

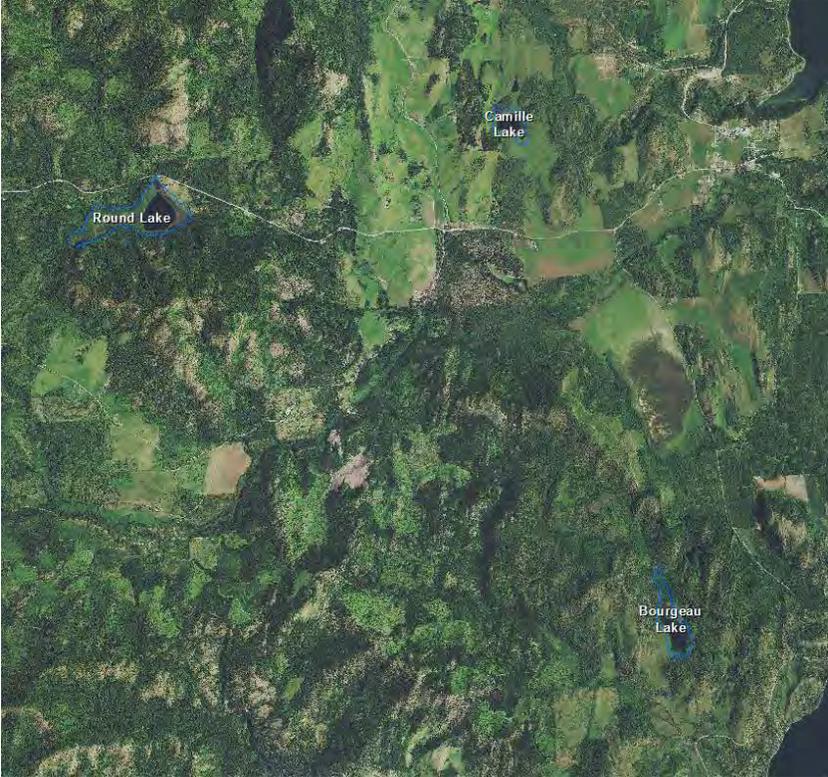
APPENDIX D
LAKE GROUPS REACH
CHARACTERIZATION TABLES AND
REACH MAPS

| East Ferry Lakes Group - North Ferry County |
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| <p>Reach Description</p> <p>East Ferry Lake Group North is located along the west side of Columbia River between Sherman Creek and Hall Creek</p> |
| <p>Shoreline Jurisdiction</p> <p>Lake Ellen (129 acres), Elbow Lake (140 acres), and La Fleur Lake (166 acres)</p> |
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| <p>Source: U.S. Department of Agriculture (USDA) National Agriculture Imagery Program (NAIP) 2013</p> |
| <p>Subreaches; see Figure 11:</p> <p>Not applicable</p> |
| Characteristics |
| <p>Ownership</p> <p>Lake Ellen and Elbow Lake are both 100% public (U.S. Forest Service [USFS] and tribal lands). La Fleur Lake is mostly public (tribal lakes) with a very small amount of private lands (less than 5%).</p> |

| East Ferry Lakes Group - North Ferry County |
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| <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 – Not included in the existing Shoreline Management Plan |
| <p>Existing Land Cover/Development</p> <p>This area consists mostly of unimproved lands with forest and shrubland land covers. There are access roads and limited recreational developments near Lake Ellen.</p> |
| <p>Geomorphic Character</p> <p><u>Lake Ellen</u></p> <p>Description – The lake occupies a topographic low with a shoreline consisting of mostly bedrock and a minor amount of continental glacial drift. The lake is mostly fed by small local surface streams and groundwater. The lake’s major surface outflow is to La Fleur Creek, which drains to the Columbia River.</p> <p>Hardened Banks – None Identified. The lake is located in the rural county with no visible development along its shorelines.</p> <p><u>Elbow Lake</u></p> <p>Description –The lake occupies a topographic low with a shoreline consisting mostly of continental glacial drift and a minor amount of bedrock (orthogneiss). The lake is mostly fed by small, local surface streams and groundwater. The lake’s major surface outflow is to Barnaby Creek, which drains to the Columbia River.</p> <p>Hardened Banks – None Identified. The lake is located in the rural county with no visible development along its shorelines.</p> <p><u>La Fleur Lake</u></p> <p>Description – The lake occupies a topographic low with a shoreline consisting mostly of continental glacial drift and a minor amount of bedrock (Covada Group Wacke). The lake is mostly fed by small local surface streams and groundwater. The lake’s major surface outflow is Little John Creek, which drains to Columbia River.</p> <p>Hardened Banks – None Identified. The lake is located in the rural county with no visible development along its shorelines.</p> |
| <p>Flooding and Geological Hazard</p> <p>Flooding –The lakes within the East Ferry Lakes Group - North do not have mapped Federal Emergency Management Agency (FEMA) floodplains. Localized floodplains may be present along each lake’s perimeter.</p> |

| East Ferry Lakes Group - North Ferry County |
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| <p>Geological Hazards – La Fleur Lake has soils susceptible to severe erosion. Lake Ellen is susceptible to moderate to severe erosion, with severe erosion dominate. Elbow Lake is susceptible to moderate to severe erosion, with moderate erosion dominate.</p> <p>The lakes shorelines contain 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 West Ferry Lakes Group - South.</p> |
| <p>Existing Public Access</p> <p>There are several public access sites on the lakes in the East Ferry Lakes Group - North. Lake Ellen is located in the Colville National Forest and has two campgrounds—Lake Ellen Campground and Lake Ellen West Campground. Both campgrounds are fee areas and have boat launches, docks, tent camping, toilets, and fire pits. La Fleur Lake is located on the Confederated Tribes of the Colville Reservation (CTCR) land and has a dock for fishing access. La Fleur Lake is open to tribal members and non-tribal members. Elbow Lake is located on CTCR land and has no formal public access facilities; however, the lake is open to public fishing.</p> <p>Identified Public Access Improvements</p> <p>There are no public access improvements identified for the lakes.</p> <p>Public Access Opportunities</p> <p>Public access opportunities on CTCR land will be at the discretion of the tribes. Public access opportunities are likely adequate for USFS lands.</p> |
| Ecological Conditions |
| <p>Water Quantity and Sediment</p> <p>The lakes are mostly fed by local tributary streams, surface runoff, and groundwater. All the lake surface outflows enter the Columbia River. Lake Ellen’s major surface outflow is to La Fleur Creek, which drains to the Columbia River. Elbow Lake’s major surface outflow is to Barnaby Creek, which drains to Columbia River. La Fleur Lake’s major surface outflow is to Little John Creek, which drains to the Columbia River.</p> <p>Sediment inputs to the lakes include the erodible continental glacial drift banks, perimeter soils prone to erosion, adjacent steep slopes prone to landslides, and sediment transported by local runoff and surface drainages. Where present, the vegetated riparian corridor likely helps to limit the delivery of fine sediment to the lakes. Fine sediment can be transported out of the lakes via the local surface drainages with the amount depending on local flow and sediment conditions.</p> |
| <p>Water Quality</p> <p>East Ferry Lakes Group - North is not listed on Washington State Department of Ecology’s (Ecology’s) 305b list.</p> |
| <p>Habitat Characteristics and Priority Habitat Species Presence</p> <p>Shorelines around Lake Ellen are generally undeveloped, with the exception of Lake Ellen Road along the south/eastern shore and a small boat ramp at the south/west end. The lake is surrounded by rocky mountain slopes, and in general forest cover is patchy or sparse on the slopes due to terrain.</p> |

| East Ferry Lakes Group - North Ferry County |
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| <p>The vegetation along the shoreline comprises sparse forest of coniferous and deciduous trees. There is intact riparian habitat, particularly along the southeast end, which includes a mix of trees, shrubs, and herbaceous ground cover.</p> <p>Elbow Lake shorelines are also generally undeveloped with the exception of Elbow Lake Road along the northwestern shoreline. There is a small primitive campground at the west end of the lake. The lake discharges to a small creek at the east end. The northern shoreline of the lake is adjacent to steeper sloping mountain slopes with mixed patches of steppe/shrub-steppe grassland and patches of coniferous/deciduous forest. The southern shoreline is less steep in the uplands and more completely forested. The entire shoreline is vegetated with trees and typical riparian herbaceous vegetation. Lake levels fluctuate based on precipitation and snowpack runoff. The end of the lake discharging to the creek has characteristic lacustrine wetland vegetation when water levels are low.</p> <p>La Fleur Lake is surrounded by forested hills and generally undeveloped. There are informal gravel roads surrounding the lake and a small boat dock on the southeastern shoreline. The entire shoreline is vegetated with trees and typical riparian herbaceous vegetation. The north end of the lake is very narrow, and this area has characteristic lacustrine wetland vegetation along the shoreline, with vegetative material on the water surface at lower lake levels.</p> |
| Ecological Functions Analysis |
| <p>Level of Existing Function</p> <p>East Ferry Lakes Group - North is designated as Partially Functioning, based on transportation infrastructure.</p> <p>Stressors</p> <p>Upland development:</p> <ul style="list-style-type: none"> • All lakes have roads within the jurisdiction boundary <p>Recreational use:</p> <ul style="list-style-type: none"> • La Fleur and Elbow lakes are used for fishing • Lake Ellen has campgrounds and water access (boat launches) <p>Potential Restoration Opportunities</p> <p>In association with recreation improvements, consider incorporating riparian or aquatic structure complexity to the lake shorelines.</p> <p>Potential Protection Opportunities</p> <p>Implement or retrofit stormwater controls consistent with the Eastern Washington Stormwater Manual.</p> |

| East Ferry Lakes Group - South Ferry County |
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| <p>Reach Description</p> <p>East Ferry Lake Group South is located south of Hall Creek along the west side of Columbia River</p> |
| <p>Shoreline Jurisdiction</p> <p>Camille Lake (53 acres), Round Lake (212 acres), and Bourgeau Lake (87 acres)</p> |
|  <p style="text-align: right; margin-top: 5px;">Source: USDA NAIP 2013</p> |
| <p>Subreaches; see Figure 22</p> <p>Not applicable</p> |
| Characteristics |
| <p>Ownership</p> <p>Bourgeau Lake is mostly tribal lands with a very small amount (less than 5%) of private ownership. Camille Lake is about 35% private and 65% tribal lands. Round Lake is about 40% private and 60% tribal lands.</p> |
| <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 and Indian allotment trust lands • Rural |

| East Ferry Lakes Group - South Ferry County |
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| <p>Current Shoreline Management Program Environment Designation:</p> <ul style="list-style-type: none"> • Unavailable – Not included in the existing Shoreline Management Plan |
| <p>Existing Land Cover/Development</p> <p>Camille Lake and Bourgeau Lake are mostly unimproved and have forest land cover. Round Lake has an access road and limited recreational developments.</p> |
| <p>Geomorphic Character</p> <p><u>Camille Lake</u></p> <p>Description – The lake occupies a topographic low within glacial till. The lake is mostly fed by small local surface streams and groundwater. The lake’s major outflow is to a tributary of Stranger Creek, which drains to the Columbia River.</p> <p>Hardened Banks – None Identified. The lake is located in the rural county with no visible development along its shorelines.</p> <p><u>Round Lake</u></p> <p>Description – The lake occupies a topographic low within continental glacial drift. The lake is mostly fed by small local surface streams and groundwater with outflow to a tributary of Cornstalk Creek.</p> <p>Hardened Banks – None Identified. The lake is located in the rural county with no visible development along its shorelines.</p> <p><u>Bourgeau Lake</u></p> <p>Description – The lake occupies a topographic low within continental glacial drift.</p> <p>Hardened Banks – None Identified. The lake is located in the rural county with no visible development along its shorelines.</p> |
| <p>Flooding and Geological Hazard</p> <p>Flooding – The lakes within the East Ferry Lakes Group - South do not have a mapped FEMA floodplains. Localized floodplains may be present along each lake’s perimeter.</p> <p>Geological Hazards – Bourgeau Lake and Round Lake have soils susceptible to moderate to severe erosion. Camille Lake shoreline area is susceptible to moderate erosion. The lakes shorelines contain 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 West Ferry Lakes Group - South.</p> |

| East Ferry Lakes Group - South Ferry County |
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| <p>Existing Public Access</p> <p>The East Ferry Lakes Group - South have limited public access opportunities. Bourgeau Lake is located on CTCR land. There is no formal public access, but it is open for fishing and can be accessed by road. Round Lake has a fishing dock and can be accessed by road.</p> <p>Identified Public Access Improvements</p> <p>There are no public access improvements identified for the East Ferry Lakes Group - South.</p> <p>Public Access Opportunities</p> <p>The lakes in this group are mostly located on CTCR lands, the rest are private. Public access opportunities will be at the discretion of the tribes.</p> |
| Ecological Conditions |
| <p>Water Quantity and Sediment</p> <p>The lakes are mostly fed by local tributary streams, surface runoff, and groundwater. All the lake surface outflows enter the Columbia River. Camille Lake’s outflow is mostly to the Columbia River tributary, Stranger Creek. Round Lake’s outflow is to Cornstalk Creek, a tributary to Stranger Creek. Bourgeau Lake outflow is a small unnamed surface stream that flows into the Columbia River.</p> <p>Sediment inputs to the lakes include the erodible continental glacial drift (Bourgeau and Round lakes) and till (Camille Lake) banks, perimeter soils prone to erosion, adjacent steep slopes prone to landslides, and sediment transported by local runoff and surface drainages. Where present, the vegetated riparian corridor likely helps to limit the delivery of fine sediment to the lakes. Fine sediment can be transported out of the lakes via the local surface drainages with the amount depending on local flow and sediment conditions.</p> |
| <p>Water Quality</p> <p>East Ferry Lakes Group - South is not listed on Ecology’s 305b list.</p> |
| <p>Habitat Characteristics and Priority Habitat Species Presence:</p> <p>The Columbia River in this reach supports a number of Endangered Species Act-listed fish species, as identified in the Inventory, Analysis, and Characterization Report (IAC) Report.</p> <p>Camille Lake is small and undeveloped, with no visible trails or roads near the lake. The shoreline lacks significant tree cover, and riparian vegetation is generally limited to grasses and herbaceous ground cover. It is surrounded by relatively flat lands to the south and small gently sloping hills to the north. There may be some cattle grazing or other agricultural activities in the area to the south of the lake, which is vegetated with grasses and lacks tree cover.</p> <p>Round Lake is generally undeveloped, with a small boat dock on the southern shoreline. The shorelines are all flat or gently sloped, and the lake is surrounded by areas of lacustrine wetlands and marshy areas that may become inundated. There are very few trees along the shoreline, with riparian vegetation consisting of herbaceous groundcover, semi-aquatic plants, and grasses. There is a channel on the eastern shoreline that connects round lake to a lake/wetland complex located on the eastern side of Twin Lakes Road. There is a gravel road that leads to the boat dock at Round Lake from Twin Lakes Road. There is another channel/access area at the north shoreline of the lake, which</p> |

| East Ferry Lakes Group - South Ferry County |
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| <p>is suitable for hand-carried personal watercraft launching. This channel is oriented to the east and is accessible via another access road from Twin Lakes Road. At the north end of the lake, adjacent to the shoreline wetland area, there is a park with grassy open space. A pavilion is located approximately 500 feet from the shoreline. The west shoreline of Round Lake is connected to a large wetland complex.</p> <p>Bourgeau Lake is relatively undeveloped. Stray Dog Canyon Road/State Road 65 runs along the southern/eastern shoreline of the lake and provide access to an informal shoreline access/use located along the northeastern shoreline. There is a residence located on the landward side of the road at the southern end. The northern and eastern shorelines of the lake have riparian cover, which includes trees and shrubs, and are connected to larger patches of forested area. The southwestern shoreline has few trees, and the surrounding uplands are grassy and open. The northern end of the lake is very narrow and exhibits lacustrine wetland characteristics with marshy areas along and adjacent to the shoreline.</p> |
| Ecological Functions Analysis |
| <p>Level of Existing Function</p> <p>East Ferry Lakes Group - North is designated as Partially Functioning, based on transportation infrastructure and agricultural fields.</p> <p>Stressors</p> <p>Upland development:</p> <ul style="list-style-type: none"> • Round lake has roads within the jurisdiction boundary • Camille Lake has agricultural fields nearby but outside of the jurisdiction boundary <p>Recreational use:</p> <ul style="list-style-type: none"> • Round Lake is used for fishing <p>Potential Restoration Opportunities</p> <p>None.</p> <p>Potential Protection Opportunities</p> <p>Implement or retrofit stormwater controls consistent with the Eastern Washington Stormwater Manual.</p> |

| Twin Lakes Group | Ferry County |
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| Reach Description | |
| Twin Lakes are located about 7 miles southwest of Inchelium | |
| Shoreline Jurisdiction | |
| North Twin Lake (1,174 acres) and South Twin Lake (1,161 acres) | |
|  | |
| Source: USDA NAIP 2013 | |
| Subreaches; see Figure 22: | |
| Not applicable | |
| Characteristics | |
| Ownership | |
| North and South Twin lakes are mostly tribal lands 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 Indian allotment trust lands • Rural and Rural Service Area | |

| Twin Lakes Group | Ferry County |
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| <p>Current Shoreline Management Program Environment Designation:</p> <ul style="list-style-type: none"> • Unavailable – Not included in the existing Shoreline Management Plan | |
| <p>Existing Land Cover/Development</p> <p>Land cover is dominantly forest around North and South Twin lakes, except for the associated wetland system located southwest of North Twin Lake. Much of eastern shoreline of both lakes has been developed with recreational facilities such as campgrounds, docks, restrooms, and residential buildings.</p> | |
| <p>Geomorphic Character</p> <p><u>North Twin Lake</u></p> <p>Description – The lake occupies a topographic low within the continental glacial drift with some exposed bedrock (granite and grano-diorite) along its shoreline. The lake is mostly fed by local surface streams, including Carson, Granite, and Beaverdam creeks and groundwater. The lake’s outflow is mostly to South Twin Lake and Stranger Creek, which drain to the Columbia River.</p> <p>Hardened Banks – Approximately 400 feet of hardened bank exists along the shoreline and is associated with lake access areas.</p> <p><u>South Twin Lake</u></p> <p>Description – The lake occupies a topographic low within the continental glacial drift with some exposed bedrock (granite and grano-diorite) along its shoreline. The lake is mostly fed by local surface streams and groundwater. The lake’s outflow is mostly to Stranger Creek, which drains to the Columbia River.</p> <p>Hardened Banks – Approximately 1,700 feet of hardened bank exists along the shoreline and are associated with boat launches and lake access points.</p> | |
| <p>Flooding and Geological Hazard</p> <p>Flooding – The North and South Twin lakes do not have a mapped FEMA floodplain. Localized floodplains may be present along the lakes perimeters and may be associated with Stranger Creek drainage area.</p> <p>Geological Hazards – North and South Twin lakes have soils susceptible to moderate to severe erosion. Both lake shorelines contain 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 Twin Lakes Group.</p> | |
| <p>Existing Public Access</p> <p>Carson Beach Campground is located on North Twin Lake; however, it is only open to tribal members. Rocky Point Campground on North Twin Lake is open to members and non-members. It has camping, garbage service, a boat dock, swimming area, fire rings, and outhouses. Rainbow Beach Resort encompasses North Twin Lake and South Twin Lake. It is a full-service resort with boat docks/slips, boat launch, groceries, swimming, fishing, cabins, and recreational vehicle (RV) space. Boating, fishing, and swimming are popular activities on Twin Lakes Group.</p> | |

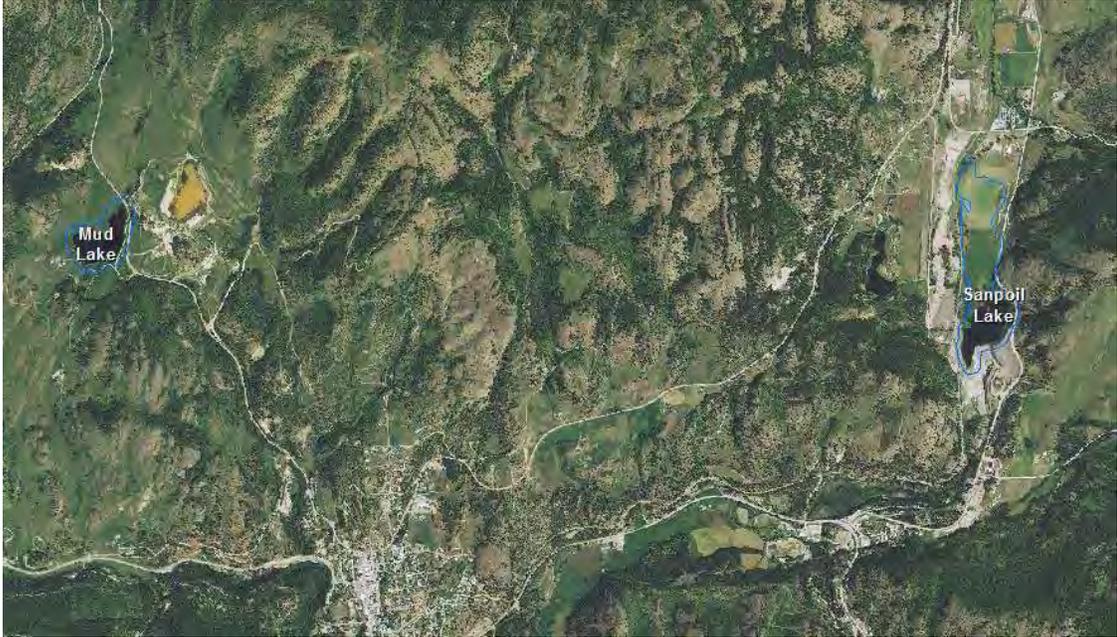
| Twin Lakes Group | Ferry County |
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| Identified Public Access Improvements | |
| There are no public access improvements identified for the Twin Lakes Group. | |
| Public Access Opportunities | |
| The Twin Lakes Group are mostly on CTCR lands and the rest is private. Public access opportunities are limited and at the discretion of the tribes. | |
| Ecological Conditions | |
| Water Quantity and Sediment | |
| <p>North Twin Lake is mostly fed by local surface streams, including Carson, Granite, and Beaverdam creeks and groundwater. The lake’s outflow is mostly to South Twin Lake and Stranger Creek, which drain into the Columbia River. South Twin Lake is mostly fed by local surface streams and groundwater. The lake’s outflow is mostly to Stranger Creek, which drains to the Columbia River.</p> <p>Sediment inputs to the lakes include the erodible continental glacial drift banks, perimeter soils prone to erosion, adjacent steep slopes prone to landslides, and sediment transported by local runoff and surface drainages. Where present, the vegetated riparian corridor likely helps to limit the delivery of fine sediment to the lakes. Fine sediment can be transported out of the lakes via surface drainages (including Stranger Creek) with the amount depending on local flow and sediment conditions.</p> | |
| Water Quality | |
| Twin Lakes Group is not listed on Ecology’s 305b list. | |
| Habitat Characteristics and Priority Habitat Species Presence | |
| <p>The Twin Lakes Group supports a number of warm-water game fish species, as identified in the IAC Report. The Twin Lakes Group is a reservoir, and connected to each other via a channel and the south end of North Twin Lake.</p> <p>There is residential and recreational development to the northeastern shore of North Twin Lake, with approximately 15 multiple-boat docks located along the shoreline. North Twin Lake is accessed via these docks and trails extending from Bridge Creek Road that run along the north shoreline of the lake. There is little structural development along the west and south shorelines. There is access to the south at North Twin Lakes Access Road and Twin Lakes-Stranger Creek Road, associated with a small campground with gravel road/trails.</p> <p>At the north end of South Twin Lake, there is residential and recreational development similar to that at North Twin Lake. Approximately 20 boat docks are visible along the northeastern shoreline. There is sparse development and informal access areas located along the southeastern shoreline, which are accessible from Twin Lakes-Stranger Creek Road. The riparian areas on the west side of both lakes are less developed and feature riparian forested areas connected to larger intact forested upland areas. There is a parcel to the west of North Twin Lake that has been cleared and drained for agricultural use, and although this parcel is outside of the shoreline jurisdiction, it does appear there may be some surface water connection to the lake.</p> | |

| Twin Lakes Group | Ferry County |
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| Ecological Functions Analysis | |
| <p>Level of Existing Function</p> <p>Twin Lakes Group is designated as Partially Functioning, based on residential and recreational development.</p> <p>Stressors</p> <p>Upland development:</p> <ul style="list-style-type: none"> • Both lakes have concentrated residential and recreational development along their northeastern shoreline. These areas include over-water structures, buildings, and access roads within the jurisdiction boundary. Generally, riparian vegetation has been preserved along the shoreline. • North Twin Lake includes additional camping with an access road near the water’s edge on the northwest side of the lake. • Irrigated landscaping runoff may contribute to algae blooms within the lakes. <p>Recreational use:</p> <ul style="list-style-type: none"> • Motorized boat use and over-water structures • Camping <p>Potential Restoration Opportunities</p> <p>In association with recreation improvements, consider incorporating aquatic structure complexity to the lake shorelines.</p> <p>Potential Protection Opportunities</p> <p>Implement or retrofit stormwater controls consistent with the Eastern Washington Stormwater Manual.</p> | |

| Curlew Lake | Ferry County |
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| <p>Existing Land Cover/Development</p> <p>Curlew Lake is heavily developed for recreational and residential uses. Land-cover types include forest, wetlands, and some agriculture near the southern end of the lake.</p> | |
| <p>Geomorphic Character</p> <p>Description</p> <p>The lake is located within continental glacial drift. Curlew Creek is the lake’s major inflow and outflow. In addition, the lake is fed by local streams and groundwater.</p> <p>Hardened Banks – Hardened banks are present along the lake’s shoreline. These include 11,550 feet of railroad alignment and approximately 3,300 feet of shoreline development.</p> | |
| <p>Flooding and Geological Hazard</p> <p>Flooding –A FEMA floodplain is designated around Curlew Lake and is connected to numerous tributaries and Curlew Creek. A FEMA floodway is not designated along any of Curlew Lake’s perimeter.</p> <p>Geological Hazards – Curlew Lake shoreline has soils susceptible to moderate to severe erosion. The lake’s shoreline 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 along Curlew Lake.</p> | |
| <p>Existing Public Access</p> <p>Curlew Lake is mostly privately owned and has several resorts that are open to the public: Tiffany’s Resort; Black Beach Resort; and Fisherman’s Cove Resort. Curlew Lake State Park is a fee area located on the east shore of Curlew Lake, which offers tent and RV camping, boating, boat launch, boat docks, fishing, picnic tables, fire pits, and restrooms. There is an airport located nearby. Black’s Beach is located on the western shoreline and provides access to the shore and a restroom. The Ferry County Rail Corridor runs along the entire length of the Lake, and there are several trailheads, motorized Americans with Disabilities Act access, and restroom locations.</p> <p>Identified Public Access Improvements</p> <p>There are no public access improvements identified for Curlew Lake.</p> <p>Public Access Opportunities</p> <p>Most of Curlew Lake is in private ownership, limiting public access opportunities.</p> | |
| Ecological Conditions | |
| <p>Water Quantity and Sediment</p> <p>Lake water levels are controlled by surface and groundwater inflows, and tributary outflows. Surface inflows are mostly from small, unnamed feeder tributaries and overland runoff. The lake’s primary inflow and outflow is Curlew Creek.</p> <p>Sediment inputs to the lakes include the erodible continental glacial drift banks, perimeter soils prone to erosion, adjacent steep slopes prone to landslides, and sediment transported by local runoff and surface drainages, including Curlew Creek. Where present, the vegetated riparian corridor likely helps</p> | |

| Curlew Lake | Ferry County |
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| <p>to limit the delivery of fine sediment to the lake. Fine sediment can be transported out of the lakes via the local surface drainages and Curlew Creek with the amount depending on local flow and sediment conditions.</p> | |
| <p>Water Quality</p> <p>In Curlew Lake, a total maximum daily load is required for total phosphorus. Water quality may be impacted by runoff from residential and recreational developments.</p> | |
| <p>Habitat Characteristics and Priority Habitat Species Presence</p> <p>Curlew Lake is known to support white-tailed deer year round, with high concentrations in the winter. It is within the winter range for mule deer and identified as a medium-density use area. Important waterfowl areas are associated with the wetlands of Curlew Valley. The wetland areas have high biodiversity of species, including waterfowl, fish, frogs, and turtles. This creek is within an important waterfowl rearing area and supports great blue heron and kingfisher. Curlew Lake wetland areas are relatively undisturbed.</p> <p>The Curlew Lake shoreline is significantly developed with recreational and residential facilities around the entire perimeter of the lake. Several roads are located around the lake within the shoreline zone. There is a railroad crossing in the north end of the lake. Vegetation includes mixture of sparse coniferous forest, maintained landscaping around residences and camping/recreation sites, some steppe/shrub-steppe remnants, and agricultural fields.</p> | |
| Ecological Functions Analysis | |
| <p>Level of Existing Function</p> <p>Curlew Lake is designated as Partially Functioning, based on residential and resort development.</p> <p>Stressors</p> <p>Upland development:</p> <ul style="list-style-type: none"> • Residential and recreational development along shorelines with topography that can support development (areas include over-water structures, buildings, and access roads within the jurisdiction boundary) • Bridge crosses lake at the north end • Irrigated landscaping runoff may contribute to algae blooms within the lakes <p>Recreational use:</p> <ul style="list-style-type: none"> • Motorized boat use and over-water structures • Camping <p>Potential Restoration Opportunities</p> <p>In association with recreation improvements, consider incorporating aquatic structure complexity to the lake shorelines. 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., plantings) efforts to increase shading and nutrient inputs to the shoreline.</p> | |

| Curlew Lake | Ferry County |
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| Potential Protection Opportunities Implement or retrofit stormwater controls consistent with the Eastern Washington Stormwater Manual. | |

| West Ferry Lakes Group - North Ferry County |
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| <p>Reach Description</p> <p>West Ferry Lake Group North is located about 2 miles north of Republic, south of Curlew Lake</p> |
| <p>Shoreline Jurisdiction</p> <p>Mud Lake (52 acres) and Sanpoil Lake (123 acres)</p> |
|  <p style="text-align: right; font-size: small;">Source: USDA NAIP 2013</p> |
| <p>Subreaches (SRs); see Map 31:</p> <p>Not applicable</p> |
| Characteristics |
| <p>Ownership</p> <p>Sanpoil Lake is mostly private with a very small amount (less than 5%) of public ownership (U.S. Bureau of Land Management). Mud Lake is entirely private.</p> |
| <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 and public lands • Rural <p>Current Shoreline Management Program Environment Designation:</p> <ul style="list-style-type: none"> • Unavailable – Not included in the existing Shoreline Management Plan |

| West Ferry Lakes Group - North | Ferry County |
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| <p>Existing Land Cover/Development</p> <p>The area near Sanpoil Lake has agricultural development to the north and industrial developments to the south. Mud Lake has limited developments and access roads. Land-cover types are a mix of agriculture, wetland, and open grassland near Sanpoil Lake, and mostly grass and shrubland near Mud Lake.</p> | |
| <p>Geomorphic Character</p> <p><u>Mud Lake</u></p> <p>Description – Mud Lake occupies a topographic low within the continental glacial drift. The lake is likely fed by local surface runoff and groundwater. The lake appears to have an outflow into a Granite Creek tributary.</p> <p>Hardened Banks – Approximately 300 feet of hardened bank exists along the shoreline and is associated with Mud Lake Road.</p> <p><u>Sanpoil Lake</u></p> <p>Description – Sanpoil Lake occupies a topographic low within the continental glacial drift. The lake’s inflow and outflow flow is the Sanpoil River.</p> <p>Hardened Banks – None Identified. However, some bank areas are highly disturbed due the lake’s proximity to a gravel mining and processing operation.</p> | |
| <p>Flooding and Geological Hazard</p> <p>Flooding – Sanpoil Lake has a mapped FEMA floodplain, but no floodway. Sanpoil Lake floodplain is connected to the Sanpoil River FEMA floodplain network. Mud Lake floodplain in not mapped by FEMA.</p> <p>Geological Hazards – Sanpoil Lake and Mud Lake have soils susceptible to severe erosion. Both lakes shorelines contain 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 West Ferry Lakes Group - North.</p> | |
| <p>Existing Public Access</p> <p>There is limited formal public access for the West Ferry Lakes Group - North. There is informal access for fishing on Sanpoil Lake. The Ferry County Rail Corridor runs along Sanpoil Lake, and there is a trailhead nearby.</p> <p>Identified Public Access Improvements</p> <p>There are no public access improvements identified.</p> <p>Public Access Opportunities</p> <p>Most of the ownership in the West Ferry Lakes Group - North is private, limiting the public access opportunities.</p> | |

| West Ferry Lakes Group - North | Ferry County |
|--|---------------------|
| Ecological Conditions | |
| Water Quantity and Sediment | |
| <p>Lake water levels are controlled by surface and groundwater inflows, and tributary outflows. Mud Lake is fed by groundwater and surface runoff. Mud Lake outflow is a tributary to Granite Creek. Sanpoil Lake inflow and outflow is the Sanpoil River.</p> <p>Sediment inputs to the lakes include the erodible continental glacial drift banks, perimeter soils prone to erosion, adjacent steep slopes prone to landslides, and sediment transported by local runoff and surface drainages. Along Mud Lake, the vegetated riparian corridor likely helps to limit the delivery of fine sediment to the lake. Vegetation appears absent along most of Sanpoil Lake’s shoreline, thereby increasing the potential for sediment delivery to the lake. Fine sediment can be transported out of the lakes via the local surface drainages with the amount depending on local flow and sediment conditions. Sanpoil River is likely Sanpoil Lake’s biggest sediment input and output.</p> | |
| Water Quality | |
| West Ferry Lakes Group - North is not listed on Ecology’s 305b list. | |
| Habitat Characteristics and Priority Habitat Species Presence | |
| <p>These lakes and associated wetland areas are identified as important waterfowl areas. The Curlew Valley bottom is identified as white-tailed deer winter range, and deer are in the area year-round.</p> <p>Sanpoil Lake – This lake is near the recycling and solid waste transfer station. The shorelines are disturbed and lack significant vegetation along the south and southwestern end of the lake. The shorelines along the north are less disturbed and feature wetland-type vegetation with scattered large trees. Land to the north of Sanpoil Lake has been drained for agricultural use, and although the agricultural use occurs more than 200 feet from the waters’ edge, there remains a direct surface water connection via the Sanpoil River.</p> <p>Mud Lake (West) – There are several homes located around the lake, concentrated on the south and east sides. Most are within the shoreline jurisdiction zone. There is one visible boat dock in the north end of the lake. Deer Lake Road is a minor residential access road that lies within 200 feet of the shoreline. The west side of the lake is bordered by coniferous forested area. Riparian areas appear marshy. There is evidence of livestock grazing activity along the eastern side.</p> | |

| West Ferry Lakes Group - North | Ferry County |
|---|---------------------|
| Ecological Functions Analysis | |
| <p>Level of Existing Function</p> <p>West Ferry Lakes Group - North is designated as Impaired, based on industrial and agricultural development with limited riparian buffers.</p> <p>Stressors</p> <p>Upland development:</p> <ul style="list-style-type: none"> • Gravel mine with limited riparian buffer (Sanpoil Lake) • Highway 21 (Sanpoil Lake) and Mud Lake Road (Mud Lake) within jurisdiction boundary • Drainages off irrigated agricultural fields may contribute to water quality issues at both lakes <p>Recreational use:</p> <ul style="list-style-type: none"> • Limited hiking and fishing along Ferry County Rail Corridor <p>Potential Restoration Opportunities</p> <p>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., plantings) efforts to increase filtration between agricultural fields and provide shading and nutrient inputs to the shoreline.</p> <p>Potential Protection Opportunities</p> <p>Implement or retrofit stormwater controls consistent with the Eastern Washington Stormwater Manual.</p> | |

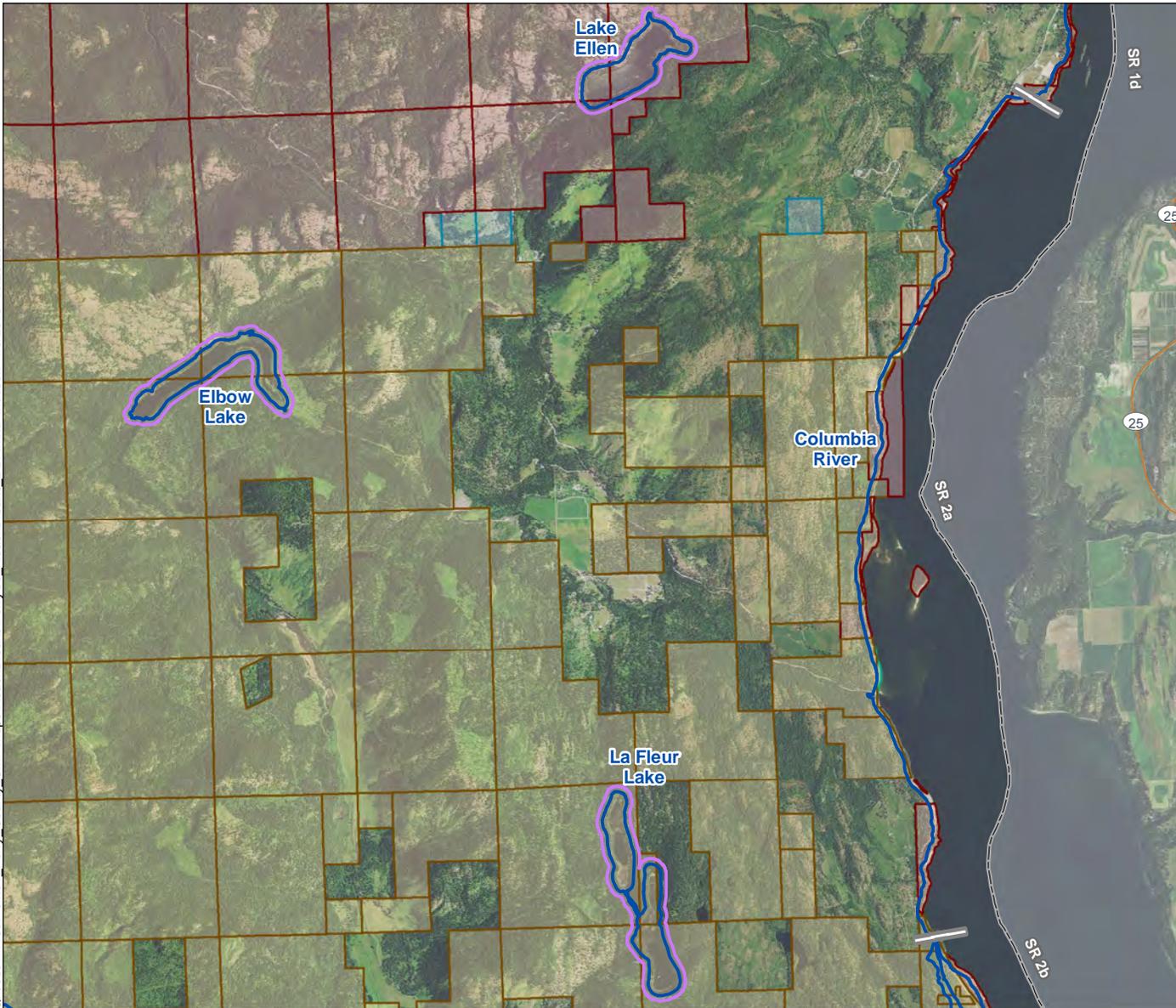
| West Ferry Lakes Group - South | | Ferry County |
|---|--|--------------|
| Reach Description | | |
| West Ferry Lakes Group - South is located between the Okanagan/Ferry County line and Sanpoil River, and north of West Fork Sanpoil River. | | |
| Shoreline Jurisdiction | | |
| Swan Lake (97 acres) and Ferry Lake (49 acres) | | |
|  | | |
| Source: USDA NAIP 2013 | | |
| Subreaches (SRs); see Map 32: | | |
| Not applicable | | |
| Characteristics | | |
| Ownership | | |
| Swan Lake and Ferry Lake are both entirely public (USFS and Washington Department of Natural Resources). | | |

| West Ferry Lakes Group - South | Ferry County |
|--|---------------------|
| <p>Land Use/Current Shoreline Management Program</p> <p>Land Use Designation:</p> <ul style="list-style-type: none"> • Current land use is public lands • Rural <p>Current Shoreline Management Program Environment Designation:</p> <ul style="list-style-type: none"> • Unavailable – Not included in the existing Shoreline Management Plan | |
| <p>Existing Land Cover/Development</p> <p>Both lakes in West Ferry Lake Group - South have been developed for recreation. Land-cover type is dominantly forest.</p> | |
| <p>Geomorphic Character</p> <p><u>Swan Lake</u></p> <p>Geomorphic Character</p> <p>Description – Swan Lake occupies a topographic low within the continental glacial drift. A portion of the Swan Lake shoreline consists of orthogneiss bedrock. The lake is likely fed by local surface runoff and groundwater. The lake outflows into a tributary of Scatter Creek.</p> <p>Hardened Banks – None Identified. Swan Lake is located in the rural county with no visible development along its shoreline.</p> <p><u>Ferry Lake</u></p> <p>Geomorphic Character</p> <p>Description – Ferry Lake occupies a topographic low within the continental glacial drift. The lake is likely fed by local surface runoff and groundwater. The lake outflows flow into a tributary of Scatter Creek.</p> <p>Hardened Banks – None Identified. Ferry Lake is located in the rural county with no visible development along its shoreline.</p> | |
| <p>Flooding and Geological Hazard</p> <p>Flooding – Both Ferry and Swan Lakes’ floodplain in not mapped by FEMA. Localized floodplains may be present along each lake’s perimeter.</p> <p>Geological Hazards – Ferry Lake and Swan Lake have soils susceptible to severe erosion. Both lakes shorelines contain 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 West Ferry Lakes Group - South.</p> | |

| West Ferry Lakes Group - South | Ferry County |
|--|---------------------|
| Existing Public Access | |
| <p>There are two main campgrounds in West Ferry Lakes Group - South and multiple trailheads in the nearby area. Ferry Lake Campground is a fee-use USFS campground. Ferry Lake Campground provides camping, vault toilets, fire pits, boat launch, non-motorized boats, picnic tables, garbage facilities, and fishing opportunities. Swan Lake Campground has a boat launch, day-use area, swimming area, fishing dock, camping, trails, vault toilets, and fire pits. Swan Lake Campground is a fee-use campground operated by the USFS.</p> | |
| Identified Public Access Improvements | |
| <p>There are no public access improvements identified for the West Ferry Lakes Group - South.</p> | |
| Public Access Opportunities | |
| <p>Public access opportunities may be adequate for the area.</p> | |
| Ecological Conditions | |
| Water Quantity and Sediment | |
| <p>Lake water levels are controlled by surface and groundwater inflows, and tributary outflows. Surface inflows are mostly from small, unnamed feeder tributaries and overland runoff. Both Swan Lake and Ferry Lake outflows are to tributaries of Scatter Creek.</p> <p>Sediment inputs to the lakes include the erodible continental glacial drift banks, perimeter soils prone to erosion, adjacent steep slopes prone to landslides, and sediment transported by surface runoff. Where present, the vegetated riparian corridor likely helps to limit the delivery of fine sediment to the stream. Fine sediment can be transported out of the lakes via the local surface drainages with the amount depending on local flow and sediment conditions.</p> | |
| Water Quality | |
| <p>West Ferry Lakes Group - South is not listed on Ecology's 305b list.</p> | |
| Habitat Characteristics and Priority Habitat Species Presence | |
| <p>Common loon breeding areas are noted for the lakes in the region of Ferry Lake and Swan Lake, and a number of other waterfowl utilize these lakes for foraging during fall and winter migrations. Lakes in this region are often stocked with trout and may have introduced, warm-water game fish species such as bass and walleye.</p> <p>Ferry Lake is generally undeveloped, with a small boat dock on the southeastern shoreline associated with Ferry Lake Campground. The shorelines are all flat or gently sloped, as the lake is surrounded by areas of lacustrine wetlands and marshy areas that may become inundated. The wetland areas are adjacent to forested areas. There are very few trees along the western and southern shoreline, with riparian vegetation consisting of herbaceous groundcover, semi-aquatic plants, and grasses typical of a wetland community. The eastern shoreline has tree cover and is connected to upland forested habitat. At the south end of the lake, the shoreline is adjacent to a wetland area; there is a park and a small forested island of trees surrounded by marshy wetland vegetation. The Pacific Northwest Trail</p> | |

| West Ferry Lakes Group - South | Ferry County |
|---|---------------------|
| <p>crosses the creek/wetland area connected to the north end of Ferry Lake.</p> <p>Swan Lake is very similar to Ferry Lake and generally undeveloped. There is a small boat dock on the northeastern shoreline associated with Swan Lake Campground. The shorelines are flat or gently sloped, and there are small bays and pockets of lacustrine wetlands and marshy areas that may become inundated. The shoreline and associated wetland areas are adjacent to forested habitat. The Pacific Northwest Trail runs along the north end of Swan Lake.</p> | |
| Ecological Functions Analysis | |
| <p>Level of Existing Function</p> <p>West Ferry Lakes Group - South is designated as Partially Functioning, based on recreation use.</p> <p>Stressors</p> <p>Upland development:</p> <ul style="list-style-type: none"> • Both lakes have campground recreational development along their eastern shorelines. These areas include limited over-water structures, campsites and an access road within the jurisdiction boundary. Riparian vegetation has been well preserved along the shoreline. <p>Recreational use:</p> <ul style="list-style-type: none"> • Over-water structures used for fishing • Camping and hiking <p>Potential Restoration Opportunities</p> <p>In association with recreation improvements, consider incorporating aquatic structure complexity to the lake shorelines.</p> <p>Potential Protection Opportunities</p> <p>Implement or retrofit stormwater controls consistent with the Eastern Washington Stormwater Manual.</p> | |

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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

Lake Group

- East Ferry Lakes Group – North

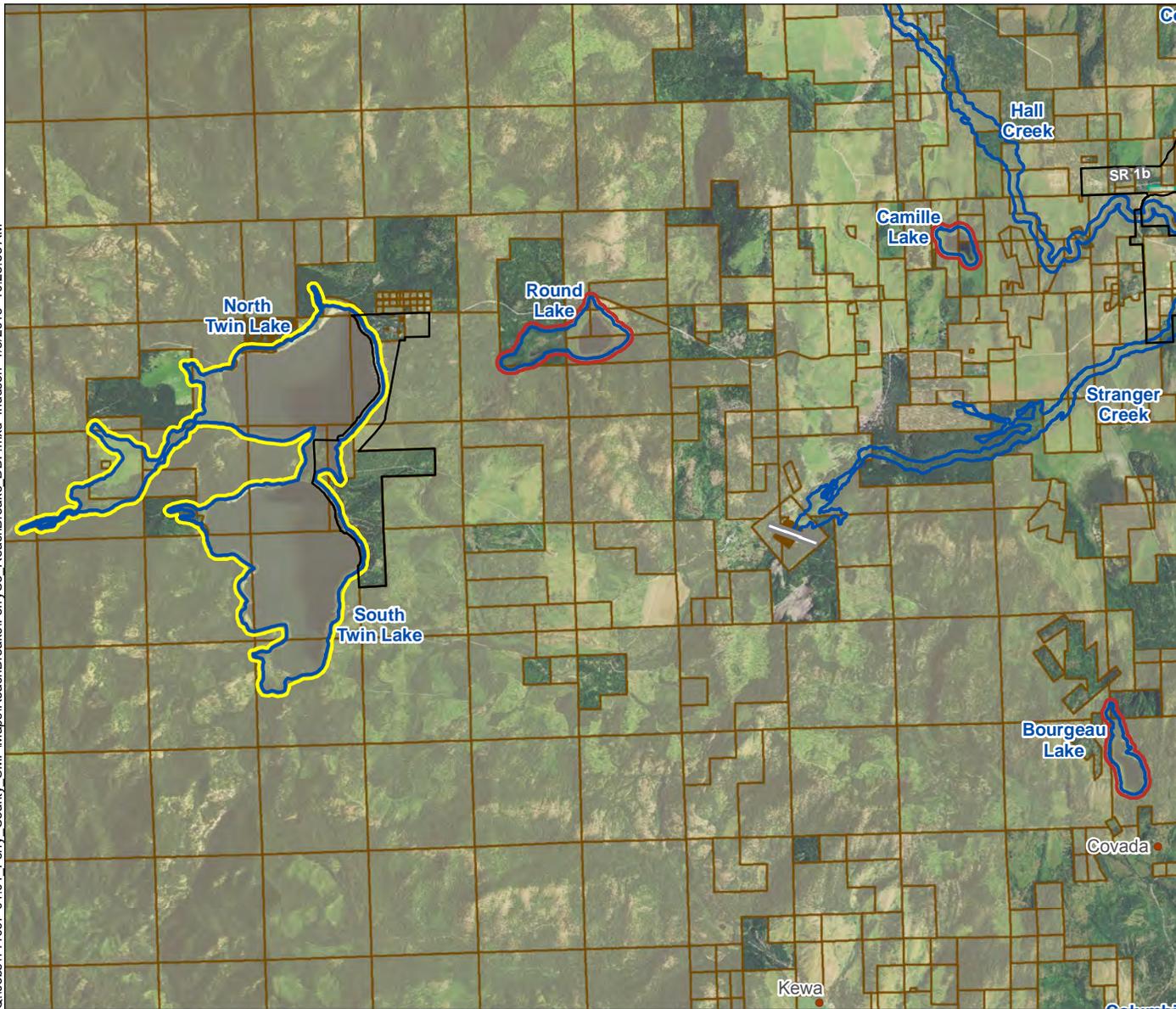
- NOTES:**
1. This information is to be used for planning purposes only. Data are displayed as is and without any guarantee of accuracy or completeness.
 2. Aerial image courtesy of USDA NAIP (2013).
 3. Ferry County's shoreline jurisdiction for Columbia River ends in the middle of the river.
 4. Floodway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



Map 29
 East Ferry Lakes Group – North
 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
- SMA Jurisdiction

Public Ownership

- Federal Government
- Local Government
- Tribal Government

Lake Group

- East Ferry Lakes Group – South
- Twin Lakes Group

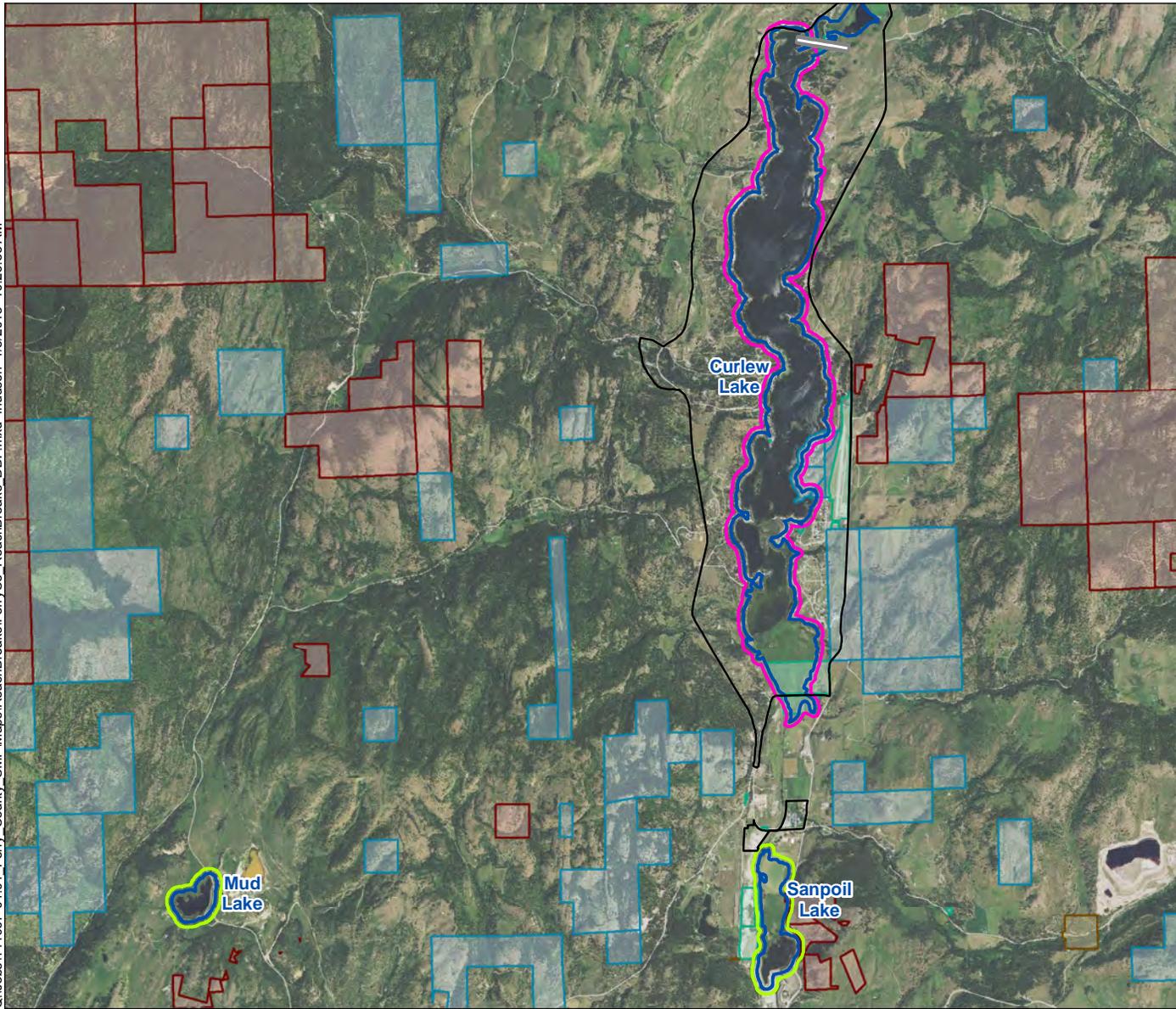
NOTES:

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 30
 East Ferry Lakes Group – South and Twin Lakes Group
 Ferry County Shoreline Master Program
 Ferry County, WA

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LEGEND

Reach and Subreach (SR) Breaks

Rural Service Area

County Boundary

SMA Jurisdiction

Public Ownership

Federal Government

State Government

Local Government

Tribal Government

Lake Group

Curlew Lake

West Ferry Lakes Group – North

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 31
 Curlew Lake and West Ferry Lakes Group – North
 Ferry County Shoreline Master Program
 Ferry County, WA

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LEGEND

- County Boundary
- Other County Boundary
- SMA Jurisdiction

Public Ownership

- Federal Government
- State Government

Lake Group

- West Ferry Lakes Group – South

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.

