moderately steep. There are a number of potential shoreline access points from U.S. Forest Service (USFS) roads and other gravel access roads and trails, as well as from the water. • SR 3b – The shoreline along this subreach has fewer inlets or drainages from the uplands. The shorelines are not as steep, but the vegetation is characterized by a shrub-steppe plant community, with few trees and some riparian habitat around upland drainage areas and inlets. There is generally minimal vegetation along the shoreline, due to climate, as well as geology, as the shoreline varies between areas of steep slopes and areas where soils are very erodible. • SR 3c – This subreach is very similar to SR 3b, although there is much less vegetation adjacent to the shoreline and in the uplands. This subreach ends near the juncture with the Sanpoil River. | |

| Columbia River (Lake Roosevelt) – Reach 3 | Ferry County |
|---|---------------------|
| Ecological Functions Analysis | |
| SR 3a | |
| <p>Level of Existing Function SR 3a is designated as Functioning.</p> <p>Stressors Upland development:</p> <ul style="list-style-type: none"> • Fairly limited rural roads and two residences, all of which are high above the river <p>Potential Restoration Opportunities None.</p> <p>Potential Protection Opportunities Protect intact shrub-steppe and riparian and upland forest.</p> | |
| SR 3b | |
| <p>Level of Existing Function SR 3b is designated as Functioning.</p> <p>Stressors Upland development:</p> <ul style="list-style-type: none"> • Very limited dirt access roads from Sand-Hills Road at western edge of subreach <p>Potential Restoration Opportunities None.</p> <p>Potential Protection Opportunities Protect intact shrub-steppe and upland forest.</p> | |
| SR 3c | |
| <p>Level of Existing Function SR 3c is designated as Partially Functioning.</p> <p>Stressors Upland development:</p> <ul style="list-style-type: none"> • Grazing and/or limited off-road vehicle use, though mostly outside of jurisdiction boundary • Limited paved roads and rural residences with one tilled field, but all are outside of jurisdiction boundary <p>Potential Restoration Opportunities None</p> | |

| | |
|--|---------------------|
| Columbia River (Lake Roosevelt) – Reach 3 | Ferry County |
| Potential Protection Opportunities | |
| Protect intact shrub-steppe and upland forest. | |

| Columbia River (Lake Roosevelt) – Reach 4 | Ferry County |
|---|--------------|
| Reach Description | |
| Columbia River from the mouth of the Sanpoil River to Okanogan-Ferry County line | |
| Shoreline Jurisdiction | |
| 4,161 acres | |
|  <p style="font-size: small; margin-top: 5px;">Source: https://fortress.wa.gov/ecy/coastalatlantlas/UICoastalAtlas/Tools/ShorePhotos.aspx</p> | |
| Subreaches (SRs); see Map 22: | |
| Not applicable | |
| Characteristics | |
| Ownership | |
| Reach 4 is mostly public (NPS and tribal) with a very small amount (less than 5%) of public ownership. | |
| Land Use/Current Shoreline Management Program | |
| Land Use Designation: | |
| <ul style="list-style-type: none"> • Current land uses are private ownership, public lands, and Indian allotment trust lands • Rural | |
| Current Shoreline Management Program Environment Designation: | |
| <ul style="list-style-type: none"> • Unavailable – No data available | |

| Columbia River (Lake Roosevelt) – Reach 4 | Ferry County |
|---|---------------------|
| Existing Land Cover/Development | |
| Reach 4 has a few agricultural developments sparsely located along the shoreline. The rest of the reach remains mostly as shrubland. | |
| Geomorphic Character | |
| <p>Description – Throughout this reach, the Columbia River is controlled by the Grand Coulee Dam. The banks and shoreline consist of glaciolacustrine deposits, outburst flood deposits, mass wasting deposits, as well as segments consisting of bedrock (Swawilla Basin biotite granite). The shoreline consists of areas of moderate to high, steep banks. River levels can fluctuate based on downstream dam operations.</p> <p>Hardened Banks – Approximately 150 feet of artificial hardened banks along the shoreline are associated with a boat launch area.</p> | |
| Flooding and Geological Hazard | |
| <p>Flooding – Flooding is regulated by Grand Coulee Dam operations and controls located downstream in addition to reservoirs located upstream in Canada that store floodwater in accordance with the Columbia River Treaty.</p> <p>Geological Hazards – Reach 4 has soils susceptible to moderate to severe erosion. Reach 4 contains slopes that are greater than 15% and underlain by outburst flood deposit and mass-wasting deposits, which make them designated landslide hazard areas. A seismic hazard area, rated low to moderate, is located in Reach 4. No mine sites are located within Reach 4.</p> | |
| Existing Public Access | |
| There is no existing formal public access in Reach 4 of the Columbia River. Boaters can access the shoreline as long as they stay below the OHWM. | |
| Identified Public Access Improvements | |
| There are general public access improvements defined in NPS’s Lake Roosevelt National Recreation Area Shoreline Management Plan; however, there are no specific improvements identified for Reach 4 of the Columbia River. | |
| Public Access Opportunities | |
| There are general public access improvements defined in NPS’s Lake Roosevelt National Recreation Area Shoreline Management Plan; however, there are no specific improvements identified for Reach 4 of the Columbia River. The uplands adjacent to the reach are mostly owned by the CTCR and are managed as a game reserve. There are few roads in to the area, so public access opportunities may be limited in this reach. | |

| Columbia River (Lake Roosevelt) – Reach 4 | Ferry County |
|--|---------------------|
| Ecological Conditions | |
| Water Quantity and Sediment | |
| <p>The major tributary inflows to Reach 4 include Qui Creek and the Sanpoil River. Numerous unnamed tributaries flow into the river along its alignment. Throughout this reach, the Columbia River is controlled by the Grand Coulee Dam and is managed as a lake. No flow data are collected along this reach or in the tributary streams; however, flow data are collected downstream at Grand Coulee Dam.</p> <p>Sediments are likely accumulating throughout this reach because the river is managed as a lake impounded by the Grand Coulee Dam downstream. Sediment input sources likely include tributary inflow and landslide potential along steep slopes. In addition, the draft of Columbia River (Lake Roosevelt) levels may cause some movement of sediment.</p> | |
| Water Quality | |
| <p>Reach 4 is not listed on Ecology’s 305b list. Water quality is likely impacted from upstream historical industrial runoff.</p> | |
| Habitat Characteristics and Priority Habitat Species Presence | |
| <p>This reach has minimal developed area. The Columbia River in this reach supports a number of fish species, as identified in the IAC Report. The shoreline within this reach has very little vegetation in the uplands or along the water’s edge due to the combination of climate and geology of this area. The vegetation present includes grasses and small shrubs, with some trees growing near inlets and drainage areas, although the water level fluctuations within the Columbia River in Lake Roosevelt create conditions difficult to maintain vegetation in this reach. The soils along this reach are very erodible, and shoreline banks are part of steep bluffs and dunes. There are a few irrigated agricultural or pasture fields within this subreach near the county line. There are few residences along this reach, aside from those associated with the agricultural/ranching activities.</p> | |
| Ecological Functions Analysis | |
| Level of Existing Function | |
| <p>Reach 4 is designated as Partially Functioning, based on agricultural fields and grazing, as well as shoreline stability.</p> | |
| Stressors | |
| <p>Upland development:</p> <ul style="list-style-type: none"> • Irrigated agricultural fields • Livestock grazing and pens, including multiple water access points • Rural residences • Access roads within jurisdiction boundary | |

**Columbia River
(Lake Roosevelt) – Reach 4** **Ferry County**

Recreational use:

- Gravel parking lots associated with paved boat ramp
- Gravel road to boat ramp/trailhead and dirt roads outside of shoreline jurisdiction

Potential Restoration Opportunities

Reduce riparian and water quality impacts from livestock through expanded use of best management practices (BMPs; e.g., exclusionary fencing and rotational grazing) for livestock operations within shoreline jurisdiction, particularly within the western half of the subreach.

Potential Protection Opportunities

Protect native shrub-steppe vegetation to preserve and support re-establishment of this land-cover type.

| Sherman Creek Ferry County | |
|---|--|
| Reach Description Sherman Creek from the SE ¼ of T35N_R36E_S06 to the confluence with the Columbia River | |
| Shoreline Jurisdiction 563 acres | |
|  |  |
| Source: U.S. Department of Agriculture (USDA) National Agriculture Imagery Program (NAIP) 2013 | |
| Subreaches (SRs); see Map 11: Not applicable | |
| Characteristics | |
| Ownership Sherman Creek is mostly public (USFS, Washington Department of Fish & Wildlife, U.S. Bureau of Reclamation, and Washington Department of Natural Resources) with a very small amount (less than 5%) of private ownership. | |
| Land Use/Current Shoreline Management Program Land Use Designation: <ul style="list-style-type: none"> • Current land uses are private ownership and public lands • Rural Current Shoreline Management Program Environment Designation: <ul style="list-style-type: none"> • Natural | |
| Existing Land Cover/Development Sherman Creek is a mix of forest, shrubland, roads, and a few residences found near the mouth of the creek. The majority of the creek still remains forested. | |

| Sherman Creek | Ferry County |
|---|---------------------|
| Geomorphic Character | |
| <p>Description – Sherman Creek flows within a moderately confined to confined valley. In the lower areas, the valley and channel consists mostly of glacial till and alluvium with local outcrops of bedrock. Wider floodplains are present throughout these lower more unconfined areas. The stream valley generally narrows upstream where bedrock (orthogneiss) valley hill slopes are present.</p> <p>Channel Migration Zone – Along most of Sherman Creek, channel migration is limited to the north by the Highway 20 alignment. The topography and valley boundary limit overall migration to the south, and areas where bedrock is exposed at the channel have limited channel migration.</p> | |
| Flooding and Geological Hazard | |
| <p>Flooding – Floodplains are not mapped in this reach. Floodplain widths appear to be relatively narrow due to the narrow valleys present along the reach.</p> <p>Geological Hazards – Sherman Creek has soils susceptible to moderate to severe erosion. Sherman Creek contains slopes that are greater than 15% and underlain by glacial continental drift, which make them designated landslide hazard areas. A seismic hazard area, rated moderate to high, is located in the upstream extent of Sherman Creek. No mine sites are located within the creek.</p> | |
| Existing Public Access | |
| <p>Sherman Pass Scenic Byway runs along much of Sherman Creek and provides scenic view sheds. Log Flume Heritage Site is located on Sherman Creek. The Heritage Site is managed by USFS and provides interpretive signs, hiking trails, and a seasonal restroom. The Bangs Mountain Campground is also located in this reach, near the Heritage Site. The campground is managed by USFS and provides camping areas, outhouses, and access to hiking trails. Sherman Creek Trailhead is located in this reach. Sherman Creek Wildlife Area and Sherman Creek Fish Hatchery are located at the mouth of Sherman Creek where it empties into the Columbia River.</p> | |
| Identified Public Access Improvements | |
| <p>The Sherman Pass Scenic Byway Corridor Plan describes a plan to link the fish hatchery and wildlife area with the scenic byway to increase visitors to the hatchery. The Plan also describes broad improvements that could be made to the already available facilities.</p> | |
| Public Access Opportunities | |
| <p>Public access opportunities will depend on the implementation of the Sherman Pass Scenic Byway Corridor Plan. All of Sherman Creek is publicly owned and there are multiple opportunities to increase public access in the area.</p> | |
| Ecological Conditions | |
| Water Quantity and Sediment | |
| <p>The major tributary inflows to Sherman Creek include Trout and Nueske creeks. Numerous unnamed tributaries flow into the stream along its alignment. No current flow data are collected for Sherman Creek or its tributaries.</p> <p>Sediment is likely transported through much of Sherman Creek due to its moderate to steep gradient. Sediment sources throughout the reach include the erodible glacial till and outwash banks, soils prone</p> | |

| Sherman Creek | Ferry County |
|---|---------------------|
| <p>to erosion, steep slopes prone to landslides, and sediment transported by local runoff and surface drainages. The well-vegetated riparian corridor likely helps to limit erosion and the delivery of fine sediment to the stream.</p> | |
| <p>Water Quality</p> <p>In this reach, TMDLs are required for dissolved oxygen in the upstream extent, and for temperature in the downstream of the South Fork Sherman Creek confluence. A TMDL is in place for dissolved oxygen and bacteria in Sherman Creek. Water quality is likely affected by grazing, wildlife, natural processes, and a lack of effective shade.</p> | |
| <p>Habitat Characteristics and Priority Habitat Species Presence</p> <p>Sherman Creek is within a bald eagle wintering area (perching and foraging). This area is within winter range for mule deer and white-tailed deer and is within a heavy-use/large-concentration area.</p> <p>This reach runs primarily through the Colville National Forest area, and the entire length of the creek is heavily forested. There is a state-owned campground and privately owned parcel near the west end of the reach as it approaches Highway 20 (Sherman Pass Scenic Byway). The creek is bounded by Highway 20 for the remainder of the reach. It is crossed by Bangs Mountain Road and Inchelium Highway. Near the end of the reach, as the creek approaches the Columbia River, it flows through a narrower valley with steeper slopes in the adjacent uplands. Because the forest habitat in this reach is dense, there are stretches where the creek riparian zone forms a near-closed canopy over the creek.</p> | |
| Ecological Functions Analysis | |
| <p>Level of Existing Function</p> <p>Sherman Creek is designated as Partially Functioning (based on transportation corridor development) within eastern half of Creek, acknowledging the western portion of the creek habitat functions at a high level.</p> | |
| <p>Stressors</p> <p>Upland development:</p> <ul style="list-style-type: none"> • Fish hatchery infrastructure, including building, roads, and a dock at the creek mouth • Orchards south of creek within eastern edge of jurisdiction area • Inchelium Highway and Highway 20 within jurisdiction boundary, limiting channel migration through some areas • Inchelium Highway creek crossing | |
| <p>Potential Restoration Opportunities</p> <p>None.</p> | |
| <p>Potential Protection Opportunities</p> <p>Manage nutrient and temperature loading at hatchery to address low dissolved oxygen and other water quality concerns. Ensure future recreational development supports protection of intact habitat. Make stormwater controls for new development consistent with Eastern Washington Stormwater Manual.</p> | |

| Hall Creek | Ferry County |
|---|---------------------|
| Reach Description | |
| Hall Creek from the SE ¼ of T34N_R35E_S17 to the confluence with the Columbia River | |
| Shoreline Jurisdiction | |
| 1,268 acres | |
|  | |
| Source: USDA NAIP 2013 | |
| Subreaches (SRs); see Maps 14 and 15: | |
| <ul style="list-style-type: none"> • SR 1a – Begins at the SE ¼ of T34N_R35E_S17 and extends southeast (SE) to the NE ¼ of T33N_R36E_S21 near the Inchelium city limits • SR 1b – Extends 9.3 miles to the SE to the confluence with the Columbia River | |
| Characteristics | |
| Ownership | |
| Reach 1 is about 40% private and 60% tribal lands, with a very small section (less than 1%) of public land (U.S. Bureau of Land Management) near the mouth of the creek. | |
| Land Use/Current Shoreline Management Program | |
| Land Use Designation: | |
| <ul style="list-style-type: none"> • Current land uses are private ownership, public lands, and Indian allotment trust lands • Rural and Rural Service Area | |
| Current Shoreline Management Program Environment Designation: | |
| <ul style="list-style-type: none"> • Unavailable – Not included in the existing Shoreline Management Plan | |

| Hall Creek | Ferry County |
|---|---------------------|
| Existing Land Cover/Development | |
| SR 1a consists of little development and remains largely forested. SR 1b includes recreational and agricultural developments. | |
| Geomorphic Character | |
| <p>Description – Hall Creek flows within an unconfined to moderately confined valley that consists mostly of glacial deposits (as glaciolacustrine deposits, outwash, and continental glacial drift) throughout the channel and valley bottom. Isolated areas of bedrock (Covada Group Wacke) occur throughout the lower segment. The presence of bedrock (quartzite, gneiss, granite, and schist) increases upstream as the valley narrows and steepens. Wide floodplain/wetland areas are present in the lower segments. However, downstream of the Inchelium Highway crossing to Lake Roosevelt, the valley is steep and narrow.</p> <p>Hardened Banks – None identified. No artificial hardened banks appear to exist along the Hall Creek extent.</p> <p>Channel Migration Zone – In most of the lower segments, channel migration potential exists throughout the valley. Areas of active channel movement are evident in the wider, low-gradient floodplain areas. In the upstream extent, channel migration is limited by the presence of bedrock valley margins and valley walls. Limited infrastructure is present, which limits channel migration potential throughout the stream valley.</p> | |
| Flooding and Geological Hazard | |
| <p>Flooding –Floodplains are not mapped in this reach. Floodplain widths appear to vary throughout the reach, from narrow in the areas where bedrock is present to relatively wide in the areas where expansive wetlands/floodplain complexes are present (SR 1a and 1b).</p> <p>Geological Hazards – Hall Creek has soils susceptible to moderate to severe erosion. Hall Creek contains slopes that are greater than 15% and underlain by glacial continental drift, which make them designated landslide hazard areas. No mine sites or areas susceptible to seismic hazards are located within the creek.</p> | |
| Existing Public Access | |
| There is no formal public access in this reach. Hall Creek runs through land that is mostly owned by the CTCR. There is little road access in this reach, with the exception of Hall Creek Road that is located in tribal and private land and Gwen Mine Road, which provides informal access to Hall Creek. | |
| Identified Public Access Improvements | |
| There are no public access improvements identified for Hall Creek. | |
| Public Access Opportunities | |
| Because the land is primarily owned by the CTCR, and there is minimal road access, public access opportunities may be limited. Developing public access opportunities will be at the discretion of the CTCR. | |

| Hall Creek | Ferry County |
|---|--------------|
| Ecological Conditions | |
| Water Quantity and Sediment | |
| <p>The major tributary inflows to Hall Creek include Spring, Lynx, Abraham, Sitdown, and Grizzly creeks. Numerous unnamed tributaries flow into the stream along its alignment. No current flow data are collected for Hall Creek or its tributaries. Runoff from local roadways and adjacent agricultural lands may contribute flow into the stream during the wet season and during snowmelt.</p> <p>Sediment sources throughout the reach include the erodible glacial outwash and continental glacial drift banks, soils prone to erosion, steep slopes prone to landslides, and sediment transported by local runoff and surface drainages. Numerous large floodplain/wetland complexes exist along the Hall Creek alignment where deposition is occurring. Where present, the vegetated riparian corridor likely helps to limit erosion and the delivery of fine sediment to the stream.</p> | |
| Water Quality | |
| <p>Hall Creek is not listed on Ecology's 305b list. Water quality may be impacted by agricultural runoff and a lack of effective shade.</p> | |
| Habitat Characteristics and Priority Habitat Species Presence | |
| <p>Hall Creek is documented wintering area (foraging and perching) for bald eagles. This reach is very heavily forested.</p> <p>SR 1a – The first half of this subreach runs though heavily forested habitat, under CTCR ownership, with very little disturbance and no visible distinction between the riparian zone and upland forest. Hall Creek Road runs along the north shoreline for the entirety of this subreach. The second half is in private ownership, there is much more development within this reach, and the valley is broader. There is significant area cleared for agricultural and livestock grazing, and evidence of clear cut for forest management or other land use within the shoreline zone.</p> <p>SR 1b – This reach transitions back into CTUIR management, and there is less cleared land in this subreach, although agricultural use is still present. The floodplain throughout this subreach is very wide, there is evidence of meandering or channel migration, and areas of wetland or marshy habitat with characteristic wetland habitat appear between the old channel areas and new channel path. The subreach continues to transition from agricultural land and forest, and has numerous access points for livestock use and recreational use. The creek finally crosses under Inchelium Highway before discharging into the Columbia River.</p> | |

| Hall Creek | Ferry County |
|--|--------------|
| Ecological Functions Analysis | |
| SR 1a | |
| Level of Existing Function | |
| SR 1a is designated as Partially Functioning, based on transportation corridors, rural development, and forest harvest. | |
| Stressors | |
| Upland development: | |
| <ul style="list-style-type: none"> • Hall Creek Road and lesser forest roads along and/or crossing channel • Rural mobile homes/development within central portion of this subreach • Forest clearing in some areas near the channel | |
| Potential Restoration Opportunities | |
| Implement riparian restoration projects that may include passive (e.g., Conservation Reserve Expanded Program riparian buffers or protected area conservation easements) or active (e.g., riparian plantings) efforts to reduce erosion and increase filtration, particularly in undeveloped areas north of the river. | |
| Potential Protection Opportunities | |
| Implement or retrofit stormwater controls consistent with the Eastern Washington Stormwater Manual. | |
| SR 1b | |
| Level of Existing Function | |
| SR 2a is designated as Partially Functioning, based on agricultural and residential development. | |
| Stressors | |
| Upland development: | |
| <ul style="list-style-type: none"> • Agricultural fields with limited riparian buffers in some areas • Rural residential development and more dense residential development at east end of the creek • Road crossings, including Inchelium Highway | |
| Potential Restoration Opportunities | |
| Create easements to encourage planting of grass or woody planting strips between agricultural fields and stream banks. | |
| Potential Protection Opportunities | |
| Implement or retrofit stormwater controls consistent with the Eastern Washington Stormwater Manual, particularly in more developed areas. | |

| Stranger Creek | Ferry County |
|---|---------------------|
| Reach Description | |
| Stranger Creek from the NW ¼ of T32N_R36E_S21 to the confluence with the Columbia River | |
| Shoreline Jurisdiction | |
| 563 acres | |
|  | |
| Source: USDA NAIP 2013 | |
| Subreaches (SRs); see Map 16: | |
| Not applicable | |
| Characteristics | |
| Ownership | |
| Stranger Creek is about 60% private and 40% tribal lands with a small amount (less than 10%) of public lands (U.S. Bureau of Reclamation) near the mouth of creek. | |
| Land Use/Current Shoreline Management Program | |
| Land Use Designation: | |
| <ul style="list-style-type: none"> • Current land uses are private ownership, public lands, and Indian allotment trust lands • Rural and Rural Service Area | |
| Current Shoreline Management Program Environment Designation: | |
| <ul style="list-style-type: none"> • Unavailable – Not included in the existing Shoreline Management Plan | |

| Stranger Creek | Ferry County |
|---|---------------------|
| <p>Existing Land Cover/Development</p> <p>Stranger Creek is forested throughout the reach. There is very little development, except roads within the shoreline jurisdiction. Some residential developments exist outside of the shoreline jurisdiction.</p> | |
| <p>Geomorphic Character</p> <p>Description – Stranger Creek flows through an unconfined valley that consists of mostly glaciolacustrine and continental drift deposits. Downstream of Inchelium Covada Road to the Columbia River, the stream flows within a steeped incised valley that consists of glaciolacustrine deposits. Upstream of this road crossing, the floodplain and valley widen. In these areas, wide floodplain and wetland complexes exist within the continental drift deposits.</p> <p>Hardened Banks – None identified. No artificial hardened banks appear to exist along the Stranger Creek extent.</p> <p>Channel Migration Zone – The channel migration potential exists throughout most of the stream valley due to the occurrence of mostly glacial deposits within the channel and floodplain. Areas of active channel movement are evident in the wider, low-gradient floodplain areas. In addition, limited infrastructure is present to limit overall channel migration.</p> | |
| <p>Flooding and Geological Hazard</p> <p>Flooding – Floodplains are not mapped in this reach. Floodplain widths appear to vary throughout the reach, from narrow to relatively wide, in the areas of expansive wetlands/floodplain areas that are present.</p> <p>Geological Hazards – Stranger Creek has soils susceptible to moderate to severe erosion. Stranger Creek contains slopes that are greater than 15% and underlain by glacial continental drift, which make them designated landslide hazard areas. No mine sites or areas susceptible to seismic hazards are located within the creek.</p> | |
| <p>Existing Public Access</p> <p>There is no existing public access in Stranger Creek.</p> <p>Identified Public Access Improvements</p> <p>No public access improvements have been identified for Stranger Creek.</p> <p>Public Access Opportunities</p> <p>Public access opportunities will depend on the discretion of the CTCR.</p> | |
| Ecological Conditions | |
| <p>Water Quantity and Sediment</p> <p>The major tributary inflow to Stranger Creek includes Cornstalk Creek. Numerous unnamed tributaries flow into the stream along its alignment. No current flow data are collected for Stranger Creek or its tributaries.</p> <p>Sediment sources throughout the reach include the erodible glacial lacustrine and continental glacial drift banks, soils prone to erosion, steep slopes prone to landslides, and sediment transported by local runoff and surface drainages. Numerous large floodplain/wetland complexes exist along the</p> | |

| Stranger Creek | Ferry County |
|---|---------------------|
| Stranger Creek alignment where deposition is occurring. Where present, the vegetated riparian corridor likely helps to limit erosion and the delivery of fine sediment to the stream. | |
| Water Quality Stranger Creek is not listed on Ecology's 305b list. Water quality may be impacted by agricultural and residential runoff. | |
| Habitat Characteristics and Priority Habitat Species Presence Stranger Creek is within wintering habitat (foraging and perching) for bald eagles. The creek runs through forested lands at the upstream end, and significant areas have been cleared for agricultural use in the lowlands as the creek approaches the Columbia River. There are large wetland areas associated with this creek, and its floodplain is within shoreline jurisdiction. The riparian vegetation is similar to the forested areas of the uplands, with the exception of habitat found in and around the wetland areas, which comprises rushes, grasses, and small shrubs. | |
| Ecological Functions Analysis | |
| Level of Existing Function Stranger Creek is designated as Partially Functioning, based on agricultural and residential development. | |
| Stressors Upland development: <ul style="list-style-type: none"> • Agricultural fields • Rural residential development • Road crossings, particularly at the east end of the Creek | |
| Potential Restoration Opportunities Implement riparian enhancement or restoration projects along agricultural areas in the lowlands that may include passive (e.g., Conservation Reserve Expanded Program riparian buffers or protected area conservation easements) or active (e.g., riparian plantings) efforts to reduce erosion and increase filtration. | |
| Potential Protection Opportunities Implement or retrofit stormwater controls consistent with the Eastern Washington Stormwater Manual, particularly in more developed areas. Protect remaining wetland habitat. | |

| Ninemile Creek | Ferry County |
|--|---------------------|
| Reach Description | |
| Ninemile Creek from the SE ¼ of T30N_R34E_S25 to the confluence with the Columbia River | |
| Shoreline Jurisdiction | |
| 386 acres | |
|  | |
| Source: USDA NAIP 2013 | |
| Subreaches (SRs); see Map 18: | |
| Not applicable | |
| Characteristics | |
| Ownership | |
| Ninemile Creek is about 45% private and 45% tribal lands with a small percentage (less than 10%) of public lands (U.S. Bureau of Reclamation) near the mouth of creek. | |
| Land Use/Current Shoreline Management Program | |
| Land Use Designation: | |
| <ul style="list-style-type: none"> • Current land uses are private ownership, public lands, and Indian allotment trust lands • Rural | |
| Current Shoreline Management Program Environment Designation: | |
| <ul style="list-style-type: none"> • Unavailable – Not included in the existing Shoreline Management Plan | |

| Ninemile Creek | Ferry County |
|--|---------------------|
| Existing Land Cover/Development | |
| Ninemile Creek is mostly forested. There is very little development in this reach. | |
| Geomorphic Character | |
| <p>Description – Ninemile Creek flows through a moderately confined valley that consists of mostly glaciolacustrine/outburst flood deposits (undivided). Immediately upstream of its confluence with the Columbia River, the stream flows within a steeped incised valley that consists of Johnny George plutonic complex. Mass wasting deposits are located near the downstream extent adjacent to bedrock. The floodplain and valley widen out upstream of this confined reach. Wider floodplain and wetland complexes dominate these lower gradient areas.</p> <p>Hardened Banks – None identified. No artificial hardened banks appear to exist along the Ninemile Creek extent.</p> <p>Channel Migration Zone – The channel migration potential exists throughout most of the stream valley due to the occurrence of mostly glacial deposits within the channel and floodplain. Areas of active channel movement are evident in the wider, low-gradient floodplain areas. In addition, limited infrastructure is present to limit overall channel migration.</p> | |
| Flooding and Geological Hazard | |
| <p>Flooding – Floodplains are not mapped in this reach. Floodplain widths appear to vary throughout the reach from moderate to relatively wide in the areas of expansive wetlands.</p> <p>Geological Hazards – Ninemile Creek has soils susceptible to moderate to severe erosion. Ninemile Creek contains slopes that are greater than 15% and underlain by outburst flood deposits, which make them designated landslide hazard areas. A seismic hazard area, rated low to moderate, is located in the downstream extent of Ninemile Creek. No mine sites are located within the creek.</p> | |
| Existing Public Access | |
| Most of Ninemile Creek is within the boundary of CTCR’s tribal game reserve area. There is very little road access and no formal public access. | |
| Identified Public Access Improvements | |
| There are no public access improvements identified for Ninemile Creek. | |
| Public Access Opportunities | |
| Because the Creek is located within a game reserve, public access may not be compatible. Any future public access opportunities would be at the discretion of the tribes. | |
| Ecological Conditions | |
| Water Quantity and Sediment | |
| Major tributary inflows to Ninemile Creek include Jerred Creek and Canteen Creek. Numerous unnamed tributaries flow into the stream along its alignment. No current flow data are collected on Ninemile Creek or its tributaries. | |
| Sediment sources throughout the reach include the erodible glaciolacustrine/outburst flood deposits (undivided) banks, soils prone to erosion, steep slopes prone to landslides, and sediment transported | |

| Ninemile Creek | Ferry County |
|--|---------------------|
| <p>by local runoff and surface drainages. In addition, mass wasting deposits (as landslides) are located along the lower extent of the stream. Where present, the vegetated riparian corridor likely helps to limit erosion and the delivery of fine sediment to the stream.</p> | |
| <p>Water Quality</p> <p>Ninemile Creek is not listed on Ecology’s 305b list. This creek appears to be relatively undisturbed, so water quality impacts may be due to natural causes and not anthropogenic causes.</p> | |
| <p>Habitat Characteristics and Priority Habitat Species Presence</p> <p>This creek runs through heavily forested mountainous areas, and there is very little development and minimal disturbed lands within this reach. Because this reach is not indicated to be adjacent to priority habitat or species according to mapping, it may provide suitable habitat for mule deer, white-tailed deer, or lynx.</p> | |
| Ecological Functions Analysis | |
| <p>Level of Existing Function</p> <p>Ninemile Creek is designated as Functioning, based on intact riparian and upland forests with very limited development.</p> <p>Stressors</p> <p>Upland development:</p> <ul style="list-style-type: none"> • Limited forest roads <p>Potential Restoration Opportunities</p> <p>None.</p> <p>Potential Protection Opportunities</p> <p>Protect intact upland and riparian forests.</p> | |

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LEGEND

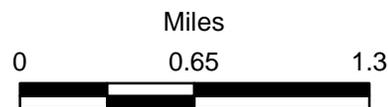
-  Reach and Subreach (SR) Breaks
 -  Rural Service Area
 -  County Boundary
 -  Other County Boundary
 -  SMA Jurisdiction
- Public Ownership**
-  Federal Government
 -  State Government
 -  Local Government
 -  Tribal Government

NOTES:

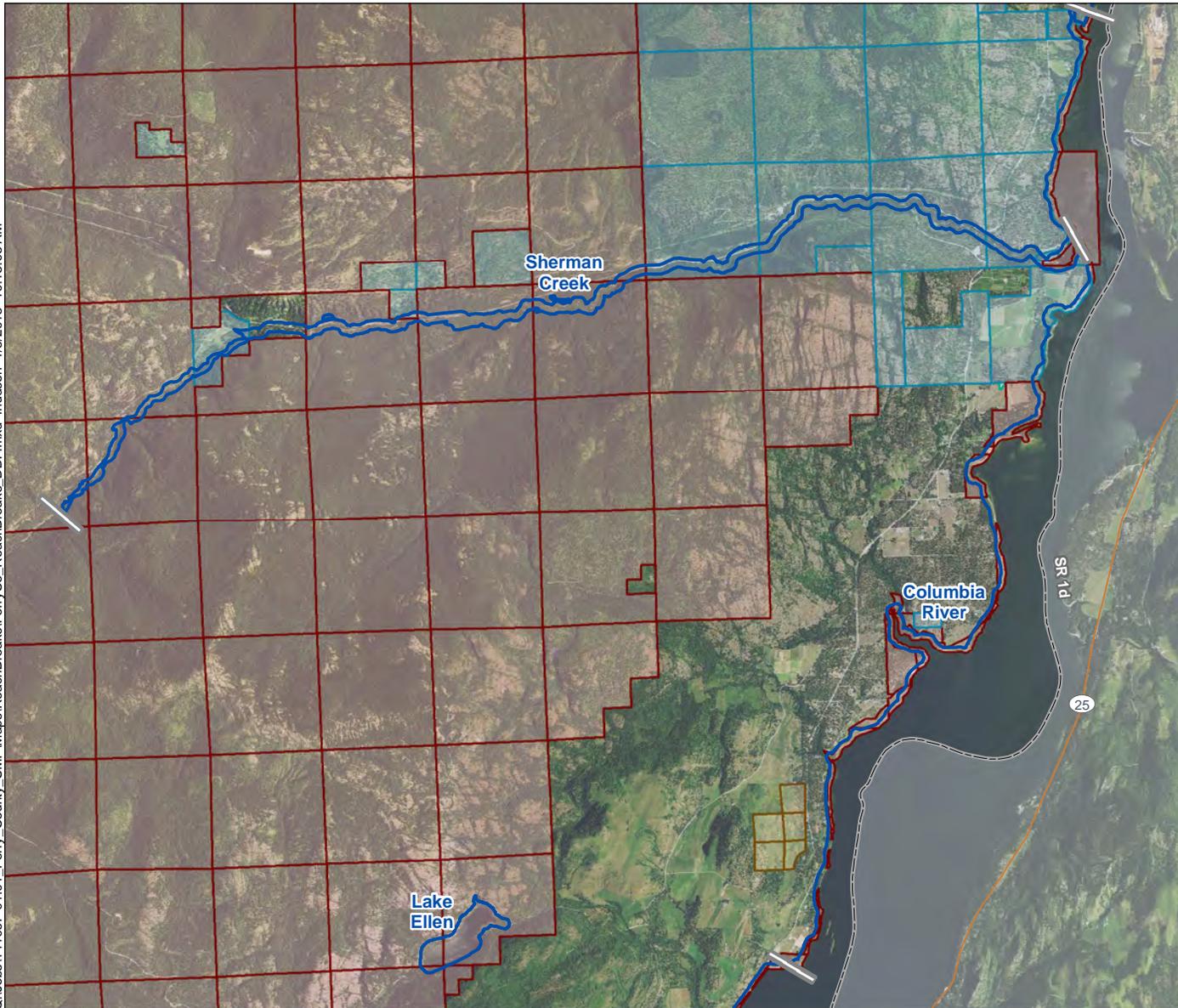
1. This information is to be used for planning purposes only. Data are displayed as is and without any guarantee of accuracy or completeness.
2. Aerial image courtesy of USDA NAIP (2013).
3. Ferry County's shoreline jurisdiction for Columbia River ends in the middle of the river.
4. Floodway and floodplain data acquired from FEMA.
5. Land ownership data acquired from Ferry County.



Map 10
 Columbia River SR 1a - 1c
 Ferry County Shoreline Master Program
 Ferry County, WA



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LEGEND

-  Reach and Subreach (SR) Breaks
 -  Highways
 -  County Boundary
 -  Other County Boundary
 -  SMA Jurisdiction
- Public Ownership**
-  Federal Government
 -  State Government
 -  Local Government
 -  Tribal Government

NOTES:

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2. Aerial image courtesy of USDA NAIP (2013).
3. Ferry County's shoreline jurisdiction for Columbia River ends in the middle of the river.
4. Floodway and floodplain data acquired from FEMA.
5. Land ownership data acquired from Ferry County.



Map 11
Columbia River SR 1d and Sherman Creek
Ferry County Shoreline Master Program
Ferry County, WA

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LEGEND

 Reach and Subreach (SR) Breaks

 Highways

 County Boundary

 Other County Boundary

 SMA Jurisdiction

Public Ownership

 Federal Government

 State Government

 Local Government

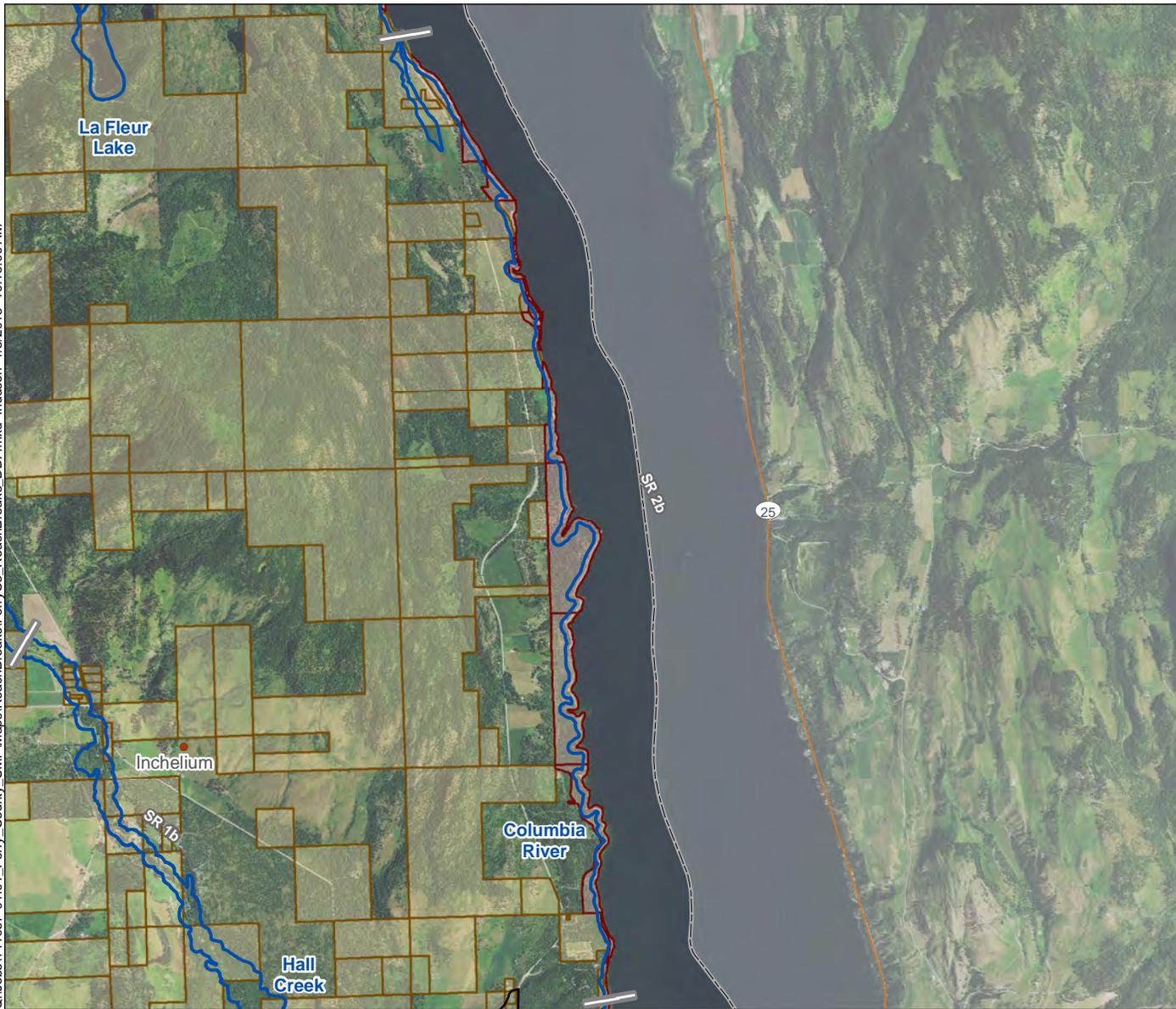
 Tribal Government

NOTES:

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2. Aerial image courtesy of USDA NAIP (2013).
3. Ferry County's shoreline jurisdiction for Columbia River ends in the middle of the river.
4. Floodway and floodplain data acquired from FEMA.
5. Land ownership data acquired from Ferry County.



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LEGEND

-  Reach and Subreach (SR) Breaks
-  Populated Place
-  Highways
-  Rural Service Area
-  County Boundary
-  Other County Boundary
-  SMA Jurisdiction

Public Ownership

-  Federal Government
-  Tribal Government

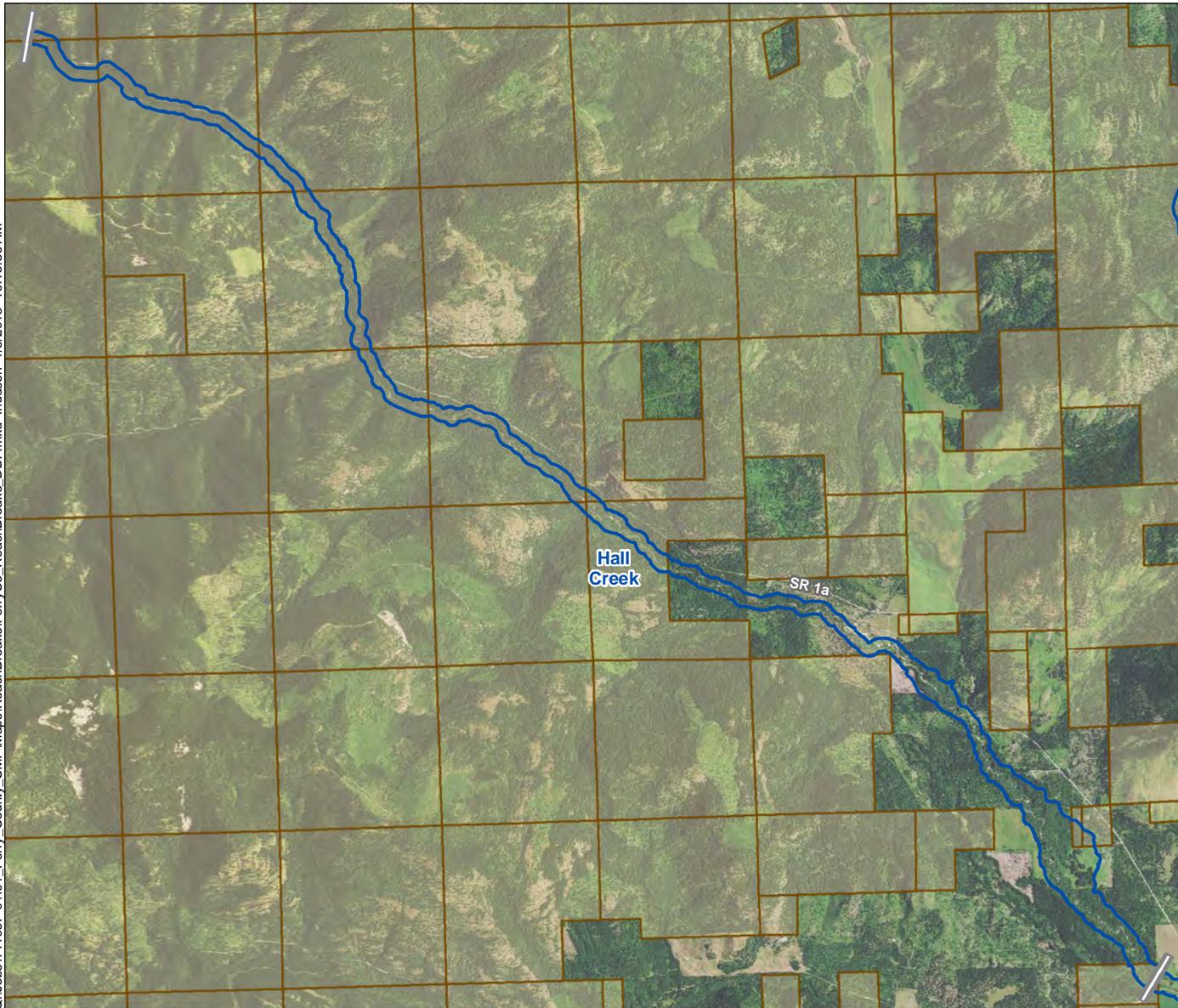
NOTES:

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2. Aerial image courtesy of USDA NAIP (2013).
3. Ferry County's shoreline jurisdiction for Columbia River ends in the middle of the river.
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5. Land ownership data acquired from Ferry County.



Map 13
Columbia River SR 2b
Ferry County Shoreline Master Program
Ferry County, WA

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LEGEND

 Reach and Subreach (SR) Breaks

 County Boundary

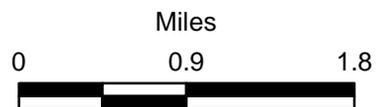
 SMA Jurisdiction

Public Ownership

 Tribal Government

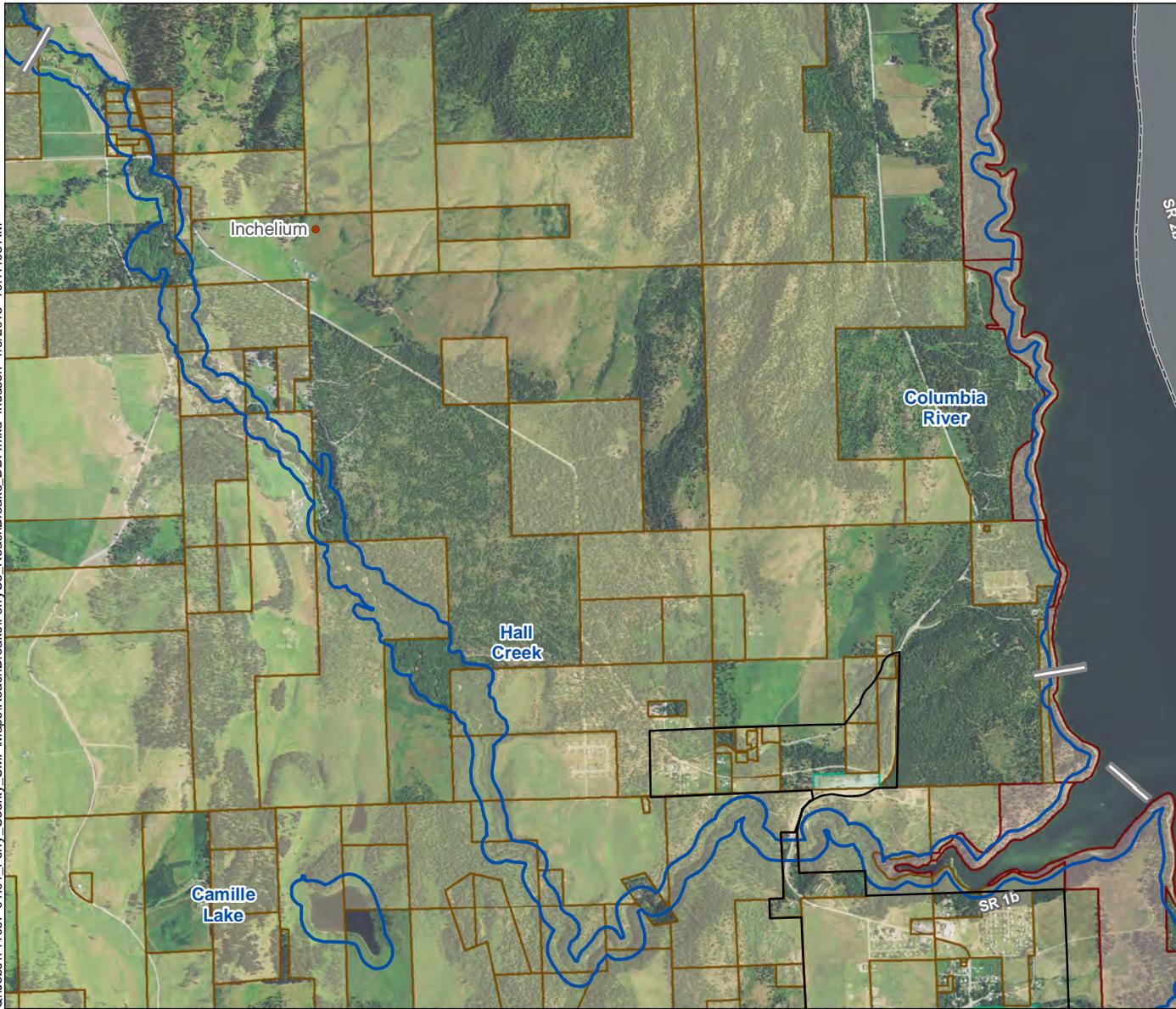
NOTES:

1. This information is to be used for planning purposes only. Data are displayed as is and without any guarantee of accuracy or completeness.
2. Aerial image courtesy of USDA NAIP (2013).
3. Ferry County's shoreline jurisdiction for Columbia River ends in the middle of the river.
4. Floodway and floodplain data acquired from FEMA.
5. Land ownership data acquired from Ferry County.



Map 14
Hall Creek SR 1a
Ferry County Shoreline Master Program
Ferry County, WA

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LEGEND

- Reach and Subreach (SR) Breaks
- Populated Place
- Rural Service Area
- County Boundary
- Other County Boundary
- SMA Jurisdiction

Public Ownership

- Federal Government
- Local Government
- Tribal Government

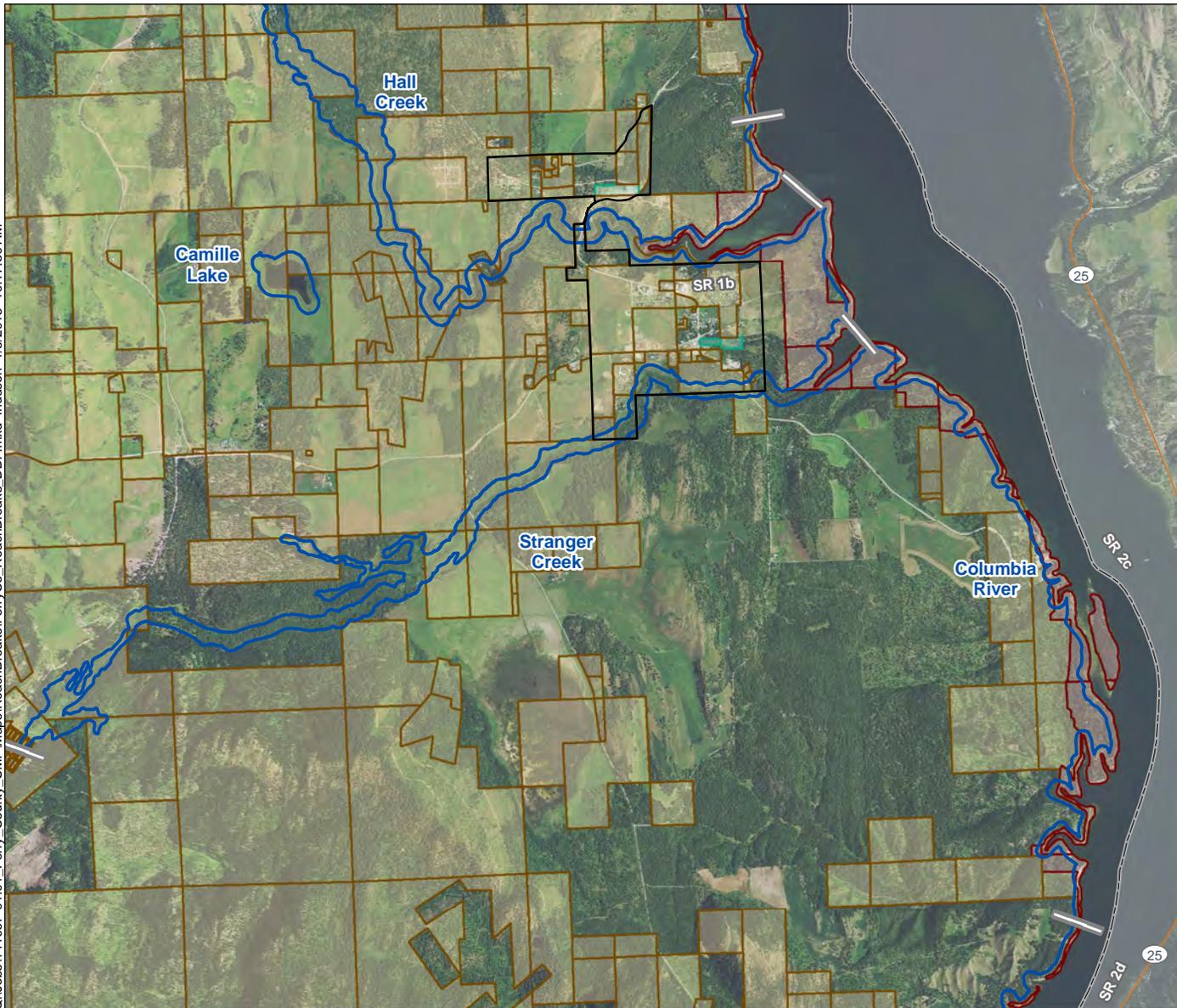
NOTES:

1. This information is to be used for planning purposes only. Data are displayed as is and without any guarantee of accuracy or completeness.
2. Aerial image courtesy of USDA NAIP (2013).
3. Ferry County's shoreline jurisdiction for Columbia River ends in the middle of the river.
4. Floodway and floodplain data acquired from FEMA.
5. Land ownership data acquired from Ferry County.



Map 15
Hall Creek SR 1b
Ferry County Shoreline Master Program
Ferry County, WA

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LEGEND

- Reach and Subreach (SR) Breaks
- Highways
- Rural Service Area
- County Boundary
- Other County Boundary
- SMA Jurisdiction

Public Ownership

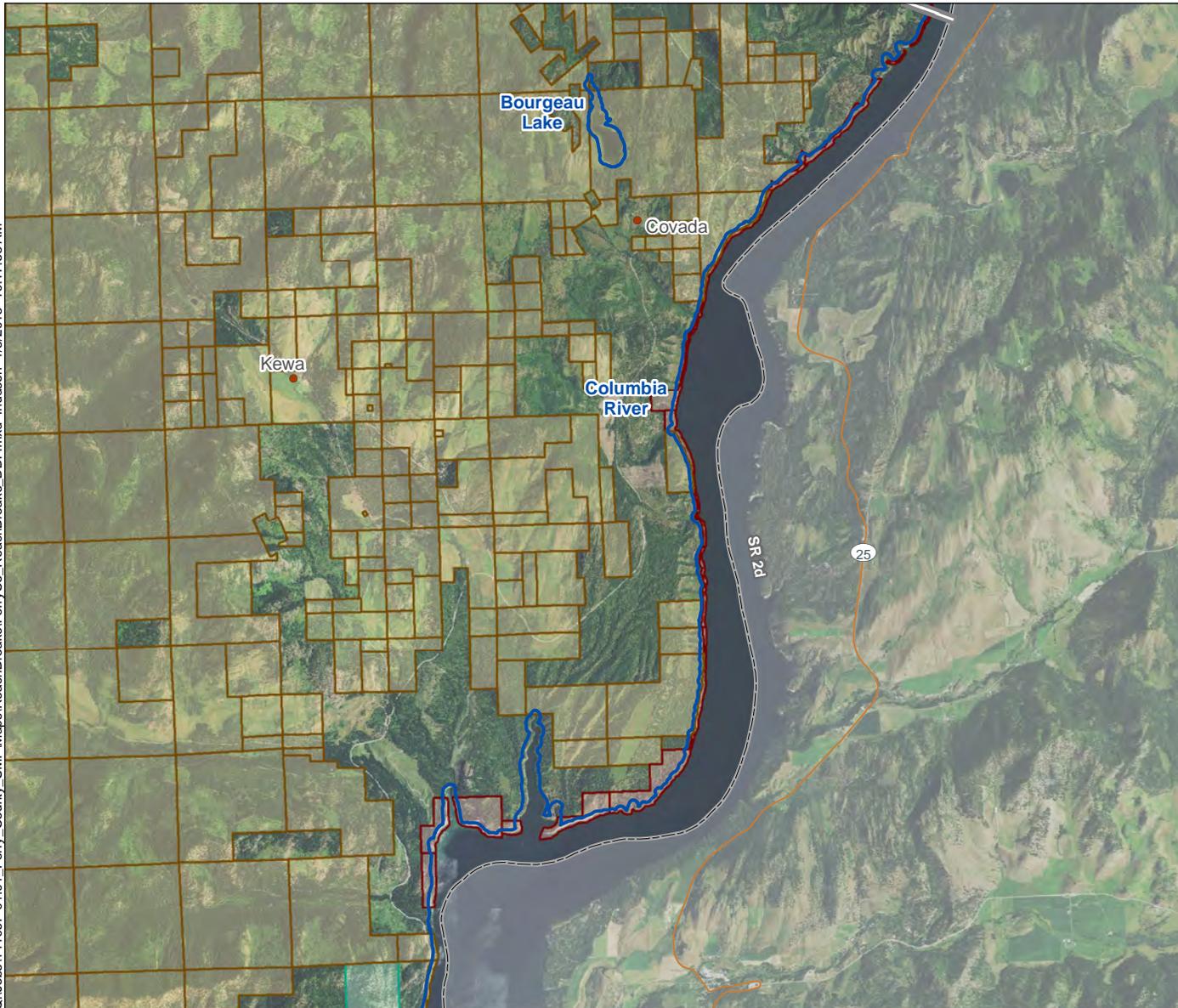
- Federal Government
- Local Government
- Tribal Government

- NOTES:**
1. This information is to be used for planning purposes only. Data are displayed as is and without any guarantee of accuracy or completeness.
 2. Aerial image courtesy of USDA NAIP (2013).
 3. Ferry County's shoreline jurisdiction for Columbia River ends in the middle of the river.
 4. Floodway and floodplain data acquired from FEMA.
 5. Land ownership data acquired from Ferry County.



Map 16
 Columbia River SR 2c and Stranger Creek
 Ferry County Shoreline Master Program
 Ferry County, WA

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LEGEND

-  Reach and Subreach (SR) Breaks
-  Populated Place
-  Highways
-  County Boundary
-  Other County Boundary
-  SMA Jurisdiction
- Public Ownership**
-  Federal Government
-  Local Government
-  Tribal Government

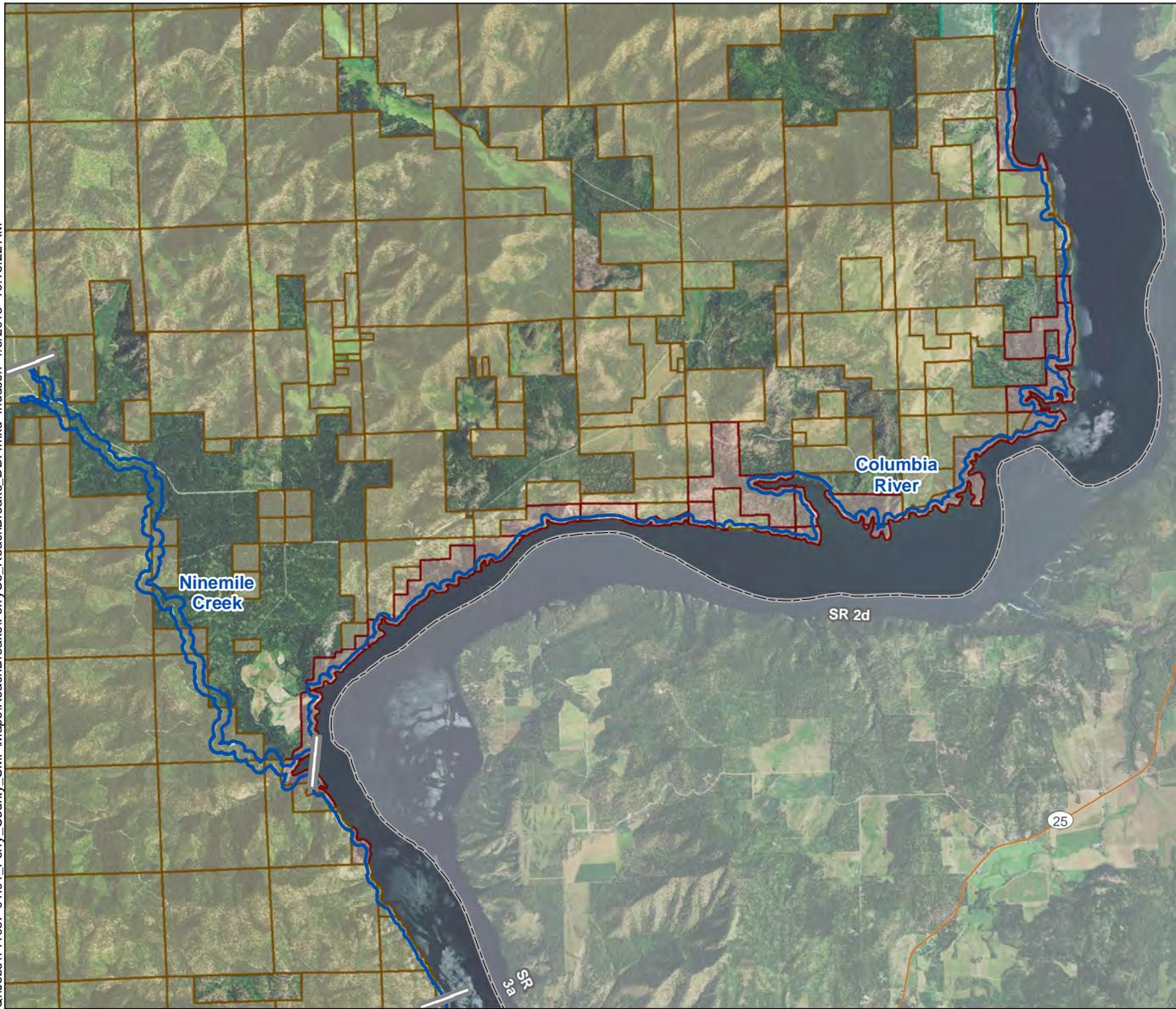
NOTES:

1. This information is to be used for planning purposes only. Data are displayed as is and without any guarantee of accuracy or completeness.
2. Aerial image courtesy of USDA NAIP (2013).
3. Ferry County's shoreline jurisdiction for Columbia River ends in the middle of the river.
4. Floodway and floodplain data acquired from FEMA.
5. Land ownership data acquired from Ferry County.



Map 17
Columbia River SR 2d Upstream Extent
Ferry County Shoreline Master Program
Ferry County, WA

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LEGEND

 Reach and Subreach (SR) Breaks

 Highways

 County Boundary

 Other County Boundary

 SMA Jurisdiction

Public Ownership

 Federal Government

 Local Government

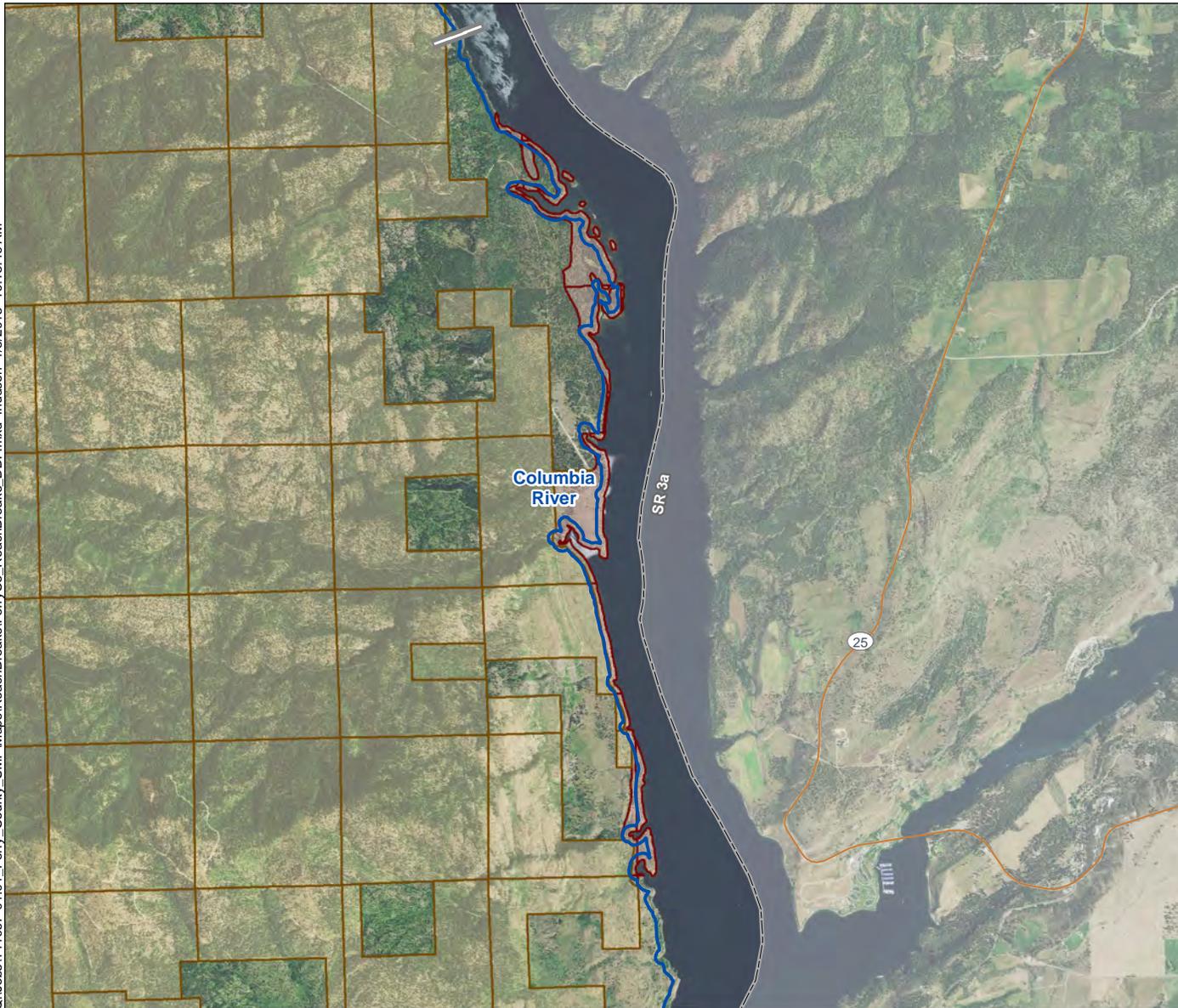
 Tribal Government

NOTES:

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5. Land ownership data acquired from Ferry County.



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LEGEND

 Reach and Subreach (SR) Breaks

 Highways

 County Boundary

 Other County Boundary

 SMA Jurisdiction

Public Ownership

 Federal Government

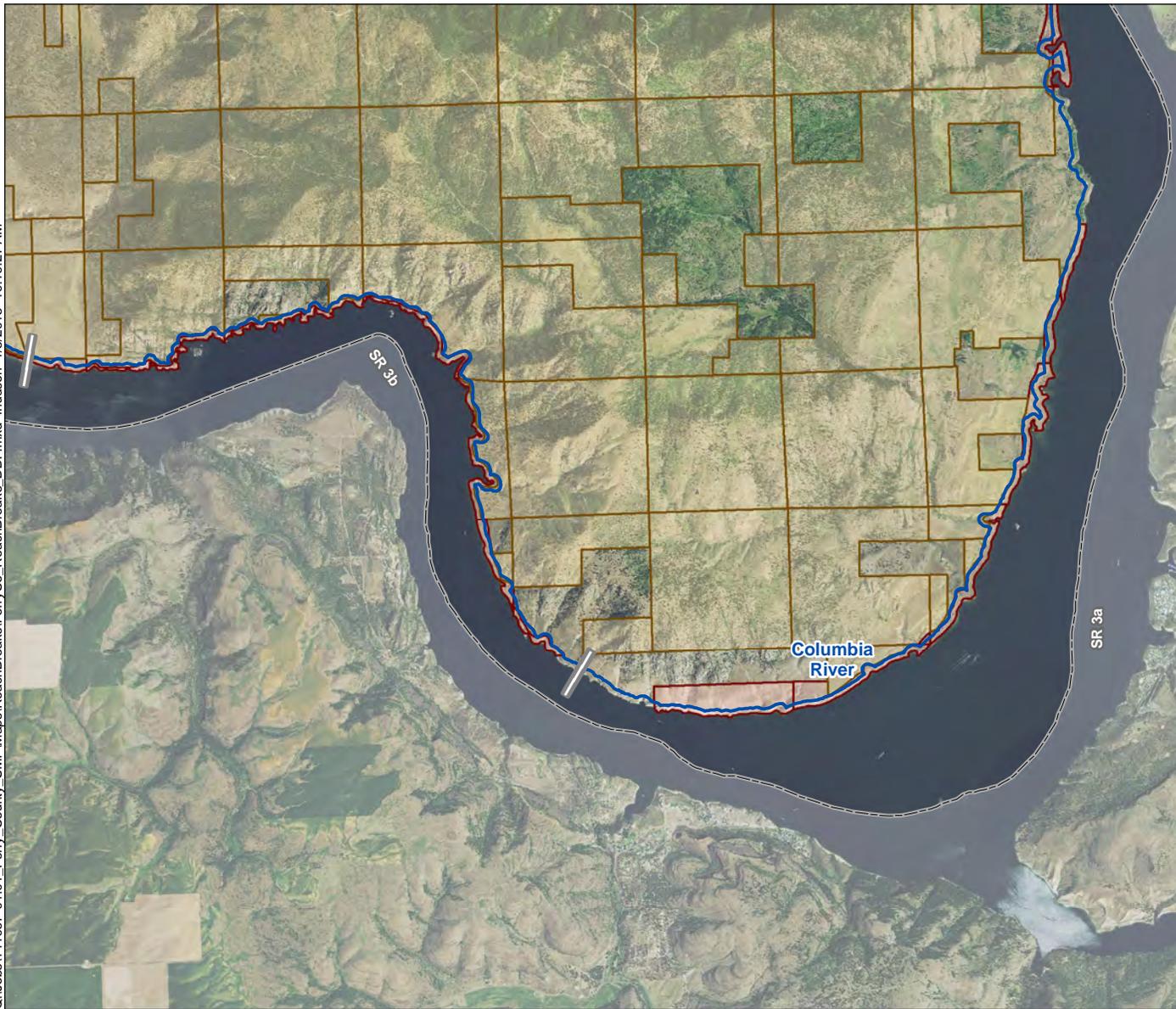
 Tribal Government

NOTES:

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LEGEND

-  Reach and Subreach (SR) Breaks
-  County Boundary
-  Other County Boundary
-  SMA Jurisdiction

Public Ownership

-  Federal Government
-  Tribal Government

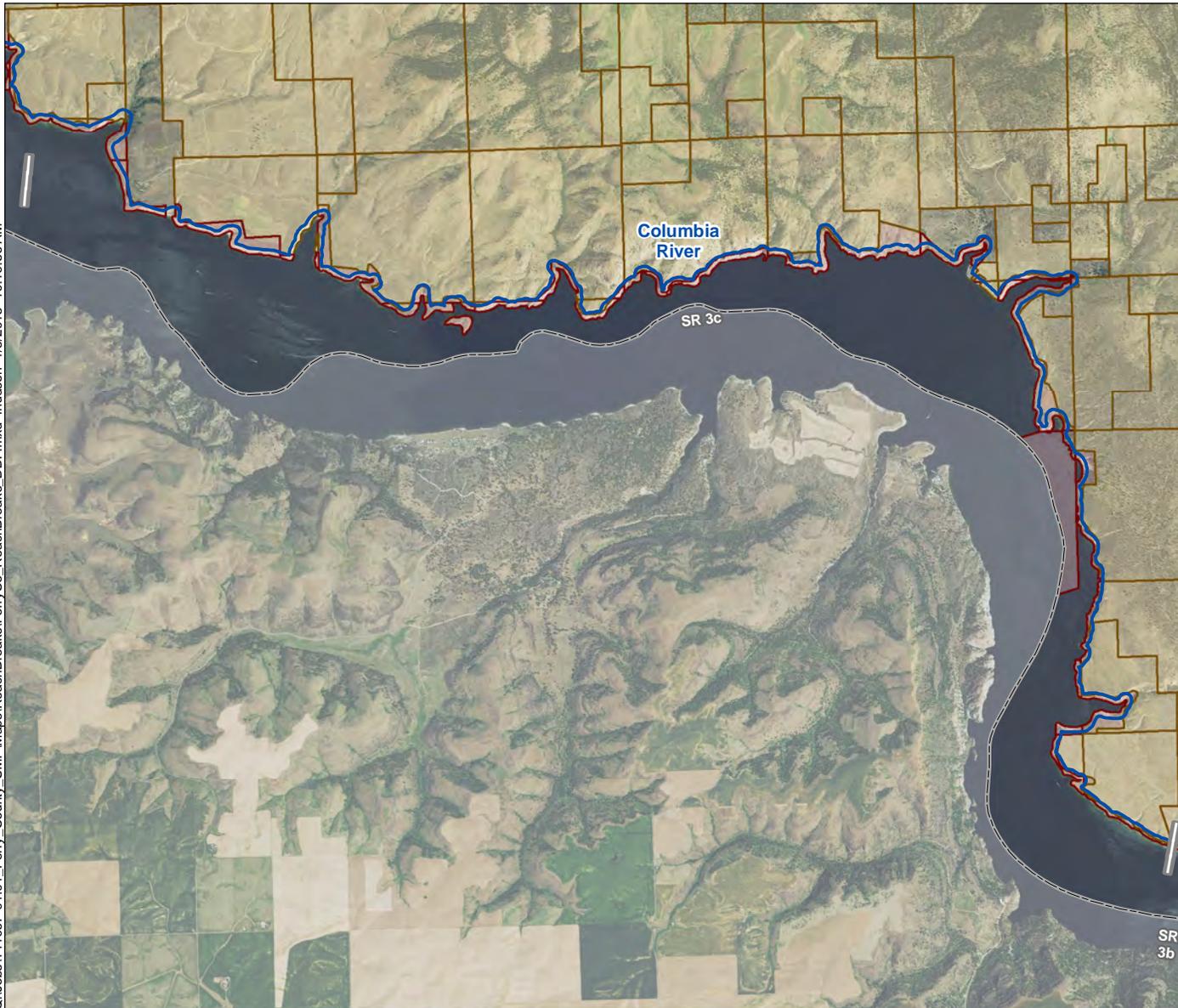
NOTES:

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2. Aerial image courtesy of USDA NAIP (2013).
3. Ferry County's shoreline jurisdiction for Columbia River ends in the middle of the river.
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5. Land ownership data acquired from Ferry County.



Map 20
 Columbia River SR 3a Downstream Extent and SR 3b
 Ferry County Shoreline Master Program
 Ferry County, WA

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LEGEND

▮ Reach and Subreach (SR) Breaks

▭ County Boundary

▭ Other County Boundary

▭ SMA Jurisdiction

Public Ownership

▭ Federal Government

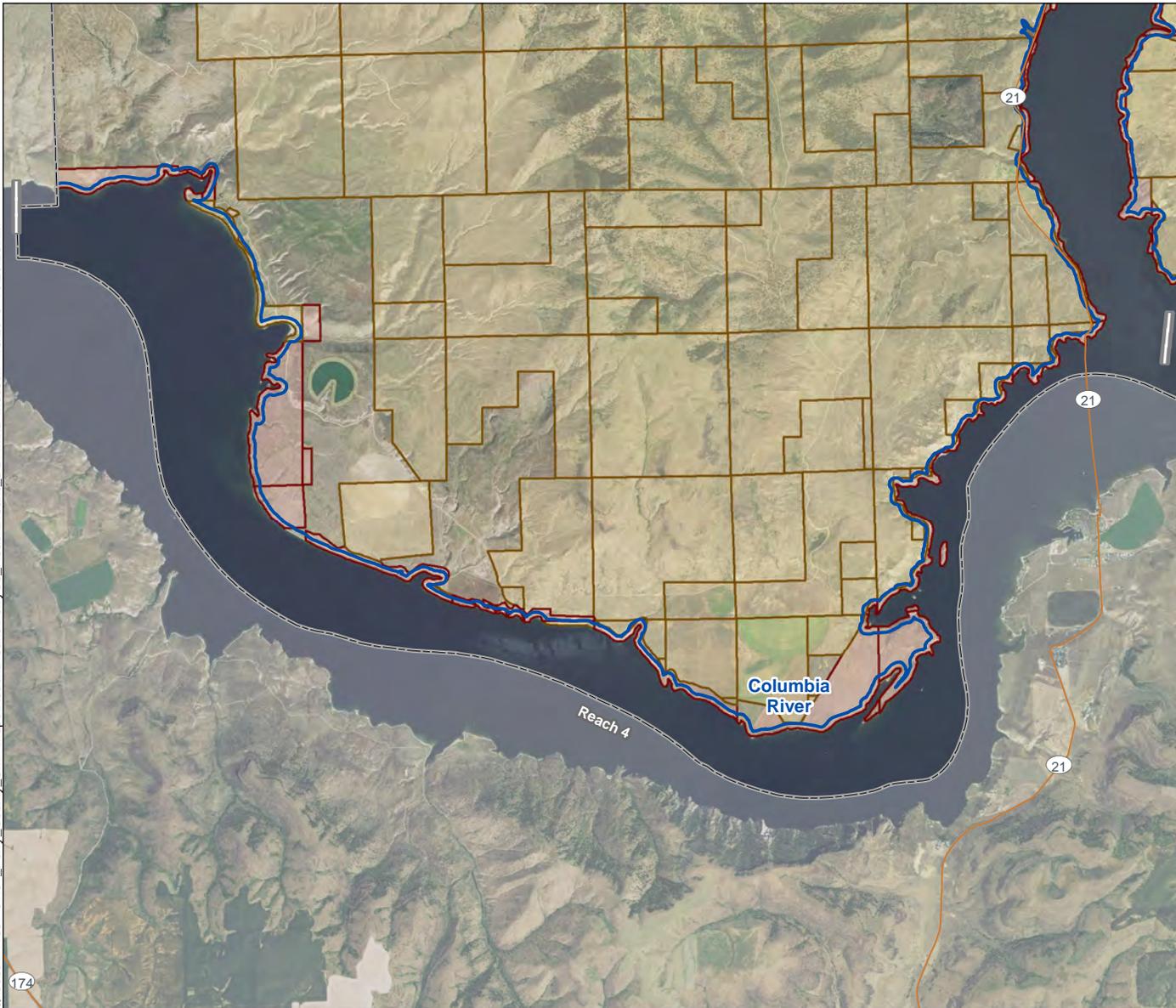
▭ Tribal Government

NOTES:

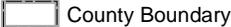
1. This information is to be used for planning purposes only. Data are displayed as is and without any guarantee of accuracy or completeness.
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LEGEND

-  Reach and Subreach (SR) Breaks
-  Highways
-  County Boundary
-  Other County Boundary
-  SMA Jurisdiction
- Public Ownership**
-  Federal Government
-  Tribal Government

NOTES:

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5. Land ownership data acquired from Ferry County.



Map 22
 Columbia River Reach 4
 Ferry County Shoreline Master Program
 Ferry County, WA