

Hanson Ponds

Concept Alternatives & Feasibility

SUBMITTED TO

Kittitas Conservation Trust
102 W. Pennsylvania Ave #202
Roslyn, WA 98941



PREPARED BY

Inter-Fluve, Inc.
501 Portway Ave., Suite 101
Hood River, OR 97031

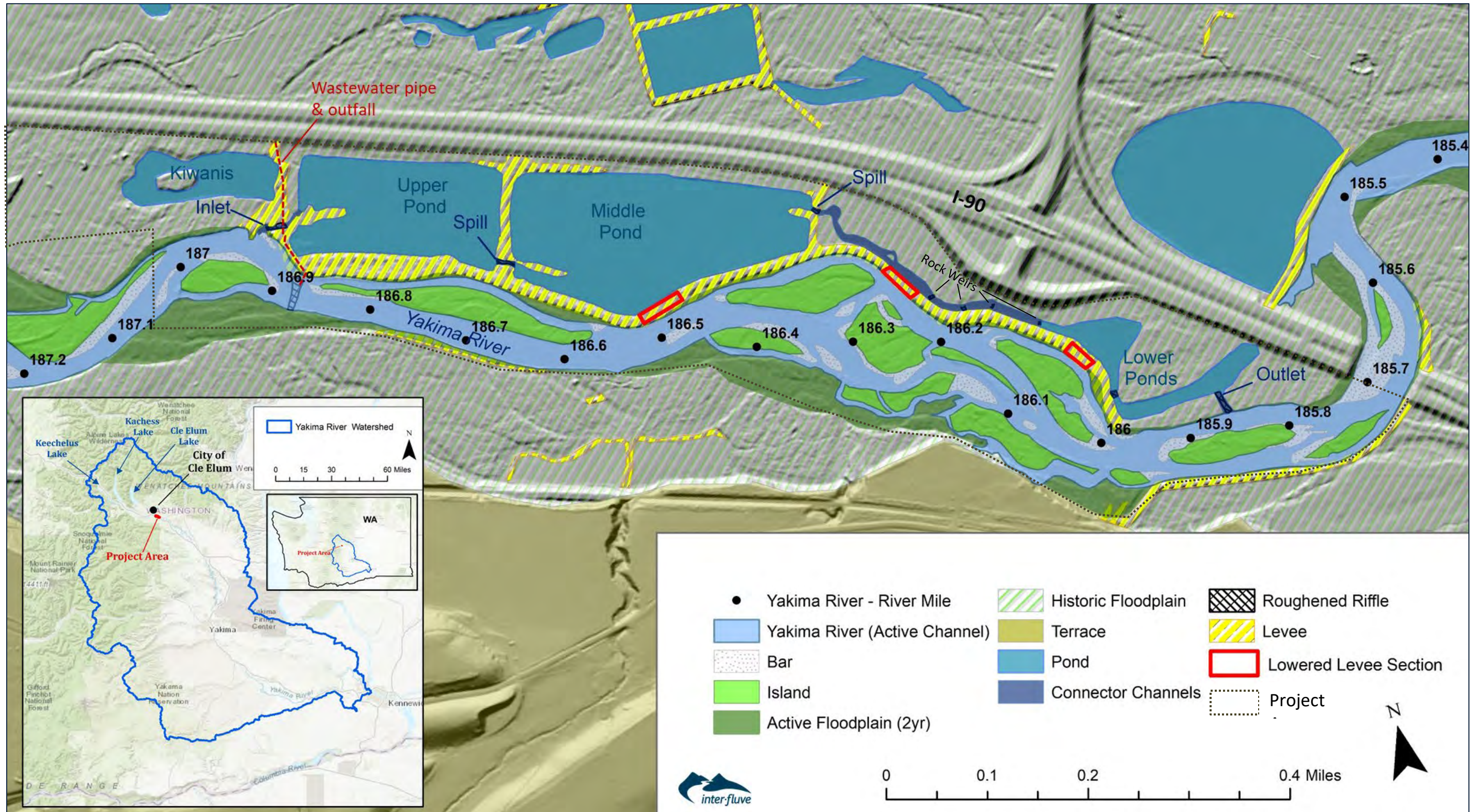


December 16, 2021

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1 Hanson Ponds Project Area Map



2 Project Goals

The Concept Alternatives proposed for the Hanson Ponds project area include a mix of treatment types designed to address previously identified goals for the Yakima River and its floodplain. The identified project goals include:

- Maintain and protect critical infrastructure, including:
 - Eroding bank at the upstream end
 - City of Cle Elum’s wastewater outfall
 - No increased risk to I-90
- Improve anadromous salmonid habitat.
- Restore floodplain connection.
- Provide recreational opportunities within the project site, if/where appropriate.

Site information is available in the Hanson Ponds Assessment (Inter-Fluve 2021).

3 Concept-Level Design Criteria

The Concept-Level Design Criteria listed below were developed in collaboration with Kittitas Conservation Trust (KCT), City of Cle Elum (City), and members of the local technical stakeholder team. Concept-Level Design Criteria serve three primary purposes:

1. to document and communicate specific concept-level objectives and constraints,
2. to help inform and guide the Alternatives development process so that objectives are met, and
3. to provide an evaluation tool to support the alternatives selection process.

Infrastructure

- Protect City of Cle Elum wastewater outfall and maintain conditions to meet existing permitted discharge requirements.
- Do not increase flood risk to I-90, unless allowable and permissible. Comply with applicable regulations.
- Do not increase flood risk to adjacent private land owners without consent. Comply with applicable regulations.

Habitat

- Improve quality and/or quantity of rearing habitat and maintain or improve migration for steelhead, chinook, coho, sockeye, and bull trout.
- Improve side channel and off-channel habitat quality and quantity, where possible for native fish.

Improve Yakama River System Function

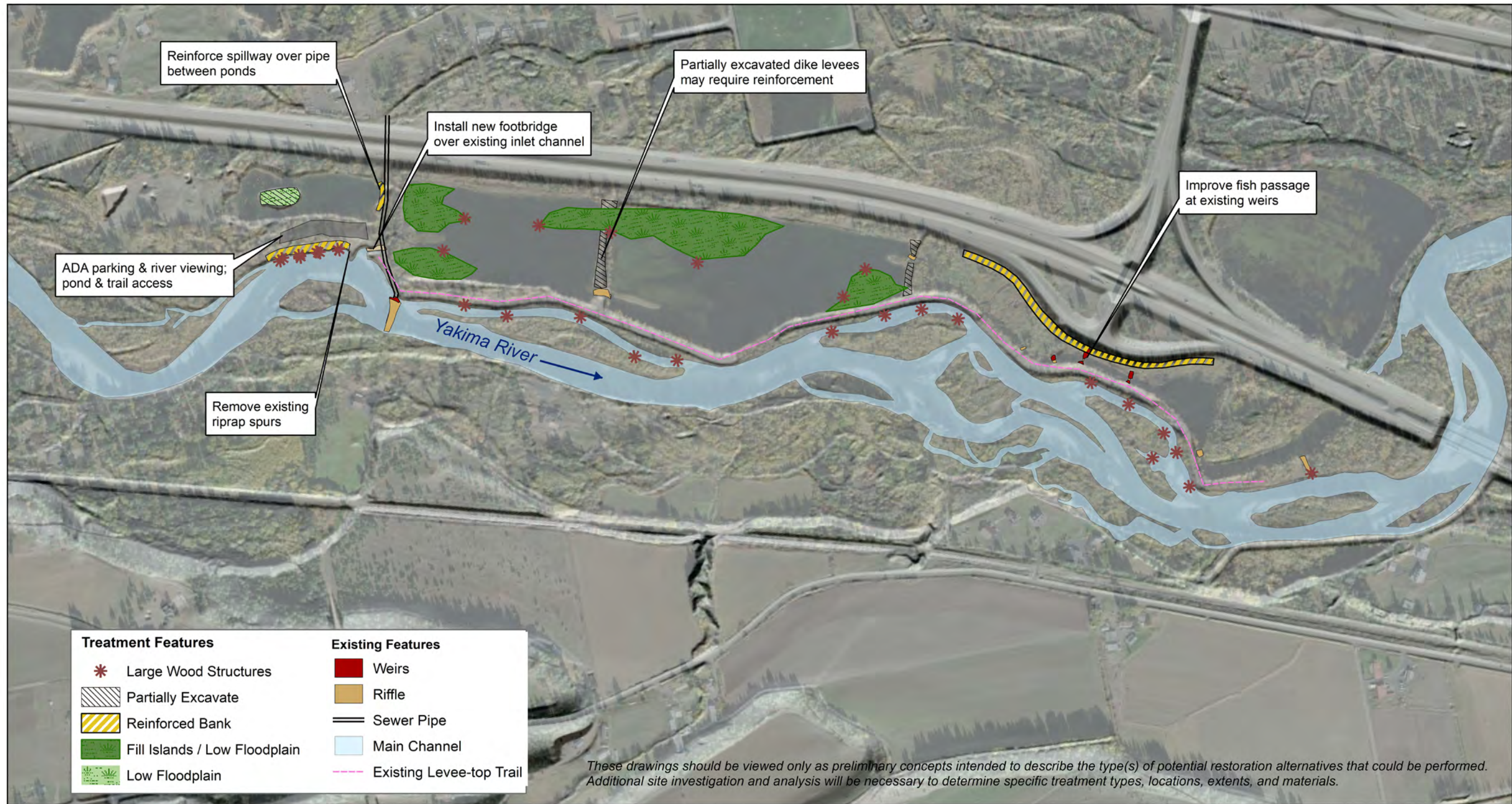
- Improve the quantity and quality of floodplain habitats (aquatic, avian, terrestrial).
 - Uplift or increase acreage and/or condition of wetland and riparian habitat
 - Increase available off-channel habitat and refugia for rearing and migration
- Increase geomorphic and ecologic complexity, where possible.
- Retain or uplift existing wetlands.
 - Maintain or increase acreage of functioning wetland
 - If ponds are retained, improve wetland quality and shore-line acreage within the ponds.

Recreation

- Maintain or improve public day-use access to trails for river access, fishing, hiking, birding, nature walk.
- Maintain or improve public day-use parking and ADA access to Kiwanis Pond and river viewing
- Consider proximity and utilization of existing restroom facilities
- Include boater/floater safety in mainstem channel treatment options.

4 Concept Alternatives

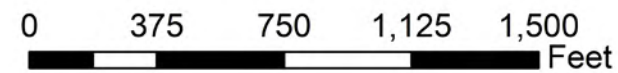
	Treatment Summary Description	Considerations
<p>Alternative 1</p> <p>Improve Existing Conditions</p> <p>Cost Estimate</p> <p>\$2M-3M</p>	<p>Concept Alternative 1 leaves the existing levees and ponds in place and focuses treatments on reinforcing areas of erosion risk while proposing to improve the existing poor-habitat conditions in the ponds and low-habitat complexity along the mainstem channel. Reinforced bank(s) and reinforced flood routing zones at erosion-prone areas are reinforced to address the existing risk(s) to the City’s wastewater outfall and I-90. Installation of Large Wood Structures to the existing side channels and the Lower Pond outlet channel mouth is included to improve the quantity and quality of off-channel and refugia habitat available to native fish without adding recreational safety impediments to the mainstem channel. Large Wood installation is an option at the reinforced eroding bank to provide habitat along the stabilized bank. Safety signage for boaters may be recommended in association with the reinforced bank, with or without habitat large wood inclusion. The existing riprap spur that is one of the factors currently promoting bank erosion at the upstream end of the project area may need to be removed or redesigned to support bank protection design and pond inlet channel persistence. Reinforcement of the current flood-routing spillway over the City’s wastewater outfall pipe at the levee between Kiwanis Pond and the Upper Pond is recommended. Partial excavation of the Kiwanis Pond Island and potentially two of the levee dikes is included in Alternative 1 to create low-floodplain areas within the ponds that support riparian vegetation and increase shore-line habitat complexity. Size and distribution of the fill islands/low floodplains will be determined by the quantity of site-generated and otherwise available adequate materials. Large Wood Structure installation to increase habitat complexity (type and condition of aquatic and avian) in the ponds is an option – depending on pond water temperature considerations. Improving fish passage at the existing weirs could improve access to off-channel refugia. However, warm water temperature issues in the ponds are not expected to be fully resolved by this alternative. Installation of a new footbridge over the Pond Inlet channel is included to restore access to existing levee-top trail route.</p> <p>Features Summary:</p> <ul style="list-style-type: none"> • Reinforce the eroding bank – option to add large wood as habitat feature to reinforced bank. • Remove or redesign the existing riprap spur & utilize existing spur material. • Improve ADA parking and river viewing at reinforced eroding bank wall. • Install new footbridge across inlet channel for levee trail access (5,320 feet (1 mile) of existing trail) • Install Large wood structures in existing side channels of the mainstem. • Install Large wood at downstream end of outlet channel in backwater zone (off-channel habitat). • Partially excavate Kiwanis Pond Island and dike levees of Middle Pond to increase riparian areas. • Create low floodplain fill islands (riparian vegetation) in the existing ponds with the option to install Large Wood habitat structures • Reinforce I-90 bank, where needed. • Reinforce dike levee or create armored riffle over wastewater pipe between Kiwanis and Upper Pond. • Improve fish passage conditions at existing weirs in connector channel. • Native riparian vegetation re-establishment on disturbed areas and new low floodplains. 	<p>Wastewater permit requires a specific quantity of river water and flow hydraulics for mixing and dilution at the outfall.</p> <p>Public and adjacent landowner aesthetic and usage needs.</p> <p>Maintain public access and recreation.</p> <p>Not all site-generated or site-available materials may not be sufficient for required design fill material quantity and quality. Thus, import of fill material may be required.</p> <p>Identify source location(s) for appropriate floodplain and fill island material – communicate with and evaluate City, WA DOT, and other partner entities projected potential to generate appropriate material from other projects.</p> <p>Evaluate potential for partnering with WA DOT on I-90 modifications.</p> <p>Design and installation sequencing option to address eroding and wastewater outfall pipe risks in Phase I.</p> <p>Maintains reinforced grade control across the available floodplain at the wastewater outfall.</p>



501 Portway Ave, Suite 101
 Hood River, Oregon 97031
 www.interfluve.com
 541.386.9003

Concept Alternative #1

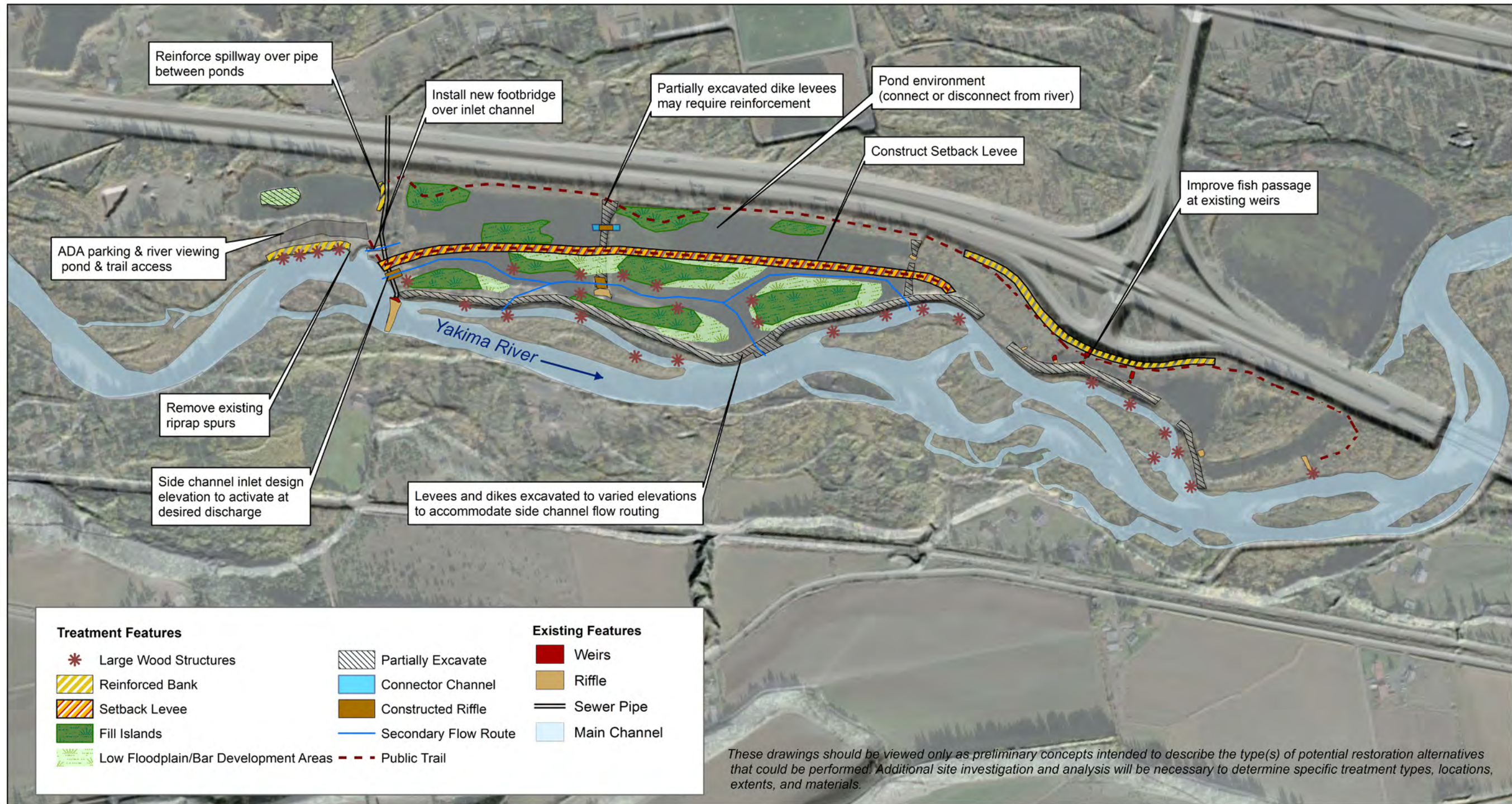
Coordinate System: NAD 1983
 State Plane Washington South FIPS 4602
 Vertical Datum: NAVD88



Hanson Ponds Park
Cle Elum, WA

Concept Alternatives

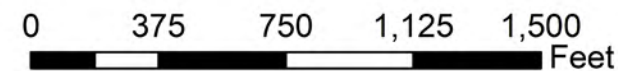
	Treatment Summary Description	Considerations
<p data-bbox="320 762 571 808">Alternative 2</p> <p data-bbox="335 842 556 943">Partially Reopen Floodplain +Setback Levee+</p> <p data-bbox="354 1104 537 1130">Cost Estimate</p> <p data-bbox="379 1165 512 1199">\$3M-4M</p>	<p data-bbox="655 298 2303 852">Concept Alternative 2 reinforces the existing eroding bank and reopens over half of the currently excluded floodplain area for river function and habitat while providing a setback levee designed to protect I-90 infrastructure and maintain pond features. Removal of the existing levee provides opportunity to create side channels, off-channel habitat, and vegetated floodplain islands. Reinforce the eroding bank at the upstream end. Large Wood installation is an option at the reinforced eroding bank to provide habitat. Safety signage for boaters may be recommended in association with the reinforced bank, with or without habitat large wood inclusion. The existing riprap spur at the upstream end of the project area may need to be removed or redesigned to support bank protection design and pond inlet channel persistence. Reinforcement of the current flood-routing spillway over the City’s wastewater outfall pipe between Kiwanis Pond and the Upper Pond is recommended. Installation of Large Wood Structures to the existing and newly created side channels and the Lower Pond outlet channel mouth is included to support island formation and improve the quality and quantity of off-channel and refugia habitat available to native fish, without adding recreational safety impediments to the mainstem channel. Partial excavation of the Kiwanis Pond Island and potentially two of the remaining pond levee dikes to create low-floodplains areas within the ponds that support riparian vegetation and increase shore-line habitat complexity. Additional fill island / low-floodplains and Large Wood Structure installation in the ponds is an option (see Alt 1). Improving fish passage at the existing weirs could improve access to off-channel refugia. However, warm water temperature issues in the ponds are not expected to be fully resolved by this alternative. Installation of a new footbridge over the Pond Inlet channel is included to establish access to the top of the newly constructed setback levee for optional trail route.</p> <p data-bbox="655 889 888 915">Features Summary:</p> <ul data-bbox="702 923 2188 1598" style="list-style-type: none"> • Reinforce the eroding bank – option to add large wood as habitat feature to reinforced bank. • Remove or redesign the existing riprap spur. • Improve ADA parking and river viewing at reinforced bank wall. • Install new footbridge across pond inlet channel and develop up to 9,000 feet of trail (1.7 miles). • Install Large wood at downstream end of outlet channel in backwater zone (off-channel habitat). • Partially excavate Kiwanis Pond Island and dike levees of Middle Pond to increase riparian areas. • Construct Setback Levee to widen available floodplain area and reduce warm-water pond area. • Provide area on or along setback levee for trail development. • Construct new connector channel riffle between Upper and Middle Pond. • Create secondary flow route side channel(s) in reopened floodplain. <ul data-bbox="795 1306 2054 1407" style="list-style-type: none"> ○ Construct reinforced riffle at inlet over wastewater treatment outfall, to be activated at defined discharge. ○ Construct Fill Islands in reopened floodplain area. Design to support bar and floodplain development. ○ Install large wood structures on fill islands along secondary flow route. • Retains off-channel pond habitat and functioning wetlands between Middle and Lower Ponds. • Reinforce I-90 bank, if/as needed. • Reinforce dike levee or constructed flood event armored riffle over wastewater outfall pipe between Kiwanis and Upper Pond. • Improve fish passage conditions at existing weirs in connector channel. • Native riparian vegetation re-establishment on disturbed areas and new low floodplains. 	<p data-bbox="2324 298 2843 399">Wastewater permit requires a specific quantity of river water and flow hydraulics for mixing and dilution at the outfall.</p> <p data-bbox="2324 425 2843 485">Public and Adjacent landowner aesthetic and usage needs.</p> <p data-bbox="2324 520 2790 546">Increase public access and use potential.</p> <p data-bbox="2324 580 2843 711">Not all site-generated or site-available materials will be sufficient for required design fill material quantity and quality. Thus, import of fill material may be required.</p> <p data-bbox="2324 741 2843 1014">Identify source location(s) for appropriate floodplain and fill island material – communicate with and evaluate City, WA DOT, and other partner entities projected potential to generate appropriate material from other projects. Evaluate potential for partnering with WA DOT on I-90 modifications.</p> <p data-bbox="2324 1044 2843 1175">Size and distribution of the fill islands/low floodplains will be determined by the quantity of site-generated and otherwise available adequate materials.</p> <p data-bbox="2324 1205 2843 1407">Channel evolution and potential sediment aggradation in response to reopened side channels and floodplain islands. Initial and long-term downstream channel change and potential need to evaluate bridge piling scour.</p> <p data-bbox="2324 1437 2843 1497">Geo-tech levee removal and setback levee construction</p> <p data-bbox="2324 1528 2843 1628">Design and installation sequencing option to address eroding and wastewater outfall pipe risks in Phase I.</p> <p data-bbox="2324 1659 2843 1759">Maintains reinforced grade control across the available floodplain at the wastewater outfall.</p>



501 Portway Ave, Suite 101
 Hood River, Oregon 97031
 www.interfluve.com
 541.386.9003

Concept Alternative #2

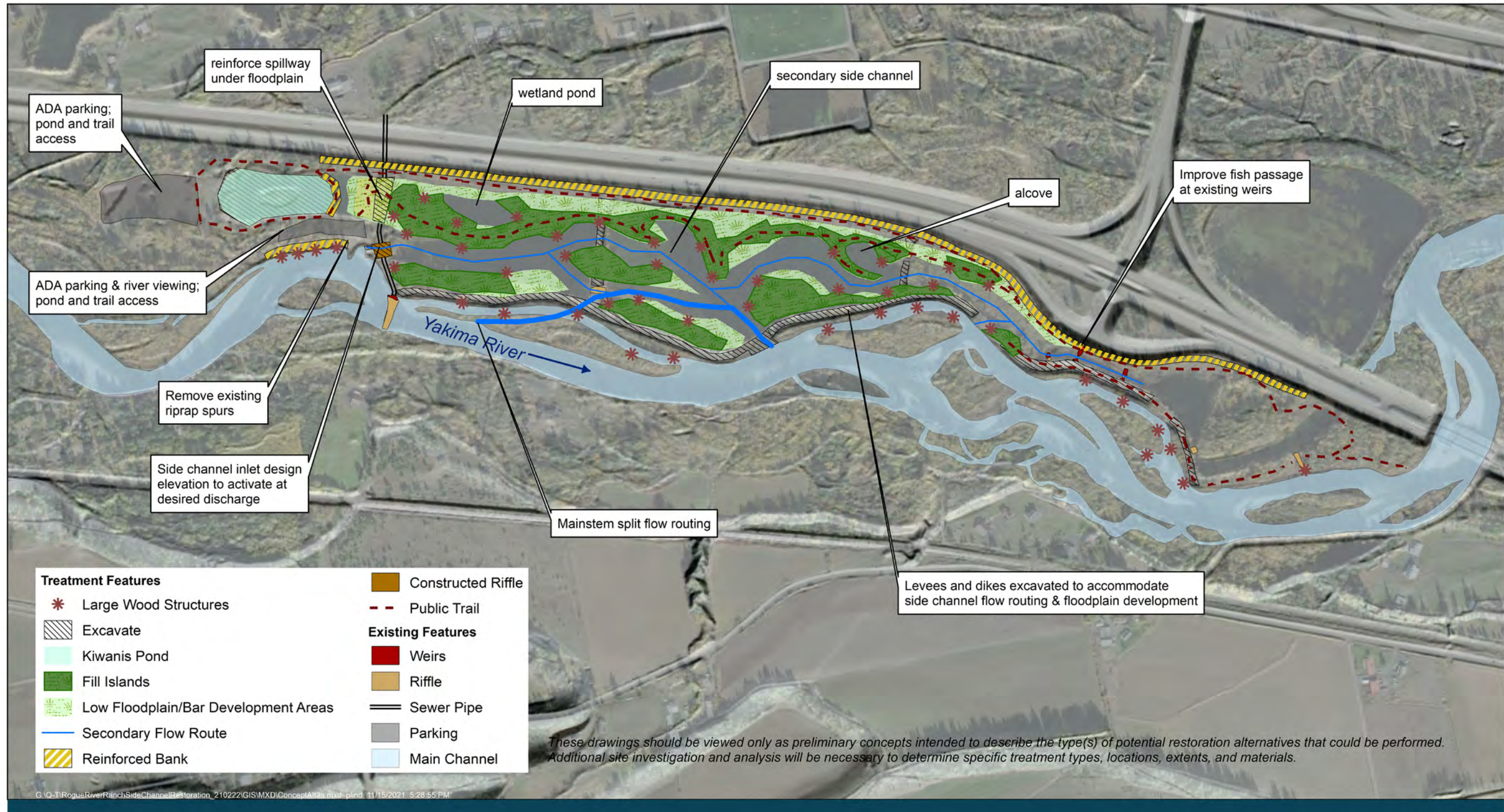
Coordinate System: NAD 1983
 State Plane Washington South FIPS 4602
 Vertical Datum: NAVD88



Hanson Ponds Park
 Cle Elum, WA

Concept Alternatives

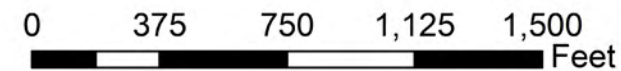
	Treatment Summary Description	Considerations
<p>Alternative 3a</p> <p>Reopen Floodplain</p> <p>Cost Estimate</p> <p>\$6M-7M</p>	<p>Concept Alternative 3a reopens and reactivates the available floodplain area downstream of the wastewater outfall and south of I-90 for maximum function and habitat, while providing a means of protecting the existing infrastructure of concern. Alternative 3a includes reinforcement of the existing eroding bank with the option of including habitat Large Wood installation (similar to Alt 2). Reinforcement of the road prism bank will be extended as needed so as not to increase risk to I-90. The existing riprap spur at the upstream end of the project area will likely need to be removed or redesigned. Reinforcement of the City’s wastewater outfall pipe under the floodplain and flow routing areas is recommended. Install Large Wood Structures in the existing and newly created side channels to support island formation and improve the quality and complexity of off-channel and refugia habitat available to native fish without adding recreational safety impediments to the mainstem channel. Safety signage for boaters may be recommended to guide users toward the mainstem flow route. Reconstruct a Kiwanis Pond west of its existing location to reduce current capture and erosion risks and to generate needed fill-island material. Utilize excavated materials to create islands and low-floodplain areas that support riparian vegetation. Improve fish passage at the existing weirs to support up and downstream migration potential in the side channels and off-channel refugia areas. Construction of an ADA trail around Kiwanis Pond to support recreational use. Potential for future development of a nature trail along the north side reopened floodplain.</p> <p>Features Summary:</p> <ul style="list-style-type: none"> • Reinforce the eroding bank – option to add large wood as habitat feature to reinforced bank • Remove the existing riprap spur • Reconstruct Kiwanis Pond west of its existing placement to reduce capture risk and to generate fill island material. • Create new ADA parking at west side of Kiwanis Pond for access to pond and trailhead – trail around Kiwanis Pond • Increase public access and uses. Potential for 15,000 feet of trail (2.8 miles). • Reopen floodplain <ul style="list-style-type: none"> ○ Remove and/or partially excavate designated levee and dikes • Create mainstem split flow, secondary flow route side channel(s), and off-channel alcoves in reopened floodplain <ul style="list-style-type: none"> ○ Construct reinforced riffle at inlet over wastewater treatment outfall, to be activated at defined discharge. ○ Construct mainstem split-flow conditions via design levee excavation and fill-island placement downstream of wastewater outfall mixing zone ○ Construct Fill Islands in reopened floodplain area. Design to support bar and floodplain development ○ Install large wood structures on fill islands along secondary flow route • Install Large wood structures in existing side channels of the mainstem Yakima and at downstream end of outlet channel in backwater zone (off-channel habitat) • Reinforce I-90 bank as needed • Reinforce dike levee or constructed flood event armored riffle over wastewater pipe under floodplain and side-channel inlet • Improve fish passage conditions at existing weirs in connector channel • Native riparian vegetation re-establishment on new low floodplains 	<p>Wastewater permit requires a specific quantity of river water and flow hydraulics for mixing and dilution at the outfall.</p> <p>Public and Adjacent landowner aesthetic and usage needs.</p> <p>Increase public access and use potential</p> <p>Not all site-generated or site-available materials will be sufficient for required design fill material quantity and quality. Thus, import of fill material may be required.</p> <p>Identify source location(s) for appropriate floodplain and fill island material – communicate with and evaluate City, WA DOT, and other partner entities projected potential to generate appropriate material from other projects. Evaluate potential for partnering with WA DOT on I-90 modifications.</p> <p>Size and distribution of the fill islands/low floodplains will be determined by the quantity of site-generated and otherwise available adequate materials.</p> <p>Channel evolution and potential sediment aggradation in response to reopened side channels and floodplain islands. Initial and long-term downstream channel change and potential need to evaluate bridge piling scour.</p> <p>Geo-tech levee removal and setback levee construction</p> <p>Design and installation sequencing option to address eroding and wastewater outfall pipe risks in Phase I.</p> <p>Maintains reinforced grade control across the available floodplain at the wastewater outfall.</p>



501 Portway Ave, Suite 101
 Hood River, Oregon 97031
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 541.386.9003

Concept Alternative #3a

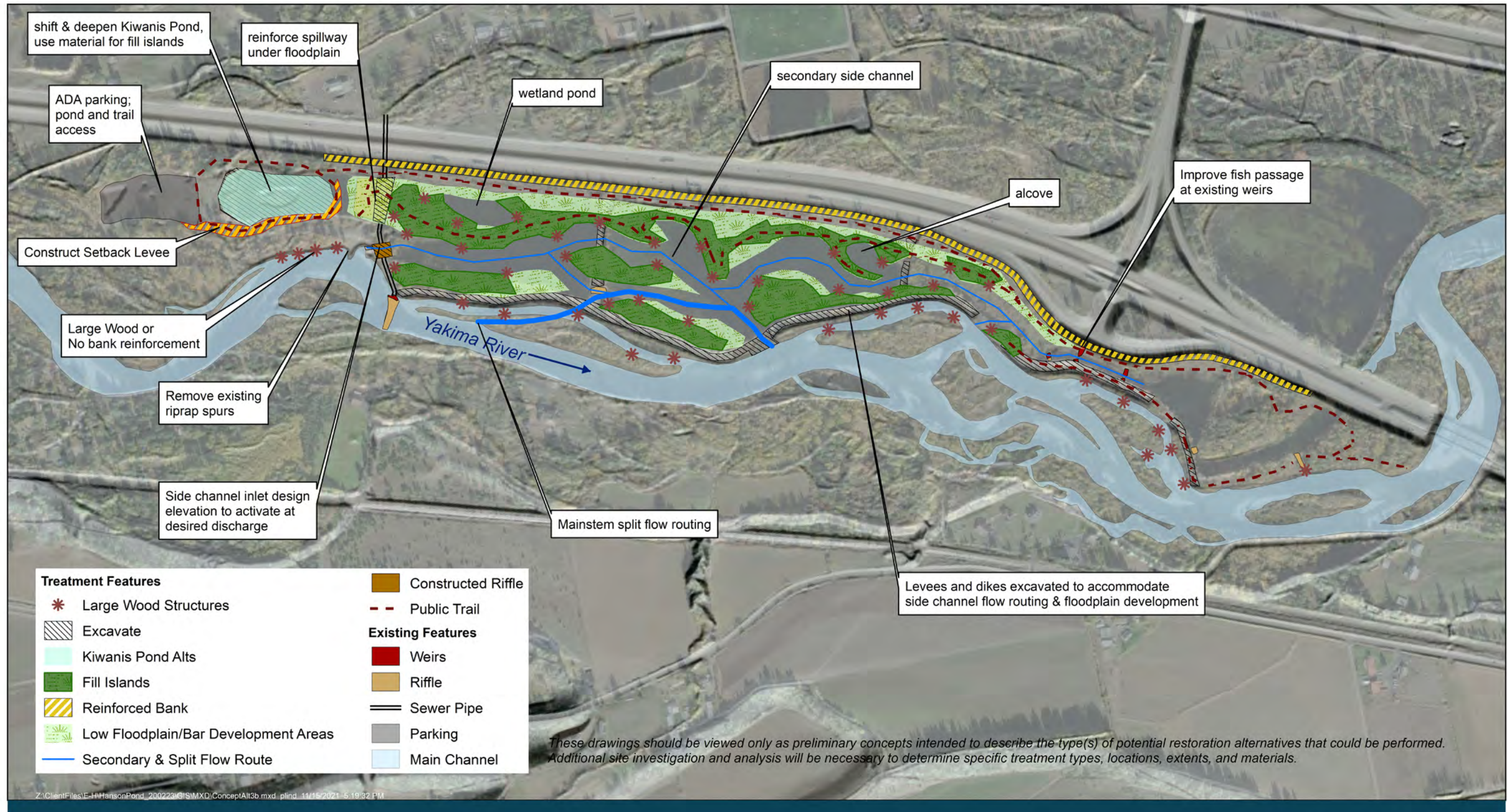
Coordinate System: NAD 1983
 State Plane Washington South FIPS 4602
 Vertical Datum: NAVD88



**Hanson Ponds Park
 Cle Elum, WA**

Concept Alt

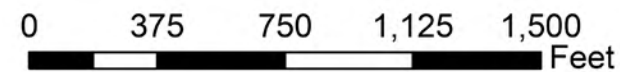
	Treatment Summary Description	Considerations
<p>Alternative 3b</p> <p>Reopen Floodplain</p> <p>Cost Estimate</p> <p>\$6M-7M</p>	<p>Concept Alternative 3 reopens and reactivates the available floodplain area south of I-90 for maximum function and habitat, while providing a means of protecting the existing infrastructure of concern Alternative 3b protects the Kiwanis Pond with a newly constructed low-elevation levee along the pond’s southern border. This approach includes removal and/or partial excavation of the existing levees and riprap spur(s) to maximize the opportunity for side channels, off-channel habitat, and vegetated floodplain islands. Reinforcement of the I-90 road prism bank will be designed so as to not increase risk. The existing riprap spur at the upstream end of the project area will be removed. Reinforcement of the City’s wastewater outfall pipe under the floodplain and at designed flow routes is included. Alternative 3b allows for the option of keeping the outfall in its current location or relocating it, in conjunction with shifting the mainstem route for permit mixing requirements. Install Large Wood Structures in the existing and newly created side channels to support island formation and improve the quality and complexity of off-channel and refugia habitat available to native fish without adding recreational safety impediments to the mainstem channel. Safety signage for boaters may be recommended to guide users toward the mainstem flow route. Reconstruct a Kiwanis Pond west of its existing location to reduce current capture and erosion risks and to generate needed fill-island material. Utilize excavated materials to create islands and low-floodplain areas that support riparian vegetation. Improve fish passage at the existing weirs to support up and downstream migration potential in the side channels and off-channel refugia areas. Construction of an ADA trail around the new Kiwanis Pond to support recreational use. Potential for future development of a nature trail along the north side reopened floodplain.</p> <p>Features Summary:</p> <ul style="list-style-type: none"> • Reinforce I-90 bank as needed • Construct protective levee along southern border of Kiwanis Pond (Alternative 3b). • Remove the existing riprap spur • Reinforce armored riffle over wastewater pipe under floodplain flow routes. • Reconstruct Kiwanis Pond west of its existing placement to reduce capture risk and to generate fill island material. • Create new ADA parking at west side of Kiwanis Pond for access to pond and trailhead – trail around Kiwanis Pond • Increase public access and uses. Potential for 15,000 feet of trail (2.8 miles). • Reopen floodplain <ul style="list-style-type: none"> ○ Remove and/or partially excavate designated levees, dikes, and spurs • Create mainstem split flow, secondary flow route side channel(s), and off-channel alcoves in reopened floodplain <ul style="list-style-type: none"> ○ Construct reinforced riffles at flow routes over wastewater treatment outfall. ○ Construct mainstem split-flow conditions downstream of wastewater outfall mixing zone via designed levee excavation and fill-island placement. ○ Construct Fill Islands in reopened floodplain area. Design to support bar and floodplain development ○ Install large wood structures on fill islands along secondary flow route • Install Large wood structures in existing side channels of the mainstem Yakima and at downstream end of outlet channel in backwater zone (off-channel habitat) • Improve fish passage conditions at existing weirs in connector channel • Native riparian vegetation re-establishment on new low floodplains 	<p>Wastewater permit requires a specific quantity of river water and flow hydraulics for mixing and dilution at the outfall.</p> <p>Public and Adjacent landowner aesthetic and usage needs.</p> <p>Increase public access and use potential</p> <p>Not all site-generated or site-available materials will be sufficient for required design fill material quantity and quality. Thus, import of fill material may be required.</p> <p>Identify source location(s) for appropriate floodplain and fill island material – communicate with and evaluate City, WA DOT, and other partner entities projected potential to generate appropriate material from other projects. Evaluate potential for partnering with WA DOT on I-90 modifications.</p> <p>Size and distribution of the fill islands/low floodplains will be determined by the quantity of site-generated and otherwise available adequate materials.</p> <p>Channel evolution and potential sediment aggradation in response to reopened side channels and floodplain islands. Initial and long-term downstream channel change and potential need to evaluate bridge piling scour.</p> <p>Geo-tech levee removal and setback levee construction</p> <p>3b design and installation sequencing option to address identified infrastructure issues with reinforced wastewater outfall and I-90 bank reinforcement.</p> <p>Maintains reinforced grade control across the available floodplain at the wastewater outfall.</p>



501 Portway Ave, Suite 101
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 www.interfluve.com
 541.386.9003

Concept Alternative #3b

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Hanson Ponds Park
Cle Elum, WA
 Concept Alternatives

5 Feasibility

5.1 BENEFITS, COSTS, AND CONSIDERATIONS

		Alternative 1	Alternative 2	Alternative 3
Ecologic/Biologic Uplift	Rating	Low	Moderate-High	High
	Rational/ Assumption	No new riverine Low floodplain area created. Small Low floodplain areas in ponds create localized riparian habitat improvement.	New riverine Low floodplain at fill islands and excavated levees (approximately 9 acres) for improved riparian habitat & function.	New riverine Low floodplain at fill islands and excavated levees (approximately 22 acres) for improved riparian habitat & function.
Aquatic Habitat Uplift/Impact	Rating	Low	Moderate - High	High
	Rational/ Assumption	Large Wood Structures in existing side channels will improve quality of existing off-channel and refugia habitat in the mainstem. Large Wood Structures in ponds at new low floodplains to increase localized habitat complexity. Improve fish passage at existing weirs.	New side channel(s) with approximately 3,800 feet of additional available habitat . Large Wood Structures for High-quality aquatic habitat complexity. Improve fish passage at existing weirs. Option to disconnect warm water pond environment.	New side channel(s) with approximately 6,600 feet of additional available habitat . Large Wood Structures for High-quality aquatic habitat complexity. Improve fish passage at existing weirs. Warm water pond environment eliminated.
FEMA Issues Addressed (Eroding bank failure, wastewater outfall, I-90)	Rating	Moderate-High	Moderate-High	High
	Rational/ Assumption	Eroding bank reinforced. Buried wastewater pipe reinforced between Kiwanis and Upper Pond. Reinforced bank along I-90 off ramp.	Eroding bank reinforced. Buried wastewater pipe reinforced between Kiwanis and Upper Pond. Reinforced bank along I-90 off ramp.	3a: Eroding bank reinforced. 3b: Reinforce infrastructure Reinforce buried wastewater pipe. Extend reinforced bank along I-90 within project area.
Potential Permitting Requirements	Rating	High	High	High
	Rational/ Assumption	See expected permitting requirements table		
Probable Construction Costs	Rating	Moderate	Moderate-High	High
	Rational/ Assumption	The most economical alternative due to smallest amount of excavation and fill. Approximate cost of \$2-3 million.	Additional cost primarily because of greater earthwork quantities. Approximate cost of \$3-4 million.	Greatest cost alternative because of large earthwork quantities. Approximate cost of \$6-7 million.
Implementation Engineering/ Technical - Construction Feasibility	Rating	Low	Moderate	Moderate
	Rational/ Assumption	Equipment will need to travel across existing levees to place fill in ponds.	Partially Filling of existing ponds and mainstem channel equipment access	Partially Filling of existing ponds and mainstem channel equipment access
River Recreationists Safety	Rating	Low	Low	Low
	Rational/ Assumption	Large Wood installed in existing side channels or ponds pose minimal increased risk to mainstem users - addressable through signage. New footbridge for safe trail access.	Large Wood installed in existing and new side channels pose minimal increased risk to mainstem users - addressable through signage.. New footbridge for safe trail access.	Large Wood installed in existing and new side channels pose minimal increased risk to mainstem users - addressable through signage.. New trail around relocated Kiwanis Pond and option for new nature trail.
Social Impact*	Rating	Moderate	Moderate	High
	Rational/ Assumption	There are some additional benefits and access. It stays away from the freeway. Buffered against the freeway.	Almost the same as Alternative 1; it helps with the pressure on the river and increases the riparian area but doesn't fully improve the ecosystem	Improves access; increases system function and ecosystem services.
Recreational Opportunities*	Rating	Moderate	Moderate - High	High
	Rational/ Assumption	maintains 1 mile of existing trail. Option to improve river viewing. Reestablishes year-round foot access to existing levee for fisherman. Levee trail provides access to all ponds.	1.7 miles of trail; option to improve parking and river viewing; establishes year-round levee-top trail access	2.8 miles of trail; option to improve parking and river viewing; better interpretive opportunities and wildlife viewing; recreational opportunities offsite; maximize off-channel habitat function (supports fish production) which will benefit fishing opportunities overall
Ability to meet project objectives*	Rating	Low	Moderate	High
	Rational/ Assumption	Short term infrastructure solution; provides minimal improvements to fish and wildlife habitat	Protects infrastructure; improves only 1/2 of the potential habitat at the site; allows for the I-90 expansion	Protects infrastructure; maximize available habitat; protects infrastructure.
Feasibility	Designation	Moderate	High	High

*Evaluated and rated by Hanson Ponds Advisory Group.

Expected Permitting Requirements

Permit	Alternative 1	Alternative 2	Alternative 3
Wetland	Yes	Yes	Yes
Water Quality	Yes	Yes	Yes
FEMA/ Floodplain	Yes	Yes	Yes
Endangered Species	Yes	Yes	Yes
Cultural Resources	TBD	TBD	TBD
WA Dept of Trans	Yes	Yes	Yes
Utilities	TBD	TBD	TBD
Land Use (City of Cle Elum)	TBD	TBD	TBD
Permitting Requirement Ranking	High	High	High

5.2 CONCEPT ALTERNATIVE RANKING METHOD

The benefit, cost, and construction considerations are ranked to support comparison and selection of the Concept Alternatives. A description of the method for relative ranking used for each of the categories is provided here. Each alternative is ranked as low, moderate, or high for the following 12 categories.

Ecologic/Biologic Uplift

Low – Maintains existing ecologic and biologic functions in the project area with minimal overall improvement.

Moderate – Increases some ecologic and biologic function overall.

High – Adds relatively the most amount of ecologic and biologic function within the project area.

Aquatic Habitat Uplift/Impact

Low – Maintains the existing aquatic habitat areas with little to no improvement.

Moderate – Adds some wood structures to improve aquatic habitat.

High – Adds both wood structures and significant amount of new side channels for aquatic habitat.

FEMA Issues Addressed (eroding bank failure, wastewater outfall, I-90)

Low – not all identified issues are addressed

Moderate – identified issues are addressed to required standards – but some risk of future failure under current hydrologic regime exists.

High – identified issues are addressed to required standards – minimal risk of future failure under current hydrologic regime

Probable Construction Costs

The cost ranking reflects the relative cost of each Alternative based on permitting, construction implementation, and projected materials needs. This is a relative cost, not an absolute cost, so the scale of the project is NOT factored into this ranking. The relative cost ranking ranges from 1 to 3, with 1 reflecting a relatively lower cost alternative. For this ranking, it is assumed that implementation occurs in one phase, not multiple phases.

High relative cost

- Requires construction techniques and equipment costs that are relatively high
- Extensive excavation, onsite utilization of spoils but potential for long-distance hauling of needed import material
- Need for import materials or prefabricated elements (i.e. trail bridge)
- Complicated permitting (multi-agency) and geo-technical support requirements
- Extensive planting or invasive weed control
- Limited, difficult, or remote access
- Intensive de-watering requirements

Moderate relative cost

- Requires construction techniques and equipment costs that are relatively moderate
- Moderate excavation, onsite utilization of spoils but potential for long-distance hauling of needed import material
- Need for import materials or prefabricated materials (i.e. trail bridge)
- Typical planting or invasive weed control
- Moderate access conditions
- Standard de-watering requirements

Low relative cost

- Requires construction techniques and equipment costs that are relatively low-cost
- Minimal excavation and minimal hauling distance of spoils or needed materials
- Minimal planting or weed control and volunteer labor for installation and maintenance
- Easy access conditions
- No or minimal de-watering required.

Potential Permitting Requirements

The Potential Permitting Requirements are broken down into eight sub-categories based on permit type: Wetland, Water Quality, Floodplain, Endangered Species, Cultural Resources, Highway, Utilities and the City of Cle Elum Land Use. It is expected that required permits for implementation are attainable within 5 years or less after final designs are in hand.

High – Requires 6 or more permit types

Moderate – Requires 3-5 permit types

Low – Requires 2 or less permit types

Long Term Inspection & Potential Long-Term Maintenance

High – Large project size with high number of elements and complexity of elements related to infrastructure.

Moderate -- Intermediate project size with intermediate number of elements and complexity of elements related to infrastructure.

Low – Small project size with low number of elements and minimal complexity of elements related to infrastructure.

Implementation Engineering/ Technical - Construction Feasibility

High – Includes new or difficult construction techniques, may include construction or permitting risk, requires geo-technical support, and high potential for utilities or infrastructure management. Neighboring landowner access, usage, and aesthetics satisfied.

Moderate – Includes previously used and permitted construction techniques, requires geo-technical support, and moderate potential for utilities or infrastructure management. Neighboring landowner access, usage, and aesthetics satisfied.

Low – Includes previously used and permitted construction techniques and low potential for utilities or infrastructure management. Neighboring landowner access, usage, and aesthetics not satisfied.

River Recreationists Safety

High – Extreme risk to river recreationists that would require them to no longer be able to recreate near the project area.

Moderate – Imposes structures with the potential to somewhat increase risk that can be mitigated through signage or otherwise.

Low – Minimal to no increased risk to river recreationists.

Social Impact, Recreational Opportunities and Ability to Meet Project Objectives

(Hanson Ponds Advisory Group)

Considerations:

- Ecosystem services provided to the public users
- Inclusiveness – equity of access to community (ADA, age differences, diversity of cultural resource)
- Support native and indigenous access (plants, fish, cultural resource, and hatchery inputs)
- Safety to the public day-use users (fishermen, ADA, hikers, birders, pet walkers, wildlife watchers)
- Maintains neighboring landowner property function, usage and aesthetics.
- Diversity of trails for diversity of users
- Does it integrate Cle Elum Complete Streets walkability plan and Yakima River Greenway plan, Cle Elum River Walk goals.
- Parking and river viewing (ADA option, bike rack, proximity to garbage and restroom)
- Costs & responsibility for maintenance and “policing” (City of Cle Elum) – have a closable day-use gate and signage.
- Aesthetics
- DOT planning
- Kiwanis Pond for stocked fishing maintained
- Interpretive signs along the trails – large kiosk entrance: safety, information (nature and history), project goals.
- Access road (maintenance, easement): City of Cle Elum responsibility
- Assess if existing restroom facilities are adequate – improve as necessary.
- Picnic tables and other user amenities.
- Reduced water depth at riffle crossings in mainstem for boat users.

Social Benefits (rating rational):

Low – Does not provide or maintain existing access to ecosystem services. Increase risk to users. Impacts neighboring landowners

Moderate - Maintains existing access to ecosystem services for diverse “users.” Does not increase risk to users. Interpretive/educational signage. Does not negatively impact neighboring landowners.

High – Increases access to ecosystem services for more users. Does not increase risk to users. Interpretive/educational signage. Does not negatively impact neighboring landowners.

Recreational Opportunities (rating rational):

Low – Reduced water depth in mainstem channel at low flow; limit seasonal access to parking area (no snow plow); Does not provide for multiple user opportunities; reduces existing trail miles;

Moderate – Sufficient water depth at low flow in mainstem (boat access); year-round access to parking area (snow plow); provides opportunities for multiple users, including ADA; maintains existing trail miles and uses.

High - Sufficient water depth at low flow in mainstem (boat access); year-round access to parking areas (snow plow); provides opportunities for multiple users, including ADA; increases existing trail miles and uses.

Ability to Meet Project Objectives (rating rational):

Low – Does not meet identified goals and objective. Does not increase system resilience.

Moderate – Meets identified goals and objectives for a long period of time. Improves function and resilience but will require maintenance.

High – exceeds initial identified goals and objectives for a long period of time. Builds resilience into the system. Builds resilience into the system with only minor future maintenance expected.

Feasibility Designation

The feasibility designation is the overall likely feasibility of being able to implement the project within a 5-10-year timeframe. This is based on landownership, as well as economic, funding, regulatory, political, social, permitting, or other considerations that are known to impact the feasibility of conducting projects within a reasonable timeframe. **The feasibility designation is not used as part of the project rating because feasibility issues may change over time and it is desirable to evaluate project benefits independent of feasibility.** The designations include the following:

High feasibility

- Minimal to no feasibility issues
- Adjacent landowner(s) has already indicated support

Moderate feasibility

- There are potential feasibility constraints that could affect the likelihood of project implementation within a 5-10-year timeframe
- Adjacent landowner(s) is likely to support

Unlikely feasibility

- There are known feasibility constraints that would be expected to limit the ability to implement the project within a 5-10-year timeframe
- Adjacent landowner(s) does not support