NWS-2023-188

LAKE ENTIAT LODGE ASSOCIATION DOCK REPLACEMENT - COLUMBIA RIVER

BIOLOGICAL ASSESSMENT

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1 INTRODUCTION AND SPECIES OF CONCERN

The applicant proposes to remove and replace the existing community docks and handling float within the three dredged basins at the subject properties on the Columbia River, Douglas County, Washington. Only one of the community docks and the handling float will be replaced by a dock of the exact size, while the other two dock will be modified and redesigned. One of the dock will not be replaced, rather the overwater coverage will be incorporated into the other docks that will be redesigned. The Endangered Species Act (ESA) of 1973, as amended, requires Federal agencies (in this case, the U.S. Army Corps of Engineers [Corps]) to ensure that they do not authorize, fund, or carry out actions that are likely to jeopardize the continued existence of threatened or endangered species or result in the destruction or adverse modification of critical habitat for such species. This Biological Assessment (BA) has been prepared to assist the Corps in its review of the Project proponent's permit application and in conducting consultation with U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS) under Section 7 of the ESA.

Species listed under the ESA that may be present in the vicinity of the project site include Upper Columbia River spring-run chinook salmon (*Oncorhynchus tshawytscha* – endangered), Upper Columbia River steelhead (*O. mykiss* – threatened), Columbia River bull trout (*Salvelinus confluentus* – threatened), and Ute ladies' -tresses (*Spiranthes diluvialis* – threatened). In addition, the Project is located within areas designated as Upper Columbia River spring-run Chinook salmon, Upper Columbia steelhead, and Columbia River bull trout critical habitat. This BA addresses the potential effects of the Project on these listed species and designated critical habitats.

Based on conversations with the Corps, NMFS has indicated that all new residential overwater structures on the Columbia River between Chief Joseph Dam and Rock Island Dam would result in an effects call of "***may affect, likely to adversely affect***" on affected ESA-listed species and critical habitats. USFWS has not determined this for species and critical habitats under its jurisdiction. Thus, the conclusions of this BA are as follows:

Species

- Upper Columbia River spring-run chinook salmon – ***may affect, likely to adversely affect***
- Upper Columbia River steelhead – ***may affect, likely to adversely affect***
- Columbia River bull trout – ***may affect, not likely to adversely affect***
- Ute ladies'-tresses – ***no effect***

Critical Habitat

- Upper Columbia River steelhead critical habitat – ***may affect, likely to adversely affect***
- Columbia River bull trout critical habitat – ***may affect, not likely to adversely affect***

2 PROJECT DESCRIPTION

2.1 BACKGROUND

The purpose of the proposed project is to replace the existing community moorage that are showing signs of deterioration and starting to require maintenance. The purpose of the proposed dock replacements would eliminate the existing modular concrete solid decked floats from the middle basin that is no longing providing the level of use required. The project would also remove the deteriorating (wood rot) wooden floats in the upriver and downriver basins. The permanent removal of the float in the upriver basin will eliminate ingress and egress concerns during low reservoir levels and will focus the primary moorage use to the middle and downriver basins. The amount of overwater coverage following the completion of the project would be slightly reduced; however, the exact footprint of the floats would be modified. To the extent possible, the floats were designed to conform to the current federal guidance for maintenance, modification, and construction of residential overwater/inwater structures in the upper Columbia River. The widths of the floats have been minimized and the floats would be located in depths less than typically required for floats (USACE standards); however, the floats would be replacing the existing floats that are located in the same water depths. The replacement of the concrete floats would also reduce the solid decked floats that are resulting in a greater level of potential impacts.

The proposed docks are located within three basins located just waterward of 250 W Beach Dr on two (2) separate waterfront parcel owned by the HOA (Parcel 67502000000 and 26211130003) in Orondo, WA, 98843, Douglas County. Section 11, Township 26, Range 21 (Sheets 1-2); 47.7648 N Lat and -120.1658 W Long. The property is located on the east shore of the Columbia River.

2.2 PROPOSED PROJECT

2.2.1 Proposed Dock/Construction Description

The applicant proposes to remove all of the existing floats within the three (3) basins at the Lake Entiat Lodge Association shoreline. The Lake Entiat Lodge Association is a large, planned development that all share two large waterfront parcels that provide a community park, river access, boat launch, and community dock. The basins were dredged in order to provide safe moorage for the development. The docks within the basins have been permitted over the years and the moorage originally was installed in the middle and lower basin along with a boat launch serving the community. The original floats all consisted of modular concrete floats with solid decking. The existing concrete floats within the middle basin is still present and additional floats were added to the upriver and downriver basins after 2000's along with a handling float at the boat launch. These existing docks have all been legally permitted through the local, state, and federal agencies. Additional permitting work within the basins has included maintenance dredging of the basins. The concrete dock is starting to show sign of deterioration and some maintenance had occurred over the years. The reason for the removal of the concrete floats is to replace them prior to them becoming a safety hazard and based on the fact that the layout of the floats are not meeting the needs of the community. Specifically, the slips lengths are short and many of the slips are not usable with boats being moored in the adjacent slips. The proposed project would remove the entire concrete floats from the middle basin and reinstall a new floats system that meets todays design standard (to the extent possible). The size of floats in the

middle basin would increase as it would incorporate a portion of the overwater coverage and moorage provided by the float in the upriver basin. The float in the upriver basin will be removed and not reinstalled. That is the only float that will not be replaced. The project would also result in the removal of the two (2) docks in the lower basin along with the handling float. The floats in the upper and lower basins are constructed with wood that are showing signs of warping and rot. The larger float and handling floats in the lower basin would be replaced with new floats of the exact same size, while the smaller float downriver of the boat launch will be replaced with the addition of another slip at the waterward end. The additional size encapsulates the remainder of the overwater coverage removed from the upper basin. Overall, the proposed project would result in the removal of approximately 10,469 sq ft of overwater coverage and will result in the installation of approximately 10,414 sq ft of overwater coverage. This will actually reduce the amount of overwater coverage by approximately 55 sq ft of overwater coverage. This minor reduction together with the removal of the solid decked concrete floats will result in a minor increase in habitat functions and values over the existing conditions. As a result, the proposed project will not result in a net loss of ecological habitat and functions and will not require compensatory mitigation. The specifics of the project are discussed below.

Demolition

The demolition of the existing floats will occur over both of the waterfront parcels. The upper basin is located on Parcel 67502000000. Within the upper basin there is a single community dock that is constructed from dimensional lumber that is starting to show signs of damage at the articulation points and some wood rot. The dock consists of a 4 ft by 4 ft concrete abutment, gangway, and floats. The existing gangway is aluminum and extends from the concrete abutment to the float. The gangway is approximately 4 ft wide and by 28 ft. The float consist of a mainwalk and fingerpiers. The mainwalk is 6 ft wide and 90 ft long and the fingerpiers are 4 ft wide and 20 ft long. There are a total of eight (8) fingerpiers. This float is providing up to 16 moorage slips; however, the landward end of the float is located in extremely shallow water making the landward slips virtually unusable during most reservoir levels. The floats are anchored by a total of four (4) 5-inch diameter pipe pile. Demolition of the dock will be accomplished by first separating the fingerpiers from the mainwalk using hand power tools. The mainwalk will then be separated in the float sections and detached from the pile. All the floats will then be towed to the boat launch in the lower basin and removed from the river. The use of the boat launch will ensure that the floats will not be damaged during removal and eliminating the potential for debris to enter the river. The floats will either be drug up the concrete launch or picked out the water using a land based excavator. The floats will be loaded onto a flatbed trailer or into a dump truck and disposed of outside of the shoreline zone at an appropriate upland disposal site. The pipe pile will be removed using either a barge mounted vibratory hammer, or a barge mounted loader. The entire pipe pile will be able to be removed and loaded onto the work barge. The pile will be offloaded at the boat launch and either disposed of or recycled at an appropriate upland disposal site. Care will be taken that no debris will enter the river. Overall, the demolition of the dock in the upper basin will remove 1,349 sq ft of overwater coverage and a total of four (4) 12-inch pipe pile.

The middle basin contains the majority of the moorage for the community. There are two (2) separate docks within the middle basin with separate accesses. Both of the docks consist of a

concrete abutment, gangway, and floats. All of the floats are modular concrete floats that have a solid concrete decking. The larger dock is located in the upriver portion of the middle basin. Access to the dock consists of a gravel trail that extends from the shoreline access trail and terminates at the concrete abutment. The concrete abutment is approximately 5 ft by 4 ft and located several feet back from the OHWM. The gangway is aluminum with solid decking and extends from the abutment to the float. The gangway is approximately 4 ft wide and 30 ft long. The float is a modular concrete structure with solid concrete decking. The floats consists of three mainwalks oriented in a C-shape. The mainwalks are 6 ft wide and the length of the mainwalks are 116 ft, 180 ft, and 112 ft. Moorage is provided by fingerpiers extending perpendicular from the mainwalks. The fingerpiers are concrete and are 4 ft wide and either 20 or 25 ft long. There is a total of fourteen (14) fingerpiers that are providing a total of 32 moorage slips. In the corners of the mainwalks there are large square floats (20 ft by 20 ft). This float is anchored by eleven (11) 12 inch diameter steel pipe piles. The second dock is accessed from the downriver side of the basin. As with the other dock, access is provided from the main shoreline access trail. The approximately 7 ft by 4 ft concrete abutment is located approximately 5 ft landward of the OHWM. The aluminum gangway extends from the abutment to the float. The gangway is 4 ft wide and 25 ft long and the decking is solid. The float system consists of a mainwalk and fingerpiers, both of which are modular concrete with solid concrete decking. The mainwalk is 6 ft wide and 110 ft long and the fingerpiers are 4 ft wide and 20 ft long. There are a total of ten (10) fingerpiers that are providing a total of 20 moorage slips, although the shallow water at the landward edge of the dock does not provide safe moorage in many reservoir levels. This float is anchored by six (6) 12 inch diameter steel pipe piles. The demolition of these floats will be accomplished by separating the concrete fingerpiers from the mainwalk and then separating the mainwalk into the smaller float section. The mainwalk floats will then be detached from the anchor pile. All the floats will then be towed to the boat launch in the lower basin and removed from the river. The use of the boat launch will ensure that the floats will not be damaged during removal and eliminating the potential for debris to enter the river. The floats will either be drug up the concrete launch or picked out the water using a land based excavator. The floats will be loaded onto a flatbed trailer or into a dump truck and disposed of outside of the shoreline zone at an appropriate upland disposal site or recycled. The pipe pile will be removed using either a barge mounted vibratory hammer, or a barge mounted loader. The entire pipe pile will be able to be removed and loaded onto the work barge. The pile will be offloaded at the boat launch and either disposed of or recycled at an appropriate upland disposal site. Care will be taken that no debris will enter the river. Overall, the demolition of the two (2) docks in the middle basin will remove 6,332 sq ft of overwater coverage and a total of 17 12-inch pipe pile.

There are three (3) docks within the lower basin that will be removed. The existing handling float for the boat launch is showing signs of deterioration and will need to be replaced. The replacement of the handling float will result in the installation of an identical sized float following removal. The handling float consists of a large, sloped concrete abutment, a 6 ft by 20 ft gangway and a 7.5 ft by 58 ft float. The float and gangway are wood framed, and the entire surface is grated. The float is anchored by two (2) 12 inch diameter pipe pile at the waterward end. The gangway will be disconnected from the float and concrete abutment using hand power tools and removed by hand or a land based excavator. The floats would be detached from the

pile and also dragged up the launch and picked up using a land based excavator. Both will be loaded on a flat bed trailer or dump truck and disposed of at an appropriate upland disposal site. The pile will not be removed. The removal of the handling float will result in the removal of 438 sq ft of overwater coverage.

The upriver dock within the lower basin consists of a concrete abutment, gangway, and float. The concrete abutment and the gangway are in good conditions and do not need to be replaced. As part of the demolition, the gangway will be removed and placed in the uplands until the new floats are installed. The existing gangway is aluminum and extends from the concrete abutment to the float. The float consist of a mainwalk and fingerpiers. The mainwalk is 6 ft wide and 116 ft long and the fingerpiers are 4 ft wide and 20 ft long. There are a total of ten (10) fingerpiers. This float is providing up to 20 moorage slips; however, the landward end of the float is located in extremely shallow water making the landward slips virtually unusable during most reservoir levels. The floats are anchored by a total of six (6) 5-inch diameter pipe pile. Demolition of the dock will be accomplished by first separating the fingerpiers from the mainwalk using hand power. The mainwalk will then be separated in the float sections and detached from the pile. All the floats will then be towed to the boat launch and removed from the river. The use of the boat launch will ensure that the floats will not be damaged during removal and eliminating the potential for debris to enter the river. The floats will either be drug up the concrete launch or picked out the water using a land based excavator. The floats will be loaded onto a flatbed trailer or into a dump truck and disposed of outside of the shoreline zone at an appropriate upland disposal site. The pipe pile will be removed using either a barge mounted vibratory hammer or a barge mounted loader. The entire pipe pile will be able to be removed and loaded onto the work barge. The pile will be offloaded at the boat launch and either disposed of or recycled at an appropriate upland disposal site. Care will be taken that no debris will enter the river. Overall, the demolition of this float in the lower basin will remove 1,496 sq ft of overwater coverage and a total of six (6) 12-inch pipe pile.

The downriver dock within the lower basin consists of a concrete abutment, gangway, and float. The concrete abutment and the gangway are in good conditions and do not need to be replaced. As part of the demolition, the gangway will be removed and placed in the uplands until the new floats are installed. The existing gangway is aluminum and extends from the concrete abutment to the float. The float consist of a mainwalk and fingerpiers. The mainwalk is 6 ft wide and 90 ft long and the fingerpiers are 4 ft wide and 20 ft long. There are a total of four (4) fingerpiers. This float is providing up to 8 moorage slips; however, the landward end of the float is located in extremely shallow water making the landward slips virtually unusable during most reservoir levels. The floats are anchored by a total of six (6) 5-inch diameter pipe pile. Demolition of the dock will be accomplished by first separating the fingerpiers from the mainwalk using hand power. The mainwalk will then be separated in the float sections and detached from the pile. All the floats will then be towed to the boat launch and removed from the river. The use of the boat launch will ensure that the floats will not be damaged during removal and eliminating the potential for debris to enter the river. The floats will either be drug up the concrete launch or picked out the water using a land based excavator. The floats will be loaded onto a flatbed trailer or into a dump truck and disposed of outside of the shoreline zone at an appropriate upland disposal site. The pipe pile will be removed using either a barge mounted vibratory

hammer, or a barge mounted loader. The entire pipe pile will be able to be removed and loaded onto the work barge. The pile will be offloaded at the boat launch and either disposed of or recycled at an appropriate upland disposal site. Care will be taken that no debris will enter the river. Overall, the demolition of this float in the lower basin will remove 854 sq ft of overwater coverage and a total of six (6) 12-inch pipe pile.

Overall, the demolition of the existing floats would result in the removal of 10,469 sq ft of overwater coverage and 33 pile (17 12-inch and 16 5-inch pile). The existing docks within the basins are providing up to 96 moorage slips although a number of the moorage locations are not safe due to the shallow water depths and fluctuating reservoir levels. Due to the amount of work, it is not expected that the removal of these structures will occur over a 3 year period with the removal of the structures in the upper and middle basins occurring first.

New Dock Structures

As stated above, the proposed replacement structures would result in the installation of a reconfigured dock within the middle basin, in kind replacement of the upriver float and handling float in the lower basin, and a slightly larger sized float downriver of the boat launch.

The majority of the new dock structures will be installed within the middle basin. The proposed dock will be a single structure with two (2) access points and will consist of a headwalk, mainwalks, and fingerpiers. Access to the proposed dock will be located at the upriver and downriver end of the dock. A new access trail will be established at both access locations and will extend from the existing shoreline trail to the proposed concrete abutments. The two concrete abutments will be 4 ft by 4 ft and located between 4 and 8 ft from the OHWM. The abutments will be framed and poured in place. An area sufficient for the concrete abutment will be excavated to allow the forms to be placed. Both gangways will be 4 ft x 30 ft constructed of aluminum with a 100% ambient light grid, greater than 60% open area. The gangway will be attached to the waterward end of the concrete abutment and to the float using galvanized transition plates. Wheels on the waterward end of the gangway will sit on a 6 ft x 6 ft float attached to headwalk allowing the ramp to articulate as the water depth raises and lowers without obstructing the use of the headwalk. The gangway will be constructed off-site and transported to the project site. The gangways will be installed by hand or land based excavator following the installation of the headwalk. The headwalk will be U-shaped and will be 5 ft wide and approximately 556 ft long. The headwalk will be installed between 18 and 27 ft waterward of the OHWM, which is roughly the same distance from the OHWM as the existing structures. No moorage is proposed on the landward side of the headwalk due to the low water depths. Extending roughly perpendicular from the headwalk, two (2) mainwalks will be attached. The mainwalks will be 5 ft wide and approximately 145 ft long. Moorage slips will be provided by the installation of fingerpiers that will be attached perpendicular to the mainwalks and the upriver and downriver sides of the headwalk. A total of 35 fingerpiers will be installed. The majority of the fingerpiers would be 4 ft wide, except for the five (5) fingerpiers located at the waterward end of the mainwalks and headwalk. The length of the fingerpiers on the upriver side of the headwalk and the mainwalks would be 20 ft long and the fingerpiers on the downriver side of the headwalk will be 24 ft long. This float will provide up to 74 moorage slips; however, the landward end of the float will still be located in extremely shallow water making the

landward slips virtually unusable during most reservoir levels. The floats will be constructed off-site and transported to the launch for placement into the river. The decking will be 100% fully ambient light grid (aluminum or molded fiberglass) with greater than 60% open area, and floatation will be achieved using black or white ACE tubs or bright aluminum tubs. The framing plan for the floats will provide varying level of functional grating due to the width of the floats; specifically, the functional grating of the 4 ft and 5 ft wide fingerpiers will be approximately 40% and 45% respectively, while the functional grating of the 6 ft wide mainwalk will be approximately 50%. The floats will be launched at the boat launch and floated into place where the mainwalk and fingerpiers will be connected using hand power tools. The float will be anchored by 24 up to 8-inch diameter steel pipe piles (8.625 inch outer diameter; may use stainless steel, epoxy coated white piles or encased piles in white PVC). The pipe piles for the float will be driven into the substrate to a suitable depth with a barge mounted vibratory or impact pile driver if subsurface conditions don't allow for adequate penetration using the vibratory hammer.

Overall, the moorage amount of overwater coverage within the middle basin will increase as it would incorporate the overwater coverage from the upper basin into the dock design. The configuration of the moorage within the middle basin will be considerably different than the existing moorage in order to maximize moorage, use, and safety of the new structure. The new float will be 7,396 sq ft (including the gangways) and will result in the installation of 24 new pile. This will represent an increase in overwater coverage and number of pile in the middle basin; however, the overall amount of overwater coverage and number of pile of the entire project will actually be less than what currently exists.

The proposed project would also result in the installation of new dock access trails to the newly installed concrete abutments and gangways. The new trails will be connected to the existing shoreline trail that is aligned approximately parallel to the OHWM down to the dock abutments. In total, the proposed new access trails and concrete abutments will encompass approximately 250 sq ft. Vegetation within this ~250 sq ft consists of maintained lawn grass. This will result in a conversion of lawn grass to compacted gravel that will result in negligible impacts to the riparian buffer. Additionally as part of the proposed project the existing access trails to the existing dock will be removed and restored. The existing access trails and concrete abutments encompass approximately 325 sq ft, which will be removed and restored to lawn grass (including the existing concrete abutments). Overall, the proposed project would result in the conversion of approximately 250 sq ft of lawn grass to gravel and concrete and the conversion of approximately 256 sq ft of gravel and concrete to lawn grass. The overall impact would be the reduction of 75 sq ft of the buffer. Overall, this portion of the project would result in no net loss of habitat functions and values within the riparian buffer.

The proposed handling float will consist of a gangway and floats. The proposed gangway would be 6 ft by 20 ft gangway would be aluminum with a 100% ambient light grid, greater than 60% open area. The gangway will be attached to the waterward end of the existing concrete abutment and to the float. The gangway will be constructed off-site and transported to the project site. The floats will be constructed off-site and transported to the launch. The decking will be 100% fully ambient light grid (aluminum or molded fiberglass) with greater than 60% open area, and floatation will be achieved using black or white ACE tubs or bright aluminum tubs. The framing plan for the float will provide 50 percent functional grating. The float will be attached to the existing pipe piles. The floats and gangway will be placed by hand or using a land based

excavator. The proposed handling floats would be the exact same size as the existing handling floats (438 sq ft) and would be installed in the exact footprint of the existing handling float. Overall there will be no change in overwater coverage associated with the replacement of the handling float.

The proposed upriver dock in the lower basin will consist of a new float section. As stated above the concrete abutment and gangway from the existing dock will still be utilized. The proposed float would be identical to the existing float and consists of a mainwalk and fingerpiers. The mainwalk will be 6 ft wide and 116 ft long and the fingerpiers will be 4 ft wide and 20 ft long. There will be a total of total of ten (10) fingerpiers. This float will provide up to 20 moorage slips; however, the landward end of the float will still be located in extremely shallow water making the landward slips virtually unusable during most reservoir levels. The floats will be constructed off-site and transported to the launch. The decking will be 100% fully ambient light grid (aluminum or molded fiberglass) with greater than 60% open area, and floatation will be achieved using black or white ACE tubs or bright aluminum tubs. The framing plan for the floats will provide varying level of functional grating due to the width of the floats; specifically, the functional grating of the 4 ft wide fingerpiers will be approximately 40% while the functional grating of the 6 ft wide mainwalk will be approximately 50%. The floats will be launched at the boat launch and floated into place where the mainwalk and fingerpiers will be connected using hand power tools. The float(s) will be anchored by six (6) up to 8-inch diameter steel pipe piles (8.625 inch outer diameter; may use stainless steel, epoxy coated white piles or encased piles in white PVC). The pile will be installed at roughly the exact same location as the piles from the existing float. The pipe piles for the float will be driven into the substrate to a suitable depth with a barge mounted vibratory or impact pile driver if subsurface conditions don't allow for adequate penetration using the vibratory hammer. Overall, there will be no change in overwater coverage associated with the replacement of the upriver float system in the lower basin.

The proposed downriver dock in the lower basin will consist of a new float section that will be slightly larger than the existing float. As stated above the concrete abutment and gangway from the existing dock will still be utilized. The proposed float would consist of a mainwalk and fingerpiers. The mainwalk will be 6 ft wide and 114 ft long and the fingerpiers will be 4 ft wide and 20 ft long. There will be a total of total of five (5) fingerpiers, which is one (1) more than the existing float contained. This float will provide up to 10 moorage slips; however, the landward end of the float will still be located in extremely shallow water making the landward slips virtually unusable during most reservoir levels. The floats will be constructed off-site and transported to the launch. The decking will be 100% fully ambient light grid (aluminum or molded fiberglass) with greater than 60% open area, and floatation will be achieved using black or white ACE tubs or bright aluminum tubs. The framing plan for the floats will provide varying level of functional grating due to the width of the floats; specifically, the functional grating of the 4 ft wide fingerpiers will be approximately 40% while the functional grating of the 6 ft wide mainwalk will be approximately 50%. The floats will be launched at the boat launch and floated into place where the mainwalk and fingerpiers will be connected using hand power tools. The float(s) will be anchored by seven (7) up to 8-inch diameter steel pipe piles (8.625 inch outer diameter; may use stainless steel, epoxy coated white piles or encased piles in white PVC). The pile will be installed at roughly the exact same location as the piles from the existing float. The pipe piles for the float will be driven into the substrate to a suitable depth with a barge mounted vibratory or impact pile driver if subsurface conditions don't allow for adequate penetration using the vibratory hammer. Overall, there will be a slight increase in size of this float associated with the additional mainwalk length and additional fingerpier. The new float will be 1,084 sq ft,

which is 230 sq ft larger than the existing float and will require one (1) additional pile. As stated above, even though this float will increase in size the overall amount of overwater coverage within the basins will decrease slightly. This additional moorage and overwater coverage is simply being relocated from the upper basin to this basin (and the middle basin as described above).

Proposed dock removal would occur using a mixture of equipment. The floats would be removed from the existing pile using power hand tools. The floats would then be towed to the existing boat launch in the downriver basin and removed using a ground based truck and backhoe. The docks would be loaded onto flatbed trailers or dump trucks and disposed of at an appropriate upland disposal location. If possible, the concrete may be taken to a quarry and recycled. Once the floats are removed, the pipe pile will be removed using a barge based vibratory hammer or barge based excavator. Pipe pile will be cut into sections and loaded on to the barge and offloaded at the launch. Piles will be loaded onto a flatbed and disposed of or recycled at an appropriate upland location. The existing concrete abutments will be removed using a jackhammer and excavator. Debris will be loaded into a dump truck and disposed of at an appropriate upland disposal site.

The installation of the pipe piles for the floats will be driven into the substrate to bearing with a barge mounted vibratory or impact pile driver. The gangway sections and gangway would be aluminum with a 100% ambient light grid, greater than 60% open area. The gangways would be constructed off-site and transported to the project site. The gangways would be placed by crane or excavator (barge-mounted or truck-mounted) and attached using hand-held power tools and galvanized transition plates. The floats would be constructed off-site and transported to the project site by truck and placed into the water at the launch in the downriver basin. The floats would be framed with either steel or aluminum. The decking would be 100% fully ambient light grid (aluminum or molded fiberglass) and floatation would be achieved using white or black ACE tubs. The concrete shore abutment would be formed and cast in place by a concrete pump truck operated above the OHWM. The floats will be connected using hand power tools.

Overall, the proposed project will not result in any adverse impacts to the existing habitat functions and values. The proposed demolition of the existing structures would result in the removal of approximately 10,469 sq ft of overwater coverage and the removal of 33 pile (17 12-inch and 16 5-inch pile). The proposed project would result in the installation of approximately 10,414 sq ft of overwater coverage and 27 (up to 8-inch pile), which is slightly less overwater coverage and pile compared to the existing conditions. Additionally, the demolition will remove the existing concrete floats that are decked with solid concrete and replace them with fully grated and ESA compliant floats. The new floats would represent a reduction in potential adverse impacts to the aquatic environment. The installation of new overwater structures on the Columbia River requires compensatory mitigation. Compensatory mitigation for the new floats will be accomplished by the removal of the existing floats ensuring that the proposed project will result in no net loss of ecological habitat functions and values.

2.2.2 Boating Use of the Reservoir

The proposed project will provide moorage for the entire Lake Entiat Lodge Association and is comprised of 440 residential parcels. The proposed project would provide up to 104 moorage slips within the basins, which would be slightly greater than the existing docks (96). However,

due to the water depths in the basins, some slips will continue to be unusable during low reservoir levels. The moorage of watercraft is expected to be short term (summer months) or temporary as they can be removed after use. Boats will be moored at the dock over the entire year (pulled out in winter). The proposed dock will be used primarily between the middle of June through the middle of September. Use will be limited during the other portions of the year based on air and water temperatures. Minimal use will occur during the period between middle of September and middle of June. The use during the summer months will primarily be fishing, water skiing and pleasure boating. The use during the fall and spring will primarily be fishing. The use of the dock will be used for swimming during the summer months. The majority of the use of the dock will occur during the current work window for the ESA species (July 16 – August 31). Boating will occur primarily in waters deeper than 25 ft as there are shallow areas within the river that are hazards to navigation. These areas are more frequent along the sides of the reservoir and in shallower water. The primary boating use of the entire reservoir occurs towards the center of the river, in deeper water (greater than 25 ft). Boats and watercraft that utilize the dock will be removed from the water for fueling and maintenance. No fueling or maintenance activities will occur at the dock. The use described within this paragraph does not currently occur at the property. The installation of the proposed replacement docks will not represent a net increase the recreational activity on the reservoir due to the already significant level of use that occurs at the subject property.

2.2.3 Proposed Mitigation Plan

The proposed project will not affect water quality, water supply, recreation, or aesthetics of the Columbia River. Potential impacts to fish and aquatic life will be sufficiently minimized by the conformance with the Corps and Douglas County's conservation measures and the fact that the proposed floats will replace existing floats. The float design has minimized the number of pile and the entire surface of the floats will consist of grated material. The proposed removal of the existing floats will eliminate large solid decked concrete floats in the middle basin.

As stated above, the proposed float replacement and reconfiguration will not result in any potential adverse impacts that would reach the level to require compensatory mitigation. As a result, no compensatory mitigation is being provided for the proposed project. The existing floats that will be removed encompasses 10,469 sq ft of overwater coverage within all three embayments. Due to the large number of floats the removal and replacement would occur over a 2-3 year period. During the first work window, the float from the upriver basin and the middle basin will be removed and the float in the middle basin will be installed. No floats will be installed back into the upriver basin. The removal of the solid decked concrete floats in the middle basin will eliminate a float system that has a significant impact on the habitat within the middle basin. Snorkel surveys under the concrete floats has resulted in the complete elimination of aquatic vegetation under the dock and a significant light/dark interface. The concrete dock will be replaced with a fully grated float system that will allow for a significantly greater level of light penetrance. This would result in an overall increase in habitat functions and values within the middle basin and within the upriver basin. The water depths within the basin range between 8-10 ft below the OHWM and the proposed floats will be installed within the same water depths as the floats removed. The best mitigation for the installation of overwater structures is the removal of overwater structures within similar habitats; at a 1:1 mitigation ratio. This proposed project would result in the installation of 10,414 sq ft of overwater coverage which will be

mitigated for by the removal of the 10,469 sq ft of overwater coverage. As a result, the proposed project is basically self-mitigating. Overall, the proposed project would reduce the overwater coverage by ~55 sq ft and will also remove the existing wooden floats with grated surfaces and solid decked concrete floats. Overall, the proposed project will not result in any adverse impacts to the existing habitat functions and values to the aquatic environment.

The proposed project would also result in the installation of new dock access trails to the newly installed concrete abutments and gangways. The new trails will be connected to the existing shoreline trail that is aligned approximately parallel to the OHWM down to the dock abutments. In total, the proposed new access trails and concrete abutment will encompass approximately 250 sq ft. Vegetation within this ~250 sq ft consists of maintained lawn grass. This will result in a conversion of lawn grass to compacted gravel that will result in negligible impacts to the riparian buffer. Additionally as part of the proposed project the existing access trails to the existing dock will be removed and restored. The existing access trails and abutments encompass approximately 325 sq ft, which will be removed and restored to lawn grass (including the existing concrete abutments). Overall, the proposed project would result in the conversion of approximately 250 sq ft of lawn grass to gravel and concrete and the conversion of approximately 325 sq ft of gravel and concrete to lawn grass. The overall impact would be the reduction of 75 sq ft of gravel access trail and abutment. Overall, this portion of the project would result in no net loss of habitat functions and values within the riparian buffer.

2.2.4 Mitigation As-Built Report

Upon completion of the mitigation plantings, an as-built mitigation report would be sent to the Corps and NMFS to demonstrate the final configuration of the community docks and verify the overall minor reduction in overwater coverage. The report would include the Corps permit number and NMFS tracking number, an as-built drawings and photographs, and the location (street address, latitude/longitude). The report would be submitted by the first January 31 following permit issuance.

2.2.5 Mitigation Monitoring and Performance Standards

The proposed project will result in the replacement of the community docks within the three basins. The project would result in an overall reduction of approximately 55 sq ft of overwater coverage and will remove solid decked modular concrete floats and replace them with narrower, grated structures. The proposed project will also result in the removal of 33 pile and the installation of 37 total pile. The overall impacts of the proposed project will not result in any adverse impacts to the existing ecological habitat functions and values. As a result, no compensatory mitigation is required, and no long term monitoring is required.

2.3 CONSTRUCTION REPORT

Upon completion of the dock replacements, a construction report would be sent to NMFS and the Corps. The report would include the Corps permit number and NMFS tracking number, the area of floating in-water dock structure, the maximum area that could potentially be covered by boats moored at the dock, the minimum water depth at the landward side of the float relative to OHWM, the number, size and type of piles installed, and the pile driving method used. If impact pile driving is required, the number of strikes per pile and per day as well as the total number of days impact pile driving or proofing that were required would also be reported. The report would

be submitted by the first January 31 following permit issuance. If the docks are not built / installed by the first January 31 following permit issuance, a report would be submitted to NMFS and the Corps stating that the docks have not been built by January 31, as well as every subsequent January 31 that the docks remains un-built remain uninstalled until the expiration date of the permit.

2.4 REPORT SUBMITTALS

All required As-built and monitoring reports will be submitted to:

- NMFS, Washington State Habitat Office, ATTN:OWS Team, 304 South Water Street, Suite 201, Ellensburg, WA. 98926.
- USACE, Seattle District, Regulatory Branch, P.O. Box 3755, Seattle, WA. 98124-3755.

2.5 PROJECT TIMING

The Project would begin as soon as possible after permits are received. The proposed project will occur over a period of 2-3 inwater work windows due to the larger number of structures to be replaced. Best Management Practices (BMPs) would be implemented to minimize the potential effects on aquatic habitats or species. All in-water work would be timed to avoid the annual outmigration of juvenile salmonids. USFWS, NOAA Fisheries, and WDFW have set closure periods during which in-water work cannot be conducted. Based on guidance from the Corps, the expected work window is July 16 through February 28 on the Columbia River. All pile driving associated with the project will occur between October 1 and February 28, the remainder of the work that will occur above the OHWM (attaching the gangway and floats, decking the pier, etc.) may occur between July 16 and February 28. Work that may occur prior to September 30 includes the construction of the pier (using hand held power tools or installation of pre-fabricated sections), placement of the gangway (with barge mounted crane), installation and attachment of the float to the piling. Although these activities may occur prior to September 30, it is anticipated that pile driving would be the first task, which cannot be installed until October 1. The Applicant will comply with the work closures determined during Project review. All in-water work proposed for this Project will be performed using standard BMPs (see Section 7.3).

3 DESCRIPTION OF THE PROJECT AREA

3.1 HABITAT ZONES

For the purposes of this BA, habitat is divided into upland and aquatic habitat. These habitats are divided by the OHWM, which is field-located based on the definition given in the Shoreline Management Act of 1971 (RCW 90.58.030):

> *"that mark that will be found by examining the bed and banks and ascertaining where the presence and action of waters are so common and usual, and so long continued in all ordinary years, as to mark upon the soil a character distinct from that of the abutting upland, in respect to vegetation…"*

Work would occur in both upland and aquatic habitat

3.2 DEFINITION OF THE PROJECT AREA

For the purpose of this analysis, the "Project Area" includes all locations where construction would occur. The Project Area is primarily aquatic habitat. Upland habitat includes areas used for the access and storage and staging of construction materials.

3.3 DEFINITION OF THE ACTION AREA

The "Action Area" encompasses the Project Area as well as all habitats that could be directly or indirectly affected by the proposed Project. To determine the boundaries of the Action Area, consideration was given to the potential reach of mechanisms that may lead to impacts on the species of concern. The project element that has the potential for the most far-reaching impacts would be pile driving. A vibratory hammer will be used to remove 33 existing pile (16 5-inch pile and 17 12-inch pile) and either a vibratory hammer or an impact pile driver the install 37 up to 8-inch diameter steel piles (8.625-inch outer diameter; may use stainless steel, epoxy coated white piles or encased piles in white PVC). If an impact hammer is used, this will generate underwater noise well outside the Project Area.

No data on underwater sound pressure levels (SPL) of driving 8-inch diameter piles are available in the Washington State Department of Transportation (WSDOT) pile driving guidance (WSDOT 2010) or the CalTrans Compendium of Pile Driving Sound Data (Illingworth and Rodkin 2007). Thus, the next largest pile size with recorded sound data in these databases was used. In both databases, a 12-inch diameter pile is the smallest pile with recorded sound pressure level (SPL) data. Data on 12-inch diameter pile SPL from these databases are presented in Table 1 (as measured 10 m from pile):

Table 1. Available 12-inch pile driving SPL/SEL data

Source	dB Peak	dB RMS	dB SEL
WSDOT	203-208	188-191	171-175
Illingworth & Rodkin (Sausalito Dock)	177	165	152
Illingworth & Rodkin (Point Isabel)	192	177	NA

Due to the small size of the piles (up to 8-inch diameter), if 12-inch pile noise data are to be used to approximate the Action Area, the lowest recorded data would be the most applicable (e.g.

Sausalito Dock: 177 dB_{peak}, 165 dB_{RMS}, and 152 dB_{SEL}; Illingworth and Rodkin 2007). Further, the Sausalito Dock data are most relevant for the proposed dock because a gravity-powered drop hammer was used to complete that pile driving. The other datasets represent pile driving that was accomplished with a diesel-powered impact hammer, which generates much more energy than a drop hammer. Due to the very small scale of the project and the small diameter of the piles, the proposed dock piles would be driven with a small drop hammer or a pneumatic vibratory pile driver, not a diesel-powered impact hammer. (If a pneumatic vibratory hammer is used, negligible noise would be generated, which would be characterized as a constant pulsating noise rather than a rapid rise in overpressure/under pressure typical of impact hammering).

Sound attenuation measures would be used to minimize impact pile driving sound, such as a bubble curtain or a 6-inch thick wood block placed between the pile and the pile driver. Both methods have been shown to be successful in reducing SPL, if they are installed properly (WSDOT 2013, Illingworth and Rodkin 2007, Laughlin 2006). No average decibel reduction is given in those documents, with SPL reductions varying widely. Many projects achieve 9 dB or greater SPL reductions from either a wood block or a bubble curtain. Thus, in the absence of project-specific data a 9 dB reduction from sound attenuation measures will be used.

With these assumptions, the practical spreading loss model was used to calculate the distance at which SPL would attenuate to 120 dB_{RMS} (assumed ambient noise level of large, slow-moving rivers per WSDOT 2013). The model returned a distance of 8,239 ft. However, this estimate greatly overstates the distance to attenuation to ambient levels, as the data used to generate this distance came from piles approximately 1.4 times the diameter of those proposed. Further, in almost all cases the piles would be installed with a vibratory hammer rather than an impact hammer. Only in rare cases is an impact hammer necessary. However, to be conservative, an Action Area of an 8,239 ft radius from the Project Area will be adopted (Figure 1). Additionally, all of the pile driving will occur within the three basins, which will significantly reduce the distance of attenuation.

Water quality could be impaired by turbidity during pile driving. However, turbidity is expected to attenuate within the 300-ft prescribed mixing zone for rivers (per WAC 173-201A). During construction, water quality standards and procedures that limit the impact of turbidity would be strictly observed (WAC 173-201A). Based on experience with other construction projects in the Columbia River, it is expected that water quality during and after Project construction would conform to the established standards. It is likely that any potential turbidity associated with the removal and installation of pile would remain in the basins.

For Ute ladies'-tresses, potential impacts of the Project would be limited to the direct effects of construction in the upland. Therefore, for this species, the Action Area is coincident with the upland portion of the Project Area. The Ute ladies'-tresses has not been identified as occurring in or near the Action Area, and there is no suitable habitat for this species in the area.

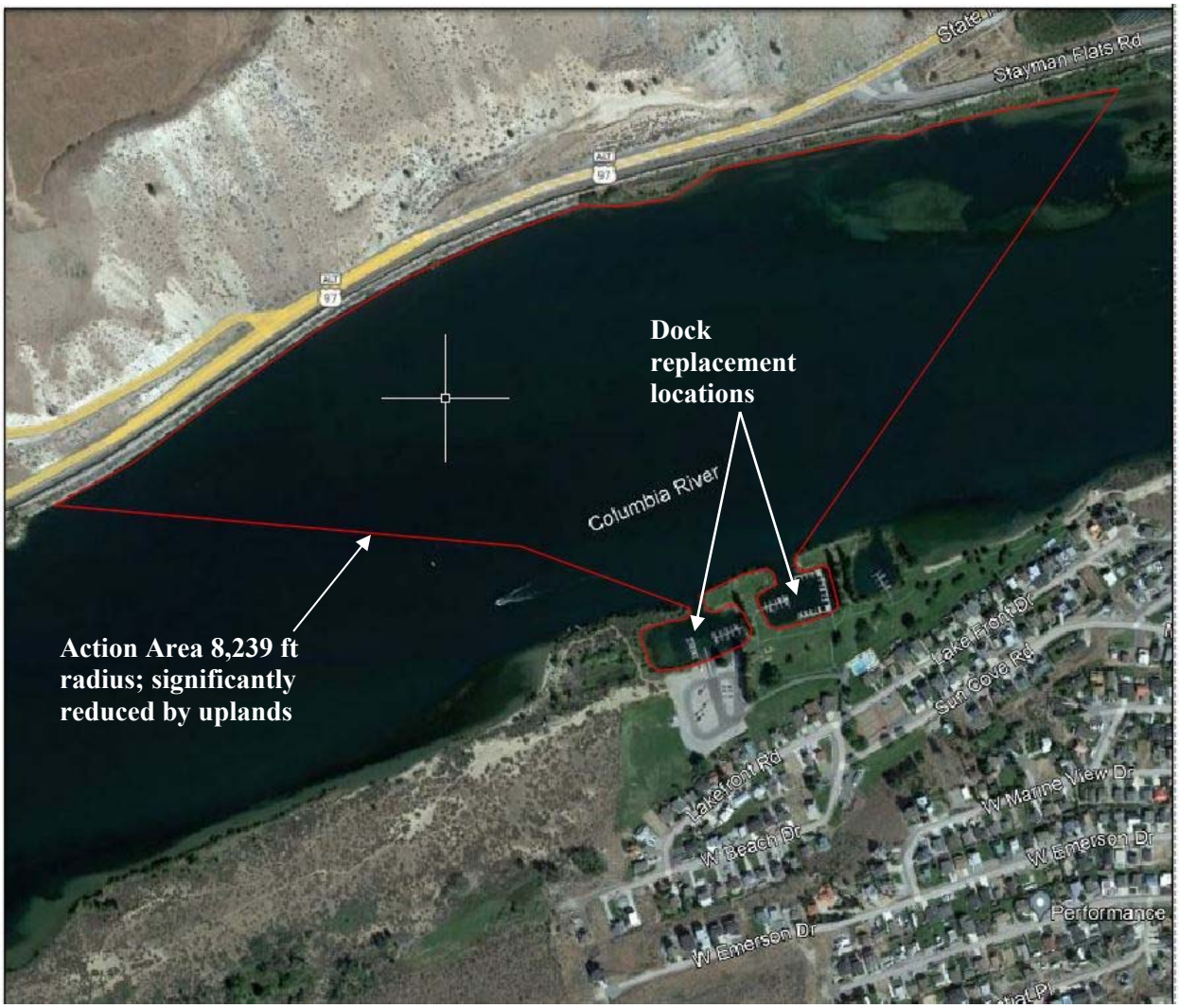


Figure 1. Action Area for the Project.

3.3.1 Current and Proposed Boating Activity and Site Use

The only overwater structures within the Reach are the five (5) community docks and handling floats on the subject properties and owned by the HOA. This is due to the fact that the HOA owns the entire waterfront waterward of the development (~0.43 miles of shoreline) and the majority of the adjacent waterfront properties are either publicly or federally owned. The nearest launch is within the lower basin. This facility contributes to the on-going boating activity in the Action Area. The existing boat use entails fishing, water skiing, and pleasure boating that primarily occurs greater than 150 ft from the OHWM. This use occurs primarily between the middle of June through the middle of September; however, some fishing occurs outside of this window. The frequency of this use is approximately daily between June and September. This use currently occurs within, and originates from, the Action Area.

As mentioned above, the proposed project will not result in an increase in existing boating use in the Action Area. No fueling or maintenance will occur at the docks, rather boats will be removed from the river to complete these activities.

3.4 DEFINITION OF THE REACH

Based on recent guidance from the Corps, a project in the Upper Columbia River must include baseline information for the "reach" in which the project is to occur. For dock projects, the Reach is defined as a distance of one half mile upstream and downstream of the proposed docks on the side of the river on which the dock is proposed. The baseline conditions of the entire Reach are described below.

3.4.1 Waterfront Parcels and Overwater/Inwater Structures

The reach includes a total of seven (7) waterfront parcel. The downriver parcels (2) are owned by the Chelan County PUD and three (3) of the parcels are owned by the application and are communal properties where no docks can be installed and no land division can occur. There is one (1) property upriver owned by the Greater Wenatchee Irrigation District and this property can't be subdivided and no dock will be installed on it. The only privately owned parcel with the opportunity for the installation of an overwater structure in the furthest upriver property. This parcel cannot be subdivided based on current Douglas County code. Overall, only one (1) dock and one (1) boatlift can be installed within the Reach.

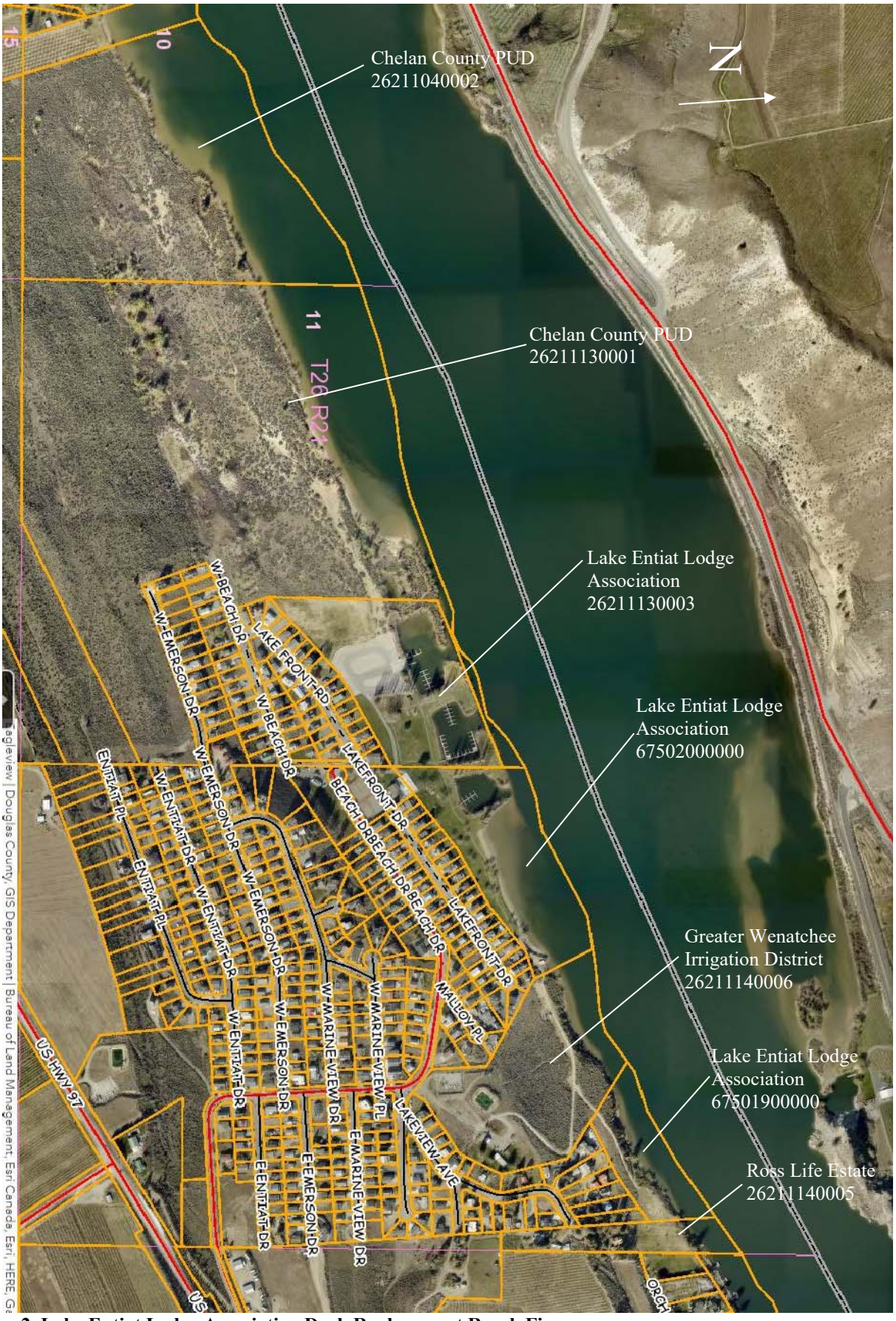


Figure 2. Lake Entiat Lodge Association Dock Replacement Reach Figure

3.4.2 Reach Survey Date and Methods

This reach was surveyed using the most recent aerial photographs available, such as the Douglas County parcel map – 2017, Google Earth Professional 2016, and WA Department of Ecology Coastal Atlas oblique aerial photos – 2007. The reach was also surveyed in June 2022.

3.4.3 Existing Riparian Conditions

The subject properties consist of two (2) large waterfront parcels that are owned and operated by the Lake Entiat Lodge Association HOA. As part of the Lake Entiat Lodge Association development, the entire shoreline was developed as community access. As part of this development, nearly the entire shoreline was graded and developed. Development along the shoreline entailed the dredging of three (3) large basins off of the mainstem of the river. Within all three (3) basins the HOA permitted and installed community docks and a boat launch (in the downriver basin). Associated with the boat launch there is a gravel and asphalt parking area. The dredging of the three (3) basins resulted in the armoring of the peninsula fingers between the basins. The majority of the waterward face of the peninsulas are armored with large, angular boulders and this armoring extends within the basins. Within the basins, the energy is much lower, and the shoreline substrates consists of gravel and cobble. Each of the basins have been dredged out and the substrates consist of sand and silt with o silt cover (deposited). Within each of the basins there is a moderate level of aquatic vegetation coverage although the use of the basins keep the areas somewhat clear. Within the middle embayment, the shade cast by the solid, modular concrete floats are also keeping aquatic vegetation from thriving. The majority of the peninsulas located between the lower and middle basin and the middle and upper basins consists of lawn grass. Lawn grass also dominates the shoreline as this area is utilized as a community park. Upriver of the basins, the shoreline consists of a gradually sloped shoreline with lawn grass or natural sand extending down to the OHWM. There are numerous mature trees within the lawn grass, which were planted as part of the development of the shoreline and the species consist of a mixture of native and ornamental species. As part of previous permitting actions on the subject parcels (access trail, dredging, new dock, etc.), has resulted in the installation of several mitigation planting areas. The first planting area is located immediately upriver of the upriver basin. The mitigation planting area was installed on the peninsula and resulted in the elimination of the lawn grass. The mitigation planting area includes native trees and shrubs. The upper peninsula was originally planted with Lombardi poplars on both sides.

Likewise, the middle peninsula was also planted with Lombardi poplars on both sides. This peninsula is T-shaped and is located between the upriver and middle basin. The waterward end of the peninsula is virtually devoid of native vegetation, except for the presence of sparse coyote willow present within and immediately landward of the existing boulders. There was a mitigation planting area installed on the downriver side of the peninsula that contains native trees and shrubs. Landward of the upper and middle basin, the vegetation consist of lawn grass. The downriver peninsula is located between the middle basin and the downriver basin and is providing a similar level of habitat as the middle peninsula. The peninsula is T-shaped, and side of the peninsula was planted with Lombardi poplars; however, the poplars of the upriver side have been removed. Similar to the middle peninsula, the vegetation in the waterward end of the peninsula consists of lawn grass with sparse coyote willow within the boulders and immediately landward of the boulders. Landward of the downriver basins, the shoreline is virtually devoid of vegetation upriver of the boat launch. There is a line of Lombardi poplars extending

perpendicular from the OHWM in the upriver portion of the basin. Upriver of the boat launch, the shoreline consists of gravel and lawn grass. Landward of this basin, the shoreline consists of gravel and asphalt parking areas. Downriver of the launch, vegetation has not been disturbed and is providing a high level of function. Vegetation is dominated by a narrow strip of riparian shrubs (10-15 ft) and emergent and dense shrub steppe vegetation immediately landward. This area is utilized as a walking area and remains open space. This area connects to the large PUD property located downriver that is virtually undisturbed. Landward of the subject properties consists of residential parcels.

The primary function provided by the buffer is limited to water quality function provided by the existing grass. The mature trees and mitigation planting areas are providing a moderate level of habitat functions and values; however, this is limited due to the heavy recreational use of the shoreline. Per the Douglas County Shoreline Master Program, the riparian buffer on the subject properties is 75 ft as measured from the OHWM. Overall, the existing conditions on the properties are provided a limited amount of habitat functions and values due to the fact that the shoreline is heavily utilized and the majority of the shoreline consists of lawn grass.

3.4.4 Nearshore Bathymetry

Nearshore bathymetry within the basins is consistent as they all have been dredged over the years. The depths within the basin max out around 8 ft below the OHWM. the shorelines are moderately sloped. Upriver of the basins, the bathymetery is extremely gradual (greater than 15H:1V) out to a depth of around 6-8 ft of depth. After that the bathymetry steepens to greater than 20 ft of depth. Downriver of the subject properties, the nearshoe bathymetry is gradual 8-10H:1V to a depth of approximately 8 ft below the OHWM where the slope increases to around 3H:1V out to a depth greater than 20 ft.

3.4.5 Nearshore Substrate

Substrate immediately above and below the OHWM within the basins consists of either large angular riprap (~40%) or gravel and cobble (60%). The slopes along the shoreline range from 2-4H:1V with the top of the bank between 2-5 ft above the OHWM. substrates below the OHWM primarily consist of silt and sand with some gravel depending on the area and existing use. The reach is a mile long and characterizing substrates over the entire reach is difficult to assess. Based on the survey, substrates range from sand/silt with some gravel to boulder. The dominant substrate type within the reach is sand and silt to a depth of 10 ft of water depth. Soils mapped on and adjacent to the property by the USDA Web Soil Survey are Burbank loamy fin sand, Pogue fine sandy loam, Pogue Cobbly fine sandy loam, and Suplee very fine sandy loam.

3.4.6 Aquatic Vegetation

Due to the steep slopes and moderate sized substrates, aquatic vegetation is covering a large portion of the entire Reach. However, as with the majority of the Columbia River, aquatic vegetation is present where the slopes below the OHWM in the nearshore shallow water area are suitable for aquatic vegetation. This is typically located between 3 ft and 10 ft of water depth. The width of the band is dependent primarily on the slope and substrates but require sand and silt. Aquatic vegetation is present in the three basins; however, the coverage was impacted by the boating use in the basins. The dominant vegetation is milfoil. This condition is typical for the upriver and downriver portion of the Reach.

4 DESCRIPTION OF SPECIES AND HABITAT USE

The species of concern associated with the Action Area are Upper Columbia River spring-run Chinook salmon, Upper Columbia River steelhead, Columbia River bull trout, and Ute ladies'-tresses.

4.1 UPPER COLUMBIA RIVER SPRING-RUN CHINOOK SALMON (*Oncorhynchus tshawytscha*)

The Upper Columbia River spring-run Chinook salmon ESU includes all naturally spawned populations of Chinook salmon in all river reaches accessible to Chinook in Columbia River tributaries upstream of the Rock Island Dam and downstream of Chief Joseph Dam in Washington (excluding the Okanogan River, which are considered as part of the Upper Columbia summer- and fall-run ESU), the Columbia River from a straight line connecting the west end of the Clatsop jetty (south jetty, Oregon side) and the west end of the Peacock jetty (north jetty, Washington side) upstream to Chief Joseph Dam in Washington, as well as six artificial propagation programs: the Twisp River, Chewuch River, Methow Composite, Winthrop NFH, Chiwawa River, and White River spring-run Chinook hatchery programs (NOAA 2005). The nearest Chinook spawning stream to the Action Area is the Wenatchee River, which is approximately 10.5 miles upstream on the opposite side of the Columbia River.

Chinook salmon are the largest of the Pacific salmon. Two distinct races of Chinook salmon, an "ocean-type" and a "stream-type", are recognized. Juvenile spring Chinook in the Upper Columbia River ESU generally exhibit a stream-type life history pattern, rearing in fresh water for about one year before migrating to the ocean (Corps 2000). The spring-run is made up of several stocks that spawn in headwater tributaries of the Columbia River, including the Wenatchee, Entiat and Methow Rivers. Hatchery populations are also produced from the Chiwawa River, Methow River, Twisp River, Chewuch River, White River and Nason Creek.

Upper Columbia River spring Chinook salmon juveniles generally emerge from the gravel in March and April. After emergence, the juvenile fish move into shallow water to rear and many are displaced downstream by high flows in spring and summer. Spring Chinook salmon rearing in the colder upper tributaries may migrate in the fall into overwintering habitats in the larger tributaries. Yearling spring Chinook salmon migrate past the Action Area on their way to the ocean from mid-April to early July, with the peak migration occurring in mid- to late-May (Fish Passage Center 1987). Juvenile spring Chinook migrate actively through this portion of the Columbia River, and are not strongly shoreline-oriented during this period. Therefore, it is likely that most juvenile spring Chinook salmon moving through the area remain in the main river channel away from the Action Area.

Adult spring Chinook salmon enter the Columbia River from March through May, with most adults passing through the Action Area from mid-April to mid-June (Chelan County PUD 1998a, 1998b). Spawning of spring Chinook salmon occurs in the upper reaches of the tributaries from late July through September. No spawning occurs in the Action Area.

Critical habitat for Upper Columbia River spring-run Chinook salmon has been designated (NOAA 2005). Section 6 includes a description of Chinook critical habitat and potential effects of the Project on critical habitat.

4.2 UPPER COLUMBIA RIVER STEELHEAD TROUT (*Oncorhynchus mykiss*)

The Upper Columbia River steelhead DPS includes all naturally spawned populations of steelhead in streams in the Columbia River Basin upstream from the Yakima River, Washington, to the U.S.-Canada border. Six artificial propagation programs are considered part of the DPS: the Wenatchee River, Wells Hatchery (in the Methow and Okanogan Rivers), Winthrop NFH, Omak Creek, and the Ringold steelhead hatchery programs (NOAA 2006). The nearest steelhead spawning stream to the Action Area is the Wenatchee River, which is approximately 10.5 miles upstream on the opposite side of the Columbia River.

Steelhead trout exhibit one of the most complex life histories of the salmonid species. Both anadromous (steelhead trout) and resident (rainbow or redband trout) forms occur in the Columbia River. Steelhead trout reside in the marine environment for two to three years before returning to their natal stream to spawn as primarily 4- or 5-year-old fish. Steelhead may spawn more than once before they die.

Steelhead trout can be divided into two reproductive ecotypes, termed "stream-maturing" ("summer run") and "ocean-maturing" ("winter run"). Stream-maturing steelhead trout enter fresh water in a sexually immature state and require from several months to a year to mature and spawn. Ocean-maturing steelhead trout enter fresh water in a mature condition and spawn shortly after entering their natal stream. Steelhead trout in the Columbia River basin are essentially all stream-maturing fish (Corps 2000).

Upper Columbia River steelhead trout juveniles generally emerge from the gravel from July through September. After emergence, juveniles move downstream into overwintering habitats. Most steelhead trout juveniles rear in fresh water for two to three years, although the duration of fresh water residence can range from one to seven years. Approximately 90 percent of the wild steelhead trout juveniles in samples taken at the Rock Island and Rocky Reach Dams (downstream of the Project Area) were two- and three-winter residents (Chelan County PUD 1998a). Wild steelhead trout juveniles migrate through the Columbia River during the spring, passing McNary Dam from April to early July, with peak numbers in early June (Fish Passage Center 1987). Juvenile steelhead trout in the mid-Columbia are actively migrating (averaging 32 km/day), and thus the residence time is short (Chelan County PUD 1998a). Migrating steelhead trout smolts typically remain in mid-channel where water velocities are highest.

The majority of adult summer steelhead trout pass Rocky Reach Dam from July to mid October and spawn the following spring or summer. Some adult steelhead overwinter in the Columbia River, passing Rocky Reach Dam from May through June (Columbia Basin Research 2008).

The Action Area is not used by steelhead trout for spawning, and rearing generally occurs within the tributaries. As mentioned above, steelhead use the Action Area as a corridor for juvenile and adult migration. Similar to juvenile spring Chinook salmon, juvenile steelhead trout migrate actively past the Action Area, and the majority of migrating juveniles likely remain in the main river channel, offshore from the Action Area. As noted above, some adult steelhead overwinter in the Columbia River, and it is possible that adult fish could be present in the Action Area during that time.

Critical habitat for Upper Columbia River steelhead trout has been designated (NOAA 2005), and a description of steelhead trout critical habitat and potential effects of the Project on critical habitat are included in Section 6.

4.3 COASTAL-PUGET SOUND BULL TROUT (*Salvelinus confluentus*)

The Columbia River DPS encompasses the entire Columbia River basin and its tributaries, excluding the Jarbidge River, Nevada. Although two distinct clades have been identified in the Columbia River basin (Upper and Lower Columbia River clades) based on genetic diversity patterns, a discrete geographical boundary between the two clades was not documented. The Columbia River DPS is significant because the overall range of the species would be substantially reduced if this discrete population were lost.

Bull trout are members of the char subgroup of the salmon family. The species exhibits both migratory and non-migratory life histories throughout much of its current range (Rieman and McIntyre 1993). The adfluvial form migrates between lakes and streams, the fluvial form migrates within river systems, and the resident form is non-migratory. Resident and migratory forms may be found together, and it is suspected that bull trout give rise to offspring that can exhibit either resident or migratory behavior (Rieman and McIntyre 1993).

Bull trout spawn when they reach maturity, between 4 and 7 years of age. They typically spawn from August to November as water temperatures drop, although spawning migrations may begin as early as April (Corps 2000). Bull trout require clean gravel or cobble substrate and cold water for spawning. Spawning generally would occur only after water temperatures drop below 8 to 10°C (Kraemer 1994). The period from egg deposition to emergence may be up to 220 days, making embryos vulnerable to temperature fluctuations and sedimentation. Fry emerge in April and May. Juvenile bull trout prey on terrestrial and aquatic insects; as they increase in size, bull trout also feed on other fish. Adult bull trout are primarily piscivorous and are known to prey on a variety of fish species (Corps 2000).

The distribution of bull trout in fresh water is strongly influenced by water temperature (Ratliff 1992; Rieman and McIntyre 1993; Buchanan and Gregory 1997) and they are associated with the coldest stream reaches in watersheds (Lee et al. 1997). Bull trout are widespread throughout the tributaries of the Columbia River, including its headwaters in Montana and Canada (Corps 2000). It is estimated that the Columbia River bull trout occurs in 45 percent of its historical range.

Subpopulations of bull trout within the mid-Columbia basin occur in the Yakima, Wenatchee, Entiat and Methow Rivers. The Action Area is used as a corridor for adult and juvenile bull trout migration, and it is possible that adult fluvial bull trout use habitats in the Action Area. According to WDFW's SalmonScape online mapper, no spawning or rearing occurs in the Action Area or the mainstem Columbia River (WDFW 2009).

Recently revised bull trout critical habitat now includes the mainstem Columbia River to Chief Joseph Dam. Bull trout critical habitat is addressed in Section 6.

4.4 UTE LADIES'-TRESSES

Ute ladies'-tresses is a perennial, terrestrial orchid with stems 8 to 20 inches tall that arise from tuberous roots. It flowers in August through early September. The inflorescence consists of multiple small, white or ivory flowers clustered at the top of the stem. Its range encompasses eight Western states, including Washington, where it was collected in 1997 from a single site in Okanogan County. This known site is in a periodically flooded alkaline flat (moist meadow) adjacent to Ponderosa pine/Douglas fir woodlands and sagebrush steppe. According to the Washington Natural Heritage Program, the species is restricted to calcareous, temporarily inundated wet meadows and channels and swales where there is stable subsurface moisture.

Wetland habitat suitable for Ute ladies'-tresses does not occur within the Action Area. In general, the riparian and wetland habitats that may support this species in other areas have been affected by stream channelization, water diversions, and other watershed and stream alterations. The species has not been identified on the Project Area.

5 EFFECTS OF THE PROJECT

5.1 INTRODUCTION

This section presents the direct effects, indirect effects, and cumulative effects of the proposed Project within the Action Area and describes interrelated and interdependent actions that may lead to effects on the species of concern. The Project's effects on threatened and endangered species are described in this section, whereas the potential effects on steelhead trout critical habitat are described in Section 6. Due to the similar use of habitat in the Action Area by all listed salmonids, and similar effects of the Project on all listed salmonids, effects of the Project are assessed for all salmonid species together. Where different salmonid species may be affected differently, this will be noted in each section.

5.2 DIRECT AND INDIRECT EFFECTS ON SALMONIDS

Project activities that have the potential to impact salmonids include impact pile driving, pile removal, potential changes in predation due to changes in dock coverage from the docks, potential aquatic/riparian impacts from the shoreline access, and potential water quality impairments resulting from the work.

Project construction is not expected to adversely affect juvenile salmonids, as the Project would be conducted during the established in-water work season approved by WDFW, the Corps, NMFS, and USFWS (anticipated to be the period between July 16 and February 28; October 1 through February 28 for pile driving). This would ensure that in-water work does not occur during the period when out-migrating juvenile salmonids are likely present in the Action Area. Although adult chinook salmon, steelhead trout and bull trout could be present in the Action Area during construction, adult fish are highly mobile and able to avoid areas where construction is occurring. No long-term impacts are anticipated.

5.2.1 Pile Driving

A total of 37 up to 8-inch diameter (maximum; 8.625-inch outer diameter; may use stainless steel, epoxy coated white piles or encased piles in white PVC) pipe piles will be installed. Piles would be driven using either a vibratory hammer or a pneumatic hammer. The National Marine Fisheries Service (NMFS) has expressed concern over the potential for impact driving of steel piles to adversely affect juvenile fish in the vicinity due to the generation of high-pressure sound waves, which if generated at high enough pressure levels, can injure or kill juvenile fish.

An interim agreement signed by several agencies has set threshold levels for potential injury and adverse behavioral effects, which are used by the Services for salmonids[1]. The agreement states that there is potential for injury to juvenile salmonids when pile driving generates an instantaneous sound pressure level (SPL) of 206 dB_{peak}, or cumulative sound exposure level (SEL) of 187 dB_{SEL} for salmonids greater than or equal to 2 grams and 183 dB_{SEL} for salmonids under 2 grams. Behavioral impacts (e.g. flushing or startle) could occur at SPLs over 150 dB_{RMS}.

Using the underwater sound assumptions from Section 3 above, it is assumed that pile driving would generate approximately 177 dB_{peak}, 165 dB_{RMS}, and 152 dB_{SEL}. As discussed above, a 9

[1] http://www.wsdot.wa.gov/NR/rdonlyres/4019ED62-B403-489C-AF05-5F4713D663C9/0/BA_InterimCriteriaAgree.pdf.

dB reduction is assumed using a bubble curtain or wood block. Thus, with sound attenuation measures, it is assumed that impact pile driving would result in 168 dB_{peak}, 156 dB_{RMS}, and 143 dB_{SEL}.

A noise impact calculator has been prepared by NMFS, which was used to estimate the potential for impacts on salmonids from pile driving[2]. Potential instantaneous injury is measured in SPLs dB_{peak}; behavioral effects are measures in dB_{RMS}; and cumulative effects are measured in dB_{SEL}. This model is used to generate the distance within which the potential for injury or behavioral effects exist.

5.2.1.1 Behavioral Impacts

Pile driving would generate an estimated instantaneous SPL of 156 dB_{RMS} with sound attenuation measures. As mentioned above, behavioral effects on salmonids are assumed possible at SPLs above 150 dB_{RMS}. Using NMFS' calculator, SPLs would attenuate to below 150 dB_{RMS} within 25 meters (~82 ft). That is, outside of this radius, juvenile salmonids may detect impact pile driving impulses, but their behavior would not be altered in any detectable way (Figure 3).

5.2.1.2 Instantaneous Injury Impacts

Pile driving would generate an estimated instantaneous SPL of 168 dB_{peak} with the use of sound attenuation measures. As mentioned above, the potential for injury to salmonids from instantaneous impulses is assumed possible at SPLs above 206 dB_{peak}. Since estimated SPLs generated by pile driving would be well below this, it is assumed that no potential exists for instantaneous injury to salmonids.

5.2.1.3 Cumulative Injury Impacts

In calculating potential cumulative pile driving impacts, it is necessary to estimate the number of strikes needed to fully embed a pile in addition to knowing the SEL resulting from each individual strike. The model assumes that cumulative effects "reset" overnight based on assumed fish movement, so only strikes in a single day are counted toward cumulative impacts. The model also has an upper limit of 5,000 strikes, as tissue damage accumulation in juvenile salmonids does not seem to increase significantly beyond 5,000 strikes. WSDOT's pile strike summary table[3] recommends assuming that each 12-inch pile would require up to 191 strikes to embed. The proposed project would likely require significantly fewer strikes than this; however, to be conservative 191 strikes per pile will be assumed in the analysis. Based on this assumption, there would be a total of 7,067 strikes. For the purposes of this analysis, it is assumed that no more than six (6) piles would be driven in one day. Thus, up to 1,146 strikes (6 times 191) would occur in any given day. It is also assumed that the pile will be installed over a period of 2-3 years with approximately 24 pile being installed the first year and up to 13 over the next two (2) years.

It is assumed that pile driving would generate an estimated SEL of 143 dB_{SEL} with use of sound attenuation measures. As mentioned above, cumulative injury on salmonids are possible at SEL

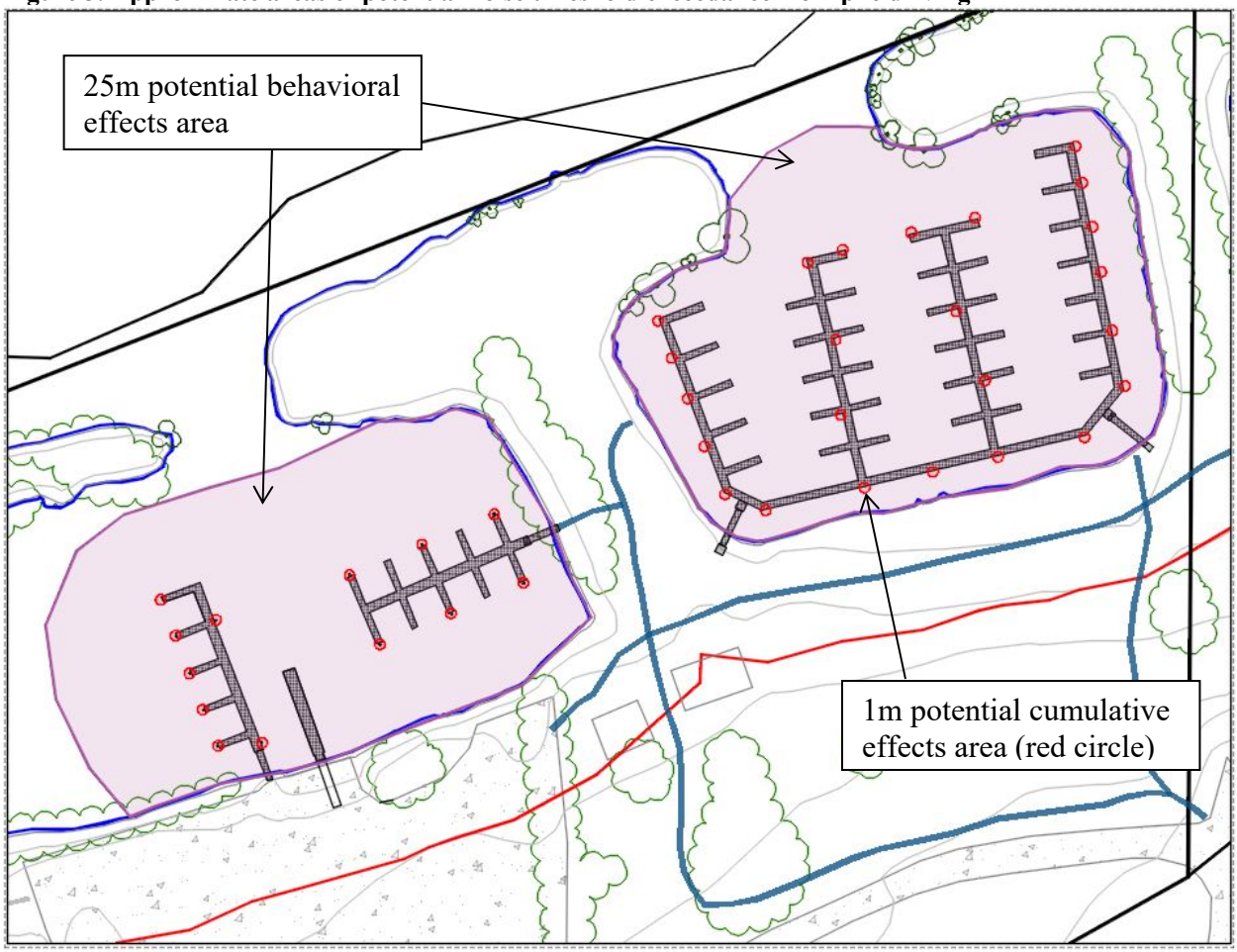
[2] http://www.wsdot.wa.gov/NR/rdonlyres/1C4DD9F8-681F-49DC-ACAF-BD307DAEAD2/0/BA_NMFSpileDrivCalcs.xls
[3] http://www.wsdot.wa.gov/NR/rdonlyres/ 42F72E68-C26D-4C61-8741-121050313200/0/BA_PileStrikeSummaryTable.pdf

above 187 dB_{SEL} for salmonids above 2 grams, and above 183 dB_{SEL} for salmonids 2 grams or smaller. Based on fork length data of juvenile salmonids passing through this portion of the Columbia River presented in Cooney (2002) and the weight:fork length curve presented in MacFarlane and Norton (2002), juvenile salmonids in the Action Area would likely be larger than 2 grams. Thus, 187 dB_{SEL} will be used.

Using NMFS' calculator and assuming piles would be driven over two days, cumulative SEL would be 174 dB_{SEL} at the measured distance of 10 meters, each day, which is below the cumulative injury threshold of 187 dB_{SEL}. Based on the calculated cumulative sound exposure levels, sound would attenuate below 187 dB_{SEL} at a distance of 1 meter and in order for injury to occur a fish would need to reside within 1 meter of each pile being driven for an entire day (Figure 3). This is not likely to occur. Thus, no cumulative injury is anticipated from pile driving.

Based on this analysis, it is concluded that the noise impacts on ESA-listed salmonids associated with pile driving would be limited to potential minor behavioral disturbance, and that there is no potential for injury to juvenile salmonids.

Figure 3. Approximate areas of potential noise threshold exceedance from pile driving



5.2.2 Water Quality

In-water construction (i.e., pile driving and pile removal) would cause a temporary and localized increase in suspended solids. However, this would have a negligible effect on salmonids that may be present. Further, the Project is not expected to adversely affect juvenile salmonids due to the construction schedule, existing coarse substrates, and because pile driving is limited to driving and removal of pile within the three basins. A total of 33 pile will be removed; 17 12-inch and 16 5-inch pile. A total of 37 up to 8-inch pipe pile will be installed. Turbidity associated with pile driving is not expected to cause conditions that would be dangerous to salmonids.

There is minor potential for accidental spills from machinery during construction. However, to minimize the potential for an accidental spill during construction, a number of BMPs will be incorporated into the Project (see Section 7.3). Best Management Practices to be implemented during Project construction include keeping construction equipment well maintained, inspecting construction equipment daily for leaks, developing a spill prevention containment, and control plan and keeping oil absorbent material on-site during construction. Overall, the risk of an accidental spill is negligible.

As noted previously, adult salmonids are highly mobile and are able to avoid areas where construction is occurring. Thus, adverse impacts to the listed fish species are not expected to occur due to water quality during in-water construction.

5.2.3 Predation

As discussed in Section 4, there is a possibility of both rearing and migrating juvenile salmonids being present in the Action Area. In freshwater environments, overwater structures can provide cover for native and non-native piscine predators and other fish that prey on juvenile salmonids. Resident fish in the Columbia River that are known to consume salmonids and may congregate around overwater structures include the northern pikeminnow, smallmouth bass, black crappie, white crappie, and yellow perch (NOAA 2003a, 2003b). Because visual acuity in a juvenile salmonid may be compromised when it passes from a light to a darkly shaded area (Brett and Ali 1958; Ali 1960; Protasov 1970), the ability of the fish to detect and avoid predators can be temporarily impaired. Pilings from docks can also provide velocity refuge for pikeminnow.

If juvenile salmonids were present, it is unlikely that the docks would result in conditions by which predation could increase. The completed Project would actually result in a slight reduction of overwater coverage (~55 sq ft) and the removal of the modular concrete floats would increase the light penetrance of the structures. The dock within the lower basin and the handling float will be replaced in the exact same footprint and the dock in the middle basin will be significantly revised; however, the widths of the dock will be between 4 ft and 6 ft. Overall, the potential impacts of the proposed project would be less than that of the existing floating sections of the docks. The proposed docks will have a 4-ft wide ramps, which will be at least 2 ft above the OHWM. The entire surface of the ramp would be decked with fully-grated decking material with over 60% open area. Based on the narrow design of the ramp, the height above the water, and the use of grated decking material, ample light is anticipated to reach the river bottom. Observations under similarly-grated docks show ample light reaching the river; shading is very minimal (Grette Associates unpub. data). Thus, visual acuity would not be affected by the ramp to the degree that juvenile salmonids would be in danger of predation. The float sections would also be decked with grated material to maximize light transference. It would also be located within

dredged basins that are not expected to provide quality salmonid habitat. The proposed docks will be installed at the same depths of the existing docks (approximatley 8 ft of water depth). If present and not migrating through the main river channel, juvenile salmonids would be expected to congregate in the nearshore area, in shallower water. Thus, the floats would not be located in typical juvenile salmonid migration or rearing habitat.

Any juvenile salmonid presence in the Action Area would primarily be in shallower water, nearer to shore. Thus, the docks would not create predator habitat in areas used by juvenile salmonids. Further, as discussed in Section 4, juvenile salmonid presence in the Action Area is likely relatively low, as the Action Area is located at the extreme upper end of the ESA-listed salmonid ESUs/DPSs. Thus, the majority of the ESA-listed salmonids either remain downstream in the Columbia River mainstem or in tributaries located downstream of the Action Area. Juvenile salmonid presence in the Action Area is also likely relatively low due to the fact that the shoreline area is rocky, relatively steep, and the water velocity is relatively high.

Further, visual observation under installed piers, gangways and floats on the Columbia River (constructed using the most current USACE dock standards) indicate that the installed structures do not cast a shadow strong enough to eliminate the presence of vegetation under the structures. Grating on the structures allow enough light to penetrate the structures and allow for the growth of aquatic vegetation. Specifically, observations under 8 ft wide floating sections still maintained 100 percent coverage of aquatic vegetation. Similar observations have been made under the fixed pier and gangway sections. This observation means that the shadow cast by the new compliant docks do not result in a light/dark interface that would impact primary productivity or result in conditions that would impact the optical ability of juvenile salmonids. This behavior reaction to a light/dark interface is based on the intensity of the interface and the intensity of the interface that results from these new docks is not sufficient to cause a behavior response. Thus, visual acuity would not be affected by the pier and ramp to the degree that juvenile salmonids would be in danger of predation. Further, during site visits to the previous compliant docks, visual observations from the docks (pier, gangway and floats) were made of juvenile fish (both salmonids and non-salmonids) swimming freely under the structures without hesitation. This is purely observational; however, the evidence is clear that the structures do not block enough light to affect aquatic vegetation.

Numerous studies have been conducted to examine the behavior of juvenile salmonids as they encounter overwater and shoreline structures in Puget Sound (Salo et al. 1980, Weitkamp and Schadt 1982, Ratte and Salo 1985, Dames & Moore and Biosonics 1994, Roni and Weitkamp 1996, Shreffler and Moursund 1999). Few such studies have been conducted in the Columbia River, so Puget Sound studies will be sued as a proxy. Of particular concern has been the potential for diverting migrating juveniles around structures into deeper water, subjecting the fish to a greater risk of predation, or for the light/dark interface to reduce visual acuity for juvenile salmonids and thus put them at a disadvantage to predators.

Studies indicate that juvenile salmonids pass readily under narrow structures oriented perpendicular to shore. Weitkamp and Schadt's (1982) observations at the Port of Seattle showed that shoreline-oriented juvenile salmonids crossed the shadow cast by a narrow (15 to 20 ft wide) overwater structure, but were unwilling to cross under a darker shadow cast by a wider structure. Intensive sampling at the Manchester Fuel Pier yielded similar results regarding passage under narrow structures. Two studies at this facility indicate that juvenile chum pass under the narrow

structure successfully (Roni and Weitkamp 1996, Dames & Moore and Biosonics 1994). Similar results were reported for finger piers at the Port of Everett (Pentec Environmental 1997).

The behavior observed at narrow structures oriented perpendicular to shore are consistent with a hypothesis that salmonid behavior is related to the intensity of the light/dark interface at the shadow line of a structure. Narrow structures allow light penetration from each side. The light/dark interface at the edge of such structures would be expected to be more diffuse than for wider structures. Further, grated decking allows light penetration over the entire width of the structure. Such an interface should be traversed easily by juvenile salmonids with negligible loss of visual acuity. Photographs taken under such docks demonstrate the negligible light/dark interface. Therefore, their ability to detect or avoid predators would be essentially undiminished, particularly under 4-ft wide docks with grated decking such as the proposed structure.

The float sections would also be decked with grated material to maximize light transference. If present and not migrating through the main river channel, juvenile salmonids would be expected to congregate in the nearshore area, in shallower water. Thus, the floats would not be located in typical juvenile salmonid migration or rearing habitat.

In addition, the proposed dock will include the following design modifications to minimize the potential for the project to cause increased predation on listed salmonids:

- Reducing the size and number of piles to the minimum necessary to support the structure.
- Fitting all piles with caps to prevent perching by piscivorous birds.

These conservation measures will minimize potential hiding habitat for ambush style predators. For these reasons, the Project is very unlikely to cause an increase in predation on listed salmonids.

5.2.4 Effects on Shoreline and Nearshore Habitat

Productivity can be lower in areas shaded by overwater structures than in unshaded areas (Kahler et al. 2000). To minimize the potential for the dock to shade the underlying bottom substrate, a number of design modifications have been incorporated into the Project, as noted in Section 5. Further, the proposed dock replacements would result in a slight decrease in overwater coverage (~55 sq ft), thus minimizing shading over any aquatic vegetation present. As a result there will be no net increase in ecological habitat functions and values. Overall, the proposed project will not result in any adverse impacts to the existing habitat functions and values. The proposed demolition of the existing structures would result in the removal of approximately 10,469 sq ft of overwater coverage and the removal of 33 pile (17 12-inch and 16 5-inch pile). The proposed project would result in the installation of approximately 10,414 sq ft of overwater coverage and 27 (up to 8-inch pile), which is slightly less overwater coverage and pile compared to the existing conditions. Additionally, the demolition will remove the existing concrete floats that are decked with solid concrete and replace them with fully grated and ESA compliant floats. The new floats would represent a reduction in potential adverse impacts to the aquatic environment. The installation of new overwater structures on the Columbia River requires compensatory mitigation. Compensatory mitigation for the new floats will be accomplished by the removal of the existing floats ensuring that the proposed project will result in no net loss of ecological habitat functions and values.

The proposed project would also result in the installation of new dock access trails to the newly installed concrete abutments and gangways. The new trails will be connected to the existing shoreline trail that is aligned approximately parallel to the OHWM down to the dock abutments. In total, the proposed new access trails and concrete abutments will encompass approximately 250 sq ft. Vegetation within this ~250 sq ft consists of maintained lawn grass. This will result in a conversion of lawn grass to compacted gravel that will result in negligible impacts to the riparian buffer. Additionally as part of the proposed project the existing access trails to the existing dock will be removed and restored. The existing access trails and concrete abutments encompass approximately 325 sq ft, which will be removed and restored to lawn grass (including the existing concrete abutments). Overall, the proposed project would result in the conversion of approximately 250 sq ft of lawn grass to gravel and concrete and the conversion of approximately 256 sq ft of gravel and concrete to lawn grass. The overall impact would be the reduction of 75 sq ft of the buffer. Overall, this portion of the project would result in no net loss of habitat functions and values within the riparian buffer.

The potential for decreased productivity is not likely to have a measurable effect on listed salmonids, as chinook salmon and steelhead trout smolts have been shown to actively migrate through this stretch of the river (Fish Passage Center 1987; Chelan County PUD 1998a). This indicates that these fish would remain in the main river channel outside of the Project Area. Overall, productivity effects on juvenile salmonids would be limited, given the conservation measures incorporated into the Project design, the active migration of juvenile salmonids through the area, and the increased productivity to be provided by the riparian planting plan.

5.3 Direct and Indirect Effects on Ute Ladies'-Tresses

As noted in Section 4, the Ute ladies'-tresses does not occur within the Action Area, and suitable habitat for this species does not occur on or in proximity to the Project site. There will be no effects related to construction, use, or maintenance of the Project on the baseline condition for this species or its habitat.

5.4 Interdependent and Interrelated Actions

The intent of this project is to provide recreational river access for the adjacent property owners. Since the properties currently has existing boat moorage, the Project would not result in an increase in recreational boating in the vicinity. The site currently experiences heavy use due to the property's amenities, boat launch, and 440 associated parcels. Upon completion, the properties will not experience any increase in use. Therefore, this increase is expected to have a negligible effect on listed salmonids.

5.5 Cumulative Effects

From an ESA perspective, the analysis of cumulative effects considers future non-Federal actions (i.e., non-Federal projects that do not require Federal permits) that may affect habitats and listed species in the Action Area. Thus, this analysis does not address the potential construction of new docks or other projects that would occur below OHWM.

The Project would occur in unincorporated Douglas County and based on the development of Douglas County it is expected that the population within Douglas County will increase. It is expected that the rate will not be higher than the Washington State average, as the County is

comprised of a lot of vacation and recreational properties, not primary residences. Washington State experienced an overall population growth of 13% (WA State Office of Financial Management 2010). Based on this information, it is possible that population growth in the greater vicinity of the project will exceed the state and county average. There are however, limited property along the river that can be developed.

Within the immediate vicinity of the proposed project, the shoreline consists of public and residential lots. There are no other IOS's within 0.5 miles upriver or downriver and only one (1) parcel could have a dock installed.

6 CRITICAL HABITAT EVALUATION

6.1 CHINOOK SALMON AND STEELHEAD TROUT CRITICAL HABITAT

On September 2, 2005, NMFS designated critical habitat for numerous ESUs, including Upper Columbia River spring-run Chinook salmon and Upper Columbia River steelhead trout (NOAA 2005). Because the Project is to occur within an area that is designated as critical habitat for the Upper Columbia River Chinook salmon ESU and Upper Columbia River steelhead ESU, an analysis on the potential effects of the Project on this is presented below.

This analysis evaluates the potential effects of the Project on Chinook salmon and steelhead trout critical habitat by means of the primary constituent elements (PCEs) of critical habitat presented in the Federal Register (NOAA 2005) describing the critical habitat designated by NMFS.

6.1.1 Geographical Extent of Designated Critical Habitat

The Project Area is located in the Upper Columbia River spring-run Chinook salmon ESU, which includes approximately 974 miles of streams and 4 square miles of lakes designated as critical habitat (NOAA 2005). The area designated as critical habitat for this ESU is divided into five subbasins/units. The Project's Action Area is located within the Upper Columbia/Entiat Subbasin, which extends upstream approximately to Chelan Falls.

The Project Area is also located in the Upper Columbia River steelhead trout ESU, which includes approximately 1,262 miles of streams and 7 square miles of lakes designated as critical habitat (NOAA 2005). The area designated as critical habitat for this ESU is divided into nine subbasins/units; the Project's Action Area is located within the Upper Columbia/Entiat Subbasin, which extends upstream to Chelan Falls (property is approximately 25 miles downriver of Chelan Falls).

Critical habitat within fresh water includes the stream channel within the designated stream reaches, which includes a lateral extent as defined by the OHWM (NOAA 2005).

6.1.2 Effects on the Primary Constituent Elements

The aquatic portion of the action area includes designated critical habitat for all Chinook ESUs, and all DPSs of steelhead trout (NOAA 2005b and 2016). At the time of listing, NOAA defined six Primary Constituent Elements (PCEs, i.e., physical and biological features)[4] of critical habitat for listed salmonids in Washington, Oregon, and Idaho, including all listed species addressed herein (2005b and 2016). Although the rules have been updated and no longer define critical habitat according to PCEs, the PCE concept is still a valuable tool for evaluating effects to critical habitat. The analysis below discusses Project impacts for non-spawning freshwater areas (PCEs 2 and 3). Because the PCEs are the same for all salmonid ESUs and DPSs, analysis for all salmonid critical habitat is completed together.

[4] In the final critical habitat designation for Lower Columbia coho, NOAA shifts from the term "primary constituent elements" (PCEs) to "essential features". However, these "essential features" are identical to the proposed Lower Columbia coho PCEs, and are also identical to the designated PCEs for Lower Columbia Chinook and Lower Columbia steelhead.

Table 2. Salmon and steelhead critical habitat PCEs

PCEs	Include in BA analysis?	Components summarized
(1) Freshwater spawning sites with water quantity and quality conditions and substrate supporting spawning, incubation and larval development;	No - spawning does not occur in the action area.	n/a
(2) Freshwater rearing sites with:	Yes - freshwater rearing occurs for some ESUs and DPSs.	(see below)
(i) Water quantity and floodplain connectivity to form and maintain physical habitat conditions and support juvenile growth and mobility;	Yes (discussed below)	water quantity, floodplain connectivity
(ii) Water quality and forage supporting juvenile development; and	Yes (discussed below)	water quality, forage
(iii) Natural cover such as shade, submerged and overhanging large wood, log jams and beaver dams, aquatic vegetation, large rocks and boulders, side channels, and undercut banks.	Yes (discussed below)	natural cover
(3) Freshwater migration corridors free of obstruction and excessive predation with water quantity and quality conditions and natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, side channels, and undercut banks supporting juvenile and adult mobility and survival;	Yes - freshwater rearing occurs for some ESUs and DPSs.	obstruction, predation, water quantity, water quality, natural cover

6.1.2.1 PCE 2: Freshwater Rearing Sites

PCE 2 is defined as "Freshwater rearing sites with water quantity and floodplain connectivity to form and maintain physical habitat conditions and support juvenile growth and mobility; water quality and forage supporting juvenile development; and natural cover such as shade, submerged and overhanging large wood, log jams and beaver dams, aquatic vegetation, large rocks and boulders, side channels, and undercut banks" (NOAA 2005b). Analyses of effects of the Project on PCE 2 within the action area are presented below.

Water Quantity and Floodplain Connectivity

The project would not significantly change water quantity at the site and would not affect floodplain connectivity at the site.

Water Quality

The effects of the Project on water quality are addressed in Section 5.2.2 of this document. As discussed, Project construction will generate temporary and highly localized increases in turbidity. Suspended sediment concentrations will not reach levels that could cause direct harm to salmonids. Overall, in consideration of standard avoidance and minimization measures, effects are anticipated to be limited in scope and duration and are considered insignificant.

Forage

The effects of the Project on salmonid prey are addressed in Section 5 of this document. As discussed, overwater coverage can decrease the abundance of both primary (phytoplankton and macrophytes) and secondary producers (epibenthic organisms). The proposed project would

result in a slight reduction of overwater coverage (~55 sq ft) of aquatic habitat. To limit the effect the structure would have on productivity and juvenile salmonids forage, the proposed dock replacement will be installed within the three basins and would be the same approximate size (no net increase in overwater coverage). Overall, the Project is not expected to have a measurable effect on salmonid foraging in the action area.

Natural Cover

The Project area shoreline is moderately sloped immediately landward of the OHWM and virtually unvegetated due to the lawn grass and existing community use of the shoreline. There are areas of native vegetation within the upriver basin and middle basin that were installed as compensatory mitigation for projects that occurred within the riparian buffer. Approximately half of the lower basin consists of a narrow strip of native riparian vegetation. The shoreline substrates consists of either large rock or gravel and sand at and above the OHWM and sand, gravel, and silt below. These are providing a low level of natural cover due to the lack of structure and the existing use of the basins for moorage by the entire community. There are some areas with milfoil coverage at depths between ~3-10 ft below the OHWM; however, these are limited due to the existing heavy use of the basins. The proposed project would result in the replacement of all of the existing structures within the basins and no work is proposed within the mainstem of the river. As a result, the proposed project would not have the potential to adversely impact any natural cover along the shoreline. Further, the location of the basins and replacement docks would not result in the removal of any shoreline vegetation eliminating the potential to impact natural cover. The proposed project would not result in any change to natural cover. Overall, the proposed project would not result in any adverse impacts (removal) to any suitable natural cover and will move the proposed use further waterward than the existing structures. As a result, the proposed project would have no adverse impacts to natural cover.

6.1.2.2 PCE 3: Freshwater Migration Corridors

PCE 3 is defined as "Freshwater migration corridors free of obstruction with water quantity and quality conditions and natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, side channels, and undercut banks supporting juvenile and adult mobility and survival" (NOAA 2005b). Analyses of effects of the Project on PCE 3 within the action area are presented below.

Overall, the potential effects on the nearshore environment are not expected to have a measurable impact on critical habitat for listed salmonids. Effects of the proposed Project on the migration corridor would be limited, given that the entire project will occur within three basins that were historically dredged out to provide safe moorage for the community. The primary mechanism by which the Project could affect the migratory corridor for salmonid species is through new inwater structure; however, the proposed project would be simply replacing the existing overwater coverage and will not result in the installation of new overwater coverage. In fact the proposed project will result in a slight reduction in overwater coverage (~55 sq ft). The proposed project will result in the removal of 33 pile (17 12-inch and 16 5-inch) and will result in the installation of 37 up to 8-inch pile. Overall, the proposed project will result in the net reduction of overwater/inwater coverage.

The Project will have a localized and temporary effect on the migratory corridor for listed salmonid species by temporarily elevating turbidity during Project construction (pile removal and driving). However, due to construction timing and substrates within the basin, in addition to

the low water circulation, turbidity levels generated during pile driving are not expected to create conditions dangerous to salmonids. Overall, no long-term adverse impacts on freshwater migration corridors utilized by listed salmonid species are expected to occur as a result of the Project.

6.2 COLUMBIA RIVER BULL TROUT CRITICAL HABITAT

USFWS recently expanded bull trout critical habitat to include the mainstem Columbia River (effective November 17, 2010). This listing extends up to Chief Joseph Dam. Additionally, the PCEs from the original listing were rearranged. The Project's effects on bull trout critical habitat are discussed below, in the context of potential effects to the PCEs.

6.2.1 Primary Constituent Element 1

Springs, seeps, groundwater sources, and subsurface water connectivity (hyporheic flows) to contribute to water quality and quantity and provide thermal refugia.

The Project has no mechanism to affect this groundwater. Thus, the Project would not affect this PCE.

6.2.2 Primary Constituent Element 2

Migration habitats with minimal physical, biological, or water quality impediments between spawning, rearing, overwintering, and freshwater and marine foraging habitats, including but not limited to permanent, partial, intermittent, or seasonal barriers.

According to USFWS 2009, the Upper Columbia River Basins Critical Habitat Unit "supports populations in core areas that exhibit unique adfluvial, fluvial, and allucustrine life history movements between lakes, rivers, and the mainstem Columbia River (18)." Thus, the overall Action Area likely serves as a migratory corridor for bull trout between the Columbia River and the upper tributaries or lakes in which spawning occurs. However, due to the shallow nature and heavy use of the basins, bull trout are not expected to utilize these basins. Migrating bull trout are expected to remain in the mid-channel area, well away from the proposed dock replacements. The proposed project would not result in a barrier to migration due to the narrow widths of the dock, use of grated decking, and work within the basins, nor would the dock replacement impact water quality within the project area.

6.2.3 Primary Constituent Element 3

An abundant food base, including terrestrial organisms of riparian origin, aquatic macroinvertebrates, and forage fish.

Sub-adult and adult migratory bull trout are opportunistic feeders and generally consume large quantities of small fish in freshwater environments (USFWS 2005). Overall, the Project would have negligible impact on bull trout food base. The Project is not expected to result in significant changes in the amount of small fish present in the Action Area. The riparian planting areas are expected to increase forage by contributing terrestrial invertebrates into the water. Overall, the Project will have negligible short- and long-term effects on bull trout food base.

6.2.4 Primary Constituent Element 4

Complex river, stream, lake, reservoir, and marine shoreline aquatic environments, and processes that establish and maintain these aquatic environments, with features such as large wood, side channels, pools, undercut banks and unembedded substrates, to provide a variety of depths, gradients, velocities, and structure.

The shoreline aquatic environment at the site and upstream and downstream consists of a moderately-sloped bank (although only 2-5 ft tall) above the OHWM with little native riparian vegetation. The limited native riparian vegetation limits the amount of organic debris and riparian habitat. Landward of the steep slope, the uplands are currently in recreational use for the entire community and consists primarily of lawn grass. The site is located on the southern shoreline of the Columbia River. Because of the fact that the proposed project would be replacing the existing dock within the three basins the existing shoreline processes would not be significantly affected. Overall, the Project would have negligible effect on the shoreline processes or features at the site. No existing shrubs would be affected by the Project. Mitigation plantings would add vegetation and eventually large wood to the site, improving shoreline habitat for bull trout.

6.2.5 Primary Constituent Element 5

Water temperatures ranging from 2 to 15 °C (36 to 59 °F), with adequate thermal refugia available for temperatures that exceed the upper end of this range. Specific temperatures within this range will depend on bull trout life-history stage and form; geography; elevation; diurnal and seasonal variation; shading, such as that provided by riparian habitat; streamflow; and local groundwater influence.

Water temperature in the Rocky Reach Reservoir varies seasonally, from as low as approximately 5 degrees Celsius in the winter to approximately 19 degrees Celsius in the summer (http://www.cbr.washington.edu/dart/adultpass.html). The Project would have no noticeable effect on water temperature at the site.

6.2.6 Primary Constituent Element 6

In spawning and rearing areas, substrate of sufficient amount, size, and composition to ensure success of egg and embryo overwinter survival, fry emergence, and young-of-the-year and juvenile survival. A minimal amount of fine sediment, generally ranging in size from silt to coarse sand, embedded in larger substrates, is characteristic of these conditions. The size and amounts of fine sediment suitable to bull trout will likely vary from system to system.

Substrates within the basins does contain some areas dominated of gravel and cobble. However, due to the nature of the basins no adequate spawning and incubating gravels exist at the site. Further, spawning does not occur at the site (WDFW 2010). Thus, the Project would have no effect on this PCE.

6.2.7 Primary Constituent Element 7

A natural hydrograph, including peak, high, low, and base flows within historic and seasonal ranges or, if flows are controlled, minimal flow departure from a natural hydrograph.

The hydrograph of the Columbia River is controlled primarily by dam operations, which cause daily water level fluctuations. The Columbia River's water level is higher in the spring, but typically varies little by season. The Project would have no effect on the hydrograph of the river.

6.2.8 Primary Constituent Element 8

Sufficient water quality and quantity such that normal reproduction, growth, and survival are not inhibited.

Reproduction and growth are not expected to occur in the Project Area, as this stretch of the Columbia River is primarily used as a migratory corridor for sub-adult and adult bull trout. Further, conditions within the basin are not suitable for these functions due to the heavy use and high water temperatures. Potential water quality impacts were discussed in Section 5 of the BA. It was determined that any potential water quality impacts would be minor, localized, and temporary, and would be controlled by BMPs. Further, any bull trout in the vicinity would likely be migrating sub-adult or adult fish, which are highly mobile and would be expected to avoid the area of water quality impairments. Juvenile bull trout are not expected to be present in the Project Area. Overall, the Project is not anticipated to produce water quality conditions such as could inhibit reproduction, growth, and survival. Water quantity would not be affected by this Project.

6.2.9 Primary Constituent Element 9

Sufficiently low levels of occurrence of nonnnative predatory (e.g., lake trout, walleye, northern pike, smallmouth bass); interbreeding (e.g., brook trout); or competing (e.g., brown trout) species that, if present, are adequately temporally and spatially isolated from bull trout.

Predatory species such as bass, walleye, and northern pikeminnow are present in the Columbia River. Brook trout and brown trout may be present. The Project's effects on predation were discussed in the BA Section 5. It was determined that, based on the minimization measures incorporated into the design of the dock, such as grated decking, white coloration, and the minimization of the number of piles present at the site, predation would be very unlikely to increase as a result of the Project. Further, the proposed dock replacement would occur within the three basins that are not providing suitable habitat for larger predator species.

6.3 INTERDEPENDENT AND INTERRELATED EFFECTS

The intent of the replacement of the exisitng docks are to provide continued safe recreational river access for the community members of the Lake Entiat Lodge Association. Since the proposed project is a dock replacement, the level of boating activity in the vicinity will not be impacted. The site currently experiences heavy use due to the use of the basins by the 440 residential parcels. Upon completion, the site will not experience any increase in use, as the docks will still only be accessible by the 440 upland parcels. Therefore, this increase is expected to have a negligible effect on critical habitat.

7 CONSERVATION MEASURES RELATED TO THE SPECIES

7.1 IMPACT AVOIDANCE AND MINIMIZATION

The Project has incorporated a number of design approaches to avoid and to minimize potential adverse impacts of the Project. The following features have been incorporated into the Project design to minimize the potential for the Project to impact listed species:

- The size and number of piles have been reduced to the minimum necessary to support the gangway and floats.
- The surface of the ramp, and floats will consist of 100 percent functional grating material to reduce shading, allowing at least 60 percent light penetration to the water.
- Construction of the floats would be designed to allow for at between 40-50 percent functional grating (narrower widths will have lower functional grating) .
- The gangway would extend from the concrete abutment at an elevation at least 2 ft above the OHWM.
- Exposed pile tops would be fitted with anti-perching caps to discourage avian predation on juvenile salmonids.
- The grated surfaces of the dock would not be used for storage or any other activities that would inhibit light penetration.
- Floats would be white or black in color.
- Floats will be placed within existing basins constructed for safe moorage. The water depths range from 8-10 ft of water in the basins and the floats will not be allowed to ground out during regular reservoir fluctuations.

7.2 REGULATORY CONSIDERATIONS

Federal, State, and Local permits contain conditions that are intended to reduce the potential for short-term effects from in-water construction activities and long-term effects from habitat change. The provisions comprise a list of conservation measures that are applied to projects in fresh water. Conditions that are part of project permits will be conservation measures for the Project. Permit conditions are expected to include the following:

- Timing restrictions on in-water work to protect fish in vulnerable life history stages. The in-water construction would occur during the approved in-water work window (July 16 through February 28; October 1 through February 28 for pile driving) for the protection of migrating juvenile salmonids.
- Corrective measures that must be implemented if water quality problems, fish distress, or fish kill occurs.
- A construction report for the proposed dock replacements will be sent to the Corps detailing the location, and components and materials.

7.3 BEST MANAGEMENT PRACTICES

BMPs are employed to reduce the potential for construction-related impacts on species and habitats. The following BMPs will be followed for this Project:

- For any impact pile driving, sound attenuation measures (bubble curtain or a wood block) would be used to minimize generation of underwater noise.
- Extreme care will be taken to prevent any petroleum products, chemicals, or other toxic or deleterious materials from entering the water. If a spill were to occur, work would be stopped immediately, steps would be taken to contain the material, and appropriate agency notifications would be made.
- No fueling of any boat or other watercraft will occur at the dock.
- All equipment operating waterward of the OHW line will be inspected daily for fluid leaks. Leaking equipment will be repaired prior to resuming operation.
- The Contractor will develop and implement a site-specific spill prevention, containment, and control (SPCC) plan, and is responsible for containment and removal of any toxicants released.
- All exposed or disturbed areas, including upland staging areas, will be stabilized to prevent erosion.
- All erosion control devices will be inspected during construction to ensure that they are working adequately.
- Grated surfaces will not be used for storage or other purposes that would reduce natural light penetration through the structure.
- Grated surfaces will not be used for storage or other purposes that will inhibit light penetration through the grating.

8 CONCLUSIONS AND DETERMINATIONS

8.1 SUMMARY OF EFFECTS

The potential impacts to ESA-listed salmonid species were discussed in Section 5 of this document. Juvenile chinook salmon, steelhead trout and bull trout are expected to be absent or present in relatively low numbers during Project construction. Overall, the proposed Project is considered to entail a negligible risk of take of listed salmonids.

Implementation of the Project is not expected to result in water quality conditions that are dangerous to salmonids, and no adverse water quality effects on salmonids are likely to occur. With the implementation of appropriate conservation measures (i.e., timing work during in-water work window, adherence to water depth requirements, minimizing the number and diameter of piles, a sound-attenuation pad when impact driving steel piles), pile driving is also considered to have a negligible risk of mortality or injury to listed salmonids.

Although it is recognized that overwater coverage and other in-water structures can provide cover for ambush style predators, a number of design modifications have been incorporated into the Project to minimize the potential for the Project to result in increased predation on listed salmonids. These conservation measures will also minimize shading of the benthic substrates. Conservation measures include use of grated decking, the minimal number and diameter of piles, the location of the docks, and adherence to in-water work windows, the project's effects on ESA-listed species and habitat would be minimal. Further, listed salmonids residence time within the Action Area is likely limited, as studies have indicated that smolts migrate actively through this stretch of river (i.e., rearing most likely occurs in the cooler upper tributaries).

Suitable habitat for Ute ladies'-tresses does not occur in the Action Area and construction; use and maintenance of the Project would not affect this species or its habitat.

8.2 DETERMINATION OF EFFECTS - SPECIES

As discussed above, the Corps has indicated NMFS' determination that all new residential overwater structures on the Columbia River between Chief Joseph Dam and Rock Island Dam will result in a "may affect, likely to adversely affect" call. Based on the analysis in this BA, the Project ***may affect, and is likely to adversely affect*** chinook salmon and steelhead trout. USFWS has not made this determination for bull trout. Thus, based on the analysis in this BA, the Project ***may affect, but is not likely to adversely affect*** bull trout. The Project would have ***no effect*** on Ute ladies' tresses.

8.3 DETERMINATION OF EFFECTS – CRITICAL HABITAT

Designated critical habitat for steelhead trout is present within the Action Area. As discussed previously, spawning is unlikely to occur in the project Reach, though very limited rearing may occur in the Action Area. Effects of the Project were considered for three of the designated critical habitat's PCEs in Section 6.1. As discussed above, the Corps has indicated NMFS' determination that all residential overwater structures on the Columbia River between Chief Joseph Dam and Rock Island Dam will result in a "may affect, likely to adversely affect" call. Based on the analysis in Section 6, and taking into consideration the avoidance/minimization measures discussed in Section 7, the Project ***may affect, and is likely to adversely affect*** steelhead critical habitat.

Additionally, critical habitat is present for bull trout. As discussed previously, the Action Area is in the upstream extent of bull trout critical habitat, and bull trout use of the site would likely be very minimal. Effects of the Project were considered for designated critical habitat's PCEs in Section 6.2. Based on the analysis in Section 6, and taking into consideration the avoidance/minimization measures discussed in Section 7, the Project ***may affect, but is not likely to adversely affect*** bull trout critical habitat.

9 ESSENTIAL FISH HABITAT ASSESSMENT

9.1 ESSENTIAL FISH HABITAT DESIGNATIONS

Pursuant to the MSFCMA and the 1996 SFA, an EFH evaluation of impacts is necessary for the Project. EFH is defined by the MSFCMA in 50 CFR 600.905-930 as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." Further definitions include:

- **Waters:** Aquatic areas and associated physical, chemical, and biological properties that are used by fish.
- **Substrate:** Sediment, hard bottom, structures underlying the waters, and associated biological communities.
- **Necessary:** The habitat required to support a sustainable fishery and managed species' contribution to a healthy ecosystem.

The Upper Columbia River and its tributaries are designated as EFH for two salmonid species, as indicated in Table 3. Salmonid EFH is discussed in Appendix A of Amendment 14 to the Pacific Coast Salmon Plan (PFMC 1999). There is no designated EFH for groundfish or pelagic species in the vicinity of this Project.

Table 3. Pacific Salmonid Species with Designated EFH in the Columbia River.

Pacific Salmon Species	Scientific Name	EFH
Coho salmon	*Oncorhynchus kisutch*	Adults – freshwater systems, pelagic and nearshore waters on migration back to freshwater, not necessarily associated with any habitat type in marine waters Juveniles – marine, estuarine, nearshore to pelagic, associated with all bottom types; 0 – 240 feet Larval Stage – gravel and shallow water in streambeds Spawning – freshwater Egg Stage – gravel and shallow water in streambeds
Chinook salmon	*Oncorhynchus tshawytscha*	Adults – freshwater systems, pelagic and nearshore waters on migration back to freshwater, not necessarily associated with any habitat type in marine waters Juveniles – estuary and oceanic, associated with all bottom types; 0 – 240 feet Larval Stage – gravel and shallow water in streambeds Spawning – freshwater rivers, timing depends on run Egg Stage – gravel and shallow water in streambeds

9.2 ANALYSIS OF EFFECTS ON EFH

The assessment of potential impacts from the proposed Project to the species' EFH is based on information in the above-referenced document (PFMC 1999).

The specific elements of the Project that could potentially impact salmonid species EFH, impact mechanisms, and conservation measures that avoid and minimize impacts are identified in Table 4. Note that because the Project is located in fresh water, the potential effects of the Project are limited to the EFH for anadromous salmonid species.

Table 4. Affected EFH by Project Element and Proposed Conservation Measures.

Project Element	Affected EFH	Impact Mechanism	Conservation Measures
Pile Driving and Removal	Salmonid EFH (Substrate)	The Project involves the removal of 33 pile (17 12-inch and 16 5-inch) and the installation of 37 up to 8-inch piles. Due to the number of piles and their small diameter, the impact on salmonid soft bottom substrate is considered minimal.	**1 and 2**
	Salmonid EFH (Waters)	Pile driving may result in a temporary increase in turbidity, but there would be no long-term effect on turbidity in the vicinity of the Project. Based on experience with similar projects, activities associated with pile driving are expected to generate very minor turbidity only in localized areas	**1, 2, 3 and 4**
	Salmonid EFH (Waters)	There is the potential for an unintentional release of fuel, lubricants, or hydraulic fluid from the construction equipment that could lead to adverse impacts to water column EFH.	**1, 4, 5, 6 and 7**
Dock Installation	Salmonid EFH (Substrate/ Waters)	Shading caused by overwater structures can lead to decreased primary productivity through light attenuation and provide refuge for predatory fish. Design considerations have been incorporated into the Project to minimize the impact of the dock on salmonid EFH. Based on these considerations, the dock is likely to have a negligible effect on productivity and predator abundance in the area.	**1, 2, 8, 9, 10, 11, 12, and 13**
	Salmonid EFH (Waters)	There is the potential for an unintentional release of fuel, lubricants, or hydraulic fluid from the construction equipment that could lead to adverse impacts to water column EFH.	**1, 4, 5, 6 and 7**

Conservation Measures

1. Timing restrictions on in-water work to protect fish in vulnerable life history stages. All in-water construction will be accomplished during the approved in-water work window for this reach of the Columbia River (July 16 through February 28; October 1 through February 28 for pile driving). No in-water work will be performed from March 1 through June 30 of any year.
2. The size and number of piles have been reduced to the minimum necessary to support the floats.
3. Water quality standards and procedures that limit the extent and impact of turbidity.
4. Corrective measures that will be implemented if water quality problems, fish distress, or fish kill occurs.
5. Extreme care would be taken to prevent any petroleum products, chemicals, or other toxic or deleterious materials from entering the water. If a spill were to occur, work would be stopped immediately, steps would be taken to contain the material, and appropriate agency notifications would be made.
6. All equipment operating waterward of the OHWM will be inspected daily for fluid leaks. Leaking equipment will be repaired prior to resuming operation.
7. The Contractor will develop and implement a site-specific spill prevention, containment, and control (SPCC) plan, and is responsible for containment and removal of any toxicants released.
8. Piles will be up to 8 inch diameter steel pipe (8.625 inch outer diameter; may use stainless steel, epoxy coated white piles or encased piles in white PVC).
9. The surface of the ramp and floats will consist of functional grating material to reduce shading, allowing at least 60 percent light penetration to the water.
10. The ramp would extend to the floats from a fixed pier elevation at least 2 feet above the OHWM.
11. Floats will be placed within the three basins where the existing dock are located with water depths around 8 ft.
12. Grated surfaces will not be used for storage or other purposes that would reduce natural light penetration through the structure.
13. Construction equipment will not be allowed to ground out.

9.3 EFH ASSESSMENT

Pursuant to the MSFCMA and the SFA, an EFH Assessment has been completed for this Project. The impacts of the Project on salmonid EFH are shown in Table 4. The primary potential effects of the Project on salmonid EFH are associated with pile removal, impact pile driving, potential water quality impairments during dock installation, and dock shading. With the proposed avoidance and minimization measures, these impacts are expected to be minimal. The dock has been designed in a manner that would maximize light transference. These conservation measures are expected to greatly minimize the potential for the Project to affect any shoreline-oriented juvenile salmonids that may enter the Action Area.

As discussed above, NMFS has indicated that all new overwater / inwater structures on the Columbia River between Chief Joseph Dam and Rock Island Dam will result in a call of "may adversely affect". For that reason, the determination of effects on EFH for this Project is ***may adversely affect***.

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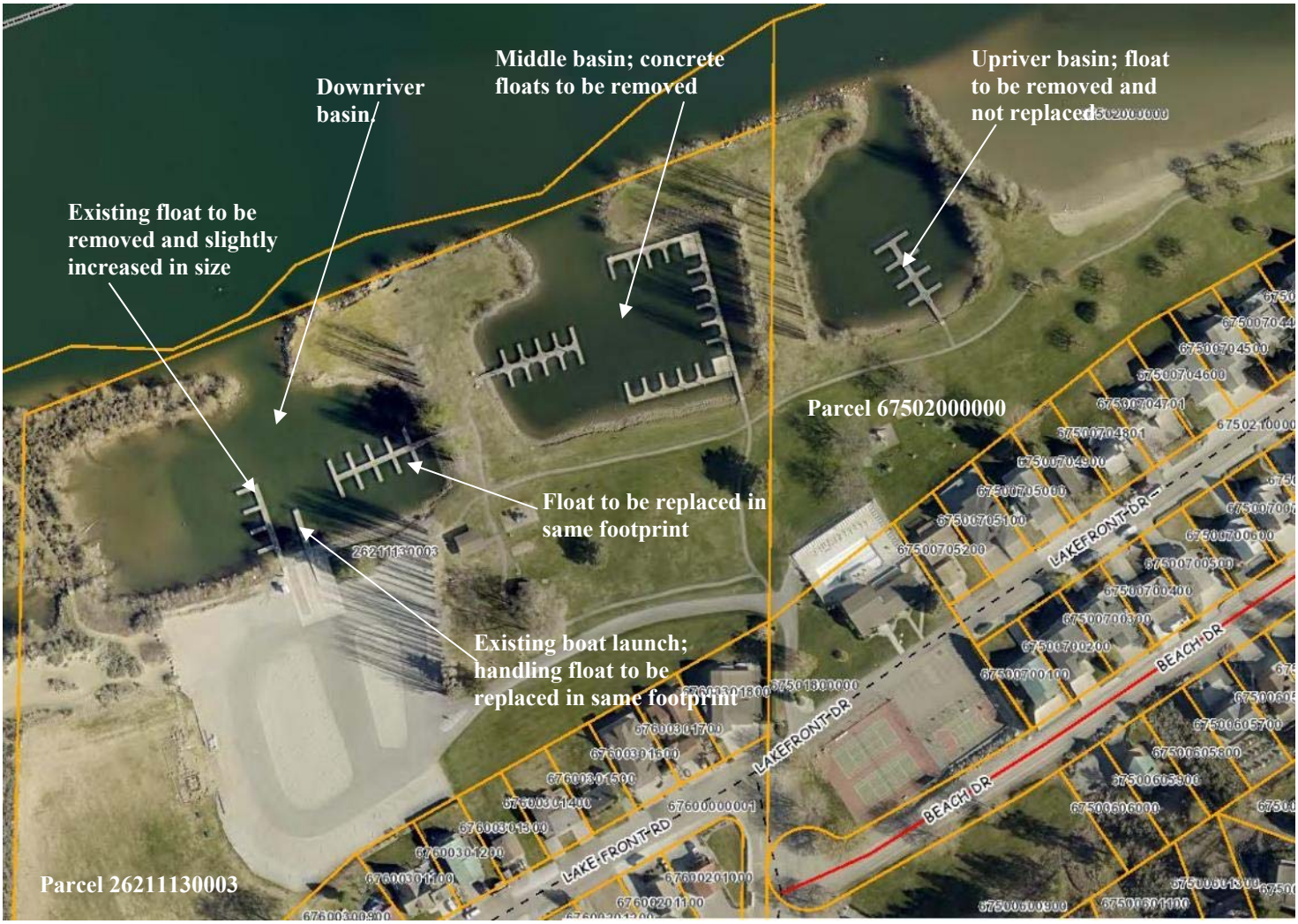
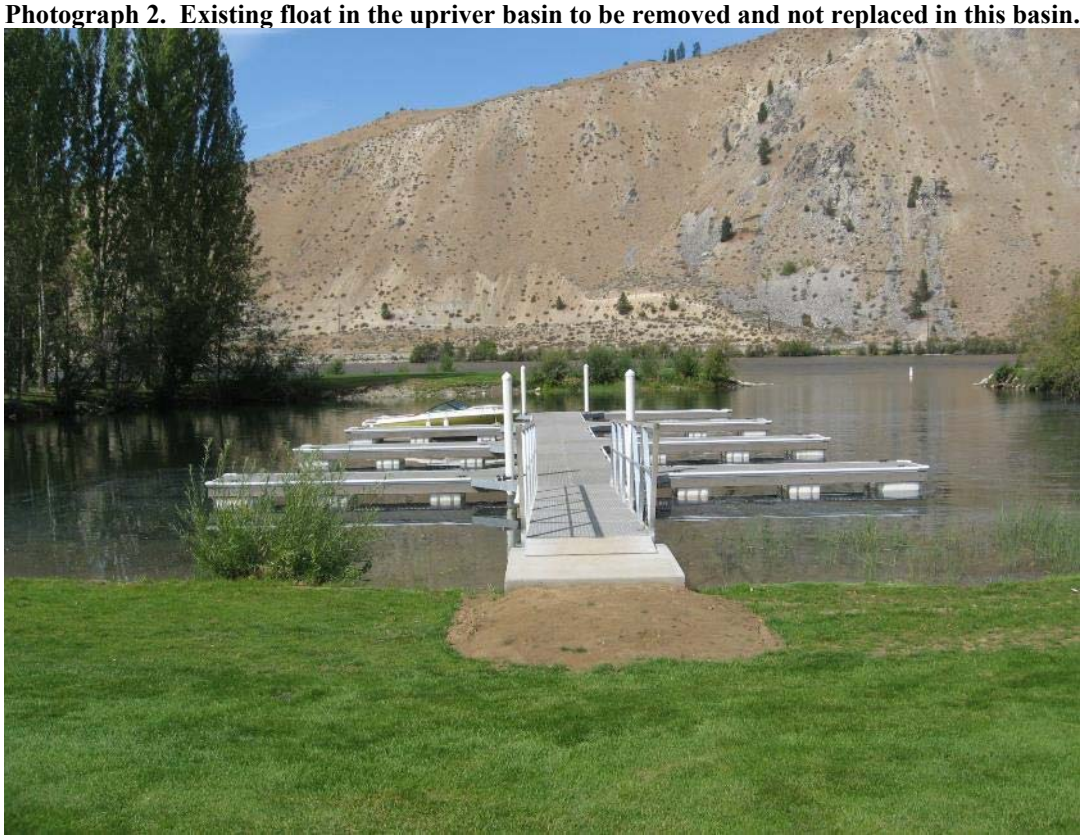
LAKE ENTIAT LODGE ASSOCIATION DOCK REPLACEMENT - COLUMBIA RIVER

PHOTOGRAPHS

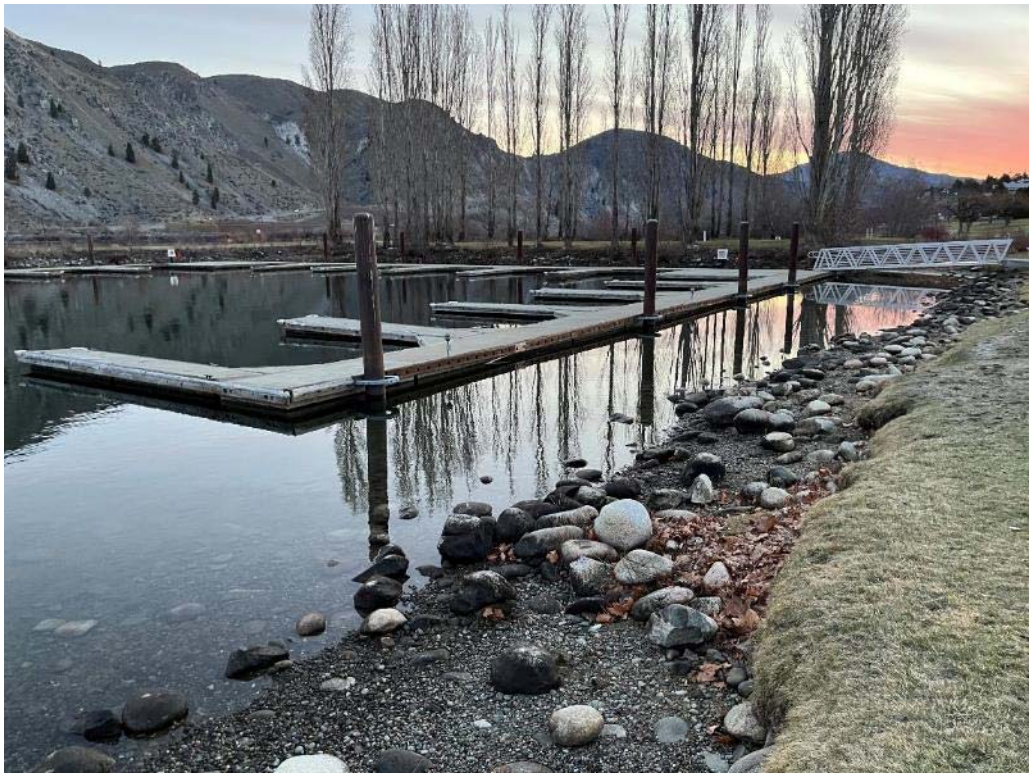


Photograph 2. Aerial of the existing Lake Entiat Lodge Association basins where the floats will be removed and replaced.

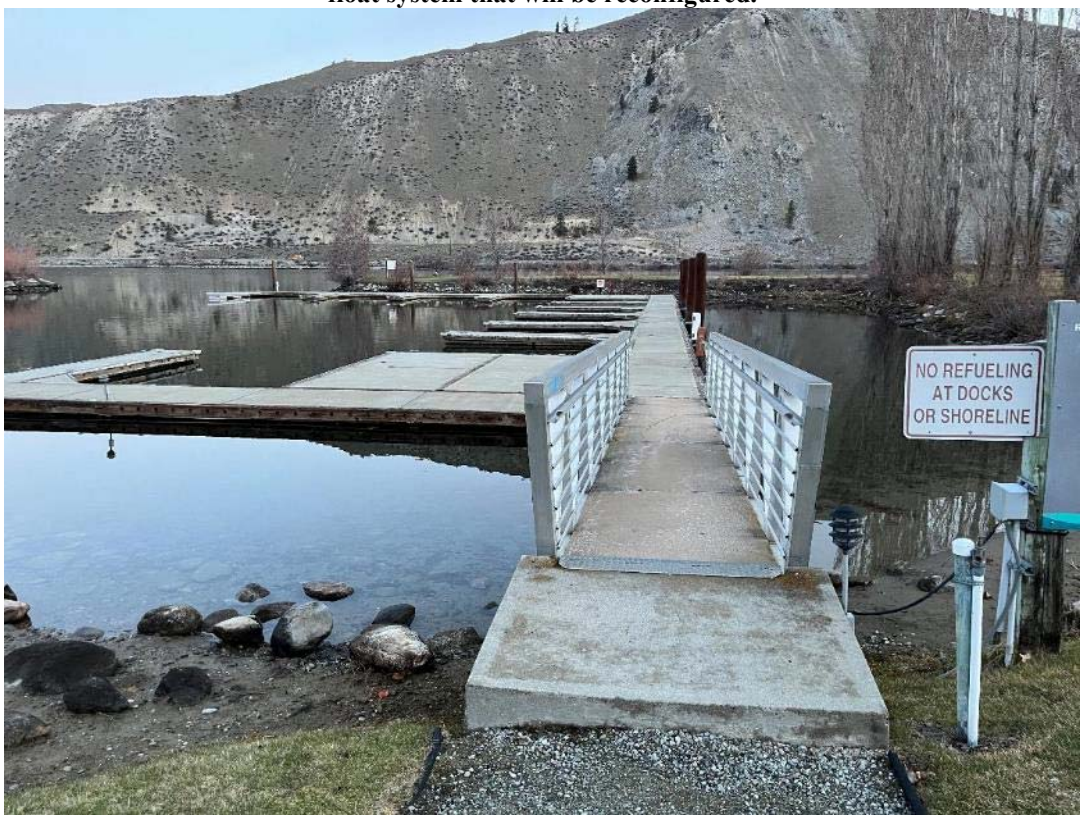
Photograph 2. Existing float in the upriver basin to be removed and not replaced in this basin.



Photograph 3. Existing float in the upriver basin to be removed and not replaced in this basin.



Photograph 4. Existing concrete float (larger float) in the middle basin to be removed and replaced with a fully grated float system that will be reconfigured.

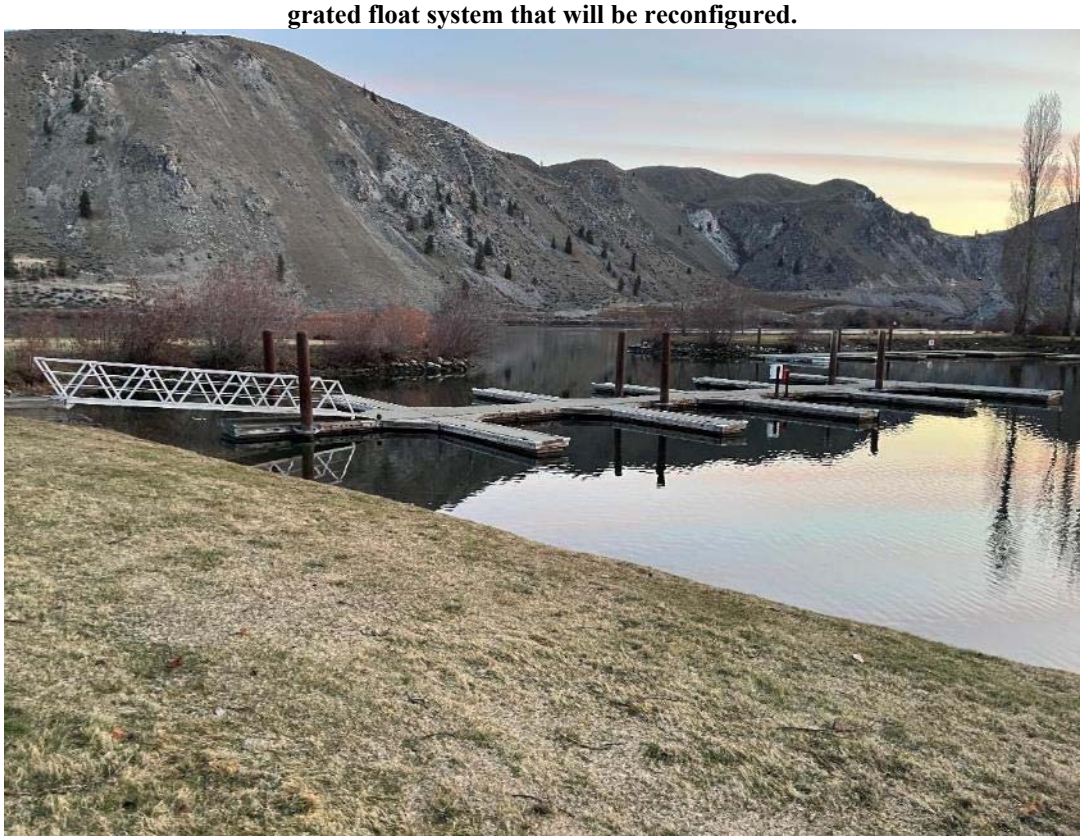


Photograph 5. Existing concrete float (larger float) in the middle basin to be removed and replaced with a fully grated float system that will be reconfigured.

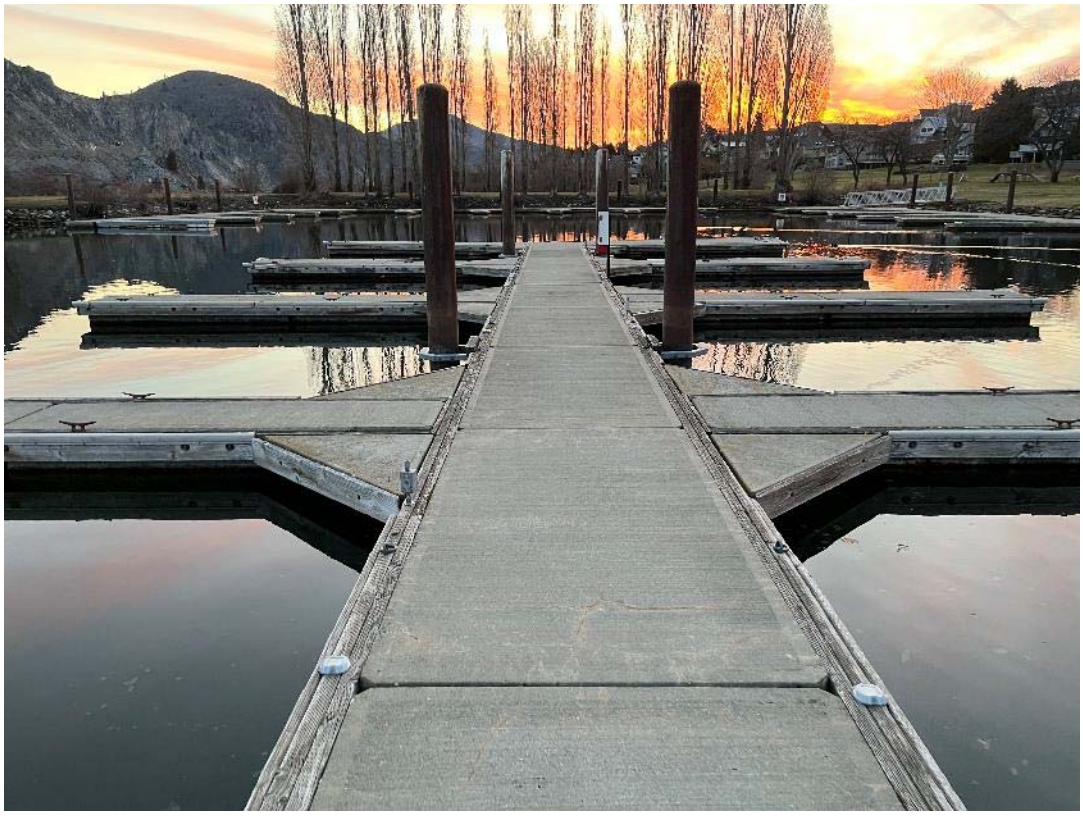
Photograph 6. Existing concrete float (larger float) in the middle basin to be removed and replaced with a fully grated float system that will be reconfigured.

Photograph 7. Existing concrete float (larger float) in the middle basin to be removed and replaced with a fully grated float system that will be reconfigured.

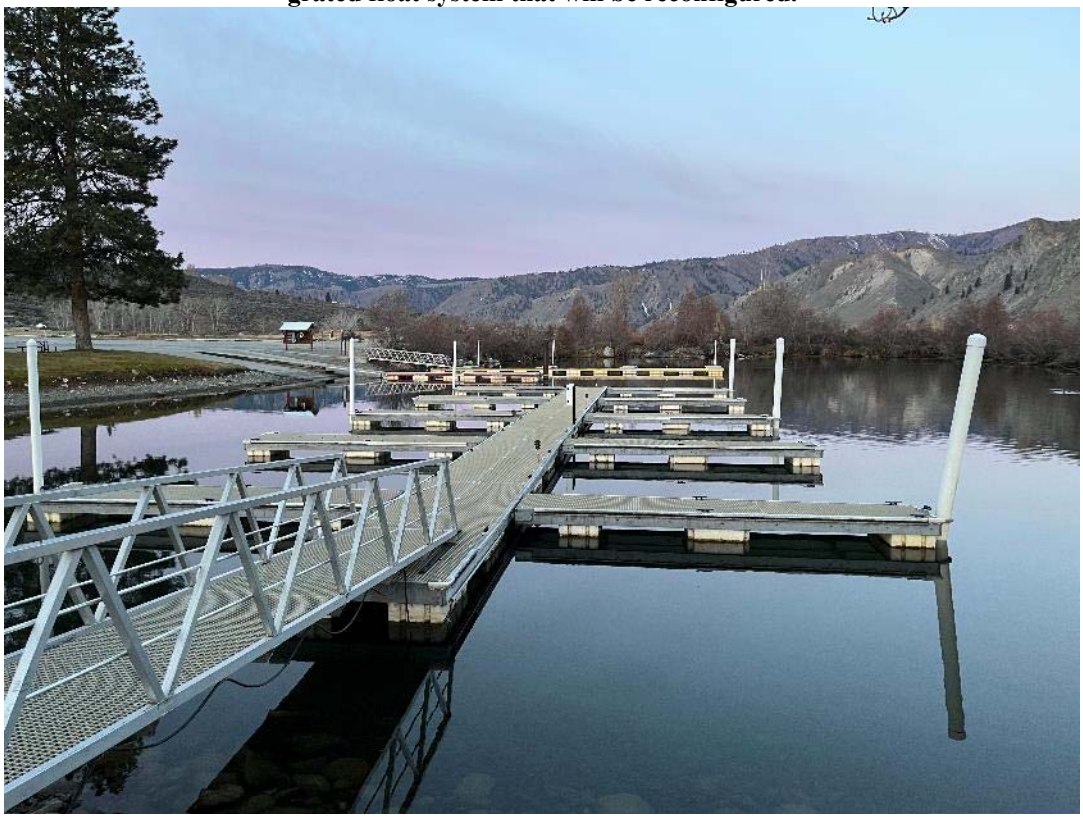
Photograph 8. Existing concrete float (smaller float) in the middle basin to be removed and replaced with a fully grated float system that will be reconfigured.



Photograph 9. Existing concrete float (smaller float) in the middle basin to be removed and replaced with a fully grated float system that will be reconfigured.

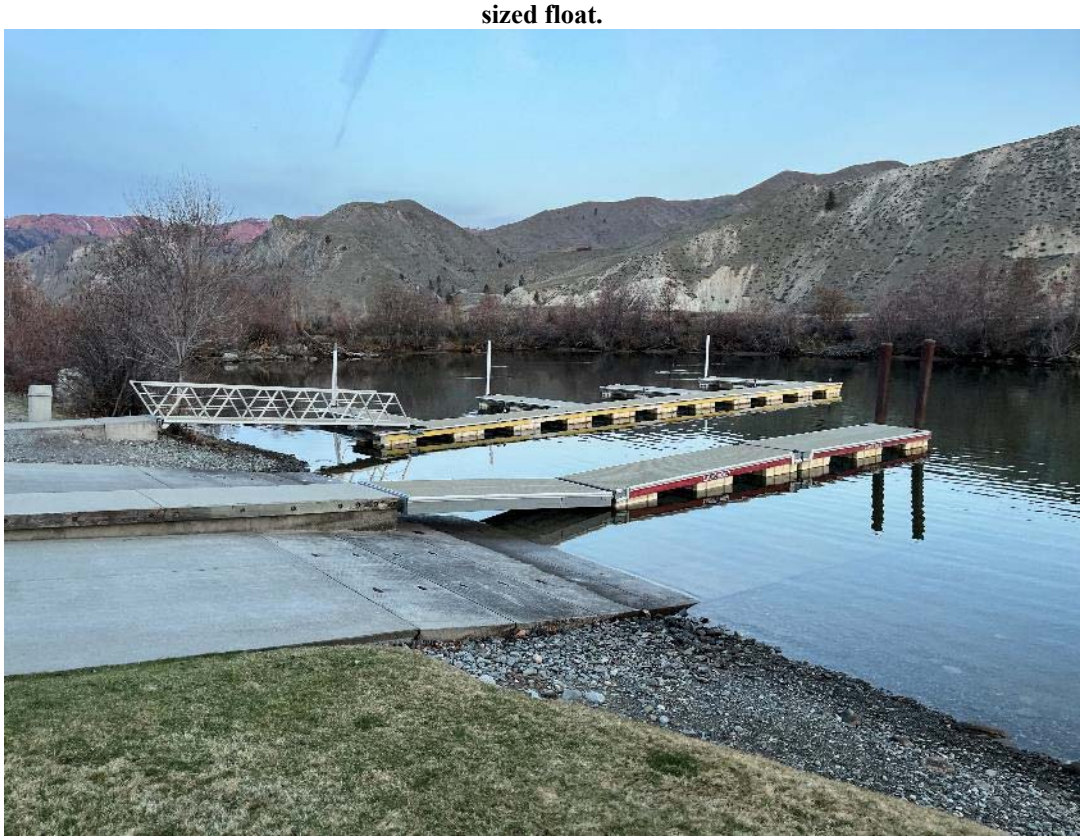


Photograph 10. Existing concrete float (smaller float) in the middle basin to be removed and replaced with a fully grated float system that will be reconfigured.

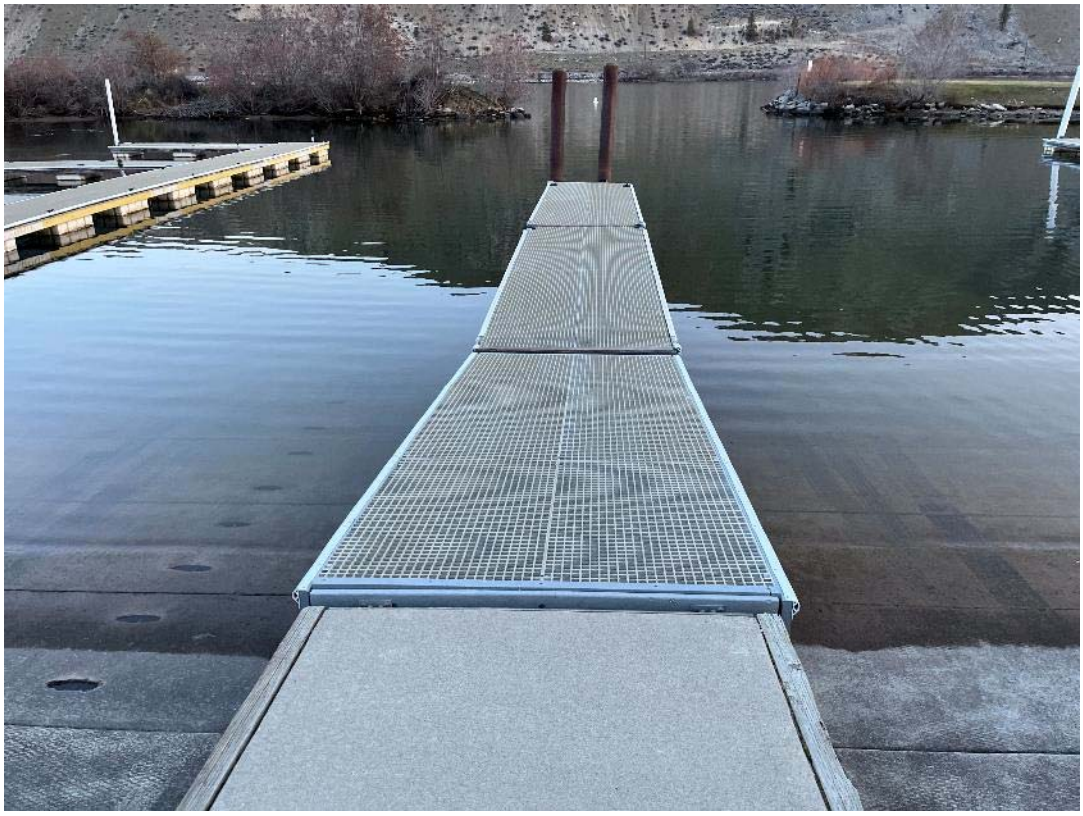


Photograph 11. Existing wooden float in the downriver basin (upriver float) to be removed and replaced with same sized float.

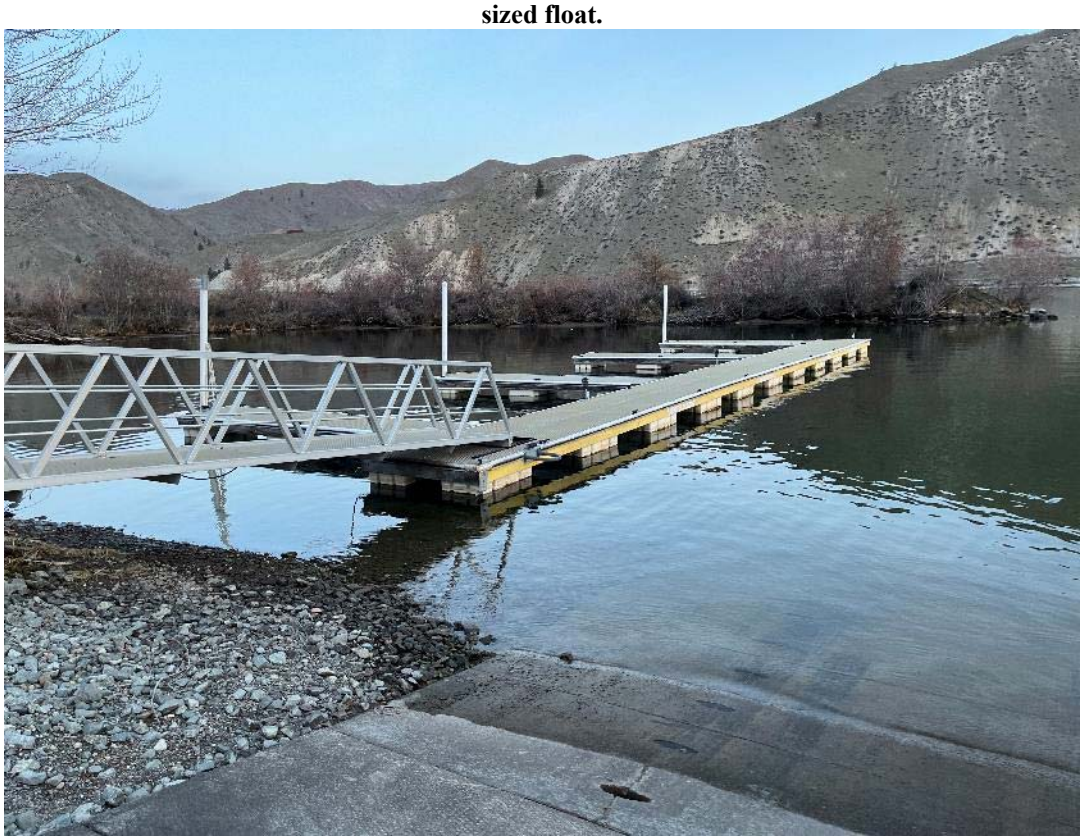
Photograph 12. Existing wooden float in the downriver basin (upriver float) to be removed and replaced with same sized float.



Photograph 13. Existing wooden launch handling float in the downriver basin to be removed and replaced with same sized float.



Photograph 14. Existing wooden launch handling float in the downriver basin to be removed and replaced with same sized float.



Photograph 15. Existing wooden float in the downriver basin (downriver float) to be removed and replaced a floats slightly larger floats (additional slip at waterward end).

Photograph 16. Existing wooden float in the downriver basin (downriver float) to be removed and replaced a floats slightly larger floats (additional slip at waterward end).

Photograph 17. Existing wooden float in the downriver basin (downriver float) to be removed and replaced a floats slightly larger floats (additional slip at waterward end).