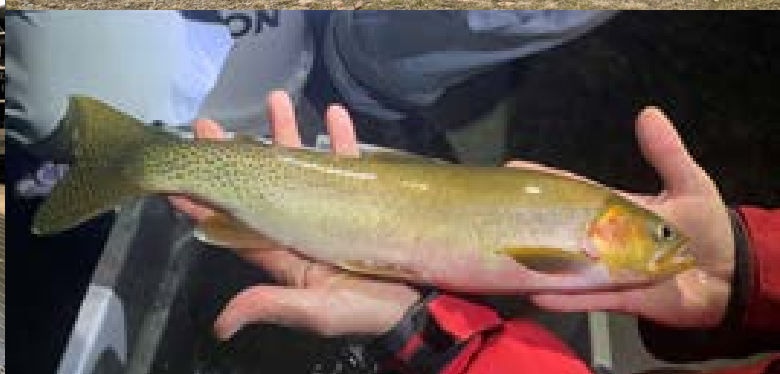
The Clark Fork Project
FERC Project No. 2058

2022 Annual Implementation Plans



2022 ANNUAL IMPLEMENTATION PLAN SUMMARY – APPENDIX A

Clark Fork Project, FERC No. 2058
Cabinet Gorge and Noxon Rapids Hydroelectric Developments

Title
Idaho Tributary Habitat Acquisition and Fishery Enhancement Program

Implementation Staff Lead
Ken Bouwens, Idaho Department of Fish and Game (IDFG), (208) 769-1414,
ken.bouwens@idfg.idaho.gov

Background
The purpose of this program is to offset the impacts of the power peaking operation of the Cabinet Gorge Project to native salmonids through the restoration and enhancement of lower Clark Fork River and Lake Pend Oreille (LPO) tributary watersheds, fishery monitoring and management support, and a public education and enforcement initiative focused on Bull Trout and their associated habitats in Idaho.

Outlined below is the 2022 annual implementation plan for Idaho Tributary Habitat Acquisition and Enhancement and Fish Resource Monitoring, Enhancement, and Management portions of this program. The public education and enforcement component of this program is described in Appendix D of the Clark Fork Settlement Agreement (CFSA). In addition, other CFSA appendices also support watershed and native salmonid protection, restoration, and enhancement (e.g., Fish Passage/Native Salmonid Restoration Plan, Watershed Council Program), and thereby augment the efforts to be initiated under this program.

2022 Project Plans
Tributary Habitat Acquisition and Enhancement

1. Habitat Restoration Scoping Allocation
2. Habitat Restoration and Acquired Property Maintenance and Monitoring Allocation
3. Priority Native Salmonid Habitat Acquisition and Conservation Allocation
4. Idaho Field Station Operation and Maintenance
5. Pack River Watershed Management Plan Addendum
6. Lower Clark Fork River Minimum Flow and Water Temperature Monitoring
7. Trestle Creek Habitat Enhancement Project Phase I
8. Trestle Creek Habitat Enhancement Project Phase II (***New***)
9. Rattle Creek Habitat Enhancement Project Design (***New***)

Fishery Resource Monitoring, Enhancement, and Management

10. Fish Resource Monitoring, Enhancement, and Management Plan

Work Products
Habitat Restoration Scoping Allocation

- Designs and cost estimates for specific projects will be reported in the form of Technical Memoranda or other appropriate documentation

- Annual Work Summary; due December 1, 2022

Habitat Restoration and Acquired Property Maintenance and Monitoring Allocation

- Annual Work Summary; due December 1, 2022

Priority Native Salmonid Habitat Acquisition and Conservation Allocation

- Annual Work Summary; due December 1, 2022

Idaho Field Station Operation and Maintenance

- All work performed for this project plan in 2022 will be documented in an Annual Work Summary; due December 1, 2022.

Pack River Watershed Management Plan Addendum

- Pack River Native Salmonid Habitat Restoration Plan; final due November 1, 2022
- Annual Work Summary; due December 1, 2022

Lower Clark Fork River Minimum Flow and Water Temperature Monitoring

- Project Completion Report; (July 2019–September 2021 data); final due November 1, 2022
- Annual Work Summary; due December 1, 2022

Trestle Creek Habitat Enhancement Project Phase I

- Engineering work will be documented via appropriate technical memoranda
- Annual Work Summary; due December 1, 2022

Trestle Creek Habitat Enhancement Project Phase II

- Engineering work will be documented via appropriate technical memoranda
- Final design drawings; due date to be determined
- Annual Work Summary; due December 1, 2022

Rattle Creek Habitat Enhancement Project Design

- Engineering work will be documented via appropriate technical memoranda
- Annual Work Summary; due December 1, 2022

Fish Resource Monitoring, Enhancement, and Management Plan

- Annual Project Update; 2021 tributary monitoring data; final due November 1, 2022
- Annual Project Update; 2021 redd count data; final due November 1, 2022
- Comprehensive Project Report; report summarizing 2009–2018 tributary monitoring data; final due December 1, 2022
- Annual Work Summary; due December 1, 2022
- Temperature monitoring data for the six sites; due December 1, 2022
- Annual Project Update: 2022 tributary monitoring data; final due November 1, 2023
- Annual Project Update; 2022 Bull Trout redd count data; final due November 1, 2023

2022 Appendix A Tributary Habitat Acquisition and Enhancement Fund Budget

Budget Summary	
Unexpended funds with interest	$2,734,027
2022 contribution (including GDP inflation rate)	$616,935
Transfer to Fish Resource Monitoring, Enhancement, and Management Fund	-$65,249
Total available	**$3,285,713**
2022 MC-approved budget	$457,618
Unobligated funds	**$2,828,095**

2022 Project	Carryover[1]	2022 Budget
Habitat Restoration Scoping Allocation	$5,000	$25,000
Habitat Restoration and Acquired Property Maintenance and Monitoring Allocation	$0	$20,000
Priority Native Salmonid Habitat Acquisition and Conservation Allocation	$5,000	$60,000
Idaho Field Station Operation and Maintenance	$159,818	$17,500
Pack River Watershed Management Plan Addendum	$0	$2,300
Lower Clark Fork River Minimum Flow and Water Temperature Monitoring	$3,000	$6,000
Trestle Creek Habitat Enhancement Project Phase I	$2,000	$10,000
Trestle Creek Habitat Enhancement Project Phase II	$0	$62,000
Rattle Creek Habitat Enhancement Project Design	$0	$80,000
Total	**$174,818**	**$282,800**
MC-approved budget		**$457,618**

[1] *Estimated carryover of unexpended, approved funds as of January 1.*

2022 Appendix A Fish Resource Monitoring, Enhancement, and Management Fund Budget

Budget Summary	
Unexpended funds with interest	$0
2022 contribution (including GDP inflation rate)	$53,266
Transfer from Tributary Habitat Acquisition and Enhancement Fund[1]	$65,249
Total available	**$118,515**
2022 MC-approved budget	$118,515
Unobligated funds	**$0**

[1] In 2019 the MC approved that the allocation for the Fish Resource Monitoring, Enhancement and Management Plan be permanently increased to $96,000. The funding for this plan will continue to be transferred from the Tributary Habitat Acquisition and Enhancement Program under Appendix A. These transferred funds will revert back to the Tributary Habitat Acquisition and Enhancement Fund if not spent in a given year.

2022 Project	Carryover[1]	2022 Budget
Fish Resource Monitoring, Enhancement, and Management Plan	$22,515	$96,000
Total	**$22,515**	**$96,000**
MC-approved budget		**$118,515**

[1] Estimated carryover of unexpended, approved funds as of January 1.

2022 PROJECT PLAN

Habitat Restoration Scoping Allocation

Project Contact
Ken Bouwens, Idaho Department of Fish and Game (IDFG), (208) 769-1414,
ken.bouwens@idfg.idaho.gov

Project History
This project was first approved in 2017. We are requesting continuation of this project in 2022. The scope and budget for this project will be reviewed by the Management Committee (MC) annually.

Background
Habitat restoration is an important component of the Appendix A program. Watershed restoration and assessment projects have been completed throughout the Lake Pend Oreille watershed aimed at improving habitat for native salmonid populations. New project development is an involved scoping process requiring the identification and integration of information regarding specific project streams, locations, willing landowners, and associated biological limitations. Often times, technical engineering support is required to develop viable project proposals, including feasibility analyses, preliminary designs, and cost estimates. This allocation is designed to provide limited resources to allow pre-project review and collaboration with qualified fish habitat engineers. It is expected that this scoping will lead to full project proposals for MC review and approval.

Beginning in 2021 we included funding for a third party to help identify, negotiate, and facilitate fish habitat enhancement projects, primarily with willing private landowners. This partnership allows the involvement of an entity who is well versed in prior fish habitat assessments and can begin discussions with willing landowners as appropriate.

This allocation is designed to provide managers with a means to rapidly respond to opportunities and needs as they arise, and to reduce the burden of numerous, low-dollar Consent Mail requests on the MC. As opportunities or needs arise, managers will notify the Aquatic Implementation Team and seek Avista approval prior to expending funds that were not specified within a Project Plan. Given it is an allocation and not related to a specific project, the Appendix A ranking criteria do not apply.

Goal
Provide engineering support to assist with the development of future fish habitat projects.

Objective
1. Provide funding for fish habitat engineers to perform preliminary site visits and review and assist with technical document preparation.

2. Fund a third-party contractor to identify and make initial contacts with willing landowners with the intent of developing future fish habitat projects.

Tasks
Specific tasks will be identified as necessary, but may include conducting initial site visits, providing conceptual design, assessing potential project feasibility, and developing preliminary agreements and cost estimates.

Work Products
- Designs and cost estimates for specific projects will be reported in the form of Technical Memoranda or other appropriate documentation
- Annual Work Summary; due December 1, 2022

Permitting Requirements
Not applicable for the tasks proposed in this project plan.

Endangered Species Act consultation for this project plan is associated with the 2019 Biological Opinion on the effects of continued operation of the Clark Fork Hydroelectric Project on Bull Trout and designated Bull Trout critical habitat (BiOp), and the U.S. Fish and Wildlife Service (USFWS)-Idaho Department of Fish and Game (IDFG) Cooperative Agreement pursuant to Section 6 of the Act. This project plan is consistent with the analysis and conclusions contained in the 2019 BiOp and the USFWS-IDFG Cooperative Agreement, and will adhere to all appropriate Terms and Conditions designed to reduce the extent and effects of incidental take on Bull Trout. No incidental take of Bull Trout is anticipated as a result of this project plan; therefore, no take reporting is required.

Cultural/Historic Resource Review
Not applicable for the tasks proposed in this project plan, there are no ground and/or vegetation disturbing activities, or proposed impacts to cultural/historic resources.

Benefit to the Resource
Projects developed using this allocation will be consistent with the 2019-2023 Clark Fork River Native Salmonid Restoration Plan (AIT 2018), and the Idaho Tributary Habitat Acquisition and Fishery Enhancement Program (Appendix A of the Clark Fork Settlement Agreement) through enhancement of tributary habitat conditions for native salmonids including Bull Trout and Westslope Cutthroat Trout. As such, they will also be consistent with goals of the Fish Passage/Native Salmonid Restoration Plan Protection, Mitigation & Enhancement measure (Appendix C). Projects developed using this allocation will also be consistent with the Dissolved Gas Supersaturation Control, Mitigation, and Monitoring Program (Appendix F5) as they will likely identify options for improving spawning, rearing, and migratory habitat for focus species of the Appendix F5 mitigation program.

Tasks conducted under this allocation are also consistent with other established plans including the Lake Pend Oreille Bull Trout Conservation Plan (habitat enhancement; Resource Planning Unlimited 1999) and the IDFG Fisheries Management Plan (IDFG 2019).

This allocation is designed to assist with the development of full fish habitat restoration/enhancement proposals with the goal of enhancing conditions for native salmonids. Project-specific benefits will be identified as a result of the use of this allocation.

Budget

Item	Estimated Carryover[1]	2022 Budget Request
Engineering support	$5,000	$15,000
Outreach support	$0	$10,000
Total	$5,000	$25,000
Anticipated Expenditures		$30,000

[1] *Estimated carryover of unexpended, approved funds as of January 1.*

Literature Cited

AIT (Aquatic Implementation Team). 2018. Clark Fork River Native Salmonid Restoration Plan (2019-2023). Noxon, Montana.

IDFG (Idaho Department of Fish and Game). 2019. Fisheries Management Plan 2019-2024. Boise, Idaho.

Resource Planning Unlimited. 1999. Lake Pend Oreille Bull Trout Conservation Plan. State of Idaho. Boise, Idaho.

2022 PROJECT PLAN

Habitat Restoration and Acquired Property Maintenance and Monitoring Allocation

Project Contact

Ken Bouwens, Idaho Department of Fish and Game (IDFG), (208) 769-1414
ken.bouwens@idfg.idaho.gov

Project History

The Habitat Restoration and Acquired Property Maintenance and Monitoring allocations have been continually approved separately since 2003. They were combined into one project plan in 2018. We request the continuation of this plan in 2022. The scope and budget for this project are reviewed by the Management Committee (MC) annually.

Background

Watershed restoration and assessment projects have been completed throughout the Lake Pend Oreille watershed aimed at improving habitat for native salmonid populations. While a substantial amount of habitat restoration still needs to be completed, ongoing minor maintenance and monitoring of completed restoration projects is also necessary to ensure that completed projects are functioning as intended. This allocation is also designed to provide an ongoing funding source to monitor, perform minor maintenance, and pay ongoing costs (weed control, etc.) associated with acquired properties. These expenses often arise throughout the year and this allocation is designed to be able to address these needs without burdening the MC for approval for each individual transaction.

Monitoring habitat restoration projects is important for both maintaining projects and for learning more about how various restoration techniques succeed. Monitoring under this allocation would be completed at various scales dependent on project magnitude and sensitivity. Lower intensity monitoring would consist of activities such as replicating photo-points or completing a qualitative “walk-through” assessment of the designated project. This scale of monitoring would typically be completed either for lower priority restoration projects or for projects which did not experience substantial changes due to flow conditions. Higher intensity monitoring would be more in-depth post construction surveys to include surveying cross-sections, longitudinal profiles, photo-points, and potentially channel geometry if substantial changes have occurred (e.g., channel avulsions).

Maintenance activities can vary depending on year and project. In general, this allocation is designed to deal with small-scale repairs, generally above the ordinary high water mark, that do not change the design of the original project or require additional engineering. Major repairs that include substantial in-water work or work that would be subject to additional engineering or permitting would generally be proposed as an individual project for MC approval.

This allocation is designed to provide managers with a means to rapidly respond to opportunities and needs as they arise, and to reduce the burden of numerous, low-dollar Consent Mail requests on the MC. As opportunities or needs arise, managers will notify the Aquatic Implementation Team and seek Avista approval prior to expending funds that were not specified within a Project

Plan. Given it is an allocation and not related to a specific project, the Appendix A ranking criteria do not apply.

Goal
Provide a stable funding mechanism to complete minor repairs and maintenance on existing habitat projects and acquired properties.

Objectives
1. Monitor previously completed habitat projects to ensure ongoing functionality and stability.

2. Perform minor maintenance to previously completed habitat projects as necessary.

3. Monitor existing properties for vandalism, etc.

4. Perform minor maintenance to existing properties as necessary.

5. Pay ongoing costs (weed control, etc.) associated with acquired properties.

Tasks
1. In 2022, we are expecting to perform weed control at previously-constructed habitat projects at Twin Creek and Granite Creek.

Work Products
- Annual Work Summary; due December 1, 2022

Permitting Requirements
Any permits necessary for weed control activities will be acquired by the applicator. If activities are substantial enough to require additional permitting, then the project will be submitted to the MC for individual approval.

Endangered Species Act consultation for this project plan is associated with the 2019 Biological Opinion on the effects of continued operation of the Clark Fork Hydroelectric Project on Bull Trout and designated Bull Trout critical habitat (BiOp), and the U.S. Fish and Wildlife Service (USFWS)-Idaho Department of Fish and Game (IDFG) Cooperative Agreement pursuant to Section 6 of the Act. This project plan is consistent with the analysis and conclusions contained in the 2019 BiOp and the USFWS-IDFG Cooperative Agreement, and will adhere to all appropriate Terms and Conditions designed to reduce the extent and effects of incidental take on Bull Trout. No incidental take of Bull Trout is anticipated as a result of this project plan; therefore, no take reporting is required.

Cultural/Historic Resource Review
Work proposed under this allocation will either: 1) not involve any ground and/or vegetation disturbing activities or impact historic resources, or 2) will be performed under the cultural assessment associated with the original project.

Benefit to the Resource

Projects developed using this allocation will be consistent with the 2019-2023 Clark Fork River Native Salmonid Restoration Plan (AIT 2018), and the Idaho Tributary Habitat Acquisition and Fishery Enhancement Program (Appendix A of the Clark Fork Settlement Agreement) through enhancement of tributary habitat conditions for native salmonids including Bull Trout and Westslope Cutthroat Trout. As such, they are consistent with goals of the Fish Passage/Native Salmonid Restoration Plan Protection, Mitigation, & Enhancement measure (Appendix C) and with the Dissolved Gas Supersaturation Control, Mitigation, and Monitoring Program (Appendix F5) as they protected spawning, rearing, and/or migratory habitat for focus species of the Appendix F5 mitigation program.

Tasks conducted under this allocation will be consistent with other established plans including the Lake Pend Oreille Bull Trout Conservation Plan (habitat enhancement; Resource Planning Unlimited 1999) and the IDFG Fisheries Management Plan (IDFG 2019).

Budget

Item	Estimated Carryover[1]	2022 Budget Request
Task-specific costs	$0	$15,000
Law enforcement monitoring (cost share with Appendix G)	$0	$5,000
Total	$0	$20,000
Anticipated Expenditures		$20,000

[1] *Estimated carryover of unexpended, approved funds as of January 1.*

Literature Cited

AIT (Aquatic Implementation Team). 2018. Clark Fork River Native Salmonid Restoration Plan (2019-2023). Noxon, Montana.

IDFG (Idaho Department of Fish and Game). 2019. Fisheries Management Plan 2019-2024. Boise, Idaho.

Resource Planning Unlimited. 1999. Lake Pend Oreille Bull Trout Conservation Plan. State of Idaho. Boise, Idaho.

2022 PROJECT PLAN

Priority Native Salmonid Habitat Acquisition and Conservation Allocation

Project Contact
Ken Bouwens, Idaho Department of Fish and Game (IDFG), (208) 769-1414,
ken.bouwens@idfg.idaho.gov

Project History
This project has been continually approved since 2003. We are requesting continuation of this project in 2022. The scope and budget for this project are reviewed by the Management Committee (MC) annually.

Background
This allocation was set up to support efforts in Idaho to acquire, protect, and improve the quality of critical native salmonid (Bull Trout and Westslope Cutthroat Trout) tributary habitat in high priority spawning streams. Land will be conserved through fee title purchase or through placement of conservation easements, working only with willing sellers and cooperators. As with the previously approved habitat acquisition proposals, purchases of specific individual parcels or conservation easements will be presented individually for MC approval. This allocation is designed to provide support to investigate potential land conservation opportunities and to perform due diligence (title report, baseline research, survey, appraisal, negotiations, etc.) to ready potential transactions for presentation to the MC.

We intend to continue our partnership with a third party to provide annual funding to help identify, negotiate, and facilitate land conservation actions. This partnership allows the involvement of an entity who is well versed in land conservation and the local markets to monitor the market and can begin discussions with willing landowners as appropriate.

No land acquisitions or conservation easements are currently being evaluated at this time. However, due to the rapid pace associated with the real estate market, having funds on hand to begin discussions and perform due diligence on perspective opportunities is imperative.

This allocation is designed to provide managers a means to rapidly respond to opportunities and needs as they arise, and to reduce the burden of numerous, low-dollar Consent Mail requests on the MC. As opportunities or needs arise, managers will notify the Aquatic Implementation Team and seek Avista approval prior to expending funds that were not specified within the Project Plan.

Goal
Identify and quickly respond to potential land acquisition opportunities.

Objective
1. Continue to provide support to investigate potential land conservation opportunities.

2. Perform due diligence to ready potential transactions for presentation to the MC.

Tasks

1. Fund a third-party contractor to provide outreach support. (Objective 1)

2. Cover due diligence costs (e.g., title report, baseline research, survey, appraisal, negotiations on potential land actions) on potential new acquisitions/easements to ready them for MC approval. (Objective 2)

Work Products

- Annual Work Summary; due December 1, 2022

Permitting Requirements

Not applicable for the tasks proposed in this project plan.

Endangered Species Act consultation for this project plan is associated with the 2019 Biological Opinion on the effects of continued operation of the Clark Fork Hydroelectric Project on Bull Trout and designated Bull Trout critical habitat (BiOp), and the U.S. Fish and Wildlife Service (USFWS)-Idaho Department of Fish and Game (IDFG) Cooperative Agreement pursuant to Section 6 of the Act. This project plan is consistent with the analysis and conclusions contained in the 2019 BiOp and the USFWS-IDFG Cooperative Agreement, and will adhere to all appropriate Terms and Conditions designed to reduce the extent and effects of incidental take on Bull Trout. No incidental take of Bull Trout is anticipated as a result of this project plan; therefore, no take reporting is required.

Cultural/Historic Resource Review

Not applicable for the tasks proposed in this project plan, there are no ground and/or vegetation disturbing activities, or proposed impacts to cultural/historic resources. Avista will review any land acquisitions that result from this project plan to determine if further Cultural/historic resource review is necessary.

Benefit to the Resource

Property conservation actions developed using this allocation would be consistent with the 2019-2023 Clark Fork River Native Salmonid Restoration Plan (AIT 2018), and the Idaho Tributary Habitat Acquisition and Fishery Enhancement Program (Appendix A of the Clark Fork Settlement Agreement) through enhancement of tributary habitat conditions for native salmonids including Bull Trout and Westslope Cutthroat Trout. As such, they would also be consistent with goals of the Fish Passage/Native Salmonid Restoration Plan Protection, Mitigation, and & Enhancement measure (Appendix C), and the Dissolved Gas Supersaturation Control, Mitigation, and Monitoring Program (Appendix F5) as they would protect spawning, rearing, and/or migratory habitat for focus species of the Appendix F5 mitigation program.

This allocation is designed to assist with land acquisitions; therefore, depending on the particular property, the benefitted species and exactly how that land action benefits those species may change. However, priority will be placed upon properties that surround streams that support native salmonids.

Budget

Item	Estimated Carryover[1]	2022 Budget Request
Outreach support	$2,500	$25,000
Due diligence costs	$2,500	$35,000
Total	$5,000	$60,000
Anticipated Expenditures		$65,000

[1] *Estimated carryover of unexpended, approved funds as of January 1.*

Literature Cited

AIT (Aquatic Implementation Team). 2018. Clark Fork River Native Salmonid Restoration Plan (2019-2023). Noxon, Montana.

2022 PROJECT PLAN

Idaho Field Station Operation and Maintenance

Project Contact
Ken Bouwens, Idaho Department of Fish and Game (IDFG), (208) 769-1414,
ken.bouwens@idfg.idaho.gov

Project History
This is a continuation of the Idaho Field Station project first approved in 2017. Construction was completed in October, 2021. We seek continuation of this project with a name change from "Idaho Field Station Construction, Furnishing, and Operation" to "Idaho Field Station Operation and Maintenance" and changes to scope and budget for 2022. The budget will be a cost share with Appendix F5.

Background
In 2020, the MC approved construction of a new field station at Trestle Creek and construction was completed in October, 2021. However, some furnishing and equipment purchases are necessary to outfit the facility. This project plan is intended to provide funding for ongoing operational costs like utilities and snow removal as well as provide a small budget for minor maintenance activities like heating system service and consumables such as paper towels, cleaning supplies, etc.

Figure 1. Photograph of the Idaho Field Station.

Goal
Complete construction, complete outfitting the facility, and provide a mechanism to address ongoing utility and operational costs for the Idaho Field Station.

Objectives
1. Cover any outstanding construction costs.

2. Purchase additional materials and equipment to complete outfitting the facility.

3. Provide CFSA funding to pay utility bills.

4. Provide CFSA funding for minor maintenance activities and consumables.

Tasks
1. Pay any outstanding construction or construction management charges. (Objective 1).

2. Purchase outstanding equipment and supplies to make the facility functional (e.g., outside storage, shelving, shop equipment, etc., Objective 2)

3. Pay appropriate electrical, telephone, IT, and trash service bills (Objective 3).

4. Conduct routine minor maintenance to the facility as necessary. (Objective 4)

Work Products
- All work performed for this project plan in 2022 will be documented in an Annual Work Summary; due December 1, 2022

Permitting Requirements
No permits are required for the implementation of this project plan.

Cultural/Historic Resource Review
Avista received approval from the Idaho State Historic Preservation Office and the Cultural Resource Management Group in 2020 for construction of the field station. The work product for this review is confidential due to the sensitive nature of the content.

Benefit to the Resource
Projects operated out of this facility will be consistent with the 2019-2023 Clark Fork River Native Salmonid Restoration Plan (AIT 2018), and the Idaho Tributary Habitat Acquisition and Fishery Enhancement Program (Appendix A of the Clark Fork Settlement Agreement) through enhancement of tributary habitat conditions for native salmonids including Bull Trout and Westslope Cutthroat Trout. As such, they will also be consistent with goals of the Fish Passage/Native Salmonid Restoration Plan Protection, Mitigation & Enhancement measure (Appendix C) and the Dissolved Gas Supersaturation Control, Mitigation, and Monitoring Program (Appendix F5). Tasks would also be consistent with other established plans including the Lake Pend Oreille Bull Trout Conservation Plan (habitat enhancement; Resource Planning

Unlimited 1999) and the IDFG Fisheries Management Plan (IDFG 2019).

Budget

Item	Estimated Carryover	2022 Budget Request
Completion of construction and construction management	$149,818	$0
Outdoor Storage (Shipping Container)	$0	$5,000
Office Furnishings	$500	$0
Lab Equipment and Supplies	$1,000	$0
Shop Equipment and Supplies	$4,500	$0
Avista Time (0.1 FTE)	$2,000	$5,000
Operational (electric, phone, IT, plowing, trash, etc.)	$2,000	$7,500
Total	$159,818	$17,500
Anticipated Expenditures		$177,318

[1] *Estimated carryover of unexpended, approved funds as of January 1.*

The construction, Avista time, and operational costs for this project are a 50:50 cost share with Appendix F5. There is a 2022 request in the amount of $17,500 in Appendix F5 in addition to the total 2022 budget request above.

Literature Cited

AIT (Aquatic Implementation Team). 2018. Clark Fork River Native Salmonid Restoration Plan (2019-2023). Noxon, Montana.

IDFG (Idaho Department of Fish and Game). 2019. Fisheries Management Plan 2019-2024. Boise, Idaho.

Resource Planning Unlimited. 1999. Lake Pend Oreille Bull Trout Conservation Plan. State of Idaho. Boise, Idaho.

2022 PROJECT PLAN

Pack River Watershed Management Plan Addendum

Project Contact

Jessica Erickson, Watershed Coordinator, Pack River Watershed Council (PRWC), (208) 255-5545, bluedeleeuw@gmail.com *and*
Ken Bouwens, Idaho Department of Fish and Game (IDFG), (208) 769-1414, ken.bouwens@idfg.idaho.gov

Project History

This is a continuing project for 2022. The Water Resources Technical Advisory Committee ranked this project on January 22, 2019. Changes have been made to the scope and budget of the project.

Background

The Pack River watershed is the second largest tributary system to Lake Pend Oreille. A variety of native and non-native species utilize the Pack River and its tributaries including Bull Trout and Westslope Cutthroat Trout. This watershed is an important area for native fish and as such, portions of the Pack River watershed have been designated as priority habitat for efforts associated with Appendix E and Appendix A of the Clark Fork Settlement Agreement.

The Pack River is currently included on the State of Idaho's list of water quality impaired waterbodies. Cold-water biota, salmonid spawning, and primary and secondary contact recreation are impaired or not fully supported in the Pack River watershed due to excess sediment, temperature, and nutrients.

In 2001, the Pack River Watershed Council (PRWC), formed in response to the Endangered Species Act listing of Bull Trout and concerns about water quality impairments and observed bank erosion. The PRWC formed a collaborative partnership with the Tri-State Water Quality Council, the Bonner Soil and Water Conservation District, and the Natural Resources Conservation Service to recruit a Technical Advisory Committee (TAC) to help create a watershed management plan that would protect the natural resources of the Pack River and its tributaries.

The Pack River Watershed Management Plan and Total Maximum Daily Load (TMDL) Implementation Plan was completed in 2006 (BSWCD 2006).This document provides general strategies for protecting and improving water quality and includes on-the-ground project recommendations divided into several categories including: development/waterfront property, stormwater, transportation/roads, forestry/agriculture, riparian/buffer zone protection and rehabilitation, tributaries, and stream channels.

Since the development of the Pack River Watershed Management Plan and TMDL Implementation Plan, other watershed assessments have been completed in the Pack River Watershed including the Upper Pack River Stressor Identification (TerraGraphics Environmental Engineering 2006a), McCormick Creek Stressor Identification (TerraGraphics Environmental

Engineering 2006b), Grouse Creek Watershed Assessment and Restoration Prioritization Plan (River Design Group 2009), the Pend Oreille Lake and Tributaries TMDL 5-year Review (IDEQ 2017), and the Grouse Creek Reassessment and Prioritization Plan Update (River Design Group 2018). More recently, a habitat evaluation for Caribou and Hellroaring Creeks was completed in 2019 (GeoEngineers 2019) and a similar evaluation for the upper Pack River and McCormick Creek was completed in 2020 (GeoEngineers 2020).

The Pack River Watershed Management Plan and TMDL Implementation Plan needs to be updated to include the recommendations from the most recent assessments. Initially the update was to be in the form of an addendum to the management plan and would identify and prioritize conservation/restoration/enhancement projects by sub-watershed. This would be a user-friendly living document that can be revised annually and will provide updates on project implementation progress.

In July of 2019, the PRWC met with members of the TAC to develop a strategic restoration plan for the Pack River watershed with the goal to identify and prioritize specific projects that benefit native salmonids by enhancing fish habitat and improving watershed function. The TAC decided it would be beneficial to identify projects specific to each sub-watershed and then prioritize sub-watersheds with a top to bottom approach. It was decided that a small working group consisting of representatives from the Idaho Department of Fish and Game (IDFG), Avista, U.S. Forest Service, Natural Resources Conservation Service, and Trout Unlimited would form a core team that would perform the majority of the work, but would report to a broader review team consisting of interested agencies, citizen groups, or other entities.

Implementation of formal meetings and planning was set to kick off in early 2020, but was not conducted due to the Covid-19 pandemic. Significant work took place in 2021. This proposal requests to extend the timeline of the project by a year and to increase the budget slightly.

Goal
Develop a document that will help stakeholders enhance the quality of the Pack River watershed's natural resources, increase available habitat, and ensure the success of restoration efforts.

Objective
1. Develop a stand-alone document (previously anticipated to be an addendum) complimentary to the Pack River Watershed Management Plan and TMDL Implementation Plan which includes recommendations and updates from the Pend Oreille Lake and Tributaries TMDL 5-year Review, as well as other Watershed Assessments and Habitat Prioritization Evaluations.

Tasks
1. Summarize existing documentation from assessments conducted in the Pack River watershed, reorganizing it into sub-watersheds. (***Completed in 2021***)

2. List completed conservation/restoration/enhancement projects by sub-watershed. (***Ongoing***)

3. Identify recommended conservation/restoration/enhancement projects, and organize by sub-watershed. (***Ongoing***)

Work Products

- Pack River Native Salmonid Habitat Restoration Plan; final due November 1, 2022
- Annual Work Summary; due December 1, 2022

Permitting Requirements

Not applicable for the tasks proposed in this project plan.

Endangered Species Act consultation for this project plan is associated with the 2019 Biological Opinion on the effects of continued operation of the Clark Fork Hydroelectric Project on Bull Trout and designated Bull Trout critical habitat (BiOp), and the U.S. Fish and Wildlife Service (USFWS)-IDFG Cooperative Agreement pursuant to Section 6 of the Act. This project plan is consistent with the analysis and conclusions contained in the 2019 BiOp and the USFWS-IDFG Cooperative Agreement, and will adhere to all appropriate Terms and Conditions designed to reduce the extent and effects of incidental take on Bull Trout. No incidental take of Bull Trout is anticipated as a result of this project plan; therefore, no take reporting is required.

Cultural/Historic Resource Review

Not applicable for the tasks proposed in this project plan, there are no ground and/or vegetation disturbing activities, or proposed impacts to cultural/historic resources.

Benefit to the Resource

This project consistent with the 2019-2023 Clark Fork River Native Salmonid Restoration Plan (AIT 2018). This project is also consistent with the Watershed Councils Program (Appendix E), as well as the Idaho Tributary Habitat Acquisition and Fishery Enhancement Program (Appendix A), as updating the Pack River Management Plan and TMDL Implementation Plan, organized by sub-watershed, will provide a clear and concise format to document past projects as well as identify and prioritize future conservation/restoration/enhancement projects. The Pack River is the second largest tributary to Lake Pend Oreille, and is ranked as a high-priority for restoration and protection under the lake's Key Watershed Bull Trout Problem Assessment (PBTAT 1998).

Budget

Item	Estimated Carryover[1]	2022 Budget Request
Report writing (FTE 0.10)	$0	$2,000
Administration fee (15% of expended funds)	$0	$300
Total	$0	$2,300
Anticipated Expenditures		$2,300

[1] *Estimated carryover of unexpended, approved funds as of January 1.*

Literature Cited

AIT (Aquatic Implementation Team). 2018. Clark Fork River Native Salmonid Restoration Plan (2019-2023). Noxon, Montana.

BSWCD (Bonner Soil and Water Conservation District, Pack River Technical Advisory Committee, Pack River Watershed Council). 2006. Pack River Watershed Management Plan and TMDL Implementation Plan. Bonner County, ID.

GeoEngineers. 2019. Habitat Prioritization Evaluation for Caribou and Hellroaring Creeks. Spokane, WA. Prepared for Avista and the Idaho Dept. of Fish and Game.

GeoEngineers. 2020. Habitat Prioritization Evaluation for McCormick Creek and Upper Pack River. Spokane, WA. Prepared for Avista and the Idaho Dept. of Fish and Game.

IDEQ (Idaho Department of Environmental Quality). 2017. Pend Oreille Lake and Tributaries TMDL 5-year Review.

PBTAT (Panhandle Bull Trout Technical Advisory Team). 1998. Lake Pend Oreille Key Watershed Bull Trout Problem Assessment. Prepared for Lake Pend Oreille Watershed Advisory Group and the State of Idaho. Boise, Idaho.

River Design Group. 2009. Grouse Creek Watershed Assessment and Restoration Prioritization Plan Final Report. Whitefish, Montana. Prepared for Avista Corporation. Noxon, Montana.

River Design Group. 2018. Grouse Creek Reassessment and Restoration Prioritization Plan Final Update. Whitefish, Montana. Prepared for Avista Corporation. Noxon, Montana.

TerraGraphics Environmental Engineering. 2006a. Upper Pack River Stressor Identification. Kellogg, ID.

TerraGraphics Environmental Engineering. 2006b. McCormick Creek Stressor Identification. Kellogg, ID.

2022 PROJECT PLAN

Lower Clark Fork River Minimum Flow and Water Temperature Monitoring

Project Contact

Paul Kusnierz, Avista, (406) 847-1274, paul.kusnierz@avistacorp.com *and*
Bob Steed, Idaho Department of Environmental Quality (IDEQ), (208) 769-1422, Robert.steed@deq.idaho.gov

Project History

This is a continuing project for 2022. It was projected to be conducted 2019–2024; however, with the extremely warm and low flow conditions that occurred in 2021 the underlying objective of collecting data during an extremely warm and dry summer has been met. We are proposing to complete the project in 2022 with data collected July 2019–September 2021. The Water Resources Technical Advisory Committee ranked this project on January 22, 2019. The project was first approved by the Management Committee (MC) in 2019. The scope and budget will be reviewed annually by the MC. The scope and budget for this project in 2022 have been modified to facilitate data analysis and completion of the Project Completion Report.

Background

In the fall of 2017, the parties to the Clark Fork Settlement Agreement (CFSA) agreed to Amendment No. 1 of the CFSA. Section 2.5 of Amendment No. 1 states that "Avista shall implement minimum flow releases of 3,000 cfs below Cabinet Gorge Dam, except for the period of September 15 through October 31 of each year when the minimum flow requirement will be 5,000 cfs below Cabinet Gorge Dam." The 3,000 cfs minimum flow is a reduction from the 5,000 cfs minimum flow identified in Article 429 of the project license issued February 23, 2000. On December 18, 2017, FERC approved this minimum flow change and amended license Article 429 to specify a minimum total project discharge of 3,000 cfs from November 1 to September 14, and 5,000 cfs from September 15 to October 31. On June 11, 2018, the IDEQ submitted a letter to Avista requesting that Avista collaborate with IDEQ through the CFSA to develop and implement a temperature sampling project on the lower Clark Fork River.

Goal

The goal of this project is to determine if discharges from Cabinet Gorge Dam at 3,000 cfs result in temperature changes in the lower Clark Fork River upstream from Lake Pend Oreille influence different than discharges at 5,000 cfs.

Objective

1. Determine the relationship between discharge flow and water temperatures in the Clark Fork River downstream from Cabinet Gorge Dam to evaluate whether discharges from Cabinet Gorge Dam at 3,000 cfs result in changes to temperatures in the lower Clark Fork River upstream from Lake Pend Oreille influence as compared to discharges at 5,000 cfs.

Tasks

1. In consultation with IDEQ, Develop Sampling and Analysis Plan and Quality Assurance Project Plan. (Objective 1; ***Completed in 2019***)

2. Deploy and maintain temperature data loggers (Table 1) and download, and report temperature and flow data for five years (see changes in Project History above). (Objective 1)

3. Collect cross-section temperature data and develop technical memorandum in consultation with IDEQ. (Objective 1; ***Completed in 2019***)

Table 1. Temperature data logger locations 2019–2021.

Stream	Site name	River Km	Latitude	Longitude
Clark Fork River	Temperature Station 1/Clark Fork River USGS gage	13.0	48.087351	-116.073078
Clark Fork River	Temperature Station 2	4.5	48.126804	-116.159274

Work Products

- Project Completion Report; (July 2019–September 2021 data); final due November 1, 2022
- Annual Work Summary; due December 1, 2022

Permitting Requirements

Not applicable for the tasks proposed in this project plan.

Endangered Species Act consultation for this project plan is associated with the 2019 Biological Opinion on the effects of continued operation of the Clark Fork Hydroelectric Project on Bull Trout and designated Bull Trout critical habitat (BiOp). This project plan is consistent with the analyses and conclusions contained in the 2019 BiOp and will adhere to all appropriate Terms and Conditions designed to reduce the extent and effects of incidental take on Bull Trout. No incidental take of Bull Trout is anticipated as a result of this project plan; therefore, no take reporting is required.

Cultural/Historic Resource Review

Not applicable for the tasks proposed in this project plan, there are no ground and/or vegetation disturbing activities, or proposed impacts to cultural/historic resources.

Benefit to the Resource

The CFSA parties' agreement to the lower minimum flow of 3,000 cfs is based on aquatic habitat and fisheries studies performed under Appendix A over the last decade by the Idaho Department of Fish and Game. This research indicated that when minimum flow was increased to 5,000 cfs there were no trends in abundance of Brown Trout, Mountain Whitefish, Rainbow Trout and Rainbow Trout x Westslope Cutthroat Trout hybrids, and Westslope Cutthroat Trout (Ryan and Jakubowski 2012). However, these studies did not include an evaluation of effects on water quality, specifically, Clark Fork River water temperatures and effects to native salmonids or other cold water aquatic life. The monitoring associated with this project plan will help fill this gap in understanding and assist with the management of fishes that utilize the lower Clark Fork River.

Budget

Item	Estimated Carryover[1]	2022 Budget Request
Biologist labor (0.04 FTE)	$3,000	$6,000
Total	$3,000	$6,000
Anticipated Expenditures		$9,000

[1] *Estimated carryover of unexpended, approved funds as of January 1.*

A match of $2,400 will be provided by IDEQ covering employee time spent reviewing data and reports.

Literature Cited

Ryan, R., and R. Jakubowski. 2012. Lower Clark Fork River Fishery Assessment Project Completion Report. Report to Avista Corporation. Noxon, Montana.

2022 PROJECT PLAN

Trestle Creek Habitat Enhancement Project Phase I

Project Contact
Ken Bouwens, Idaho Department of Fish and Game (IDFG), (208) 769-1414,
ken.bouwens@idfg.idaho.gov

Project History
This project was ranked by the WRTAC on January 21, 2020 and approved by the Management Committee in 2020. The physical installation of the project has been completed. The scope and budget have been modified to continue collaboration with Federal Highways engineers through their design process.

Background
Located approximately three miles northwest of Hope, Idaho, Trestle Creek is a third order watershed that encompasses 14,713 acres and includes several smaller tributaries (Figure 1). Trestle Creek watershed's stream density is 1.56 miles of streams per square mile, and the relatively high drainage density and generally steep slopes lead to rapid flood events. This watershed drops 3,300 feet in elevation from the divide across from Quartz Creek to Lake Pend Oreille (LPO).

FIGURE 1. Map of the Trestle Creek watershed. Cross symbols depict ½ km stream increments.

Trestle Creek is a high priority watershed because of the presence of Bull Trout spawning and rearing habitat. It contains some of the highest quality Bull Trout habitat remaining in the LPO /lower Clark Fork River tributary system (PBTTAT 1998). During the past 20 years of Bull Trout redd counts, Trestle Creek has had the overall highest average number of redds. At 223, it's nearly twice as many redds on average as any other tributary where redds are surveyed annually (Jakubowski and Bouwens 2018). However, the number of Bull Trout redds counted in

the watershed has been declining steadily since the mid-2000s (Figure 2) and are declining disproportionately with respect to the rest of the LPO tributaries (Figure 3; Alta 2019), indicating the problem was likely occurring within Trestle Creek, not LPO.

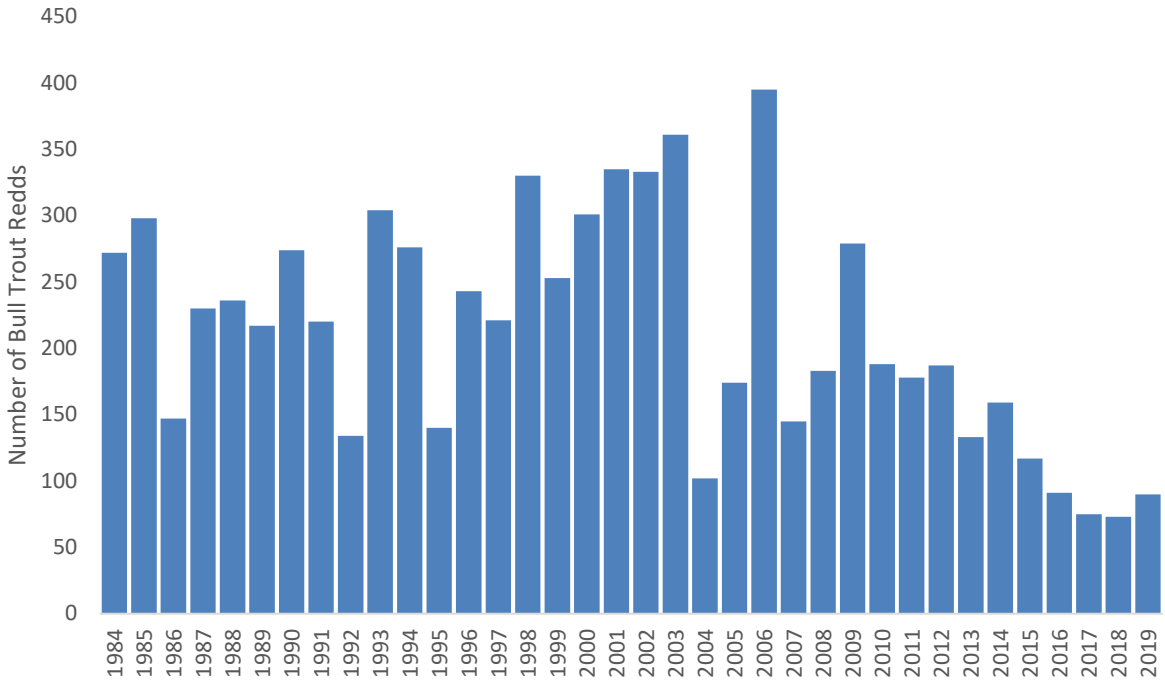


FIGURE 2. Number of Bull Trout redds counted in Trestle Creek, 1984 through 2019.

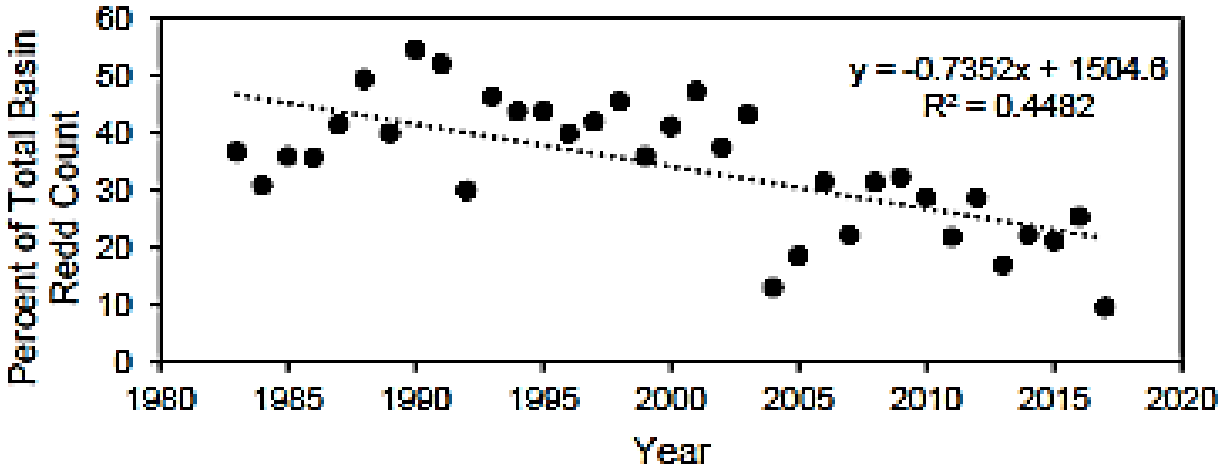


FIGURE 3. Trestle Creek Bull Trout redds as a percentage of the total number of Bull Trout redds counted per year in the LPO basin, 1984–2017. Figure from Alta (2019).

This information inspired the Trestle Creek Habitat Prioritization Evaluation study (Alta 2019). This Clark Fork Settlement Agreement (CFSA)-funded project evaluated Trestle Creek's habitat, geomorphic and riparian condition, and identified areas of degradation and prioritized actions to benefit native salmonids- including Bull Trout. A specific area of impairment was not identified

that could account directly for Bull Trout declines. However, numerous areas were identified that could be improved to increase spawning and rearing conditions for juvenile Bull Trout (Figure 4), and specific projects were proposed to address these impairments. Construction in 2021 will address areas that were identified as severely impaired (Figure 4; Alta 2019).

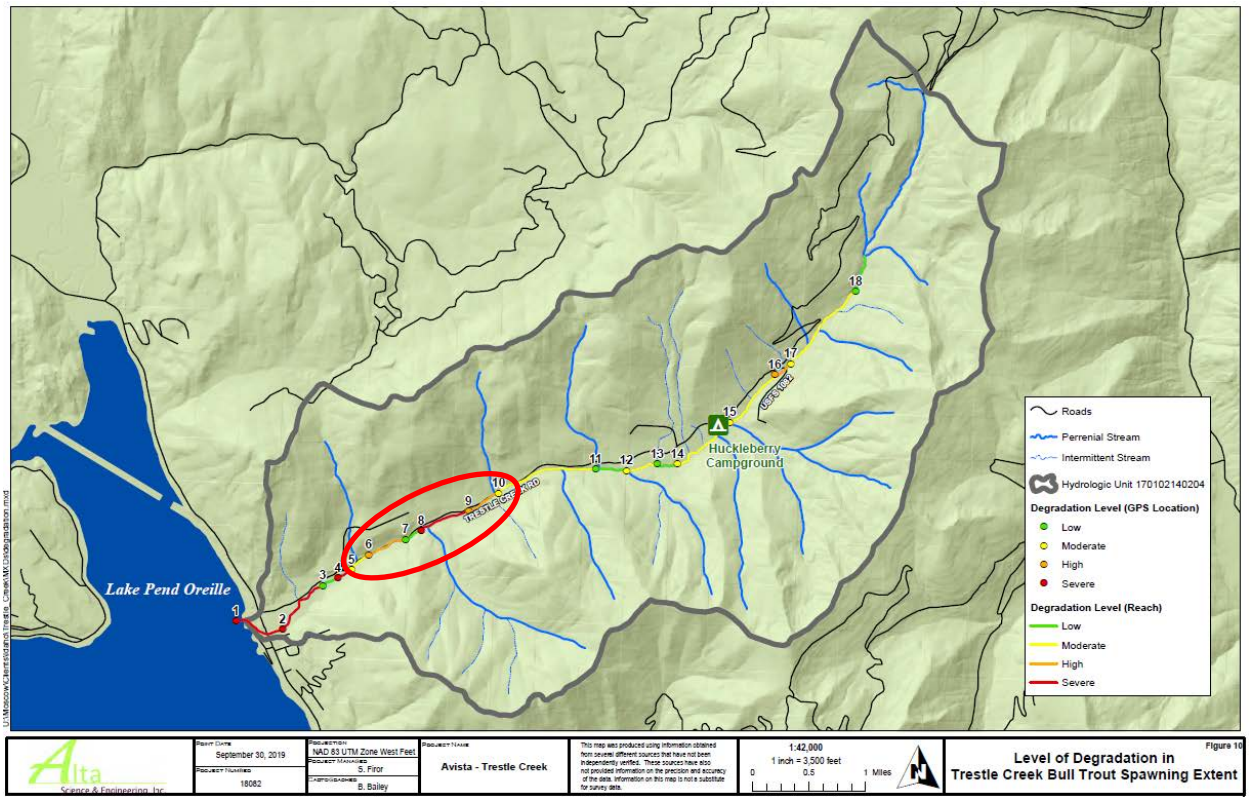


FIGURE 4. Areas of degradation in Trestle Creek. Project area is circled in red. Figure from Alta (2019).

Prioritizing the order to complete these projects can be difficult. In the case of Trestle Creek, an opportunity exists to work with the Federal Highways' Federal Land Access Program (FLAP) and Bonner County to address areas where Trestle Creek Road directly impacts Trestle Creek. The FLAP is designed to provide funding to non-federal entities to increase access to Federal lands. In this case, Trestle Creek Road is owned and maintained by Bonner County. Beginning in 2020, funds prioritized preliminary engineering and topography survey data collection to begin designing habitat rehabilitation as part of the upgrades to Trestle Creek Road. The priority of the road project is to increase the quality of Trestle Creek Road while reducing impacts to Trestle Creek. Drainage will be improved, the road will be widened where possible, and the road will be paved to reduce sedimentation to Trestle Creek and improve drivability. This project will address areas where we can work collaboratively with the FLAP project to provide additional native fish habitat protection and enhancement in coordination with the planned road construction. For example, this project will focus on separating Trestle Creek from the road prism where possible; when not possible, goals include increasing the riparian buffer between the road and the stream (Figure 5). The intent is to partner with the road engineers to blend the FLAP's and the CFSA's priorities into a project beneficial to all. Achieving this goal with the various partners will require additional levels of coordination and engineering collaboration beyond what is typical for a fish

habitat project. Our involvement with this project resulted in a MOU between IDFG and Federal Highways and Bonner County insuring the habitat installed from this project will be preserved during the paving project and IDFG/Avista engineers will be an official part of the design and review team for the road project.

FIGURE 5. Streambank adjacent to Mile 1.3 of Trestle Creek Road.

This proposed project will require coordination and collaboration between our fisheries/hydraulic engineer with the road design team to ensure protection of critical Bull Trout habitat in Trestle Creek. As the road design advances, our team will ensure consideration of fisheries habitat features. Using natural elements such as large trees and boulders, our hydraulic engineer will work with the road engineers to encourage natural processes that will minimize future road bank erosion. In addition, our design goals will include protection of the stream from further road impacts such as limited riparian or floodplain interaction and sediment inputs. Hydraulic features that encourage Bull Trout habitat, such as deflection barbs and increased pool density, will be used to ensure the roadway design has minimal negative impacts to the adjacent stream. This will involve an iterative and collaborative design process using multiple expertise from the partners. The culmination will be mutually acceptable design drawings and cost estimates for projects to be implemented in 2021 and beyond.

Three specific project areas were identified for construction in 2021 (Figure 6). A common intent

in all projects is to use native wood and materials to manipulate the hydraulics and increase pool density and hydraulic roughness. Project 1, the most upstream project, will specifically focus to push water to the left remnant channel and inundate the left floodplain. There is a fork at this location where the left channel will become the primary channel alleviated hydraulic pressure from the roadbed. Wood will be relocated to the toe of the eroding bank below the road to reduce shear stress and velocities causing scour. The Project 2 area will focus on removing some trees that are blocking the left channel and floodplain and similarly use these to protect from the right losing bank below the road. Large equipment will be used on the left channel through this area to encourage the left channel to become primary, which will effectively move much of the flow away from the road while also creating additional rearing and lateral habitat and floodplain inundation. Project 3 is located at extremely steep sections of roadbed where the County maintains practice of dumping rip rap rock into the channel to protect from erosion. The project intent is to roughen the right bank with native large wood (versus riprap), effectively reducing the ability for downstream transfer of shear stress and creating lateral pockets of habitat for juvenile fish. Wood will be strategically located to deflect the creek away from the road and improve rearing pools and lateral habitat.

FIGURE 6. Map of 2021 habitat projects in Trestle Creek.

Goal
Restore and improve Bull Trout habitat in Trestle Creek while protecting it from impacts associated with Trestle Creek Road.

Objectives
1. Continue to participate as a member of the FLAP design team to influence decisions that can be beneficial to native salmonids in Trestle Creek.

2. Develop final designs and cost estimates for implementation of these projects in 2021 and beyond.

3. Complete construction of identified and designed projects.

Tasks
1. Contract a fish habitat engineer to work closely with FLAP design team. (Objective 1; ***Ongoing***)

2. Perform initial bathometry surveys, collect and analyze hydrology data, etc., to develop a description of existing conditions. (Objective 1 and 2; ***Completed in 2021***)

3. Develop final stamped project designs, including CAD drawings and revisions, hydraulic modeling of proposed conditions, stability calculations, technical specifications, etc. (Objective 2; ***Completed in 2021***)

4. Develop cost estimates of final design. (Objective 2; ***Completed in 2021***)

5. Hire a contractor to construct the final design. (Objective 3; ***Completed in 2021***)

6. Construct the project(s). (Objective 3; ***Completed in 2021***)

Work Products
- Engineering work will be documented via appropriate technical memoranda
- Annual Work Summary; due December 1, 2022

Permitting Requirements
All necessary permits were acquired for the construction phase of this project. As the remaining portion of Phase I only involves engineering consultation, no additional permits are required.

Endangered Species Act consultation for this project plan is associated with the 2019 Biological Opinion on the effects of continued operation of the Clark Fork Hydroelectric Project on Bull Trout and designated Bull Trout critical habitat (BiOp), and the U.S. Fish and Wildlife Service (USFWS)-IDFG Cooperative Agreement pursuant to Section 6 of the Act. This project plan is consistent with the analysis and conclusions contained in the 2019 BiOp and the USFWS-IDFG Cooperative Agreement, and will adhere to all appropriate Terms and Conditions designed to reduce the extent and effects of incidental take on Bull Trout. Incidental take reporting for this project plan will be included in the annual Biological Opinion report as required by Term and

Conditions 15–18 of the 2019 Incidental Take Statement, as well as IDFG's annual Section 6 report to the USFWS.

Cultural/Historic Resource Review
Avista received approval from the Idaho State Historic Preservation Office and the Cultural Resource Management Group in 2021 for construction of phase I. The work product for this review is confidential due to the sensitive nature of the content.

Benefit to the Resource
This project is consistent with the 2019-2023 Clark Fork River Native Salmonid Restoration Plan (AIT 2018). The project is also consistent with the Idaho Tributary Habitat Acquisition and Fishery Enhancement Program (Appendix A of the Settlement Agreement), through enhancement of tributary habitat conditions for native salmonids including Bull Trout and Westslope Cutthroat Trout. It is also consistent with the goals of the Dissolved Gas Supersaturation Control, Mitigation, and Monitoring Program (Appendix F5) as it identifies options for improving rearing habitat for Bull Trout, a species identified as the focus of the Appendix F5 mitigation program. The project is consistent with other established plans including the Lake Pend Oreille Bull Trout Conservation Plan (habitat enhancement; Resource Planning Unlimited 1999) and the IDFG Fisheries Management Plan (conservation and enhancement of Bull Trout; IDFG 2019).

Budget

Item	Estimated Carryover[1]	2022 Budget Request
FLAP Consultation Engineering Contract costs	$2,000	$10,000
Total	$2,000	$10,000
Anticipated Expenditures		$12,000

[1] *Estimated carryover of unexpended, approved funds as of January 1.*

Literature Cited
AIT (Aquatic Implementation Team). 2018. Clark Fork River Native Salmonid Restoration Plan (2019-2023). Noxon, Montana.

Alta Science and Engineering Inc. 2019. Trestle Creek Habitat Prioritization Evaluation. Report to Avista and Idaho Department of Fish and Game.

IDFG (Idaho Department of Fish and Game). 2019. Fisheries Management Plan 2019-2024. Boise, Idaho.

Jakubowski, R., and K. A. Bouwens. 2018. 2017 Pend Oreille Basin Bull Trout Redd Monitoring Project Update. Report to Avista, Noxon, Montana and the Idaho Department of Fish and Game, Boise, Idaho.

PBTTAT (Panhandle Bull Trout Technical Advisory Team). 1998. Lake Pend Oreille Key Watershed Bull Trout Problem Assessment.

Resource Planning Unlimited. 1999. Lake Pend Oreille Bull Trout Conservation Plan. State of Idaho. Boise, Idaho.

2022 PROJECT PLAN

Trestle Creek Habitat Enhancement Project Phase II

Project Contact

Ken Bouwens, Idaho Department of Fish and Game (IDFG), (208) 769-1414,
ken.bouwens@idfg.idaho.gov

Project History

This is a new project for 2022, but builds on the first phase of Trestle Creek Habitat work completed in 2021. This project was scored by the WRTAC on 1/19/2022 and the Evaluation and Ranking Criteria scores are included as the last page of this project plan.

Background

Located approximately three miles northwest of Hope, Idaho, Trestle Creek is a third order watershed that encompasses 14,713 acres and includes several smaller tributaries (Figure 1). Trestle Creek watershed's stream density is 1.56 miles of streams per square mile, and the relatively high drainage density and generally steep slopes lead to rapid flood events. This watershed drops 3,300 feet in elevation from the divide across from Quartz Creek to Lake Pend Oreille (LPO).

FIGURE 1. Map of the Trestle Creek watershed. Cross symbols depict ½ km stream increments.

Trestle Creek is a high priority watershed because of the presence of Bull Trout spawning and rearing habitat. It contains some of the highest quality Bull Trout habitat remaining in the LPO /lower Clark Fork River tributary system (PBTTAT 1998). During the past 20 years of Bull Trout redd counts, Trestle Creek has had the overall highest average number of redds. At 223, it's nearly twice as many redds on average as any other tributary where redds are surveyed annually (Jakubowski and Bouwens 2018). However, the number of Bull Trout redds counted in the watershed has been declining steadily since the mid-2000s (Figure 2) and are declining

disproportionately with respect to the rest of the LPO tributaries (Figure 3; Alta 2019), indicating the problem was likely occurring within Trestle Creek, not LPO.

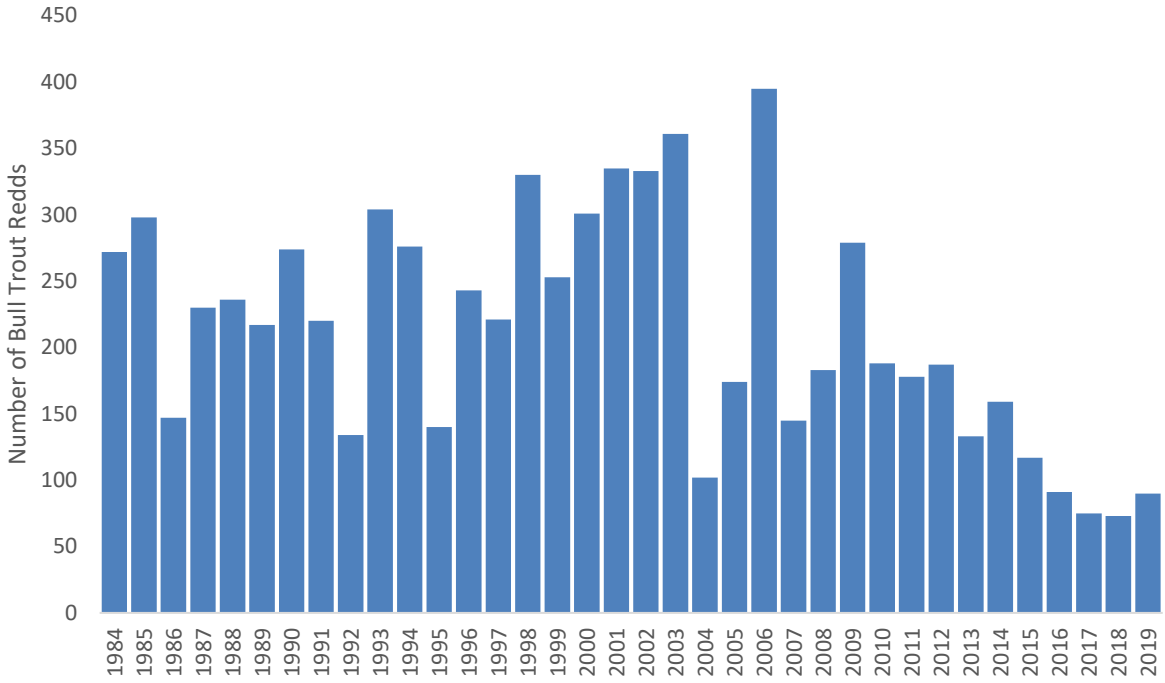


FIGURE 2. Number of Bull Trout redds counted in Trestle Creek, 1984 through 2019.

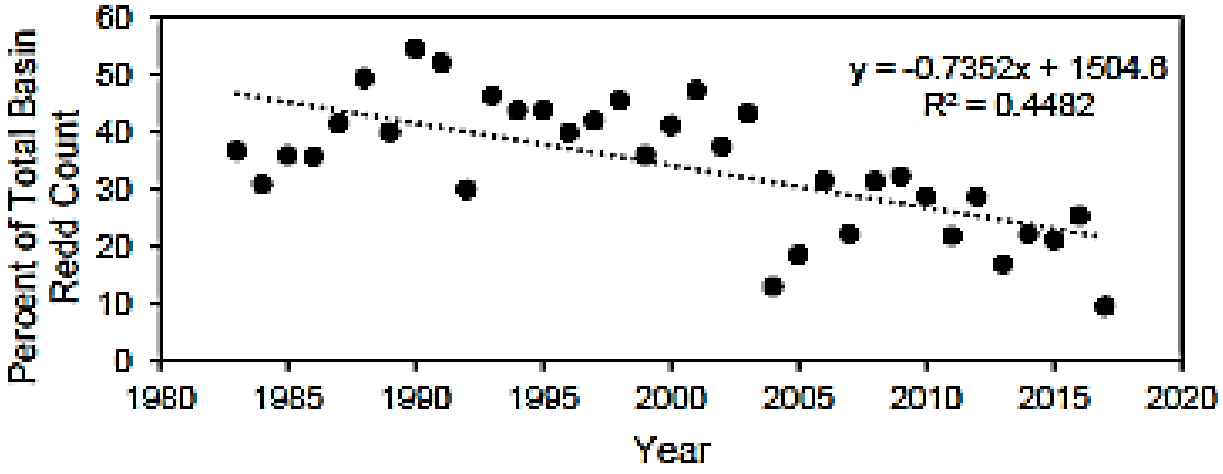


FIGURE 3. Trestle Creek Bull Trout redds as a percentage of the total number of Bull Trout redds counted per year in the LPO basin, 1984–2017. Figure from Alta (2019).

This information inspired the Trestle Creek Habitat Prioritization Evaluation study (Alta 2019). This Clark Fork Settlement Agreement (CFSA)-funded project evaluated Trestle Creek's habitat, geomorphic and riparian condition, and identified areas of degradation and prioritized actions to benefit native salmonids- including Bull Trout. A specific area of impairment was not identified that could account directly for Bull Trout declines. However, numerous areas were identified that

could be improved to increase spawning and rearing conditions for juvenile Bull Trout (Figure 4), and specific projects were proposed to address these impairments. Construction in 2022 will address areas that were identified as severely impaired (Figure 4; Alta 2019).

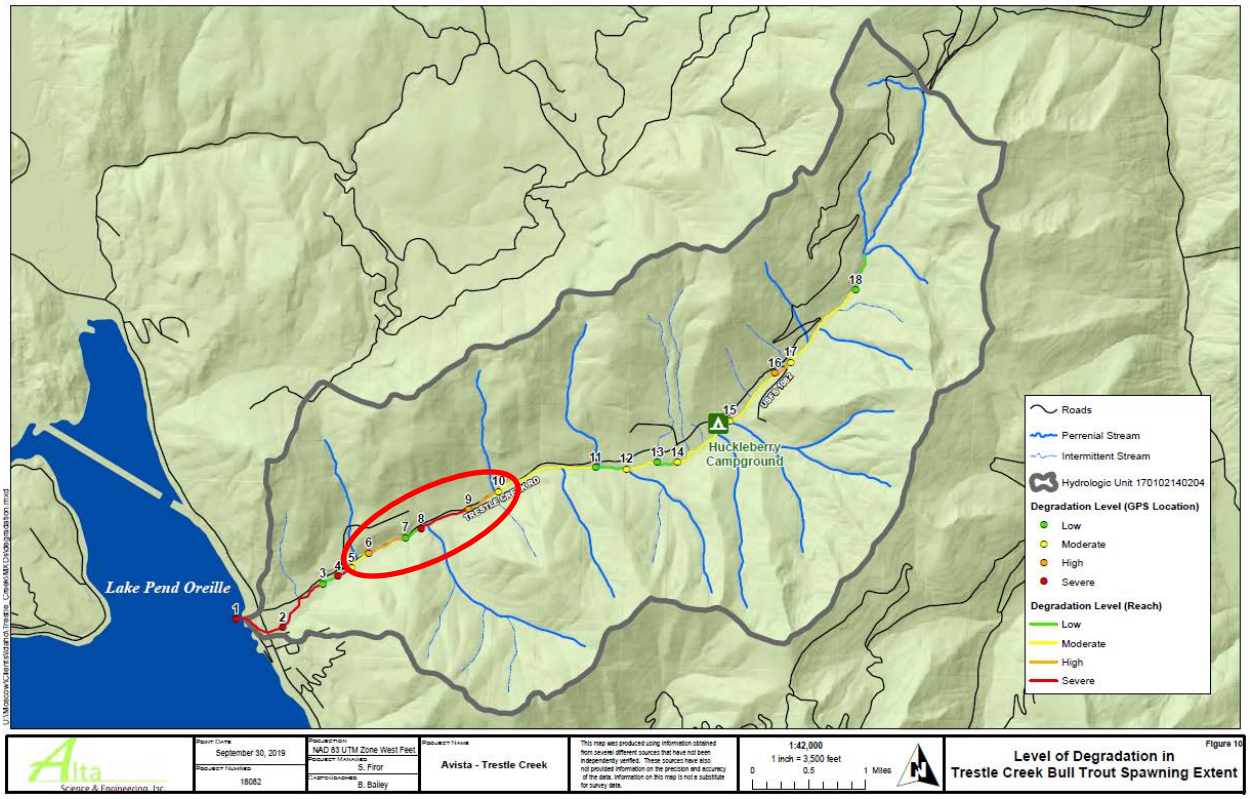


FIGURE 4. Areas of degradation in Trestle Creek. Project area is circled in red. Figure from Alta (2019).

One observation made in the in the Alta study was that in some areas although there seems to be natural blowdown, the relatively large size of the trees in comparison to the stream width precluded this wood from directly interacting with the streambed. These trees often bridge up over the stream and do not come in contact with the stream bed to create significant gravel sorting. In addition, in many places the banks of Trestle Creek are very stable due to “armoring” by large root masses and don’t allow lateral erosion. Without these natural processes, peak flows cause downward bed scour and gravel-sized substrate washes away. A boulder-dominated stream bed is left behind, with associated high stream velocities. This scour creates a disconnection with the floodplain which further increasing stream velocities which in turn causes more scour, forcing the stream to become entrenched (Figure 5).

FIGURE 5. Example of an area with bridged trees and scoured channel in Trestle Creek.

Phase I work involved heavy construction where three areas' low-quality habitat was improved greatly by diverting flow to access previously perched floodplains and was quite successful. A lighter touch is proposed during the second phase. Areas of bed scour with associated appropriate nearby wood sources will be identified for treatment on Avista property. A two-person team, including a highly skilled sawyer/rigger, using a combination of hand tools and directional felling techniques, will install logs/log complexes designed to maximize stream hydraulics, pools, gravel retention, and cover. All trees will be sourced from existing down bridged timber or from the adjacent riparian zone and a grip hoist will be used to move logs into position when necessary. Structures will be passively anchored, using ballast trees and/or bracing against existing trees/boulders, limiting movement where necessary (Figure 6).

FIGURE 6. Trees felled for instream wood structure as part of phase I of the Trestle Creek Improvement Project.

Goal
Restore and improve Bull Trout habitat in Trestle Creek while protecting it from impacts associated with Trestle Creek Road.

Objectives
1. Develop final designs.

2. Complete permitting requirements for Phase II of the project.

3. Complete construction of identified and designed projects.

Tasks
1. Contract a fish habitat engineer to assist with project design and implementation. (Objective 1)

2. As necessary, perform initial bathometry surveys, collect and analyze hydrology data, etc., to develop a description of existing conditions. (Objectives 1 and 2)

3. Develop final stamped project designs, including CAD drawings and revisions, hydraulic modeling of proposed conditions, stability calculations, technical specifications, etc. (Objective 2)

4. Hire a contractor to construct the final design. (Objective 3)

5. Construct the project(s). (Objective 3)

Work Products

- Engineering work will be documented via appropriate technical memoranda
- Final design drawings; due date to be determined
- Annual Work Summary; due December 1, 2022

Permitting Requirements

All necessary state, federal and local permits required for construction will be procured by Idaho department of Fish and Game (IDFG).

Endangered Species Act consultation for this project plan is associated with the 2019 Biological Opinion on the effects of continued operation of the Clark Fork Hydroelectric Project on Bull Trout and designated Bull Trout critical habitat (BiOp), and the U.S. Fish and Wildlife Service (USFWS)-IDFG Cooperative Agreement pursuant to Section 6 of the Act. This project plan is consistent with the analysis and conclusions contained in the 2019 BiOp and the USFWS-IDFG Cooperative Agreement, and will adhere to all appropriate Terms and Conditions designed to reduce the extent and effects of incidental take on Bull Trout. Incidental take reporting for this project plan will be included in the annual Biological Opinion report as required by Term and Conditions 15–18 of the 2019 Incidental Take Statement, as well as IDFG's annual Section 6 report to the USFWS.

Cultural/Historic Resource Review

Avista cultural staff will coordinate a cultural/historic resource review for the project. The work product for this review will be confidential due to the sensitive nature of the content.

Benefit to the Resource

This project is consistent with the 2019-2023 Clark Fork River Native Salmonid Restoration Plan (AIT 2018). The project is also consistent with the Idaho Tributary Habitat Acquisition and Fishery Enhancement Program (Appendix A of the Settlement Agreement), through enhancement of tributary habitat conditions for native salmonids including Bull Trout and Westslope Cutthroat Trout. It is also consistent with the goals of the Dissolved Gas Supersaturation Control, Mitigation, and Monitoring Program (Appendix F5) as it identifies options for improving rearing habitat for Bull Trout, a species identified as the focus of the Appendix F5 mitigation program. The project is consistent with other established plans including the Lake Pend Oreille Bull Trout Conservation Plan (habitat enhancement; Resource Planning Unlimited 1999) and the IDFG Fisheries Management Plan (conservation and enhancement of Bull Trout; IDFG 2019).

Budget

Item	Estimated Carryover[1]	2022 Budget Request
Design Engineering Contract costs	$0	$25,000
Construction Engineering Contract cost	$0	$5,000
Construction Contract costs	$0	$30,000
Avista employee costs (0.02 FTE; fish removals, etc.)	$0	$2,000
Total	$0	$62,000
Anticipated Expenditures		$62,000

[1] *Estimated carryover of unexpended, approved funds as of January 1.*

Literature Cited

AIT (Aquatic Implementation Team). 2018. Clark Fork River Native Salmonid Restoration Plan (2019-2023). Noxon, Montana.

Alta Science and Engineering Inc. 2019. Trestle Creek Habitat Prioritization Evaluation. Report to Avista and Idaho Department of Fish and Game.

IDFG (Idaho Department of Fish and Game). 2019. Fisheries Management Plan 2019-2024. Boise, Idaho.

Jakubowski, R., and K. A. Bouwens. 2018. 2017 Pend Oreille Basin Bull Trout Redd Monitoring Project Update. Report to Avista, Noxon, Montana and the Idaho Department of Fish and Game, Boise, Idaho.

PBTTAT (Panhandle Bull Trout Technical Advisory Team). 1998. Lake Pend Oreille Key Watershed Bull Trout Problem Assessment.

Resource Planning Unlimited. 1999. Lake Pend Oreille Bull Trout Conservation Plan. State of Idaho. Boise, Idaho.

Appendices A and B Tributary Habitat Acquisition and Enhancement Funds Project Evaluation and Ranking Criteria score sheet

As scored by the WRTAC on 1/19/2022

Appendix: A **Project Title: Trestle Creek Habitat Enhancement Project Phase II**

Criteria	Score			
	3	**2**	**1**	**0**
A. Species to benefit	**Bull Trout and Westslope Cutthroat Trout**	Bull Trout or Westslope Cutthroat Trout	Target species but not Bull Trout or Westslope Cutthroat Trout	None
B. Resource increase	Great (> 25%)	**Moderate (10–25%)**	Limited (< 10%)	No increase
C. Project addresses	Threat to existence of population	**Problem that limits population**	Does not address a problem but enhances population	Not associated with target populations
D. Project effectiveness	Solves primary problem	**Partially solves or provides all information to solve primary problem**	Provides some information to address primary problem	Does not address primary problem
E. Cost/benefit	Benefit exceptional relative to cost	**Benefit high relative to cost**	Benefit consistent with cost	Cost exceeds benefit
F. Outside funding	≥ 50%	25–49%	≤ 24%	**Entirely CFSA funded**

Scoring Instructions:

- When ranking proposals that do not involve on-the-ground implementation but are necessary to the scope of physical projects (e.g., applied research, watershed assessments, NEPA analyses), score them with regard to the "expected" or "average" resultant physical project.
- **A score of "0" in any of the criteria does not necessarily mean the project is ineligible for CFSA funding.** Rather, a score of "0" should be considered an indication that this aspect of the project needs to be thoroughly discussed and considered.
- Although total scores for each proposed project can be summed to get a general idea of the relative strength of each project, **the scoring system should be viewed as an ordinal rather than absolute ranking system.** In light of this and in the interest of maintaining a simple and objective scoring system, only whole numbers will be utilized (e.g., no half points).

2022 PROJECT PLAN

Rattle Creek Habitat Enhancement Project Design

Project Contact
Ken Bouwens, Idaho Department of Fish and Game (IDFG), (208) 769-1414,
ken.bouwens@idfg.idaho.gov

Project History
This is a new project for 2022. This project was scored by the WRTAC on 1/19/2022 and the Evaluation and Ranking Criteria scores are included as the last page of this project plan.

Background
Located approximately 16 miles north of Clark Fork, Idaho, Rattle Creek is a third order tributary to Lightning Creek (Figure 1). It drains an area of approximately 27 km^2, and on average receives over 75 inches of precipitation annually, mostly between October and June. It is susceptible to frequent rain-on-snow events due to its elevation and high winter precipitation levels. It is recovering from moderate to high levels of land use through logging and associated road infrastructure (PWA 2004). Recent work in the watershed includes road obliteration and replacement of the U.S. Forest Service (USFS) bridge where the USFS road crosses Rattle Creek near its mouth.

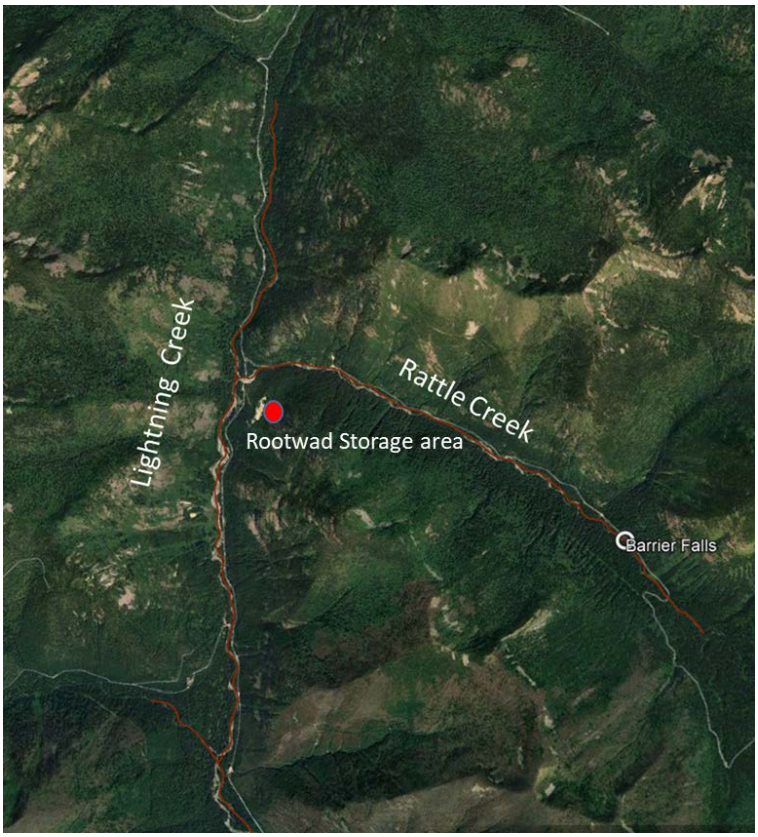


FIGURE 1. Map of Rattle Creek.

Bull Trout utilize the lower 5.8 km of Rattle Creek for spawning and rearing and resident and potentially migratory Westslope Cutthroat Trout are also found throughout the watershed (Bouwens et al. 2021, Ransom et al. 2021). Since 1992 Rattle Creek supported approximately 4% of all Bull Trout redds counted in the LPO watershed and 27% of the redds counted in the Lightning Creek drainage. Rattle Creek Bull Trout redd counts have varied from a high of 67 in 2001 to a low of 0 in 1994, averaging 26 redds over that time period (Figure 2).

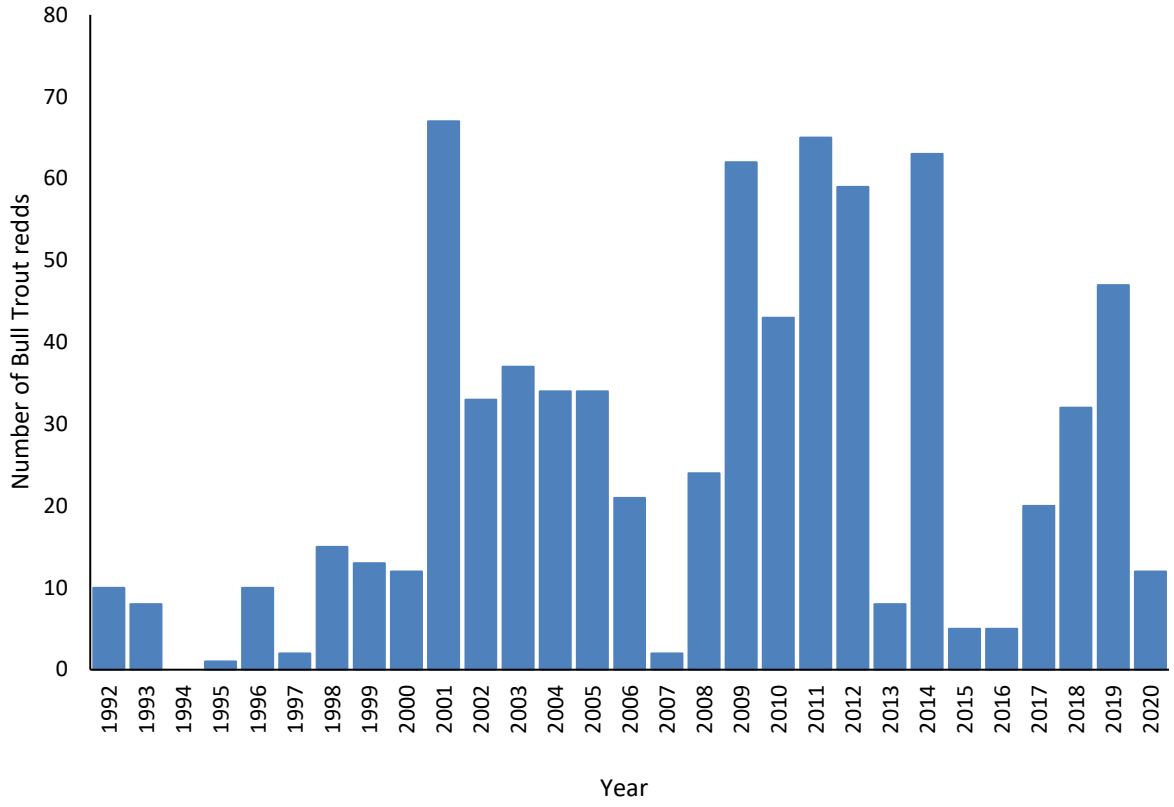


FIGURE 2. Number of Bull Trout redds counted in Rattle Creek, 1992 through 2020.

Two major flood events occurred in the Lightning Creek watershed within the past 15 years. In both 2006 and 2015, discharge exceeded the 50-year flood frequency estimate of 10,300 cfs. The 2006 flood exceeded even the 100-year flood event at 16,400 cfs and the 2015 flood topped at 10,500 cfs (Figure 3; for reference, the 100-year flood event is 12,000 cfs). These two events caused massive scour through the large cobble substrate in Rattle Creek and left much of the wetted stream width completely void of large wood which has resulted in significant loss of pools and fine gravels. Without floodplain wood, the stream lacks ability to retain fine gravels and sediment which has resulted in loss of surface water and pools with increased void space in the large cobble substrate.

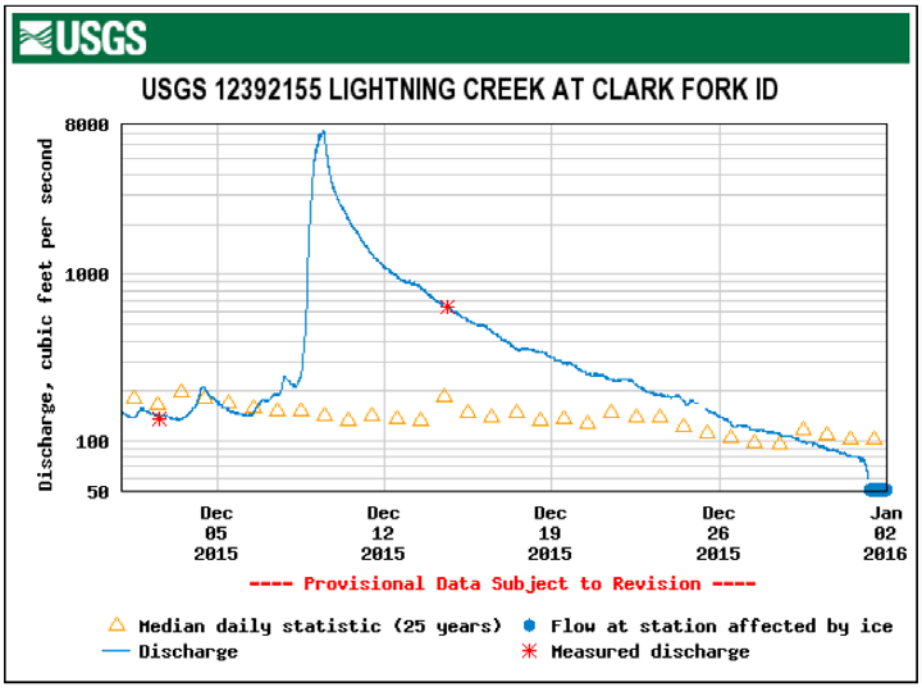


FIGURE 3. Lightning Creek hydrograph.

These events mobilized a large amount of wood and caused significant erosion in the Rattle Creek watershed, and much of wood was transported downstream into Lightning Creek. Most of the riparian timber was lost from the system during this event and transported downstream into mainstem Lightning Creek (Figure 4).

FIGURE 4. Photograph of lower Lightning Creek shortly after the peak of the 2015 flood showing large amounts of new accumulated large woody debris sourced from the upper watershed.

Instream conditions have degraded markedly in Rattle Creek since 2015. There are few

established log jams remaining in the system and the potential for new large wood recruitment has been greatly diminished due to the riparian zone being heavily scoured. Thus, despite ample smaller sediment supply, gravel retention and sorting has been reduced and the streambed has become cobble and boulder dominated with associated high stream velocities. This scour creates a disconnection with the floodplain which further increasing stream velocities, further exacerbating the problem. With little potential wood recruitment, conditions are not expected to change without some sort of intervention (Figures 5 and 6).

FIGURE 5. Photo of current conditions in Rattle Creek.

FIGURE 6. Aerial photo of current conditions in Rattle Creek.

In 2018 and 2019, over 200 rootwads were salvaged from a natural blowdown in the area and stored near Rattle Creek for future use using Appendix A funding (Figure 7). This project proposes to install a portion or all of these trees along with directionally felling select riparian timber in Rattle Creek to create log complexes designed to maximize stream hydraulics, pools, gravel retention, and cover. Due to the lack of road access in the area, it is likely these logs need to be will be transported and placed via helicopter.

The USFS manages the property where the project is proposed to take place, and a substantial amount of coordination with them is anticipated before final project approval. Hence, this design aspect of the project will be conducted in stages so enough information is provided to facilitate USFS review of the project without spending unnecessary dollars. If at any point it appears project approval will not be granted, then work toward final design will be halted.

FIGURE 7. Salvaged rootwads being hauled for storage. The Rattle Creek drainage is visible in the background of this photo.

Goal

Create a preliminary design to restore and improve Bull and Westslope Cutthroat trout habitat and stream functionality in Rattle Creek.

Objectives

1. Work with the U.S. Fish and Wildlife Service (USFWS), USFS, and other project partners to identify areas and types structures to be installed.

2. Create a preliminary and final engineering designs.

3. Develop cost estimates for construction.

Tasks

1. Begin discussion with the U.S. Forest Service (landowner) regarding project implementation.

2. Gain landowner (U.S. Forest Service) permission to implement the project. The project design will not be developed beyond 30% without landowner permission. (Objective 1)

3. Contract a fish habitat engineer. (Objectives 1–3)

4. Perform initial surveys, collect and analyze hydrology data, etc., to develop a description of existing conditions. (Objectives 1–2)

5. Develop 30% project designs, including CAD drawings, proposed conditions, etc. (Objectives 1–2)

6. If landowner agrees with 30% project designs, develop 60% project designs, including refined CAD drawings, modeling of proposed conditions, hydraulic modeling, etc. (Objectives 1–2)

7. If landowner agrees with 60% project designs, develop final design including design verification, technical specifications, and construction details. (Objectives 1–2).

8. Develop cost estimates of construction. (Objective 3)

Work Products

- Engineering work will be documented via appropriate technical memoranda
- Annual Work Summary; due December 1, 2022

Permitting Requirements

As this is for project design only, no permits are required.

Endangered Species Act consultation for this project plan is associated with the 2019 Biological Opinion on the effects of continued operation of the Clark Fork Hydroelectric Project on Bull Trout and designated Bull Trout critical habitat (BiOp), and the USFWS-IDFG Cooperative Agreement pursuant to Section 6 of the Act. This project plan is consistent with the analysis and conclusions contained in the 2019 BiOp and the USFWS-IDFG Cooperative Agreement, and will adhere to all appropriate Terms and Conditions designed to reduce the extent and effects of incidental take on Bull Trout. Incidental take reporting for this project plan will be included in the annual Biological Opinion report as required by Term and Conditions 15–18 of the 2019 Incidental Take Statement, as well as IDFG's annual Section 6 report to the USFWS.

Cultural/Historic Resource Review

Not applicable for the tasks proposed in this project plan, there are no ground and/or vegetation disturbing activities, or proposed impacts to cultural/historic resources.

Benefit to the Resource

This project is consistent with the 2019-2023 Clark Fork River Native Salmonid Restoration Plan (AIT 2018). The project is also consistent with the Idaho Tributary Habitat Acquisition and Fishery Enhancement Program (Appendix A of the Settlement Agreement), through enhancement of tributary habitat conditions for native salmonids including Bull Trout and Westslope Cutthroat Trout. It is also consistent with the goals of the Dissolved Gas Supersaturation Control, Mitigation, and Monitoring Program (Appendix F5) as it identifies options for improving rearing habitat for Bull Trout, a species identified as the focus of the Appendix F5 mitigation program. The project is consistent with other established plans including the Lake Pend Oreille Bull Trout Conservation Plan (habitat enhancement; Resource Planning Unlimited 1999) and the IDFG Fisheries Management Plan (conservation and enhancement of Bull Trout; IDFG 2019).

Budget

Item	Estimated Carryover[1]	2022 Budget Request
Design Engineering Contract costs	$0	$78,000
Avista employee costs (0.02 FTE; assist with field work, etc.)	$0	$2,000
Total	$0	$80,000
Anticipated Expenditures		$80,000

[1] *Estimated carryover of unexpended, approved funds as of January 1.*

Literature Cited

AIT (Aquatic Implementation Team). 2018. Clark Fork River Native Salmonid Restoration Plan (2019-2023). Noxon, Montana.

Bouwens, K.A., R. Jakubowski, A. Ransom, J. Johnson, and S. Busmire. 2021. 2020 Idaho Tributary Salmonid Abundance Monitoring Annual Project Update. Avista Doc. No 2021-0162. Report to Avista and the Idaho Department of Fish and Game.

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PWA. 2004. Lightning Creek Watershed Assessment. Phillip Williams and Associates, Ltd. San Francisco, California.

Ransom, A., R. Jakubowski, and K.A. Bouwens. 2021. 2020 Pend Oreille Basin Bull Trout Redd Monitoring Project Update. Avista Doc. No. 2021-0041. Report to Avista and the Idaho Department of Fish and Game.

Resource Planning Unlimited. 1999. Lake Pend Oreille Bull Trout Conservation Plan. State of Idaho. Boise, Idaho.

Appendices A and B Tributary Habitat Acquisition and Enhancement Funds Project Evaluation and Ranking Criteria score sheet

As scored by the WRTAC on 1/19/2022

Appendix: A **Project Title: Rattle Creek Habitat Enhancement Project Design**

Criteria	Score			
	3	**2**	**1**	**0**
A. Species to benefit	**Bull Trout and Westslope Cutthroat Trout**	Bull Trout or Westslope Cutthroat Trout	Target species but not Bull Trout or Westslope Cutthroat Trout	None
B. Resource increase	Great (> 25%)	**Moderate (10–25%)**	Limited **(**< 10%**)**	No increase
C. Project addresses	Threat to existence of population	**Problem that limits population**	Does not address a problem but enhances population	Not associated with target populations
D. Project effectiveness	Solves primary problem	Partially solves or provides all information to solve primary problem	**Provides some information to address primary problem**	Does not address primary problem
E. Cost/benefit	Benefit exceptional relative to cost	**Benefit high relative to cost**	Benefit consistent with cost	Cost exceeds benefit
F. Outside funding	≥ 50%	25–49%	≤ 24%	**Entirely CFSA funded**

Scoring Instructions:

- When ranking proposals that do not involve on-the-ground implementation but are necessary to the scope of physical projects (e.g., applied research, watershed assessments, NEPA analyses), score them with regard to the "expected" or "average" resultant physical project.
- **A score of "0" in any of the criteria does not necessarily mean the project is ineligible for CFSA funding.** Rather, a score of "0" should be considered an indication that this aspect of the project needs to be thoroughly discussed and considered.
- Although total scores for each proposed project can be summed to get a general idea of the relative strength of each project, **the scoring system should be viewed as an ordinal rather than absolute ranking system.** In light of this and in the interest of maintaining a simple and objective scoring system, only whole numbers will be utilized (e.g., no half points).

2022 PROJECT PLAN

Fish Resource Monitoring, Enhancement, and Management Plan

Project Contact
Ken Bouwens, Idaho Department of Fish and Game (IDFG), (208) 769-1414
ken.bouwens@idfg.idaho.gov

Project History
This is a continuing project that was originally approved for funding from Appendix A by the Management Committee (MC) in 1999. The scope and budget for this project are reviewed by the MC annually. Continued periodic monitoring of fish abundance in the Clark Fork River in Idaho has occurred through this project plan since 1999. In 2021, this monitoring was moved to the Appendix F5 project plan titled "Clark Fork River Population Monitoring." In 2022, the comprehensive report associated with this monitoring prior to 2021 was moved to the "Clark Fork River Population Monitoring" project plan.

Background
Implementation of on-the-ground activities associated with the Clark Fork Settlement Agreement (CFSA) began in 1999. One tenant of the CFSA and the Native Salmonid Restoration Plan is that restoration actions will be monitored to evaluate their effectiveness in achieving the maintenance, enhancement, and restoration of native salmonid populations. This requires some funds be used for research and monitoring to meet this need.

Monitoring of salmonid abundance in 25 Lake Pend Oreille (LPO) spawning and rearing tributaries and annual monitoring of Bull Trout redd abundance in LPO tributaries are long-term projects expected to continue. The information collected in these projects is necessary for evaluating impacts from habitat changes, both as a result of directed fish habitat improvement projects and as a result of natural events such as floods. Abundance monitoring provides valuable information on recruitment trends of juvenile Bull Trout as well as long-term trends in the fish assemblages in tributary streams. Bull Trout redd counts are required monitoring identified in the CFSA and provide a valuable long-term data set for use in evaluating project goals. In addition, this monitoring is valuable for describing abundance and distribution trends of other native and non-native fishes.

In 2009, IDFG began implementing a rotating LPO basin-wide abundance monitoring plan. In this plan each monitored stream throughout the LPO basin would be sampled approximately once every five years. Following the intent of the proposed guidelines for juvenile abundance monitoring, we propose sampling streams last surveyed in 2017 including East Fork Lightning, Porcupine, Rattle, Savage, Wellington, and North Gold creeks. This will complete the third round of sampling of these streams. In addition to this work we will continue to look for opportunities to make new observations by surveying tributaries not previously sampled, and to perform other monitoring or sampling as necessary and as time allows.

Goal
Perform necessary fish resource monitoring to support enhancement and management actions

with respect to the CFSA.

Objectives

1. Perform annual tributary monitoring.

2. Summarize 2009–2018 tributary monitoring data.

3. Perform annual redd counts.

Tasks

1. Monitor East Fork Lightning, Porcupine, Rattle, Savage, Wellington, and North Gold creeks using standardized stream e-fishing methods for salmonid abundance (see Bouwens et al., 2021). Sampling will take place over approximately 100 m reaches every km or every other km, depending on stream length, to correspond with reaches last sampled in 2017. A temperature data logger will be deployed near the mouth of each stream in 2022 (Table 1). (Objective 1)

2. Summarize 2021 and 2022 tributary monitoring data in annual project update reports. (Objective 1)

3. Perform a comprehensive analysis of 2009–2018 tributary monitoring data and summarize long-term trends in species-specific abundance, distribution, size, and relative species composition. (Objective 2)

4. Perform Bull Trout redd counts using standardized methods on 22 tributaries to LPO. (see Ransom et al. 2021; Objective 3)

5. Summarize 2021 and 2022 Bull Trout redd count data in annual project update reports. (Objective 3)

Table 1. Location of temperature data loggers on E.F. Lightning, Porcupine, Rattle, Savage, Wellington, and North Gold creeks.

Stream	Site name	River km	Latitude	Longitude
E.F. Lightning	E.F. Lightning 1	1.0	48.244064	-116.102375
Porcupine	Porcupine 1	1.0	48.263145	-116.135107
Rattle	Rattle 1	1.0	48.328901	-116.161492
Savage	Savage 1	0.4	48.245491	-116.093878
Wellington	Wellington 1	2.9	48.289320	-116.196221
North Gold	North Gold 1	1.0	47.972025	-116.440196

Work Products

- Annual Project Update; 2021 tributary monitoring data; final due November 1, 2022
- Annual Project Update; 2021 redd count data; final due November 1, 2022
- Comprehensive Project Report; report summarizing 2009–2018 tributary monitoring data; final due December 1, 2022
- Annual Work Summary; due December 1, 2022

- Temperature monitoring data for the six sites; due December 1, 2022
- Annual Project Update: 2022 tributary monitoring data; final due November 1, 2023
- Annual Project Update; 2022 Bull Trout redd count data; final due November 1, 2023

Permitting Requirements
Not applicable for the tasks proposed in this project plan.

Endangered Species Act consultation for this project plan is associated with the 2019 Biological Opinion on the effects of continued operation of the Clark Fork Hydroelectric Project on Bull Trout and designated Bull Trout critical habitat (BiOp), and the U.S. Fish and Wildlife Service (USFWS)-Idaho Department of Fish and Game (IDFG) Cooperative Agreement pursuant to Section 6 of the Act. This project plan is consistent with the analysis and conclusions contained in the 2019 BiOp and the USFWS-IDFG Cooperative Agreement, and will adhere to all appropriate Terms and Conditions designed to reduce the extent and effects of incidental take on Bull Trout. Incidental take reporting for this project plan will be included in the annual Biological Opinion report as required by Term and Conditions 15–18 of the 2019 Incidental Take Statement, as well as IDFG's annual Section 6 report to the USFWS.

Cultural/Historic Resource Review
Not applicable for the tasks proposed in this project plan, there are no ground and/or vegetation disturbing activities, or proposed impacts to cultural/historic resources.

Benefit to the Resource
Ongoing monitoring of LPO tributary native salmonid populations provide a measure of effectiveness of past work (e.g., habitat improvement) and also provide a tool for determining and prioritizing future work priorities. The proposed activities using this fund are consistent with the Idaho Tributary Habitat Acquisition and Fishery Enhancement Program (Appendix A of the Clark Fork Settlement Agreement), through assessment of native salmonid populations, including Bull Trout and Westslope Cutthroat Trout. As such, they are also consistent with goals of the Fish Passage/Native Salmonid Restoration Plan (Appendix C), and the Dissolved Gas Supersaturation Control, Mitigation, and Monitoring Program (Appendix F5) as many of the focus species of the Appendix F5 mitigation program also utilize tributary habitat during part of their life history. Tasks conducted under this fund are also consistent with other established plans including the Lake Pend Oreille Bull Trout Conservation Plan (Resource Planning Unlimited 1999) and the IDFG Fisheries Management Plan (IDFG 2019).

Budget
In recognition of the activities occurring through this project plan and the costs associated with them, in 2019 we requested and the MC approved that the allocation for the Fish Resource Monitoring, Enhancement and Management Plan be permanently increased to $96,000. The funding for this plan will continue to be transferred from the Tributary Habitat and Acquisition and Enhancement Program under Appendix A. These transferred funds will revert back to the Tributary Habitat and Acquisition and Enhancement Program if not spent in a given year.

Item	Estimated Carryover[1]	2022 Budget Request
Avista labor (0.8 FTE)	$22,515	$79,500
Field gear (waders, raingear, gloves, etc.)	$0	$2,900
Data collection supplies (PIT Tags, vials, dip nets, etc.)	$0	$4,100
Vehicle/boat operation and maintenance	$0	$6,000
Avista technician training and professional development	$0	$3,000
Avista administration	$0	$500
Total	$22,515	$96,000
Anticipated Expenditures		$118,515

[1] *Estimated carryover of unexpended, approved funds as of January 1.*

Literature Cited

Bouwens, K.A., R. Jakubowski, A. Ransom, J. Johnson, and S. Busmire. 2021. 2020 Idaho Tributary Salmonid Abundance Monitoring Annual Project Update. Avista Doc. No 2021-0162. Report to Avista and the Idaho Department of Fish and Game.

IDFG (Idaho Department of Fish and Game). 2019. Fisheries Management Plan 2019-2024. Boise, Idaho.

Ransom, A., R. Jakubowski, and K.A. Bouwens. 2021. 2020 Pend Oreille Basin Bull Trout Redd Monitoring Project Update. Avista Doc. No. 2021-0041. Report to Avista and the Idaho Department of Fish and Game.

Resource Planning Unlimited. 1999. Lake Pend Oreille Bull Trout Conservation Plan. State of Idaho. Boise, Idaho.

2022 ANNUAL IMPLEMENTATION PLAN SUMMARY – APPENDIX B

Clark Fork Project, FERC No. 2058
Cabinet Gorge and Noxon Rapids Hydroelectric Developments

Title
Montana Tributary Habitat Acquisition and Recreational Fishery Enhancement Program

Implementation Staff Lead
Travis Rehm, Montana Fish, Wildlife and Parks (MFWP), (406) 382-3032, travis.rehm@mt.gov

Background
The purpose of this program is to offset the impacts of the power peaking operation of the Cabinet Gorge and Noxon Rapids Projects to native salmonids and recreational fisheries in Montana. This program is a multiple component effort that includes the restoration and enhancement of Clark Fork River tributary watersheds, support of recreational fishery monitoring and management, and evaluation and implementation of recreational fishery enhancement projects. This program is comprised of two primary components: Tributary Habitat Acquisition and Enhancement; and, Fish Resource Monitoring, Enhancement, and Management (including Sub-impoundment Fisheries).

2022 Project Plans
Tributary Habitat Acquisition and Enhancement

1. Habitat Restoration Monitoring and Native Salmonid Abundance Monitoring Plan
2. Redd Surveys in Montana Tributaries
3. Sims Meander Stream and Floodplain Restoration Project
4. Stream Gage Monitoring
5. Crow Creek Bull Trout Investigation
6. Graves Creek Pilot Habitat Enhancement Project
7. Upper Prospect Creek LWD Project
8. Lower Clark Fork Watershed Group Project Coordination
9. Habitat Restoration Monitoring, Maintenance, and Contingency Allocation
10. Habitat Restoration, Property Acquisition, and Conservation Easement Contingency Allocation
11. East Fork Bull River Morphology, Connectivity, and Habitat Enhancement Project

Recreational Fishery Enhancement

12. Cabinet Gorge and Noxon Reservoir Fisheries Monitoring Plan
13. Pilot Project: Treatment of Eurasian Watermilfoil Beds with a Mechanical Harvester
14. Mountain Lake Fisheries Monitoring Project
15. Lower Bull River Day Use Boat Access Site Operation
16. Noxon Reservoir Boat Ramp Improvements
17. Managing Aquatic Invasive Plants on Noxon and Cabinet Gorge Reservoirs
18. Dreissenid Mussel Sampling on Noxon and Cabinet Gorge Reservoirs
19. Noxon Reservoir Bathymetry Update (***New***)

Work Products

Habitat Restoration Monitoring and Native Salmonid Abundance Monitoring Plan

- Annual Project Update; 2021 activities; final due October 1, 2022
- Annual Project Update; 2022 activities; final due October 1, 2023
- Temperature monitoring data for the long-term sites; due December 1, 2022
- Annual Work Summary; from Appendix B Aquatic Program Lead to Avista; due December 1, 2022

Redd Surveys in Montana Tributaries

- Annual Project Update; Redd Survey (2021 data); final due April 1, 2022
- Annual Work Summary; due December 1, 2022
- Annual Project Update; Redd Survey (2022 data); final due April 1, 2023

Sims Meander Stream and Floodplain Restoration Project

- Mid-Year Report; due to the Appendix B Aquatic Program Leader (APL) August 1, 2022
- Annual Work Summary; due to the APL November 15, 2022
- As-built monitoring report; expected December 2022

Stream Gage Monitoring

- Excel spreadsheet containing 2022 water year temperature and discharge data in 30-minute intervals for each stream (and channel) will be provided to Avista by January 1, 2023
- 2022 Annual Water Year Data Report for each stream (Bull River, East Fork Bull River, Rock Creek, Trout Creek, Vermilion River, Graves Creek); due January 1, 2023
- Mid-year report; due to Appendix B Aquatic Program Leader (APL) August 1, 2022
- Annual Work Summary; due to APL November 15, 2022

Crow Creek Bull Trout Investigation

- Annual Work Summary; from Appendix B Aquatic Program Leader to Avista; due December 1, 2022
- Project Completion Report; final due December 31, 2022

Graves Creek Pilot Habitat Enhancement Project

- Mid-year report; due to the Appendix B Aquatic Program Leader (APL) August 1, 2022
- Annual Work Summary; due to the APL November 15, 2022
- Review of substrate changes in a technical memo following two years of spring runoff; due March 31, 2022
- Annual fixed-point photo-documentation

Upper Prospect Creek LWD Project

- Mid-year report; due to Appendix B Aquatic Program Leader (APL) August 1, 2022
- Annual Work Summary; due to the APL November 15, 2022
- Review of fisheries and/or physical habitat monitoring efforts two-years post run-off (2022-2024, depending on timing of final monitoring activities) in technical memo or in Appendix B Native Salmonid Tributary Habitat Restoration Monitoring Update

Lower Clark Fork Watershed Group Project Coordination

- Comprehensive Project Report; Lower Clark Fork Stream Restoration Summary (1995-2021) – review draft; March 31, 2022
- Comprehensive Project Report; Lower Clark Fork Stream Restoration Summary (1995-2021) – final; June 30, 2022
- Comprehensive Project Report; Lower Clark Fork Stream Restoration Summary (1995-

2021) – complementary maps; December 31, 2022
- Mid-year report; due to Appendix B Aquatic Program Leader (APL), August 1, 2022
- Annual Work Summary; due to APL November 15, 2022

Habitat Restoration Monitoring, Maintenance, and Contingency Allocation
- Project Completion Report for Mainstem Bull River Reforestation on Forest Service Lands and NEPA Process (including photo-documentation); final due May 1, 2022
- Mid-year report; due to Appendix B Aquatic Program Leader (APL) August 1, 2022
- Annual Work Summary; due to APL November 15, 2022

Habitat Restoration, Property Acquisition, and Conservation Easement Contingency Allocation
- Annual Work Summary; from Appendix B Aquatic Program Leader to Avista; due December 1, 2022
- Designs for specific projects would be reported in the form of a Technical Memorandum

East Fork Bull River Morphology, Connectivity, and Habitat Enhancement Project
- Beaver management plan (likely memorandum); due June 1, 2022
- Flow management assessment and recommendations (likely memorandum); due June 1, 2022
- Annual Work Summary; due to Appendix B Aquatic Program Leader November 15, 2022

Cabinet Gorge and Noxon Reservoir Fisheries Monitoring Plan
- Annual Project Update; 2019 activities; final due May 31, 2022
- Annual Project Update; 2021 activities; final due October 31, 2022
- Annual Work Summary; from Appendix B Aquatic Program Leader to Avista; due December 1, 2022

Pilot Project: Treatment of Eurasian Watermilfoil Beds with a Mechanical Harvester
- Mid-year report; due to Appendix B Aquatic Program Leader (APL) August 1, 2022
- Annual Work Summary; due to APL November 15, 2022
- Comprehensive Project Report (2022–2024 data); final due May 1, 2025

Mountain Lake Fisheries Monitoring Project
- Annual Work Summary; from Appendix B Aquatic Program Leader to Avista; due December 1, 2022
- Comprehensive Project Report; final due to Avista December 31, 2022

Lower Bull River Day Use Boat Access Site Operation
- Annual Work Summary (of site visitation information); from contractor to Appendix B Aquatic Program Leader and Avista; due November 15, 2022
- Annual Work Summary; due December 1, 2022

Noxon Reservoir Boat Ramp Improvements
- Early spring Thompson Falls State Park Management Plan addendum; Technical memorandum or other appropriate work product listing associated development options, including site plan(s) and cost estimates; due April 1, 2022
- Annual Work Summary; due December 1, 2022

Managing Aquatic Invasive Plants on Noxon and Cabinet Gorge Reservoirs
- Mid-year report; due to the Appendix B Aquatic Program Leader (APL) August 1, 2022
- Annual Work Summary; due to the APL November 15, 2022

Dreissenid Mussel Sampling on Noxon and Cabinet Gorge Reservoirs

- Mid-year report; due to Appendix B Aquatic Program Leader (APL) August 1, 2022
- Sampling status report (likely memorandum); due September 30, 2022
- Annual Work Summary; due to the APL November 15, 2022

Noxon Reservoir Bathymetry Update

- Internal-use map; due December 31, 2022
- Annual Work Summary; due December 1, 2022

2022 Appendix B Tributary Habitat Acquisition and Enhancement Fund Budget

Budget Summary	
Unexpended funds with interest	$2,091,406
2022 contribution (including GDP inflation rate)	$439,567
Total available	**$2,530,973**
2022 MC-approved budget	$334,432
Unobligated funds	**$2,196,541**

2022 Project	Carryover[1]	2022 Budget
Habitat Restoration Monitoring and Native Salmonid Abundance Monitoring Plan	$29,500	$108,500
Redd Surveys in Montana Tributaries	$8,000	$20,500
Sims Meander Stream and Floodplain Restoration Project	$33,979	$0
Stream Gage Monitoring (cost share with Appendix C)	$0	$5,092
Crow Creek Bull Trout Investigation	$2,749	$0
Graves Creek Pilot Habitat Enhancement Project	$2,831	$0
Upper Prospect Creek LWD Project	$0	$880
Lower Clark Fork Watershed Group Project Coordination	$0	$21,351
Habitat Restoration Monitoring, Maintenance, and Contingency Allocation	$0	$24,050
Habitat Restoration, Property Acquisition, and Conservation Easement Contingency Allocation	$0	$60,000
East Fork Bull River Morphology, Connectivity, and Habitat Enhancement Project	$17,000	$0
Total	**$94,059**	**$240,373**
MC-approved budget		**$334,432**

[1] *Estimated carryover of unexpended, approved funds as of January 1.*

2022 Appendix B Recreational Fishery Enhancement Fund Budget

Budget Summary	
Unexpended funds with interest	$1,313,699
2022 contribution (including GDP inflation rate)	$293,042
Total available	**$1,606,741**
2022 MC-approved budget	$228,159
Unobligated funds	**$1,378,582**

2022 Project	Carryover[1]	2022 Budget
Cabinet Gorge and Noxon Reservoir Fisheries Monitoring Plan	$15,000	$83,000
Pilot Project: Treatment of Eurasian Watermilfoil Beds with a Mechanical Harvester	$30,000	$17,000
Mountain Lake Fisheries Monitoring Project	$2,001	$0
Lower Bull River Day Use Boat Access Site Operation	$2,518	$3,500
Noxon Reservoir Boat Ramp Improvements	$4,250	$7,800
Managing Aquatic Invasive Plants on Noxon and Cabinet Gorge Reservoirs	$4,500	$40,000
Dreissenid Mussel Sampling on Noxon and Cabinet Gorge Reservoirs	$0	$2,140
Noxon Reservoir Bathymetry Update	$0	$16,450
Total	**$58,269**	**$169,890**
MC-approved budget		**$228,159**

[1] *Estimated carryover of unexpended, approved funds as of January 1.*

2022 PROJECT PLAN

Habitat Restoration Monitoring and Native Salmonid Abundance Monitoring Plan

Project Contact

Travis Rehm, Montana Fish, Wildlife and Parks (MFWP), (406) 382-3032, travis.rehm@mt.gov,
and
Jason Blakney, MFWP, (406) 382-3033, jblakney@mt.gov

Project History

This is a continuing project. Habitat Restoration Monitoring was originally approved by the Management Committee (MC) in 2001 and the addition of Native Salmonid Abundance Monitoring was originally approved in 2003. The scope and budget of this project are reviewed by the MC annually.

Background

The main goal of this project is to monitor the abundance of juvenile and resident salmonids with an emphasis on Bull Trout and Westslope Cutthroat Trout (WCT) in drainages key to the long-term persistence of these species. A secondary goal is to monitor salmonid abundance before and after stream restoration projects. Monitoring stream fish populations is necessary for documenting long-term variation associated with native fish populations and changes in the abundance and distribution of non-native fish species. This long-term monitoring is essential for the planning and implementation of restoration projects and/or management intervention, supplementation, reintroduction of extirpated populations and/or to focus other conservation-based activities.

Stream monitoring activities proposed for 2022 will focus on 1) long-term abundance, habitat restoration monitoring and updating WCT genetic information; 2) Prospect Creek native salmonid salvage; 3) evaluation of baseflow barriers to upstream Bull Trout movement; and 4) Bull River drainage native salmonid data collection and evaluation.

Long-term abundance and habitat restoration monitoring

Data collection in local native salmonid streams should be tailored to specific restoration and enhancement projects to ensure the best possible biotic and abiotic data is quantified. A one-size-fits-all approach to sampling is not recommended as each stream is unique, as are the challenges they face and the potential suite of projects that may be used to restore or enhance them. In some instances, sampling a stream multiple years in a row may be warranted (ex., Bull Trout outmigration dynamics in Graves Creek, PIT tagging fish in the Vermilion River or evaluating the impact of restoration and demographic support in Crow Creek). The collection of habitat data such as flow measurements, LWD counts or substrate scoring may also be beneficial in some instances. While sampling priority will be given to Bull Trout streams, streams that are strongholds for Westslope Cutthroat Trout will be monitored and genetic data will be updated for population where that information has never collected or if needs to be update (>10 years old).

Monitoring in 2022 will likely occur at sites in lower Graves Creek (n=3-4), upper Graves Creek (n=3), Swamp Creek (n=1-3), East Fork Bull River (n=5-8), South Fork Bull River (n=4),

Mainstream Bull River, and the upper forks of the Bull River. Generally, two electrofishing sites can be conducted per day and thus there will be approximately 20-22 days of electrofishing efforts. Streams inhabited by WCT may be sampled in September or October (i.e., upper Graves) and additional WCT samples may be collected in other streams within the project area if recent samples (>10 years) have not been collected. Sampling activities will also help facilitate collection of WCT genetic tissue samples for Fish Passage/Native Salmonid Restoration Plan (Appendix C), *Westslope Cutthroat Trout Transport Evaluation*.

Beginning in 2019, tributary salmonid abundance monitoring will be conducted solely under the Montana Tributary Acquisition and Recreational Fishery Enhancement Clark Fork Settlement Agreement (CFSA), Appendix B program; previously, salmonid abundance was also conducted under the Fish Passage/Native Salmonid Restoration Plan (CFSA Appendix C). Appendix C sampling was undertaken, in part, to assess tributary salmonid populations' response to fish passage and other management efforts, therefore, a major component of this combined monitoring will encompass regular and periodic sampling of tributaries or areas of tributaries known to be utilized by native salmonids that have been subject to fish passage efforts. These combined monitoring efforts are generally outlined in TABLE 1 and other tributaries streams may be sampled on occasion that are not listed in TABLE 1. The number of monitoring sites and the frequency of sampling in TABLE 1 should be considered a general guideline.

TABLE 1. Stream electrofishing monitoring schedule for select lower Clark Fork River tributaries.

Stream	Target species	Occupied Habitat (miles)	# monitoring sites	Year Last Sampled	Frequency (~ years)	Next Sample Date
upper Prospect Creek	BULL, WCT	~ 4	4	2020	2-3	2023
Cooper Gulch	BULL, WCT	~ 3	3-4	2020	2-3	2023
Crow Creek	BULL, WCT	~ 3-4	4	2021	2	2023
lower Graves Creek	BULL, WCT	~ 3	3-4	2020	2	2022
WF Trout Creek	BULL, WCT	~ 4-5	4	2021	2	2023
lower Vermilion River	BULL, WCT	~ 9	6-8	2021	2-3	2024
upper Vermilion River	WCT, EB	unknown	~8	2021	4+	2025
Swamp Creek	BULL, WCT	~3-5	3	2017	2-3	2022
Rock Creek	BULL, WCT	~ 3	4	2021	2	2023
EF Bull River	BULL, WCT	~ 8	8	2020	2	2022
upper Graves Creek	WCT	~ 3-4	3	2017	4+	2022
Deep Creek	WCT	~ 5	2	2021	4+	2025
EF Trout Creek	WCT	~ 3-4	3	2021	4+	2025
South Fork Bull River	WCT	~ 4-5	4	2016	4+	2022
East Fork Blue Creek	WCT	~ 3	2	2017	4+	2023
mainstem Bull River	WCT	many	?	n/a	4+	2022
upper Forks of Bull R.	WCT	many	?	2014	4+	2022
lower Prospect Creek	EB, LL, RBT	many	2	2016	4+	2023

Prospect Creek native salmonid salvage

The Prospect Creek drainage is unique in that the lower portion of the drainage is mainly occupied by non-native salmonids, while the upper drainage and its major tributaries are occupied solely by native fish species. This dichotomy is likely facilitated by the geology of the area where large unconsolidated substrate was deposited by Glacial Lake Missoula and underlies portions of the stream causing the mainstem and reaches of its tributaries to go dry during low flow periods each year (Sando and Blasch 2015; M. Lawlor, U.S. Geological Survey, unpublished data). Two lengthy, naturally intermittent sections of stream occur on the mainstem of Prospect Creek. The lower dry reach begins just upstream of Brush Gulch and extends approximately 4 km upstream to above the Daisy Creek confluence. A short perennial section of stream occurs from an area between Daisy Creek and Therriualt Gulch to just upstream of the Crow Creek confluence. Above Crow Creek, Prospect Creek again becomes ephemeral for about 6.8 km. The upper portion of Prospect Creek and its tributaries from just upstream of Evans Gulch have perennial flow.

In 2017, Appendix B staff initiated sampling efforts to capture native salmonids in stranded pools within the two ephemeral portions of Prospect Creek. Westslope Cutthroat captured in these areas are moved to lower Prospect Creek near Brush Gulch, while Bull Trout are relocated into the Crow Creek drainage. Crow Creek has low densities of Bull Trout compared to the other two streams occupied by the species in the upper drainage. From 2017 to 2021, a total of 115 Bull Trout have been released in Crow Creek through this effort. In 2021 alone, 56 WCT were salvaged with all of these fish receiving PIT tags. Since their release near Brush Gulch, several of the salvaged WCT have been detected on the PIT array in lower Prospect Creek (Blakney et al. 2021). No changes in protocol or methods for native salmonid salvage efforts in Prospect Creek are proposed for 2022.

Evaluate baseflow barriers to upstream Bull Trout movement

In recent years, field staff have observed barriers to upstream Bull Trout movement during baseflow periods in late summer and fall. The two most common barriers to upstream migration encountered in local spawning tributaries are debris jams and beaver dams. Debris jams are typical caused by one or more large tress that fall in the stream. In some cases, subsequent runoff events cause aggrading of streambed material which raises the streambed elevation and may cause an impassable barrier to form. Allochthonous material such as trees, branches, leaves, and conifer needles often come to rest in areas where channel spanning wood is located, creating low flow barriers, especially in smaller streams. Debris jams believed to be seasonal barrier from 2019-2021 were observed on redd count walks in numerous lower Clark Fork River Bull Trout spawning tributaries including West Fork Trout Creek, East Fork Crow Creek, West Fork Crow Creek, Cooper Gulch, West Fork Thompson River, Jungle Creek, Beatrice Creek and West Fork Fishtrap Creek. Intuitively, one would think many of these jams would become compromised during spring runoff conditions. Some of these debris jams are compromised each year but often other debris jams form. The same debris jams have been observed multiple years in serval of these streams

Most Bull Trout populations in the lower Clark Fork River drainage in Montana are operating at very low population levels (i.e., less than 50 adults) and therefore it is imperative for these fish to have yearly access to the most possible amount of habitat, especially in areas where they have

previously been documented to use for spawning and rearing. Historically and in present day areas with robust, connected population such seasonal barrier were/are likely not an issue if enough other adequate spawning and rearing habitat exist. However, in small and/or isolated populations each year, each mature adult and every meter of suitable habitat is important. Therefore, in late summer of 2022 efforts will be made to clear debris from these jams (only those believed to be complete barriers to upstream movement) from Bull Trout spawning streams in the Avista project area. In many cases debris jams will become passable if debris and streambed material is moved, with much of this work possible by hand. In more extreme examples, a portion of a channel spanning log would need to be cut to allows passage. An after-the-fact 124 Permit would be submitted to MFWP if the work was deemed to be at the level it would require such a permit. It is estimated that this work would take about a week or two and would occur in late August through September. Modification of a debris jam complexes in 2020 in Cooper Gulch led to multiple redds being found above a jam where they have typically been found in the past. In 2019, no redds were found above the debris jam. Debris jams were also modified by hand in West Fork Trout Creek, East Fork Crow Creek, and West Fork Crow Creek; however, no redds were observed in these streams above where this work took place.

Beaver dams have also been observed to impede upstream movement by Bull Trout on spawning migrations. In recent years, a myriad of beaver dams throughout the Fishtrap Creek drainage (Thompson River) have precluded migratory fish from reaching ideal and previously used spawning and rearing habitats, often many kilometers upstream (MFWP, unpublished data). Multiple beaver dams were observed on the lower portion of the East Fork Bull River, where the stream is braided, in the fall of 2019 (field staff notes suggest beavers have been using the lower East Fork since at least 2006). These channel-spanning dams appear to preclude or at least severely reduce both upstream and downstream movement of Bull Trout (Avista, unpublished data; Avista and MFWP, personal observations). Because these dams are so low in the system, Bull Trout captured below Cabinet Gorge dam in September and October were released above these dams so they could have access to prime spawning habitat much higher in the drainage. These dams also likely hinder outmigration of juvenile Bull Trout in a stream important to Appendix C downstream transport efforts. Beaver have come and gone in various other Bull Trout streams in the area but appear most prevalent and impactful in the two aforementioned drainages. Due to the small population size and isolated nature of most local Bull Trout populations, active management of beavers and their dams is imperative.

The consequences of Bull Trout spawning lower in these systems due to the presence of beaver dams is not completely known but in Fishtrap Creek these less than ideal spawning areas have a much higher proportion of non-native salmonids present which may decrease survival at early life stages through increased competition and predation. Such conditions could cause downstream migrating Bull Trout to leave these systems earlier and at a smaller size which may also increase their risk of being preyed upon in larger waterbodies. Furthermore, spawning in larger downstream portions of tributaries areas could leave redds more suspectable to scour and bedload movement when compared to smaller, more stable spawning reaches in the headwaters and tributary streams. Similar to the proposed actions associated with debris jams, if beaver dams are found to be barriers to movement in late summer and early fall in Bull Trout streams within the Avista project area, they will be altered or removed to allow fish passage. An after-the-fact 310 or 124 permit could then be submitted if the action is deemed to rise to such a level.

However, the Green Mountain Conservation District does not have a current rule on the books that specially states a 310 permit is required to alter or remove a beaver dam. If beavers become a nuisance in a given drainage, MFWP wildlife and enforcement staff will be consulted on actions needed to remove the animals from the area.

Temperature monitoring

Thermographs will be placed in selected streams to record water temperature as described in TABLE 2. This measurement provides a means to assess a fundamental requirement of native salmonids and provides a needed index to assess success of habitat restoration activities that were undertaken, in part, to address identified state water quality listed impairments.

TABLE 2. Stream thermograph locations for select lower Clark Fork River tributaries.

Stream	location	Rkm	Lat	long
Prospect Creek	17-Mile Bridge	29.3	47.57532	115.63960
Prospect Creek	Below Crow Creek confluence	19.5	47.53792	115.54430
Cooper Gulch	Below Chipmunk	5.5	47.51573	115.63824
Cooper Gulch	Above long-term site #1	3.7	47.52697	115.62262
Crow Creek	2007 restoration reach	1.8	47.52654	115.55730
West Fork Crow Creek	2-3 minutes up WF trail	0.6	47.52253	115.56592
East Fork Crow Creek	Above culvert	2	47.50772	115.54918
West Fork Trout Creek	Below 1st creek crossing	1.4	47.79791	115.73014
West Fork Trout Creek	Above Robin Run	4.9	47.79922	115.77051
West Fork Trout Creek	Below South Branch confluence	7.0	47.78782	115.79187
Vermilion River	Near mouth	2.1	47.83113	115.53483
Vermilion River	Between Roe Gulch and Canyon Creek	5.5	47.85102	115.50986
Canyon Creek	Below bridge	0.8	47.85416	115.50043
Vermilion River	Below Cataract Creek	9.5	47.85833	115.46500
Vermilion River	1.1 km downstream of Grouse Creek	13.8	47.86951	115.41712
Sims Creek	Near mouth	0	47.86984	115.40367
Vermilion River	Above Chapel Slide	17.9	47.87542	115.37028
Vermilion River	Below Willow Creek	22.8	47.87008	115.31618
Vermilion River	Below Frosty/Charred Creeks	25.8	47.85178	115.29940
Vermilion River	Below Miller	29	47.82653	115.29953
Vermilion River	Control-Verm confluence	32.7	47.79630	115.30254
Happy Gulch	Near mouth	0	47.81109	115.30100
Miller Creek	Near mouth	0.3	47.82551	115.30341
Graves Creek	Above falls	5.5	47.72145	115.37679
Graves Creek	Upstream of bridge above falls	10.5	47.74743	115.33042
Graves Creek	At Lawn Lake trailhead	13.4	47.74835	115.29729
Rock Creek	Above West Fork	8.6	48.02432	115.70541
Rock Creek	Upstream of first bridge on trail	12.4	48.04322	115.66750
Rock Creek	Upper cascade-upper Bull distribution	13.5	48.04305	115.65551

TABLE 2 (continued). Stream thermograph locations for select lower Clark Fork River tributaries.

Stream	location	Rkm	Lat	long
South Fork Bull	~30 meters above mouth	0.03	48.19279	115.81584
East Fork Blue	Long-term temp monitoring site	0.3	48.10473	116.01051

Goal

The goal of this project is to monitor the abundance and distribution native and non-native salmonids to assess the success of past and future restoration and enhancement projects and to inform management decisions in drainages important to the long-term persistence of Bull Trout and Westslope Cutthroat Trout in the lower Clark Fork River drainage, Montana.

Objectives

1. Monitor native salmonid abundance in streams important to the species local persistence and in reaches where stream restoration, habitat improvements or fish passage efforts have taken or will take place.

2. Salvage native salmonids from ephemeral reaches of Prospect Creek.

3. Evaluate baseflow barriers to upstream Bull Trout movement and take actions to make these areas passable to fish for spawning.

4. Collect fisheries, flow and temperature data in the upper Vermilion River drainage to evaluate potential for Brook Trout removal above Vermilion Falls.

5. Evaluate opportunities for restoration, management intervention, supplementation, reintroduction or other conservation focused activities.

Tasks

1. Monitor native salmonid populations at long-term electrofishing sites. Population estimates will be carried out at sampling locations using electrofishing- depletion methodology (Zippin 1958, Carle and Strub 1978). In 2022, sampling will likely occur at sites in lower Graves Creek (n=3-4), upper Graves Creek (n=3), Swamp Creek (n=3), East Fork Bull River (n=8), South Fork Bull River (n=4), Mainstream Bull River, and the upper forks of the Bull River. Generally, two electrofishing sites can be conducted per day and thus there will be approximately 16-18 days of electrofishing efforts. Streams inhabited by WCT may be sampled in September or October (i.e., upper Graves) and additional WCT samples may be collected in other streams within the project area if recent samples (>10 years) have not been collected. Sampling activities will also help facilitate collection of WCT genetic tissue samples for Fish Passage/Native Salmonid Restoration Plan (Appendix C), Westslope Cutthroat Trout Transport Evaluation.

2. Native salmonid rescue efforts utilizing backpack electrofishing will occur throughout the summer and fall of 2022 in portions of the Prospect Creek drainage that experience natural stream intermittency. Efforts may also focus on capturing stranded fish in other portions of the drainage including in the lower reaches of Crow Creek and Cooper Gulch.

Stranded Bull Trout captured in mainstem Prospect Creek will again be moved into the Crow Creek, while Westslope Cutthroat Trout will be moved to lower Prospect Creek in the vicinity of Brush Gulch. All Bull Trout and Westslope Cutthroat Trout > 99 mm will be PIT tagged to support the evaluation of movement and life-history expression in the drainage (based on PIT array detections and recaptured fish) (Objectives 2, 3 and 5).

3. Bull Trout spawning stream/reaches will be walked in late August through early September to evaluate barriers (i.e., debris jams and beaver dams) that preclude fish from accessing prime spawning habitat. Complete barriers will be altered only enough to allow fish passage and an after-the-fact 310/124 will be submitted if deemed necessary.

4. Thermographs will be placed in the following streams to record water temperature: upper Prospect Creek, Cooper Gulch, Crow Creek, Graves Creek, Vermilion River, West Fork Trout Creek, Rock Creek, South Fork Bull River and Blue Creek. Thermographs will be set to record temperature every 30 minutes, are deployed at established sites prior to July 1 and will be retrieved after October 1 (Objectives 1, 4 and 5).

5. Collect and analyze Westslope Cutthroat Trout genetic samples in stream reaches sampled in where appropriate. Westslope Cutthroat populations that have not been evaluated for hybridization in the last 10 years are appropriate candidates for updating their genetic composition as are drainages where hybrid *Oncorhynchus* have been documented in headwater lakes (data collected from *Mountain Lakes Fisheries Monitoring Project*). Westslope Cutthroat genetic samples will be randomly collected and will be analyzed at the Conservation Genetics lab at the University of Montana (Objectives 1, 4 and 5).

Work Products

- Annual Project Update; 2021 activities; final due October 1, 2022
- Annual Project Update; 2022 activities; final due October 1, 2023
- Temperature monitoring data for the long-term sites; due December 1, 2022
- Annual Work Summary; from Appendix B Aquatic Program Lead to Avista; due December 1, 2022

Permitting Requirements

The only permit that would need to be filed would be an after-the-fact 124 permit (if done or supervised by MFWP biologist) or 310 permit (if done by a non-government organization). No permits are required for fisheries sampling work as all work will be conducted and/or overseen by MFWP fisheries biologists.

Cultural/Historic Resource Review

Not applicable for the tasks proposed in this project plan, there are no ground and/or vegetation disturbing activities, or proposed impacts to cultural/historic resources.

Benefit to the Resource

The collection of long-term data for stream fish populations is essential for defining natural variation associated with native salmonid populations, determining changes in the distribution or abundance of non-native fish species, the planning and implementation of restoration/

enhancement projects, management intervention, and/or to focus other conservation-based activities. The proposed work is consistent with the language and spirit of Appendix B of the Clark Fork Settlement Agreement and the goals and objectives of MFWP. The proposed work also supplements efforts conducted under Appendix C of the CFSA.

Budget

Item	Estimated Carryover[1]	2022 Budget Request
Avista Labor (Technician, 0.6 FTE)	$15,000	$57,000
MFWP short-term worker (Tech 3 level)	$0	$22,500
Waders, wading boots, field gear, etc.	$1,000	$2,000
PIT tags	$1,000	$3,000
Fuel	$0	$3,000
Repairs, supplies (sampling gear and vehicle maintenance)	$0	$6,000
Thermographs	$2,500	$2,500
WCT Genetic monitoring ($40/sample @ up to 250 samples)	$10,000	$10,000
Training and Professional Development for Avista Technician (AFS, CPR, Software, etc.)	$0	$2,500
Total	$29,500	$108,500
Anticipated Expenditures		$138,000

[1] *Estimated carryover of unexpended, approved funds as of January 1.*

Literature Cited

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2022 PROJECT PLAN

Redd Surveys in Montana Tributaries

Project Contact
Travis Rehm, Montana Fish, Wildlife and Parks (MFWP), (406) 382-3032, travis.rehm@mt.gov,
and
Sean Moran, Avista, (406) 847-1291, sean.moran@avistacorp.com

Project History
From 2000 through 2020, redd surveys were one component of the Fish Abundance Monitoring Program conducted under Appendix C of the Clark Fork Settlement Agreement (CFSA). Beginning in 2019, all electrofishing-based abundance monitoring in Montana streams was implemented through the Montana Tributary Habitat Acquisition and Recreational Fishery Enhancement Program (Appendix B). Similarly, Bull Trout and Brown Trout redd surveys were conducted through Appendix B beginning in 2021. Due to this change, this project was ranked by the WRTAC on January 20, 2021.

Background
Previously, redd surveys were conducted under the Fish Passage/Native Salmonid Restoration Plan (CFSA Appendix C). These surveys were undertaken, in part, to assess tributary salmonid populations' response to fish passage and other management efforts, therefore, redd survey of tributaries or areas of tributaries (e.g., Index Reaches) known to be utilized by Bull Trout that have been subject to fish passage efforts will continue to be emphasized (Table 1). Surveys in other tributaries or exploratory reaches (Table 2) will also continue as time allows to assess Bull Trout, and to a lesser degree, Brown Trout spawning trends. Commonality of methods used, and replication of areas surveyed will facilitate continuation through Appendix B monitoring. This long-term data set helps identify population trends, potential contribution of transported and/or non-transported Bull Trout, critical habitat, potential threats and barriers, and when combined with Brown Trout redd surveys in area tributaries where both species are present, lost spawning potential due to superimposition of Brown Trout redds on Bull Trout redds. Completion and/or accuracy of redd surveys, particularly Brown Trout redd surveys, are subject to field conditions and are performed as such conditions (i.e., streamflow, snow and ice, etc.) allow.

Goal
Monitor the relative abundance of adult Bull Trout and Brown Trout in important Montana tributaries to the lower Clark Fork River.

Objectives
1. Monitor spawning activity of Bull Trout and Brown Trout.

Tasks
1. In conjunction with Appendix C and other Appendix B programs, coordinate and conduct annual Bull Trout and Brown Trout redd counts in tributaries of the Montana portion of Avista Project Area tributaries and the Thompson River drainage. Index reaches will be surveyed annually as conditions allow; whereas, the additional areas listed in Table 2 will

be surveyed opportunistically, as appropriate. (Objective 1)

2. Continue to sample and genetically analyze eggs from positively identified Brown Trout redds in the East Fork Bull River. (Objective 1)

3. Survey locations and periodicity will be reviewed by the Aquatic Implementation Team during 2022 to ensure they are still meeting CFSA and management needs and objectives. A revised schedule may be implemented during 2022 or through the 2023 Annual Implementation Plan Process. (Objective 1)

Table 1. Bull Trout redd survey index reaches for tributaries of the Lower Clark Fork River–Avista Project Area, and tributaries of the Thompson River.

Stream	Reach description	Upstream extent	Downstream extent
Bull River	East Fork Bull River to Solid Rock bridge	48.10903; -115.78388	48.08025; -115.78908
East Fork Bull River	Mouth to Isabella Creek	48.10970; -115.67815	48.10903; -115.78388
Rock Creek	Near mouth of West Fork to Trailhead	48.03956; -115.67906	48.02442; -115.70617
Swamp Creek	Wilderness Boundary to 3 km upstream	47.98547; -115.56454	47.96561; -115.58108
Marten Creek	Mouth to perennial near Clinton Gulch	47.89147; -115.80457	47.87945; -115.75562
West Fork Trout Creek	Robin Run to Devil Run	47.79204; -115.81705	47.79895; -115.76984
Vermilion River (upper)	Grouse Creek spur to 0.8 km below Falls	47.87619; -115.36521	47.86975; -115.41889
Vermilion River (lower)	Bottom of Roe Gulch braids to China Gorge	47.85578; -115.47959	47.84881; -115.51561
Graves Creek	USFS road 367 bridge to Falls	47.72088; -115.37824	47.71415; -115.38219
Prospect Creek (upper)	Highway mile marker 17 to 19.5 (Glidden Gulch)	47.56443; -115.68977	47.57545; -115.63990
Prospect Creek (lower)	Wilkes bridge to 400 m upstream of Brush Gulch	47.55518; -115.48697	47.57587; -115.39372
Dry Creek	Mouth to top of flow/gradient barrier	47.58118; -115.35287	47.58494; -115.35465
Crow Creek	Mouth to forks	47.52438; -115.55832	47.53838; -115.54589
East Fork Crow Creek	Mouth to USFS road crossing	47.50813; -115.54926	47.52438; -115.55832
Cooper Gulch	Lower perennial to USFS road 7623 bridge	47.51311; -115.64364	47.53420; -115.61759
WF Thompson River	Spruce Creek to Anne Creek	47.71386; -115.20695	47.68998; -115.20549
Fishtrap Creek	Beatrice to 400 m upstream of WF Fishtrap	47.81750; -115.15326	47.79424; -115.10262
WF Fishtrap Creek	Mouth to road mile 4	47.79870; -115.21008	47.81641; -115.14465
Beatrice Creek	Mouth to road crossing in section 2	47.77530; -115.15220	47.79424; -115.10262
Jungle Creek	Mouth to west section line of T23N, R28W, S13	47.74564; -115.13402	47.72486; -115.05607

Table 2. Non-index reach areas surveyed for Bull Trout redds along tributaries of the Lower Clark Fork River–Avista Project Area, and tributaries of the Thompson River.

Stream	Reach description	Upstream extent	Downstream extent
Bull River	"Spring branch" to South Fork Bull River	48.19313; -115.81577	48.18773; -115.85779
Swamp Creek	Trail head to Wilderness Boundary	47.96561; -115.58108	47.91859; -115.61102
SF Marten Creek	Mouth to perennial near Jackson Gulch	47.87233; -115.76401	47.87595; -115.76139
Vermilion River (lower)	Bottom of Roe Gulch braids to mouth	47.84881; -115.51561	47.82931; -115.53804
Graves Creek	Mouth to USFS road 367 bridge	47.71415; -115.38219	47.68271; -115.40770
Prospect Creek (upper)	Upstream of Evans Gulch to Hwy mile 17 bridge	47.57545; -115.63990	47.55670; -115.62533
EF Crow Creek	300 m upstream of USFS road crossing	47.50627; -115.54551	47.50813; -115.54926
WF Crow Creek	Mouth to ~ river km 1	47.52341; -115.56411	47.52440; -115.55834
Cooper Gulch	Above FR 7623 Crossing	47.51241; -115.64775	47.51311; -115.64364
Cooper Gulch (Spokane)	Lower ~ 400 m of Spokane Creek	47.51635; -115.63231	47.51635; -115.63266
Cooper Gulch (Chipmunk)	Lower ~ 400 m of Chipmunk Creek	47.51121; -115.64095	47.51380; -115.64097
WF Thompson River	Honeymoon Creek to Spruce Creek	47.68998; -115.20549	47.66036; -115.19294
Fishtrap Creek	Just below Jungle Creek to mouth of Beatrice Creek	47.79424; -115.10262	47.72377; -115.05600
WF Fishtrap Creek	Upstream of index	47.78033; -115.23129	47.79870; -115.21008

Work Products

- Annual Project Update; Redd Survey (2021 data); final due April 1, 2022
- Annual Work Summary; due December 1, 2022
- Annual Project Update; Redd Survey (2022 data); final due April 1, 2023

Permitting Requirements

Redd surveys, by themselves are not specified in Montana Scientific Collection Permit; however, data recorded follows state database requirements and is reported.

Endangered Species Act consultation for this project plan is associated with the 2019 Biological Opinion on the effects of continued operation of the Clark Fork Hydroelectric Project on Bull Trout and designated Bull Trout critical habitat (BiOp). This project plan is consistent with the analyses and conclusions contained in the 2019 BiOp and will adhere to all appropriate Terms and Conditions designed to reduce the extent and effects of incidental take on Bull Trout. No incidental take of Bull Trout is anticipated as a result of this project plan; therefore, no take reporting is required.

Cultural/Historic Resource Review
Not applicable for the tasks proposed in this project plan, there are no ground and/or vegetation disturbing activities, or proposed impacts to cultural/historic resources.

Benefit to the Resource
Bull Trout, listed as threatened under the Endangered Species Act, is a primary species identified in the Native Salmonid Restoration Plan (NSRP) for consideration for fish passage and associated Protection Mitigation and Enhancement Efforts (PM&E) measures. The NSRP identified "native fish abundance studies" to measure changes in tributary native salmonid population's distribution and abundance in relation to fish passage and other native fish restoration activities. The Aquatic Implementation Team has determined that implementation of native fish abundance studies including annual Bull Trout and Brown Trout redd counts should proceed in a manner that facilitates long term monitoring. Data provided enables managers to assess the effect of related PM&Es and provides data for state and federal management plans.

Budget

Item	Estimated Carryover[1]	2022 Budget Request
Biologist field work and reporting (<0.10 FTE)	$5,000	$8,000
Technician field work, data mgmt., and reporting (0.20 FTE)	$2,000	$10,000
Equipment (waders, etc.)	$0	$500
Vehicle mileage	$0	$1,000
Lab costs for Brown Trout egg samples genetic analysis	$1,000	$1,000
Total	$8,000	$20,500
Anticipated Expenditures		$28,500

[1] *Estimated carryover of unexpended, approved funds as of January 1.*

2022 PROJECT PLAN

Sims Meander Stream and Floodplain Restoration Project

Project Contact

Brita Olson, Lower Clark Fork Watershed Group (LCFWG), (208) 304-3852, brita@lcfwg.org,
Sarah Busmire, Green Mountain Conservation District (GMCD), (406) 827-4833, GMCD@blackfoot.net, *and*
Craig Neesvig, Kootenai National Forest (KNF), (406) 827-0734, craig.neesvig@usda.gov

Project History

This is a continuing project based on information developed during the Vermilion River Sims Reach Restoration Survey and Design project, which was approved in 2017 and scored 74/110 by the WRTAC.

Background

The Sims reach of the Vermilion River provides important Bull Trout and Westslope Cutthroat Trout habitat. The Vermilion River has consistently been one of the primary Bull Trout spawning areas in the Lower Clark Fork River drainage. Due to its importance to native fish species, the Vermilion River has been the focus of concerted efforts to implement watershed scale restoration.

Montana's 2002 303(d) list classified 22.5 miles of the Vermilion River as impaired and only partially supporting its beneficial uses of aquatic life and cold-water fisheries. In 2005, the Lower Clark Fork River Drainage Habitat Problem Assessment (GEI Consultants, 2005) ranked the Vermilion River as among the top priorities for improving and protecting native fish habitat in the Lower Clark Fork watershed. In 2006, the Kootenai National Forest completed the Vermilion River Watershed Assessment (Neesvig et al. 2007). This assessment included a preliminary restoration plan aimed at addressing identified impairments and habitat deficiencies in the Vermilion River, resulting from historic disturbances such as mining and riparian timber harvest. In 2012, watershed partners began a top-down watershed-scale restoration effort in the drainage with the Chapel Slide Project. This was followed by the Miners Gulch Project in 2016. Post-runoff monitoring completed by the Kootenai National Forest indicates that these projects are performing well (Neesvig 2019).

The Sims reach of the Vermilion River is located approximately 8 miles upstream of the mouth of the Vermilion River (accessed via the Grouse Creek Trailhead) and immediately downstream of the Miners Gulch Project. The proposed Sims Meander Project will reactivate the floodplain of the Vermilion River that has been disconnected due to past disturbances (primarily the removal of large diameter wood and mining activity) (Figure 1).

Figure 1. The Vermilion River's floodplain is disconnected throughout much of the Sims Meander Reach. While a narrow border of vegetation thrive at the immediate water's edge, the remaining floodplain is a dry, cobble bar.

Project design alternatives were developed by the KNF, based on LiDAR data and detailed hydrological surveys, that employ on-the-ground techniques to improve channel dimensions relative to reference conditions, bank stability, in-stream habitat complexity, bedload transport, and riparian and floodplain function. Designs were reviewed by a group of project stakeholders and further evaluated in NEPA consultation completed in June 2021.

Bull Trout redds have been found in both restoration reaches post-construction, however overall Bull Trout redd numbers have recently declined in the Vermilion River. Therefore, techniques used successfully upstream in the Chapel Slide and Miners Gulch restoration projects were modified for the Sims Meanders Project in response to concerns raised by fisheries biologists (Montana Fish, Wildlife & Parks and Avista). These concerns are focused on the desire to minimize short-term disturbance required to construct instream habitat features in the face of a declining Bull Trout population. Final project designs were reviewed by project stakeholders in order to minimize impacts and maximize benefits to native fish. Proposed activities included stabilizing the channel while maintaining proper channel and floodplain dimensions; reshaping of the floodplain; bank protection; installation of large woody debris (LWD) structures, and an aggressive riparian planting program that includes temporary irrigation for maximum success.

Disturbed areas will be planted with native species including cottonwood, willow, conifers and a suite of local brush species.

Goal

The overall goal of the Sims Meander Project is to correct historic disturbances in the Vermilion River drainage from logging and mining by restoring a degraded stream channel and floodplain, such that vegetation can be established through planting and natural regeneration and the surrounding area can reach over the long-term a self-sustaining, fully functional, dynamic equilibrium.

Objectives

1. Reconnect and recontour the floodplain along 1,500-2,000 feet of stream channel.

2. Install floodplain structures (large woody debris and/or fascines) to stabilize the stream channel, trap fine sediments and support revegetation efforts.

3. Install in-stream structures for bank protection, grade control, and fish habitat (where and if necessary).

4. Reestablish native trees and shrubs in the floodplain along the stream channel.

5. Develop outreach materials to educate the public about the work in the Vermilion River, the characteristics of healthy streams and rivers, the importance of floodplains, and the habitat needs of native fish.

Tasks

1. NEPA consultation will be completed and necessary permits will be secured by the KNF over the winter and spring of 2021 (Objectives 1, 2, 3, and 4; ***Completed spring 2021***)

2. Funding for project will be secured by March 2021, and contractor selection will be made (Objectives 1, 2, and 3; ***Completed spring 2021***)

3. Construction will be completed by July 15 and August 31, 2021 (Objectives 1, 2 and 3; ***Completed summer 2021***)

4. Riparian revegetation will be completed in fall of 2021 and/or spring of 2022 and irrigated in subsequent 2-3 years (Objective 4; ***Partially completed fall 2021***)

5. Outreach materials (including a 3-5 minute film) will be developed and finalized for distribution by December 31, 2021 (Objective 5)

6. Monitoring: As-built survey and construction documentation (including sediment reduction) will be monitored in 2021 immediately post-construction. Post-runoff and revegetation monitoring will occur in 2022 and subsequent years (Objectives 1, 2, 3, and 4)

7. Coordination of project planning, implementation, reporting, and as-needed project support will occur through 2022 (Objectives 1-5).

Work Products

- Mid-Year Report; due to the Appendix B Aquatic Program Leader (APL) August 1, 2022
- Annual Work Summary; due to the APL November 15, 2022
- As-built monitoring report; expected December 2022

Permitting Requirements

This project required NEPA consultation, which included Endangered Species Act consultation, and the following permits/authorizations: 404, 318 and 124. All NEPA consultation and permitting were completed by the KNF.

Endangered Species Act consultation for this project plan is associated with the 2019 Biological Opinion on the effects of continued operation of the Clark Fork Hydroelectric Project on Bull Trout and designated Bull Trout critical habitat (BiOp), and the USFWS-IDFG Cooperative Agreement pursuant to Section 6 of the Act. This project plan is consistent with the analysis and conclusions contained in the 2019 BiOp and the USFWS-IDFG Cooperative Agreement, and will adhere to all appropriate Terms and Conditions designed to reduce the extent and effects of incidental take on Bull Trout. Incidental take reporting for this project plan will be included in the annual Biological Opinion report as required by Term and Conditions 15–18 of the2019 Incidental Take Statement, as well as IDFG's annual Section 6 report to the USFWS.

Cultural/Historic Resource Review

Cultural and historic resource review were completed by the KNF as a part of NEPA consultation.

Benefit to the Resource

This project is consistent with the objectives of Appendix B. Bull Trout are known to be present in the Vermilion River along with Westslope Cutthroat Trout. This project will improve native fish habitat by restoring a degraded stream channel and floodplain, regenerating native riparian vegetation, increasing habitat complexity with LWD structures, and improving the stability of the stream channel. Therefore, this project supports state and federally approved management plans for Bull Trout and Westslope Cutthroat Trout. In addition, stream enhancement measures will help address listed state water quality impairments throughout the Vermilion River as well as providing important riparian habitat for wildlife. Therefore, this project provides ancillary benefits to appendices C and K.

Budget

Item	Estimated Carryover[1]	2022 Budget Request
GMCD-sponsored construction contract	$0	$0
GMCD Administration fee, 10%	$0	$0
USFS-led Revegetation – Labor (USFS staff and crew to oversee and implement revegetation effort)	$15,549	$0
USFS-led Revegetation – Materials (cottonwood, willow, seed, t-posts, fencing, irrigation equipment, herbicide, etc.)	$17,850	$0
USFS-led Revegetation – Travel (mileage only)	$180	$0
LCFWG Project Contribution.	$400	$0
Total	$33,979	$0
Anticipated Expenditures		$33,979

[1] *Estimated carryover of unexpended, approved funds as of January 1.*

This project plan provided nonfederal match for the following federal contributions to the planning and implementation of this project:
Montana Department of Environmental Quality, $200,000
Sanders Count Resource Advisory Committee, $25,000
Kootenai National Forest (in-kind), $35,100
Kootenai National Forest (cash), $10,000

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2022 PROJECT PLAN

Stream Gage Monitoring

Project Contact
Craig Neesvig, United States Forest Service (USFS), (406) 827-0734, craig.neesvig@usda.gov

Project History
This Project Plan represents the merger of two interrelated continuing projects; Rock and Graves Creek 2016–2020 Stream Gage Maintenance and Stream Gage Replacement and 2017–2021 Maintenance. The "Rock and Graves Creek 2016–2020 Stream Gage Maintenance" project was originally approved by the Management Committee (MC) in 2010 and was then renewed as a five-year project in 2016. Thus, the MC has approved the funding for this work through the 2020 water year. The five-year "Stream Gage Replacement and 2017–2021 Maintenance" project was originally approved by the MC in 2017. Thus, the MC has approved the funding for this work through the 2021 water year. Beginning in 2018, these two continuing projects were merged into the "Stream Gage Monitoring" project. Thus, annual stream gage monitoring in all six tributaries through is now covered through this project plan. The scope and budget for this project are reviewed by the MC annually.

Background
Since 2008, automated stream gages have been installed and maintained by the USFS in multiple locations across the Cabinet Ranger District. These autonomous gages record temperature and pressure values which can be used to estimate parameters such as discharge. Thus, stream gages have provided continuous discharge and temperature information since 2008. In addition to informing water forecasting and annual water budgets, information collected through stream gage monitoring provide valuable insights into to multiple aspects of projects implemented under the Clark Fork Settlement Agreement (CFSA) such as fish trap design and performance, fish migration behaviors, design and function of restoration projects, and stream intermittency.

Over the last three years new data loggers with a guaranteed lifespan of 7–10 years were purchased through appendices B and C of the CFSA and installed and maintained by USFS personnel. These new loggers were deployed in the Bull River at the historic U.S. Geological Survey gage house, East Fork Bull River near the historic Ranger Station (one gage in each of the two channels), Trout Creek at the 214 bridge, Vermilion River at the red bridge, Rock Creek near the mouth, and Graves Creek at the permanent weir trap site. These projects also provided funding for the USFS to conduct annual calibration, maintenance, and data compilation and reporting through 2022 in the Bull River, East Fork Bull River (EFBR), Trout Creek, Vermilion River, Rock and Graves creeks.

Goal
The goal of this project is to maintain and operate the current stream gaging network and to provide continuous, accurate streamflow data in selected area tributaries.

Objectives

1. Continue accurately characterizing stream discharge, temperature and other metrics within the Bull River, EFBR, Trout Creek, Vermilion River, Rock Creek and Graves Creek. Data and reports produced within the 2022 water year will be added to the long-term period of record to arrive at various streamflow and temperature statistics over time.

Tasks

1. Annually, and as needed, calibrate, maintain, and download data from all seven electronic stream gages (EFBR has two channels, thus two electronic data loggers).

2. Perform manual discharge, stage and temperature measurements at each gaging station when streamflow conditions allow for safe measurement to accurately represent the rising and falling limbs of the hydrograph to describe the current water year condition.

3. Utilize known pressure–discharge relationships to estimate gage height and discharge at 30-minute intervals for each site for water year 2022. Record temperature at 30-minute intervals for each site for water year 2022.

4. Perform data quality assurance and control for accuracy and import finalized data into an annual report format.

Work Products

- Excel spreadsheet containing 2022 water year temperature and discharge data in 30-minute intervals for each stream (and channel) will be provided to Avista by January 1, 2023
- 2022 Annual Water Year Data Report for each stream (Bull River, East Fork Bull River, Rock Creek, Trout Creek, Vermilion River, Graves Creek); due January 1, 2023
- Mid-year report; due to Appendix B Aquatic Program Leader (APL) August 1, 2022
- Annual Work Summary; due to APL November 15, 2022

Permitting Requirements

Not applicable for the tasks proposed in this project plan.

Endangered Species Act consultation for this project plan is associated with the 2019 Biological Opinion on the effects of continued operation of the Clark Fork Hydroelectric Project on Bull Trout and designated Bull Trout critical habitat (BiOp). This project plan is consistent with the analyses and conclusions contained in the 2019 BiOp and will adhere to all appropriate Terms and Conditions designed to reduce the extent and effects of incidental take on Bull Trout. No incidental take of Bull Trout is anticipated as a result of this project plan; therefore, no take reporting is required.

Cultural/Historic Resource Review

Not applicable for the tasks proposed in this project plan, there are no ground and/or vegetation disturbing activities, or proposed impacts to cultural/historic resources.

Benefit to the Resource

The information collected by this project will further enhance the regional hydraulic relationships which are used in channel design and stream restoration, thereby informing decisions and help adaptively manage projects conducted under appendices B and C of the CFSA.

With very few active USGS stream gaging stations in the area (Prospect Creek. Thompson River) these monitoring stations will provide for the long-term period of record at each location listed which represent annual streamflow conditions specific to the tributaries in the Lower Clark Fork drainage.

Bull Trout and Westslope Cutthroat Trout populations are present within all six of these streams. Information from the Graves Creek, Rock Creek, East Fork Bull River, and Vermilion River gages will help managers understand the relationships between discharge and trap efficiency and juvenile Bull Trout emigrations. Ultimately, this information will be used to inform trapping protocols and improve efficiencies. Additionally, discharge information from the Bull River will help researchers understand and evaluate the success of the Clark Fork River Westslope Cutthroat Trout Experimental Transport Program.

Budget

Item	Estimated Carryover[1]	2022 Budget Request
USFS data collection and report writing (Hydro Crew – Usually GS-04 and GS-06)	$0	$7,930
All 7 gage station operation/maintenance and repair supplies, waders, etc.	$0	$1,500
8% Overhead	$0	$754
Total	$0	$10,184
Anticipated Expenditures		$10,184

[1] *Estimated carryover of unexpended, approved funds as of January 1.*

This project is a 50:50 cost share with Appendix C; thus, one half of the above expenditures will be paid from each appendix.

2022 PROJECT PLAN

Crow Creek Bull Trout Investigation

Project Contact

Jason Blakney, Montana Fish, Wildlife and Parks (MFWP), (406) 382-3033, jblakney@mt.gov,
and
Travis Rehm, MFWP, (406) 382-3032, travis.rehm@mt.gov

Project History

This is a continuing project that was approved by the Management Committee (MC) in 2016. A total funding request of $18,500 was approved in 2016 and no additional funding is requested. It is being requested that the Project Completion Report completion date be extended to December 31, 2022.

Background

Crow Creek is a third order tributary that enters Prospect Creek at river kilometer 19.8. The lower portion of Crow Creek, like many other streams in the lower Clark Fork River drainage, experiences seasonal intermittency associated with the underlying geology of the area (Sando and Blasch 2015). Crow Creek enters Prospect Creek in a small perennial stretch of stream that dried in 2015- the first time since at least 2000. Two mainly resident Bull Trout populations occur upstream of Crow Creek, in upper Prospect Creek and Cooper Gulch. These populations are isolated during base flow conditions by seasonal intermittency but have been shown to exchange migrants (Oldenburg et al. 2015; DeHaan and Bernall 2017). Bull Trout have been found at low abundance in Crow Creek since at least 1996 (WWP 1996; Moran 2004; Horn and Tholl 2011; Moran and Storaasli 2013). At least three age classes of Bull Trout were captured in Crow Creek at long-term monitoring sites in 2014. In the fall of 2015, three larger resident Bull Trout were observed during redd counts in Crow Creek including one individual in a 2007 restoration site. Three Bull Trout redds have been found in Crow Creek from 2003-2015, two in the East Fork in 2012 (Moran and Storaasli 2013) and one in the lower mainstem in 2014 (Storaasli 2015). Therefore, based on low density Bull Trout observations over multiple years and locations including in both forks of Crow Creek, as well as the occasional occurrence of observable redds in the stream, it does appear to provide suitable habitat for Bull Trout. However, it is unclear if this population is self-sustaining.

Field work for this study was completed in 2016 and 2017. Initial results suggest a small population of Bull Trout does inhabit the Crow Creek drainage as multiple age class of fish were found both years, albeit at low densities. Low levels of natural reproduction did occur in the drainage during the study period as young-of-the year (YOY). Bull Trout were encountered in the West Fork of Crow Creek in both 2016 and 2017. However, no redds have been found in the drainage since 2014. Genetic analyses from fish sampled in Crow Creek in 2016 suggests most fish in the drainage assign to upper Prospect Creek and Cooper Gulch (Adams et al. 2017). Crow Creek was not able to be evaluated to determine if it is genetically distinct population because samples were only collected from 41 individuals, half of which were YOY and likely siblings. Crow Creek, Cooper Gulch and upper Prospect Creek are isolated for a significant portion of the year, but this genetic information adds further evidence of movement and connectivity between

the three streams occupied by the species in the Prospect Creek watershed (Oldenburg et al. 2015; DeHaan and Bernall 2017; Adams et al. 2017).

Over the two-year study period, Bull Trout were documented at 14 of 20 sites sampled in Crow Creek and at all 10 sites sampled in Cooper Gulch. Westslope Cutthroat Trout were found at all sites in both streams and Cedar Sculpin were noted at 19 of 20 sites in Crow Creek but were not found to occur in Cooper Gulch. A number of habitat variables were quantified at each electrofishing site along with fish abundance data including stream discharge, substrate, canopy cover, bankfull width, habitat unit classification and measurements (length, widths, and depths), large woody debris and undercut banks. Stream temperature data was recorded at six sites in Crow Creek and five sites in Cooper Gulch. Thermographs have collected two years of winter water temperature data to help assess groundwater influence, which in turn will help better understand spawning potential in both streams. Streambed core samples were collected in late August and early September of 2017 to evaluate levels of fine sediment in spawning gravels.

Goal

The goals of this project are to assess the current status of Bull Trout in Crow Creek, investigate habitat variables that are essential for the species at different portions of their life cycle, determine if the population is self-sustaining or if the stream is capable of supporting an independent population as well as to quantify and compare stream habitat condition in Crow Creek and a neighboring stream with higher Bull Trout abundance, Cooper Gulch. This information will be used to inform future stream restoration, land management, supplementation and other conservation-based actions.

Objective

1. Assess the current status of Bull Trout in Crow Creek and investigate critical habitat variables to determine if the population is self-sustaining or if the stream is capable of supporting an independent population.

Tasks

1. Monitoring Bull Trout at two long-term sample sites and additional locations in the Crow Creek and Cooper Gulch drainages in 2016 and 2017 to assess fish species distribution and abundance using multiple pass electrofishing (***Completed in 2017***).

2. Conduct genetic assessment tests of Bull Trout captured electrofishing in the Crow Creek drainage to determine population of origin (***Completed in 2018***)

3. Implant Passive Integrated Transponder (PIT) tags in high proportion of Bull Trout in Crow Creek to evaluate future movements and habitat use in the drainage at electrofishing sites and by walking the stream with a mobile PIT tag scanner (***Completed in 2018***).

4. Monitoring juvenile rearing habitat quality at electrofishing sites using substrate scoring method (Bjornn et al. 1977; Leathe and Enk 1985; Weaver and Fraley 1991) (***Completed in 2017***).

5. Conduct habitat surveys of low to moderate intensity at the reach scale to quantify variables associated with riffle and pool habitats at low flow periods (Overton et al. 1997). Compare known habitat occupied by Bull Trout in Cooper Gulch (***Completed in 2017***).

6. Monitor stream temperature and flow in mainstem and both forks by seasonal deployment of temperature loggers throughout Bull Trout occupied areas of the Crow Creek and Cooper Gulch drainages (***Completed in 2017***).

7. Determine areas of groundwater upwelling that could be potentially used by spawning Bull Trout by visually inspecting streams reaches during very cold periods in the winter (***Completed in 2017***).

8. Investigate spawning/incubation environment using substrate core samples to determine if fine sediment limits Bull Trout embryo survival (Shepard et al. 1984). Areas chosen in Crow Creek will be based on location of previously known spawning and areas that appear to be influenced by groundwater upwelling. Areas chosen in Cooper Gulch will be those where Bull Trout have been documented spawning in the same location on multiple occasions (***Completed in 2018***).

9. Continue to conduct redd counts in Crow Creek. Possibly conduct redd counts in mid to late September (versus in October) when fish are actively spawning in hopes of more easily identifying smaller resident-type redds (***Completed in 2018***).

Work Products

- Annual Work Summary; from Appendix B Aquatic Program Leader to Avista; due December 1, 2022
- Project Completion Report; final due December 31, 2022

Permitting Requirements

No permitting requirements have been identified. Instream sampling associated with this project has been completed; therefore, Endangered Species Act consultation for this project plan is associated with the 2019 Biological Opinion on the effects of continued operation of the Clark Fork Hydroelectric Project on Bull Trout and designated Bull Trout critical habitat (BiOp). This project plan is consistent with the analyses and conclusions contained in the 2019 BiOp and will adhere to all appropriate Terms and Conditions designed to reduce the extent and effects of incidental take on Bull Trout. No incidental take of Bull Trout is anticipated as a result of this project plan; therefore, no take reporting is required.

Cultural/Historic Resource Review

Not applicable for the tasks proposed in this project plan, there are no ground and/or vegetation disturbing activities, or proposed impacts to cultural/historic resources.

Benefit to the Resource

This study will help achieve a better understanding of habitat factors that dictate resident Bull Trout abundance in two neighboring and cosmetically similar streams (temperature, discharge,

anthropogenic impacts) in the upper Prospect Creek watershed, Crow Creek and Cooper Gulch. The upper Prospect Creek watershed is an important resident Bull Trout metapopulation, as it the only lower Clark River drainage where Bull Trout still occur in three streams (with seasonal connectivity documented among populations) and one of only two areas where only native fish species presently occur. While multiple age classes of Bull Trout have been found in Crow Creek over the past 20 years, relatively sparse spatial sampling has shown the species at low abundance and very few redds have been found. In contrast, Bull Trout in Cooper Gulch have been consistently abundant and redds are commonly found every year. By comparing habitat variable measurements between Crow Creek and Cooper Gulch, this study should help determine if habitat limits Bull Trout in Crow Creek and if so, where and how to focus restoration activities. This work will also help determine if the population in Crow Creek is self-sustaining or if it would be feasible to establish a self-sustaining population in Crow Creek. This project is consistent with CFSA Appendices B and C and is line with State of Montana and Federal Fisheries management plans.

Budget

Item	Estimated Carryover[1]	2022 Budget Request
Finalize Project Completion Report	$2,749	$0
Total	$2,749	$0
Anticipated Expenditures		$2,749

[1] *Estimated carryover of unexpended, approved funds as of January 1.*

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2022 PROJECT PLAN

Graves Creek Pilot Habitat Enhancement Project

Project Contacts

Brita Olson, Lower Clark Fork Watershed Group, (208) 304-3852, brita@lowerclarkforkwatershedgroup.org, *and*
Travis Rehm, Montana Fish, Wildlife and Parks (MFWP), (406) 382-3032, travis.rehm@mt.gov

Project History

This is a continuing project that was approved by the Management Committee (MC) in 2018. The Water Resources Technical Advisory Committee ranked this project in 2018. A total funding request of $29,500 was approved in 2018 and no additional funding is requested. A project approved by the MC in 2017 (i.e., "Lolo National Forest Priority Native Salmonid Habitat Restoration Assessment and Planning") provided funding to complete the National Environmental Policy Act (NEPA) process which included the environmental review and design of this project. In February of 2019, the Lolo National Forest (LNF) produced a Decision Memo as a product of the NEPA process which included this work in Graves Creek. The project was implemented in August of 2019 with four large woody debris (LWD) structures built. Pre-runoff monitoring data was collected in 2019 to assess baseline habitat conditions within the treated reach and a control reach. Post-runoff monitoring occurred in the fall of 2020 and 2021. The technical memo describing the effect of the LWD to stream substrate and applying this information to assessment of potential future efforts were not completed in 2021, therefore this proposal has been carried forward to 2022.

Background

The goal of this project is to construct LWD structures that will facilitate localized sorting and deposition of spawning gravel and provide habitat complexity within the portion of Graves Creek managed by the LNF. Graves Creek is a key migratory Bull Trout spawning tributary to Noxon Reservoir. This stream represents a significant component of the upstream and downstream transport programs under Appendix C, focused on reconnecting this tributary with Lake Pend Oreille.

Due to a natural migration barrier, only the lower three miles of Graves Creek is accessible to migratory Bull Trout. Spawning substrate in this reach is limited and the addition of LWD would help increase the localized deposition of smaller spawning sized substrate as well as provide additional cover for migratory fish, increase habitat complexity, and the likelihood of pool formation. Fisheries biologists conducting redd surveys in this reach have long observed migratory redds associated with the few large natural wood structures present. The overhead cover and substrate sorting associated with such structures are important components in where redds are built.

The installation of LWD will occur using a phased approach, in order to monitor the success of such enhancement work. Structures will emulate the existing stable pieces of wood that represent the best microhabitat for spawning and rearing Bull Trout. Because of the importance of this reach to Bull Trout production, a phased methodology that maximizes potential benefits

(confirmed through monitoring) and limits disturbance will be taken. Structures installed in 2019 should experience at least two seasons of spring runoff, before additional structures are added to the stream.

Goal
The goal of this project is to install woody debris structures into Graves Creek to facilitate localized deposition of smaller substrate that is more suitable for Bull Trout spawning, as appropriately sized spawning gravel is limited in Graves Creek. This project should also increase habitat complexity that may be used as cover by juvenile and adult Bull Trout and Westslope Cutthroat Trout.

Objectives
1. Initiate localized sorting and deposition of spawning gravel.

2. Increase habitat complexity for juvenile and adult Bull Trout.

Tasks
1. Submit design report to AIT for review. (***Completed in 2019***)

2. Secure necessary permits to install LWD structures in lower Graves Creek. (Objectives 1 and 2) (***Completed in 2019***)

3. Select a contractor to facilitate installation of structures. (Objectives 1 and 2) (***Completed in 2019***)

4. Construct five LWD jams during the summer of 2019. (Objectives 1 and 2) (***Completed in 2019***)

5. Monitor changes in substrate size and distribution in the enhanced reaches. (LNF, MFWP, and/or Lower Clark Fork Watershed Group) (Objectives 1 and 2) (*pre-runoff monitoring:* ***Completed in 2019,*** *two post-runoff monitoring:* ***Completed in 2020 and 2021***)

6. Determine whether or not the addition of future structures is warranted.

Work Products
- Mid-year report; due to the Appendix B Aquatic Program Leader (APL) August 1, 2022
- Annual Work Summary; due to the APL November 15, 2022
- Review of substrate changes in a technical memo following two years of spring runoff; due March 31, 2022
- Annual fixed-point photo-documentation

Permitting Requirements
Not applicable for the tasks proposed in this project plan.

Endangered Species Act consultation for this project plan is associated with the 2019 Biological

Opinion on the effects of continued operation of the Clark Fork Hydroelectric Project on Bull Trout and designated Bull Trout critical habitat (BiOp). This project plan is consistent with the analyses and conclusions contained in the 2019 BiOp and will adhere to all appropriate Terms and Conditions designed to reduce the extent and effects of incidental take on Bull Trout. No incidental take of Bull Trout is anticipated as a result of this project plan; therefore, no take reporting is required.

Cultural/Historic Resource Review
The area of this project (Graves Creek) was included in the cultural/historic review that was completed for this and other stream habitat improvements projects completed in 2019 by the Lolo National Forest through the NEPA process.

Benefit to the Resource
Work is targeted within the Bull Trout spawning reach of Graves Creek and is focused on enhancing the limited spawning gravel. Creating a more complex environment using LWD will provide cover and substrate sorting for redd building, and improved rearing and overwintering conditions. This will complement previous habitat restoration lower in the watershed and the ongoing Appendix C adult and juvenile Bull Trout transport programs.

The project fits within the restoration and enhancement of Clark Fork River tributary watersheds to offset power peaking operation of Noxon Rapids Dam to native salmonids. Actions are consistent with the Tributary Habitat Acquisition and Enhancement component of Appendix B. Actions also support the U.S. Fish and Wildlife Service Recovery Plan for the Coterminous United States Population of Bull Trout, Conservation Strategy for Bull Trout on U.S. Forest Service lands in Western Montana, and Memorandum of Understanding for the Conservation Agreement for Westslope Cutthroat Trout and Yellowstone Cutthroat Trout in Montana.

Budget

Item	Estimated Carryover[1]	2022 Budget Request
Total remaining for monitoring and reporting	$2,831	$0
Total	$2,831	$0
Anticipated Expenditures		$2,831

[1] *Estimated carryover of unexpended, approved funds as of January 1.*

2022 PROJECT PLAN

Upper Prospect Creek LWD Project

Project Contacts

Travis Rehm, Montana Fish, Wildlife and Parks (MFWP), (406) 382-3032, travis.rehm@mt.gov,
Brita Olson, Lower Clark Fork Watershed Group, (208) 304-3852, brita@lcfwg.org, *and*
Christine Brissette, Trout Unlimited, (406) 544-9649, Christine.Brissette@tu.org

Project History

This project was ranked by the WRTAC and approved by Management Committee (MC) in 2020.

Background

The goal of this project is to encourage localized gravel deposition to improve the abundance of suitable sized spawning substrate in a stream only occupied by native salmonids, Bull Trout and Westslope Cutthroat Trout. The proposed project would occur over about 1.5 km of upper Prospect Creek within the Bull Trout redd count index reach (FIGURE 1). Suitable spawning gravel in upper Prospect Creek is limited and is often found along streams margins, areas with little to no flow which are not readily used by Bull Trout for spawning. Much of the gravel deposition within the reach is associated with cobble and boulders, with minimal large woody debris (LWD) present in the system, except in a few large log jams. Visual inspection suggests there is enough of the proper size spawning gravel (up to 50 mm) distributed throughout this reach but not concentrated in many areas. The reach is relatively high gradient and thus needs large trees that would stay in place in order to provide the energy dissipation needed to deposit spawning gravel.

Data amassed over the past two decades suggests the Bull Trout population in upper Prospect Creek may be in peril. No redds were found in 2019, although four adult-sized fish were encountered within the redd count index reach. The lower two miles of upper Prospect Creek, below the redd count index reach before the stream becomes intermittent, has been walked three of the last four years as well but no redds have been found. In fact, only two Bull Trout redds have been documented in upper Prospect Creek since 2015 and while the trend of redds by year has yet to show a statistically significant decline (p=0.18), signs of population decline are beginning to emerge (FIGURE 2). Of the two long-term electrofishing sites in upper Prospect Creek (FIGURE 1), a significant decline in Bull Trout abundance has occurred at the lower monitoring site while a significant decline in Bull Trout biomass has been observed at the upper site (Blakney and Tholl 2019). This project represents a low cost, minimally invasive action to try to provide more adequate spawning gravel and additional cover/habitat complexity to fish in one of the few remaining streams in the lower Clark Fork River drainage in Montana occupied by an entirely native fish assemblage.

Mature trees are not limited along this section of Prospect Creek with dense stands of larger conifers present along most of the reach (FIGURE 3). The plan for this project is to create 8 to 10 LWD jams consisting of 1 to 5 larger conifers by strategically dropping trees using a skilled sawyer. Logs will be dropped at varying angles but not directly perpendicular to the current to

maximize contact with the bed. Research has suggested that logs longer than the average bankfull width of the stream should be used if the goal of the project it to retain the wood in place (Hilderbrand et al. 1998). Since trees are abundant along this section of the stream and because the reach is located in a narrow mountain valley, additional solar inputs to the stream from tree removal would be very minimal and are unlikely to have a deleterious impact on stream temperature. Trees along the stream banks will not be removed. In most cases trees will be selectively cut from the heavily timbered hillside on the south side of the stream. Project partners assessed the risk of this project to downstream infrastructure and determined that risk is low due to two large log jams that sit between this project and the downstream bridge near Twentyfour Mile Creek. Trees selected for this project will also be large, and left whole, limiting the potential for mobilization.

While the primary goal of the proposed project is to increase sorting and retention of spawning gravel within the redd count index reach, this project may have other ancillary benefits for native salmonids, such as improving overwintering habitat, and the stream ecosystem in which they live. Woody debris in salmonid streams also functions to diversify habitat by influencing and/or changing channel velocity, flow direction and gradient; depth associated with bed scour; habitat complexity essential for spatial isolation and cover; localized retention of organic matter and the distribution of invertebrates that consume such detritus (Meehan 1991). A study was recently conducted to evaluate the influence of stream and riparian habitat variables on Bull Trout and Westslope Cutthroat Trout in the two other streams occupied by both species in the Prospect Creek drainage, Crow Creek and Cooper Gulch (Blakney, *In Prep*). While this study found the amount of LWD did not influence the abundance (fish/100 m, fish caught) or biomass ($g/100m^2$, g/100m) of either salmonid species at the reach scale in either stream (~100 m), young-of-the-year (YOY) and juvenile Bull Trout were often associated with collections of small woody debris (SWD) and organic material, likely because these areas provide adequate cover and food. Large wood often facilitates the collection of SWD and other allochthonous materials in these low order streams. Fisheries and/or physical habitat monitoring will be incorporated into this project in hopes of better understanding how such habitat enhancement projects may benefit native salmonids and stream habitat.

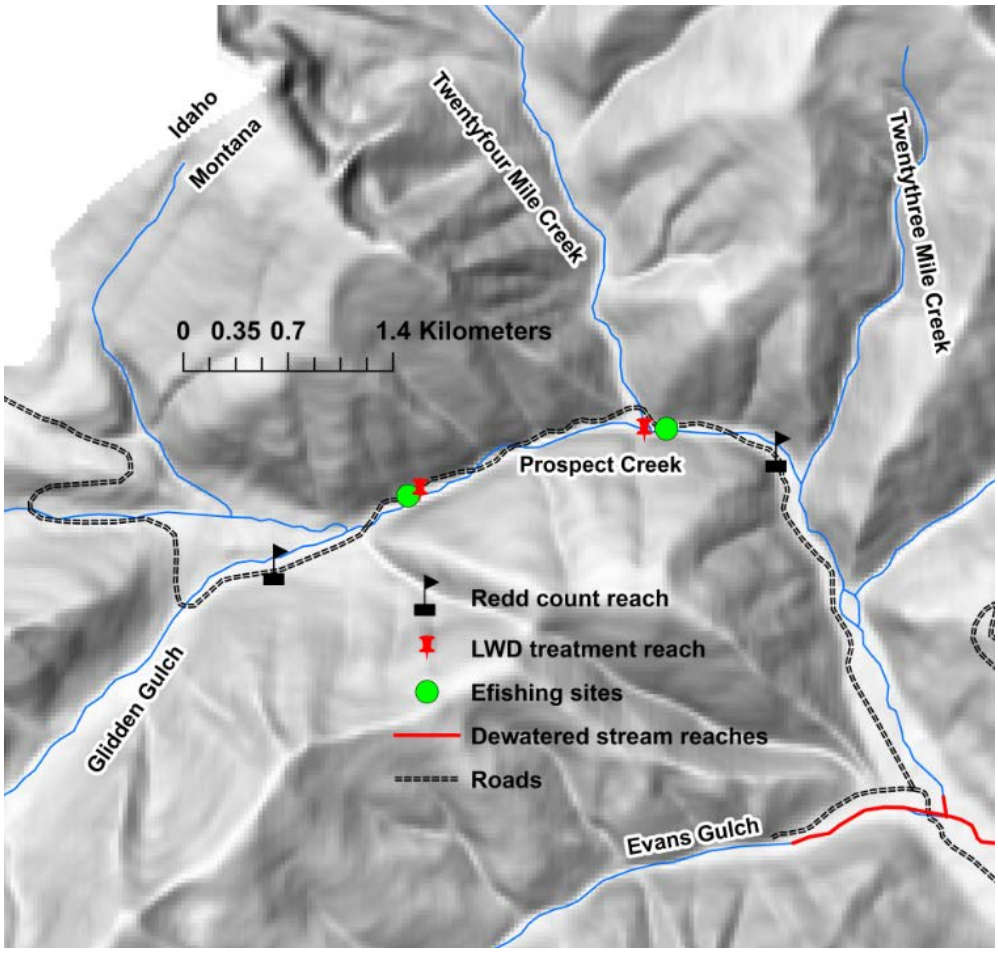

FIGURE 1. Upper Prospect Creek redd count reach (2001-2019), long-term electrofishing sites (1999-20019) and stream reach where selective woody debris addition will occur.

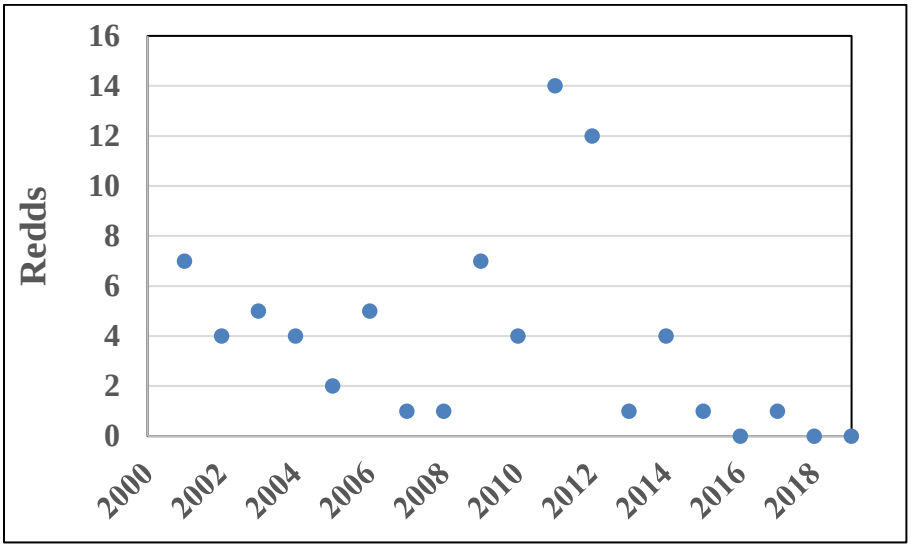

FIGURE 2. Bull Trout redds observed within the index reach in the upper Prospect Creek from 2001 to 2019.

FIGURE 3. Lower gradient section of upper Prospect Creek within the Bull Trout redd count index reach and proposed project area.

Goal

The primary goal of this project is to increase the abundance of suitable sized spawning gravel for Bull Trout within redd count index reach in upper Prospect Creek by selectively felling large conifer trees over approximate 1.5 km of habitat. Secondary benefits to native salmonids and the stream ecosystem from this project may include increased habitat diversity and complexity.

Objectives

1. Increase spawning gravel (up to 50 mm) deposition in the Bull Trout redd count index reach in upper Prospect Creek by selectively felling large conifers trees along up to 1.5km of stream.

2. Monitor physical habitat and/or fisheries response associated with this project.

Tasks

1. Secure any additional permits that may be needed for this project, March-July 2020. (NEPA complete) (Objective 1; ***Completed in 2020***)

2. Fell trees at strategic locations along 1.5km of upper Prospect Creek between July 15 and August 31, 2020. Trees will be dropped at 8 to 10 locations with 1 to 5 large trees (longer than average bankfull width) felled at each location. An engineer from Trout Unlimited and fisheries biologist from MFWP will oversee this work which is expected to take about two days. A skilled sawyer will be hired to fell trees. (Objective 1; ***Completed in 2020***)

3. Evaluate the influence of this project on stream habitat and native trout by collecting fisheries and/or physical habitat data for at least two years following the first run-off event (2021 and 2022-2024). Pre-runoff data was collected in 2020. Post-runoff data was collected in 2021. Project proponents will collect a second year of post-runoff data sometime in the next three years, following a significant runoff event likely to promote channel changes as a result of the structures. (Objective 2; ***Ongoing***)

Work Products

- Mid-year report; due to Appendix B Aquatic Program Leader (APL) August 1, 2022
- Annual Work Summary; due to the APL November 15, 2022
- Review of fisheries and/or physical habitat monitoring efforts two-years post run-off (2022-2024, depending on timing of final monitoring activities) in technical memo or in Appendix B Native Salmonid Tributary Habitat Restoration Monitoring Update

Permitting Requirements

The NEPA for this project has been completed by a project that was approved by the MC in 2017 “Lolo National Forest Priority Native Salmonid Habitat Restoration Assessment and Planning”. A 124 permit was obtained from MFWP for this project.

Endangered Species Act consultation for this project plan is associated with the 2019 Biological Opinion on the effects of continued operation of the Clark Fork Hydroelectric Project on Bull Trout and designated Bull Trout critical habitat (BiOp), and the USFWS-MFWP Cooperative Agreement pursuant to Section 6 of the Act. This project plan is consistent with the analysis and conclusions contained in the 2019 BiOp and the USFWS-MFWP Cooperative Agreement, and will adhere to all appropriate Terms and Conditions designed to reduce the extent and effects of incidental take on Bull Trout. Incidental take reporting for this project plan will be included in the annual Biological Opinion report as required by Term and Conditions 15–18 of the 2019 Incidental Take Statement, as well as MFWP’s annual Section 6 report to the USFWS.

Cultural/Historic Resource Review

The area of this project (upper Prospect Creek) was included in the cultural/historic review that was completed for this and other stream habitat improvements projects completed in 2019 by the Lolo National Forest through the NEPA process.

Benefit to the Resource

This intended goal of this project is to increase the amount of suitable sized spawning substrate available to Bull Trout within the index redd count reach in upper Prospect Creek by selectively felling large conifers along 1.5 km of stream. While appropriately sized gravels occur within the reach, this substrate is not well sorted or is distributed in areas not often used by Bull Trout for spawning (streams margins with little or no flow). Secondary benefits of this project are increased cover, habitat complexity and habitat diversity for Bull Trout, Westslope Cutthroat Trout and other aquatic organisms. Signs of decline, based on long-term data, are becoming evident for a population that occupies about 6.5 km of habitat. This project represents a low-dollar minimally invasive attempt to enhance spawning habitat in a stream comprised solely of native salmonids. The proposed work is consistent with the underpinnings and spirit of Appendix B of the Clark Fork Settlement Agreement and the goals and objectives of MFWP.

Budget

Item	Estimated Carryover [1]	2022 Budget Request
Planning and Site Assessment*	$0	$0
Design, monitoring plan, and permitting** ($50 x 20 hrs.)	$0	$0
LCFWG project management, contracting, and coordination ($28.30 x 24 hrs.)	$0	$0
Sawyer ($60 x 20 hrs.)	$0	$0
Sawyer travel ($0.58 x 200 miles)	$0	$0
TU Oversight ($50 x 25 hrs.)	$0	$0
TU Oversight travel ($0.58 x 300 miles)	$0	$0
Monitoring* ($50 x 16 hrs.)	$0	$800
Project Administration (10%)***	$0	$80
Total	$0	$880
Anticipated Expenditures		$880

[1] *Estimated carryover of unexpended, approved funds as of January 1.*

* This cost is estimated at $1000 and will be funded by a Bureau of Reclamation (BOR) grant.
**Design needs, fisheries and/or physical monitoring plan, and permitting will be developed by project proponents; labor TBD.
***An additional $100 of project administration will be funded by the BOR grant.

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Blakney, J., and T. Tholl. 2019. Native Salmonid Abundance and Tributary Habitat Restoration Monitoring. Annual Project Update-2017. Report to Avista Corporation, Noxon, Montana and Montana Fish, Wildlife and Parks, Thompson Falls, Montana.

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2022 PROJECT PLAN

Lower Clark Fork Watershed Group Project Coordination

Project Contact

Brita Olson, Lower Clark Fork Watershed Group (LCFWG), (208) 304-3852, brita@lcfwg.org,
and
Travis Rehm, Montana Fish, Wildlife and Parks (MFWP), (406) 382-3032, travis.rehm@mt.gov

Project History

The LCFWG was formed in 2004, and has received continuing support from Clark Fork Settlement Agreement (CFSA) Appendix B in addition to funding under Appendix E as annually approved by the Management Committee.

Background

The LCFWG began as an umbrella group to coordinate watershed projects in the Lower Clark Fork (LCF) watershed and assist the eight watershed councils in the LCF: Elk Creek, Prospect Creek, Rock Creek, Whitepine Creek, Bull River, Trout Creek, Pilgrim Creek and Little Beaver Creek. A significant amount of this work has been associated with habitat restoration in support of CFSA Appendix B, with the primary focus on improving habitat for native salmonids such as Bull Trout and Westslope Cutthroat Trout. Therefore, a majority of the emphasis and work performed under this project relate to facilitating on-the-ground work and maintenance of habitat restoration projects.

The LCFWG helps support Appendix B projects in the LCF watershed in multiple ways: from the development of project ideas and engaging in watershed restoration planning to ensuring the long-term follow-through on past projects. There are many details that must fall in line in order to bring successful projects to fruition, and the LCFWG helps coordinate these details and all necessary stakeholders in the process. These efforts are closely tied to funding received for project implementation from other CFSA Appendix B project plans, and from CFSA Appendix E Watershed Councils Program for the coordination of the LCFWG. Historically, there has been much overlap between these proposals. For example, this project will fund development and ongoing coordination of LCF projects, which is closely related to separate project plans that were funded previously and others that may be developed in future years. This work also involves the coordination of watershed stakeholders funded by Appendix E.

Other 2022 project plans that include funding for LCF Project Coordination include:

- Habitat Restoration Monitoring, Maintenance and Contingency Allocation

Additionally, the LCFWG works to leverage other (non-CFSA) resources for restoration work in the LCF watershed, which directly assists CFSA Appendix B projects and often provides ancillary benefits to CFSA Appendices C, E, and K.

Goal

The goal of this project plan is to improve the effectiveness of watershed restoration projects in the LCF through project coordination, assisting with implementation, adaptive management, follow through, and planning.

Objectives

1. Complete successful stream enhancement and restoration projects in the LCF through multi-partner planning, prioritizing, and strategizing that leads to on-the-ground project implementation.

2. Adaptively manage projects by providing consistent follow-through; learning from past successes and failures; and guiding watershed work that complements the values of local stakeholders.

Tasks

1. Coordination: Continue coordinating ongoing and upcoming stream enhancement and restoration projects in the LCF watershed and Avista's project area (Objectives 1 and 2). Upcoming projects "on the radar" and expected to be pursued and/or implemented in 2022 or 2023 (subject to designs, permitting, and funding acquisition) include:

    a. Cooper Gulch restoration/enhancement project (scope TBD)

    b. Crow Creek connectivity project (scope/need TBD)

    c. Prospect Creek drainage culvert improvements (as guided by the Lolo National Forest, Montana Fish, Wildlife & Parks and other stakeholders)

    d. Additional projects pursued at the discretion of the Appendix B Aquatic Program Leader (APL) and project partners.

2. Project development: Plan, develop, and implement ideas for new projects, in line with priorities of CFSA Appendix B and local stakeholders, and move towards implementation (Objectives 1 and 2).

    a. While ongoing Bull River revegetation efforts require significant ongoing investment, the maintenance burden of existing projects is beginning to wane as projects reach maturity. Furthermore, the benefits of the project are increasingly recognized by adjacent landowners and recreational users of the Bull River. Catalyzed by successful past projects and ongoing landowner outreach efforts, there are opportunities to develop additional projects in the Bull River and continue a watershed scale effort to revegetate the Bull River. These will be informed by conclusions articulated in site plans for individual property owners, lessons learned and documented in the LCF Stream Restoration Summary (below), and ongoing maintenance efforts (below).

b. Pursue opportunities and priorities identified by the Appendix B Aquatic Program Leader (APL) and project partners.

3. Funding Development: Work with Avista Grant Writer to obtain additional funding to support Appendix B projects and the above tasks (Objective 1).

4. Documentation and Maintenance: Follow-up with and monitor the success of past projects and help coordinate maintenance as deemed necessary. The Coordinator will work with staff from Montana Fish, Wildlife and Parks (MFWP), the Forest Service (USFS), Natural Resource Conservation Service (NRCS), Avista and other partners to provide continued care for past restoration projects, which will help ensure their success into the future (Objective 2).

    a. The update of the LCF Stream Restoration Summary (1995-2010), originally written by Chris Horn (MFWP) in 2011, is a continuing effort initiated in 2018 and is expected to be completed in early 2022. The LCFWG Coordinator is taking the lead on an update of the document which will include stream restoration projects completed from 2011-2021, as well as current updates on previous projects from 1995-2010. Appendix B funding has continued to support this effort.

    b. Following the completion of the LCF Stream Restoration Summary (1995-2021), LCFWG Coordinator will work to compile a GIS database, Google Earth file and/or an ArcGIS Story Map to make information about past projects more accessible to partners. The final output for this tool will be informed by consultation with project partners, and special focus on usability and usefulness.

    c. In order to be successful, many restoration projects require ongoing maintenance. A good example of this is the ongoing revegetation efforts on private land along the East Fork and mainstem Bull River. These efforts were initiated more than a decade ago, but have required ongoing fencing maintenance, browse protection, and, in some cases, mortality replacement plantings. Even though the results of these efforts are now paying off (there are areas within the project where natural regeneration is occurring and some planted vegetation is well upwards of 15 feet tall, providing shade to the stream), this project still requires maintenance to protect the long-term investment made at this site. On some properties, a lot of the ongoing work has been initiated and sustained by the landowner(s), but this is a unique circumstance among past projects. In many areas, projects are easily neglected as landowners do not live on-site and project partners have limited capacity for exhaustive maintenance tasks and move on to new priorities, affecting not only project outcomes, but also public perceptions and the future potential of engaging with willing landowners to implement priority restoration projects. Project maintenance is difficult to fund, as many funding sources are much more apt to support new – not ongoing – projects, but crucial to long-term resource benefit. Many maintenance tasks are easily accomplished by one person, either early or late in the season, and would either not be worthwhile for

mobilizing an entire Montana Conservation Corps (MCC) crew for or be best accomplished outside of the season when crewmembers are available. In 2022, LCFWG Coordinator will accomplish maintenance tasks at past projects with landowners, volunteers, project partners, and additional staff as is required by the specific tasks.

Work Products

- Comprehensive Project Report; Lower Clark Fork Stream Restoration Summary (1995-2021) – review draft; March 31, 2022
- Comprehensive Project Report; Lower Clark Fork Stream Restoration Summary (1995-2021) – final; June 30, 2022
- Comprehensive Project Report; Lower Clark Fork Stream Restoration Summary (1995-2021) – complementary maps; December 31, 2022
- Mid-year report; due to Appendix B Aquatic Program Leader (APL), August 1, 2022
- Annual Work Summary; due to APL November 15, 2022

Permitting Requirements

No permits are required to implement this project. Permitting efforts for related projects will be covered under project-specific proposals.

Endangered Species Act consultation for this project plan is associated with the 2019 Biological Opinion on the effects of continued operation of the Clark Fork Hydroelectric Project on Bull Trout and designated Bull Trout critical habitat (BiOp). This project plan is consistent with the analyses and conclusions contained in the 2019 BiOp and will adhere to all appropriate Terms and Conditions designed to reduce the extent and effects of incidental take on Bull Trout. No incidental take of Bull Trout is anticipated as a result of this project plan; therefore, no take reporting is required.

Cultural/Historic Resource Review

Not applicable for the tasks proposed in this project plan, there are no ground and/or vegetation disturbing activities, or proposed impacts to cultural/historic resources. Avista cultural staff will coordinate a cultural/historic resource review for those projects associated with coordination tasks described above, prior to implementing those specific projects. The work product for those reviews will be confidential due to the sensitive nature of the content.

Benefit to the Resource

This project exists to support stream protection and enhancement projects in the LCF watershed. Engaging and coordinating work with landowners and other stakeholders helps get more projects off the ground and improves their overall outcome. The LCFWG serves as a point of contact for long-term follow through with landowners and past projects as well as helps leverage resources to maximize the positive impact of CFSA dollars in the watershed. A significant amount of this work has been associated with habitat restoration in support of CFSA Appendix B, with the primary focus on improving habitat for native salmonids such as Bull Trout and Westslope Cutthroat Trout. In addition, stream enhancement projects facilitated by this project also provide benefit to riparian and instream native salmonid habitat and therefore provide ancillary benefits

to appendices C and K, and help address listed state water quality impairments in LCF tributaries.

Budget

Item	Estimated Carryover[1]	2022 Budget Request
LCFWG staff time, up to 160 hours (Project Coordination, Task 1)	$0	$5,280
LCFWG staff time, up to 160 hours (Project Development, Task 2)	$0	$5,280
LCFWG staff time, approx. 40 hours (Funding Development, Task 3)	$0	$1,320
LCFWG staff time, approx. 80 hours (Documentation and Maintenance, Task 4b)	$0	$2,640
Travel expenses (Documentation and Maintenance, Tasks 1-4b)	$0	$1,500
LCFWG staff time, up to 80 hours (Documentation and Maintenance, Task 4c)	$0	$2,640
Travel expenses (Documentation and Maintenance, Tasks 4c)	$0	$750
Administration, 10%	$0	$1,941
Total	$0	$21,351
Anticipated Expenditures		$21,351

[1] *Estimated carryover of unexpended, approved funds as of January 1.*

In addition to the watershed coordination and project development work supported through Appendix B, outreach efforts intended to generate the impetus for work on private lands is described in LCFWG's 2021 Project Plan under the Appendix E Watershed Councils Program and will also be supported by a Montana Department of Natural Resources and Conservation (DNRC) Watershed Management Grant in 2022 and 2023.

Literature Cited

Horn, C. 2011. Lower Clark Fork Stream Restoration Summary (1995–2010). Montana Tributary Habitat Acquisition and Recreational Fishery Enhancement Program. Report to Avista Corporation, Spokane, Washington. Montana Fish, Wildlife & Parks, Thompson Falls, MT.

2022 PROJECT PLAN

Habitat Restoration Monitoring, Maintenance, and Contingency Allocation

Project Contacts

Travis Rehm, Montana Fish, Wildlife and Parks (MFWP), (406) 382-3032, travis.rehm@mt.gov,
and
Brita Olson, Lower Clark Fork Watershed Group (LCFWG), (208) 304-3852, brita@lcfwg.org

Project History

This is a continuing project originally approved by the Management Committee (MC) in 2015. The scope and budget for this project are reviewed by the MC annually.

Background

Habitat Restoration is an important component of Appendix B in the Clark Fork Settlement Agreement (CFSA). Stream restoration projects are expensive and due to the dynamic nature of the watersheds in this area, future maintenance is often required. Therefore, funding for maintenance of these projects is often crucial for successful implementation. Contingency funds are designed to provide managers a means to rapidly respond to needs as they arise, and to reduce the burden of numerous, low-dollar Consent Mail requests on the MC. As needs arise, managers will notify the Aquatic Implementation Team (AIT) and seek Avista approval prior to expending meaningful funds that were not specified within the Project Plan. Given it is a fund and not related to a specific project, the Appendix B ranking criteria do not apply.

The annual ability to address maintenance and revegetation along native salmonid stream as well as at previous restoration or enhancement projects sites is a cost-effective way to ensure the best performance of such investments. Such projects are consistent with stated goals of Appendix B and E of the CFSA to conserve and improve important tributary habitat as well as having ancillary benefits to Appendices C, and K, state water quality prescriptions, and when located along streams with native salmonids, are consistent with Federal and State of Montana management plans for these species.

These funds will be used if damage to previously funded restoration sites occurs, and maintenance is needed. Implementation and/or planning for smaller-scale revegetation work (at previously funded restoration sites) may also occur under this project plan. Methods for implementing maintenance activities and revegetation efforts will be site specific and depend on the scope of effort needed. The Montana Conservation Corps (MCC) has been used in the past to assist with implementation of revegetation and restoration work and may be hired if needs are great enough that a crew would be occupied for an entire week or more (maximizing benefits relative to the cost of fielding a crew for a week).

Goal

The goal of this project is to provide support to fix or enhance stream restoration sites in the lower Clark Fork River drainage, Montana.

Objective

1. Sustain or enhance previous restoration or enhancement projects through continued maintenance.

Tasks

1. Identify, assess and implement maintenance needs at past stream habitat restoration or enhancement projects performed along area tributaries. Specific methods used for restoration site maintenance are site dependent. (Objective 1).

2. Plant additional riparian shrubs (if need is identified) and fix any damage sustained to browse protection exclosures at previously completed projects in the lower Clark Fork River drainage, Montana (Objective 1).

3. Remove old and no longer functional browse protection on the Stein ownership along the East Fork Bull River from decades old revegetation effort (Objective 1).

4. Remove all fencing and browse protection materials from the 2007 restoration reach in Crow Creek (Objective 1).

5. Treat up to 5 acres of invasive weeds growing in the Miners Gulch and Sims Meander reaches the Vermilion River, utilizing a combination of herbicide (using a sponge applicator) and hand-pulling (Objective 1).

6. As time and capacity allows, work with the Kootenai National Forest to remove ineffectual fencing in the Chapel Slide reach of the Vermilion River.

Work Products

- Project Completion Report for Mainstem Bull River Reforestation on Forest Service Lands and NEPA Process (including photo-documentation); final due May 1, 2022
- Mid-Year report; due to Appendix B Aquatic Program Leader (APL) August 1, 2022
- Annual Work Summary; due to APL November 15, 2022

Permitting Requirements

No permitting requirements have been identified at this time; however, if required maintenance required stream bank alteration, a 310 or 124 permit will be submitted to Green Mountain Conservation District or MFWP necessary.

Endangered Species Act consultation for this project plan is associated with the 2019 Biological Opinion on the effects of continued operation of the Clark Fork Hydroelectric Project on Bull Trout and designated Bull Trout critical habitat (BiOp). This project plan is consistent with the analyses and conclusions contained in the 2019 BiOp and will adhere to all appropriate Terms and Conditions designed to reduce the extent and effects of incidental take on Bull Trout. No incidental take of Bull Trout is anticipated as a result of this project plan; therefore, no take reporting is required.

Cultural/Historic Resource Review
This is a carryover or maintenance project and the cultural/historic resource review was completed for Bull River revegetation in 2016 by the Cultural Resources Management Group. For activities in other areas, Avista cultural staff will coordinate cultural/historic resource review for those activities prior to implementing the project. The work product for this review will be confidential due to the sensitive nature of the content.

Benefit to the Resource
Conducting maintenance of previously funded restoration and enhancement projects is essential for the long-term success of these projects. A significant portion of maintenance projects Appendix B has dealt with in the past involve streamside vegetation. The general goal of riparian planting projects is to reestablish native vegetation along streams which has a plethora of ecological benefits including improved bank and channel stability, cover for fish, increased stream shading, localized water retention as well as bird and wildlife habitat. As such, this project is also in line with Appendix K as well as State of Montana and Federal fisheries management plans and water quality objectives.

Budget

Item	Estimated Carryover[1]	2022 Budget Request
LCFWG planning, labor, contracting, and coordination ($25-33 x 100 hrs)	$0	$3,300
LCFWG staff travel (IRS mileage rate)	$0	$750
Fund to cover necessary labor (MCC crew, additional contract or staff labor, etc.) related to maintenance at past stream restoration sites.	$0	$15,000
Funds to purchase native plants from local nursery, weed treatments, other materials necessary to implement maintenance or planting activities, or other unforeseen expenses related to maintenance at past stream restoration sites.	$0	$5,000
Total	$0	$24,050
Anticipated Expenditures		$24,050

[1] *Estimated carryover of unexpended, approved funds as of January 1.*

2022 PROJECT PLAN

Habitat Restoration, Property Acquisition, and Conservation Easement Contingency Allocation

Project Contact
Travis Rehm, Montana Fish, Wildlife and Parks (MFWP), (406) 382-3032, rehm.travis@mt.gov

Project History
This is a continuing project originally approved by the Management Committee (MC) in 2017. The scope and budget for this project are reviewed by the MC annually.

Background
This proposed project is a fund and not related to a specific project, thus the Appendix B ranking criteria does not apply. This fund is proposed so that quick and timely actions can be made to purchase property and/or conservations easements for recreational or native fisheries as well as to support restoration planning opportunities that may become available. The Aquatic Implementation Team (AIT) will be notified if any substantial expenditures are anticipated under this contingency fund and would confer on appropriateness and whether additional actions were required.

This fund will be set up to support efforts in Montana to acquire, protect, and improve the quality of critical native salmonid (Bull Trout and Westslope Cutthroat Trout) tributary habitat in high priority spawning streams as well areas deemed important to recreational fisheries. Therefore, funding for specific projects will either come from the Tributary Habitat Acquisition and/or Recreation Enhancement Fisheries funds. Purchase of specific individual parcels or conservation easements will be presented individually for MC approval. Land conservation will be through fee title purchase or through placement of conservation easements, working only with willing sellers and cooperators. This fund is designed to provide support to potential land acquisition, conservation opportunities and to perform due diligence (title report, baseline research, survey, appraisal, negotiations, etc.) to ready potential transactions for presentation to the MC.

We intend to continue our partnership with a third party to provide annual funding to help identify, negotiate, and facilitate land conservation actions. This partnership allows the involvement an entity who is well versed in land conservation and the local markets, to monitor the market and begin discussions with willing landowners as appropriate.

Habitat restoration is also an important component of the Appendix B program. New project development is an involved scoping process requiring the identification and integration of information regarding specific project streams, locations, willing landowners, and associated biological limitations. Often times, technical engineering support is required to develop viable project proposals, including feasibility analyses, preliminary designs, and cost estimates. This fund is designed to provide limited resources to allow pre-project review and collaboration with qualified fish habitat engineers and other interested parties. It is expected that this scoping will lead to full project proposals for MC review and approval.

Projects developed using this fund will be consistent with the Montana Tributary Habitat Acquisition and Recreational Fishery Enhancement Program (Appendix B of the Clark Fork Settlement Agreement), through enhancement of tributary habitat conditions for native salmonids and improvements or access for recreational fisheries. Native fisheries or recreational fisheries funds could be used depending on the specific project.

This fund is designed to provide managers with a means to rapidly respond to opportunities and needs as they arise, and to reduce the burden of numerous, low-dollar Consent Mail requests on the MC. As opportunities or needs arise, managers will notify the AIT and seek Avista approval prior to expending funds that were not specified within a Project Plan. Given it is a fund and not related to a specific project, the Appendix B ranking criteria do not apply.

Goal
The goal of this project is to provide the ability for timely investigations associated with engineering support for restoration projects and support to potential land acquisition, conservation opportunities and to perform due diligence (title report, baseline research, survey, appraisal, negotiations, etc.) to ready potential transactions for presentation to the MC.

Objectives
1. Fund a third-party contractor to provide outreach support.

2. Cover due diligence costs (title report, baseline research, survey, appraisal, negotiations on potential land actions) on potential new acquisitions/easements to ready them for MC approval.

3. Provide engineering support to assist with the development of future fish habitat projects.

Tasks
Specific tasks will be identified as necessary, but may include conducting initial site visits, providing conceptual design, assessing potential project feasibility, and developing preliminary cost estimates.

Work Products
- Annual Work Summary; from Appendix B Aquatic Program Leader to Avista; due December 1, 2022
- Designs for specific projects would be reported in the form of a Technical Memorandum

Permitting Requirements
Not applicable for the tasks proposed in this project plan.

Endangered Species Act consultation for this project plan is associated with the 2019 Biological Opinion on the effects of continued operation of the Clark Fork Hydroelectric Project on Bull Trout and designated Bull Trout critical habitat (BiOp). This project plan is consistent with the analyses and conclusions contained in the 2019 BiOp and will adhere to all appropriate Terms and Conditions designed to reduce the extent and effects of incidental take on Bull Trout. No incidental take of Bull Trout is anticipated as a result of this project plan; therefore, no take

reporting is required.

Cultural/Historic Resource Review
Not applicable for the tasks proposed in this project plan, there are no ground and/or vegetation disturbing activities, or proposed impacts to cultural/historic resources.

Benefit to the Resource
This fund is designed to: 1) assist with land acquisitions and conservation easements, depending on the particular property, for native or recreational fish species 2) assist with the development of fish habitat restoration/enhancement proposals with the goal of enhancing conditions for native salmonids or recreational fisheries.

Budget

Item	Estimated Carryover[1]	2022 Budget Request
Outreach support	$0	$5,000
Due diligence costs	$0	$35,000
Engineering Support	$0	$20,000
Total	$0	$60,000
Anticipated Expenditures		$60,000

[1] *Estimated carryover of unexpended, approved funds as of January 1.*

2022 PROJECT PLAN

East Fork Bull River Morphology, Connectivity, and Habitat Enhancement Project

Project Contacts

Travis Rehm, Montana Fish, Wildlife and Parks (MFWP), (406) 382-3032, travis.rehm@mt.gov,
Brita Olson, Lower Clark Fork Watershed Group (LCFWG), (208) 304-3852, brita@lowerclarkforkwatershedgroup.org, *and*
Eric Oldenburg, Avista, (406) 847-1290, eric.oldenburg@avistacorp.com

Project History

This is a continuing project that was first approved by the Management Committee in 2020 and is closely related to numerous past projects that have been implemented, in part, through the Clark Fork Settlement Agreement (CFSA) and CFSA stakeholders. This project was ranked by the WRTAC in 2020. The majority of this project is now complete. No additional funding is being proposed for 2022; however, we are seeking a deadline extension to finalize the "beaver management plan" and "flow management assessment and recommendations" work products. Follow-up work regarding channel management will likely be proposed through a new project plan at a later date.

Background

Bob Stein owns the only two private parcels of land along the East Fork Bull River (other than a small parcel right at the Bull River confluence). Much of the Stein property was once dominated by an old growth, closed canopy cedar forest; however, it was heavily logged by a previous owner decades ago (prior to the Streamside Management Zone law of 1991 that would have prevented or penalized such actions). The Stein property is located in a transitional area, where the river leaves confined, stable, and higher gradient reaches of East Fork Bull River and enters a broader, less steep valley. Riparian forests with large trees that provide shade, large woody debris, and strong root networks are crucial elements for providing habitat stability in such transitional areas.

Prior to 1997 (and despite the aforementioned logging), the majority of the East Fork Bull River flowed through a relatively high-quality channel, a portion of which was characterized by mature riparian forest and stable banks on the south side of the valley, with a secondary channel on the north side. In the historically large flood events of 1996/1997, the channel avulsed and sent all of the flow to the north side of the valley. Because this area lacked many mature trees, extreme erosion occurred during the floods, and there was concern that additional erosion would occur during high flow conditions. In the fall of 1997, a few emergency measures were taken to reduce risk of further erosion. In 1998, MFWP devised a plan to install an engineered split in the north channel such that 60% of the base flow would be diverted back to the higher quality south channel and 40% would remain in the north channel. At MFWP's request, Mr. Stein allowed the engineered split to be installed. Additional work (1,200 feet of channel reconstruction) was completed in 2001 to stabilize the north channel and improve fish habitat (Horn 2011). In 2002, a large revegetation effort was also initiated to restore the valley bottom from a monoculture of reed canarygrass to a dark forest community, beginning with first stage successional species (alder, willow, serviceberry, etc.) and following with slower growing (shade tolerant) late

successional species (cedar). Many of these efforts have been very successful, in no small part due to Mr. Stein's continued commitment to stewarding this section of the river. In 2019, dozens of planted cedar trees were 10 to 15 feet tall or more; and naturally regenerated conifers can be observed among the understory which is no longer solely dominated by reed canarygrass.

Figure 1. Cedar tree along the East Fork Bull River threatened by beaver.

Over the last decade, flow within the East Fork Bull River has flipped between the south and north channels and is currently relatively balanced between the two. The north channel (now 18 years post-reconstruction) is relatively stable and well vegetated; however, it has not fully recovered to the desired dark riparian forest dominated by large-diameter trees. Much of the riparian area is still dominated by reed canarygrass and shrub species, and the valley has been populated by a robust community of beavers who favor this habitat. While beavers are in many circumstances positive contributors to watershed health and resiliency, they continue to threaten the mature cedar trees that remain and hinder efforts to restore the riparian area (see Figure 1).

The present-day successional state and associated vegetative community on the Stein property is ideal for beaver colonization as an artifact of the logging that occurred in the late 1980s. A local logger likened this property before it was logged to Ross Creek Cedars and the closed-canopy cedar forest would have generally lacked plant species such as willow, alder, and dogwood that are now sustaining beavers in the area. Beaver dams weren't noticed in the area by Mr. Stein until the early 2000s and were first documented during Bull Trout redd surveys in 2006. While not well documented, beaver and dam densities appear to have remained relatively low until the early 2010s when the number, size, and complexity of beaver dams in the East Fork Bull River increased. In 2019, eight beaver dams were documented within the East Fork Bull River: six in the split-channel reaches on or near the Stein property and two upstream from this location.

In addition to hindering riparian restoration efforts, beavers present a number of documented and purported threats to native salmonids within East Fork Bull River. First, the series of dams likely represent a migratory barrier to adult Bull Trout. In 2019, four fisheries biologists from Avista; MFWP; and the U.S. Forest Service visited the dams during the fall Bull Trout migration period. The biologists unanimously agreed that the dams were likely preventing upstream fish migrations. This assertion was corroborated by observations on the movements of PIT-tagged adult Bull Trout. It is likely that spring-spawning species such as Westslope Cutthroat Trout can navigate past the dams during the spring freshet; however, passage is not likely possible for some fall-spawning fishes, a proportion of which migrate up tributaries following the spring freshet.

In addition, it is suspected that the dams present challenges to the downstream outmigrations for both juvenile and adult Bull Trout. Many of these dams have matured to the point where the upstream face of the dam is completely lined with silt or clay and no through-dam passage routes could be identified. Thus, under base flow conditions, very little water passes through the base of the dams and it does not spill over the top of the dams. Rather, the majority of streamflow passes through a narrow margin of unconsolidated twigs and branches near the top of the dam. We believe fish either do not attempt to pass the dams, or attempt to go over the top of the dams. We speculate there is a high probability that fish attempting to pass over the top of the dam would be strained out by the network of twigs on the downstream face of the dam and not survive. Among the 12 adult Bull Trout transported and released near the St. Paul Lake trailhead prior to the spawn in 2019, only four fish were detected leaving the stream as of December 3 (typically, a high proportion of adult Bull Trout outmigrate immediately following the spawn with a much smaller proportion leaving the following spring).

In addition to connectivity problems, the pools created by the dams may be negatively affecting native salmonids as they likely benefit non-native salmonids (i.e., Brook and Brown trout) disproportionately over native salmonids. This is because they create habitat conditions more closely associated with non-native salmonids and because they generally occur downstream in the reaches predominated by non-native species (Bull Trout densities are greatest upstream from these locations).

Figure 2. Dead fish in the north channel of the East Fork Bull River associated with an overnight dewatering event caused by beaver dams.

Lastly, the direct mortality of hundreds of fish has been caused by the beaver dams. In the fall of 2018 we documented two instances in which the north channel went dry in a matter of hours and numerous “piles” of dead fish were documented in locations where the resultant stranding pools went dry (Figure 2). The dewatering event was caused by two unfortunately located beaver dams. In the north channel, there is a beaver dam directly downstream from the engineered split. A second beaver dam is located in the engineered split. These two dams serve to back up the same pool of water. When beavers actively fortify the dam in the north channel proper, nearly all of the flow is temporarily diverted through the engineered split and back to the south channel. When this happens, the little bit of water that remains within the north channel goes subsurface and the north channel rapidly goes dry.

After much deliberation, we are proposing to aggressively manage beavers and beaver dams in the East Fork Bull River in the interest of enhancing revegetation efforts and ultimately to protect and enhance native salmonid populations in the East Fork Bull River. In addition, if not addressed, flow, or a proportion thereof, is likely to periodically change channels. It may be

desirable to maintain a consistent split of flow between the channels to fully utilize the available habitat, optimize downstream fish capture efforts, and ensure infrastructure considerations are addressed. Additionally, we need to ensure Mr. Stein fully supports any proposed action and that we honor past agreements made in this regard. Thus, we are proposing to work with appropriate agencies and Mr. Stein to develop a long-term plan with regard to flow management within the split channels of the East Fork Bull River.

Goal
The goal of this project is to enhance connectivity and stream conditions for native salmonids in the East Fork Bull River.

Objectives
1. Manage beavers and beaver dams in the interest of maintaining connectivity, protecting riparian vegetation and channel function, and otherwise reducing threats to native salmonids.

2. Develop a site plan and proposal to enhance efforts to (1) promote and establish riparian vegetation and (2) reach the climax successional state (e.g., cedar canopy) as rapidly as is reasonable. **(Complete)**

3. Work with the landowner and appropriate stakeholders to develop a long-term strategy (or lack thereof) for managing channel morphology and flows in the split channel reaches of the lower river.

Tasks
1. Ensure communication and collaboration with the landowner and all stakeholders (e.g., Kaniksu Land Trust, U.S. Forest Service, U.S. Fish and Wildlife Service, Green Mountain Conservation District), as appropriate. (Objectives 1–3)

2. Complete due diligence and obtain all necessary permits to remove new beaver dams (and prohibit future dams from being constructed) on the private property. Dams will be partially removed using hand tools. Crews will remove any remaining components following the spring freshet. (Objective 1)

3. Develop a long-term beaver management plan for monitoring future beaver activity and subsequently removing beavers and/or dams. For the remainder of 2022, the project proponents will monitor and immediately address any new activity. A damage permit will be obtained from MFWP for this purpose. (Objective 1)

4. Develop a site plan to enhance riparian vegetation and otherwise promote rapid advancement toward a climax successional community (e.g., dominated by cedar canopy). In addition, an associated long-term monitoring and maintenance plan will be developed. If deemed prudent, a private consultant may be utilized to help with this task. Physical implementation will be proposed as a 2021 consent mail or 2022 project plan; however, we may begin due diligence toward identifying and obtaining any required permits. (Objective 2) **(Complete)**

5. Work with the landowner and appropriate stakeholders to develop a long-term plan for managing channel morphology and flows in the dynamic split channel reaches of the lower river. If necessary, a ground or LiDAR survey may be implemented to inform the plan. A brief assessment will be developed along with a collaboratively developed recommendation regarding active channel management or a lack thereof. (Objective 3)

Work Products

- Beaver management plan (likely memorandum); due June 1, 2022
- Flow management assessment and recommendations (likely memorandum); due June 1, 2022
- Annual Work Summary; due to Appendix B Aquatic Program Leader November 15, 2022

Permitting Requirements

Project proponents will obtain a MFWP damage permit if beaver removal is necessary. With regard to the flow management assessment components of this project, physical implementation will be proposed through a future consent mail or subsequent year's project plan. However, it is possible we will pursue permits associated with potential work simultaneous to seeking Management Committee approval. Required permits will be identified once the plans are final.

Endangered Species Act consultation for this project plan is associated with the 2019 Biological Opinion on the effects of continued operation of the Clark Fork Hydroelectric Project on Bull Trout and designated Bull Trout critical habitat. Incidental take reporting for this project plan will be included in the annual Biological Opinion report as required by Term and Conditions 15–18 of the 2019 Incidental Take Statement.

Cultural/Historic Resource Review

If ground or vegetation disturbance activities are proposed, Avista cultural staff will coordinate a cultural/historic resource review for the project. The work product for this review will be confidential due to the sensitive nature of the content.

Benefit to the Resource

One component of Appendix B to the CFSA is to enhance tributaries to the lower Clark Fork River in the interest of benefiting native salmonid populations. Similarly, Appendix C of the CFSA calls for implementation of the Native Salmonid Restoration Plan and associated Five-Year Plan. This project is designed to directly and indirectly benefit native salmonids in the East Fork Bull River by increasing connectivity, enhancing habitat conditions, and eliminating survival threats. In addition, this project is designed to enhance and expedite reforestation in the interest of re-establishing channel stability and a return to a closed canopy community that will likely be naturally devoid of beaver activity.

These efforts are consistent with direction from the U.S. Fish and Wildlife Service through the Bull Trout Recovery Plan, Biological Opinion for the Clark Fork Projects FERC license, and informal consultation through the CFSA process. These actions also align with MFWP management plan in the interest of managing for the recovery of native species.

Budget

Item	Estimated Carryover[1]	2022 Budget Request
Hydrologist/geomorphologist consultant (if deemed necessary)	$2,000	$0
LiDAR or ground survey (if deemed necessary)	$15,000	$0
Total	$17,000	$0
Anticipated Expenditures		$17,000

[1] *Estimated carryover of unexpended, approved funds as of January 1.*

While challenging to quantify a monetary value, Mr. Stein continually invests substantial time, labor, and money addressing the objectives from this study. The Appendix B Lower Clark Fork Watershed Group Projects Coordination project plan also provides support for this project with miscellaneous coordination (landowner, partners, contracting, etc.) for all tasks. Additionally, staff working on the Appendix C Tributary Trapping and Downstream Juvenile Bull Trout Transport Program will provide labor support for this project (~$10,000).

Literature Cited

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2022 PROJECT PLAN

Cabinet Gorge and Noxon Reservoir Fisheries Monitoring Plan

Project Contact

Jason Blakney, Montana Fish, Wildlife and Parks (MFWP), (406) 382-3033, jblakney@mt.gov, *and*
Travis Rehm, MFWP, (406) 382-3032, travis.rehm@mt.gov

Project History

This is a continuing project originally approved by the Management Committee (MC) in 2000. The scope and budget for this project are reviewed by the MC annually.

Background

Over the past 20 years, monitoring on Noxon and Cabinet Gorge reservoirs has revealed important changes in the fisheries community. For example, eliminations of large water level fluctuations by Avista in the 1980s resulted in successful reproduction of bass species which has translated to an increase in angling pressure (Kreiner and Tholl 2016). Additionally, dramatic shifts in species composition of tournament-caught fish and increases in Walleye abundance since 2000 have been documented and monitored under this program (Kreiner and Tholl 2016; Kreiner et al. 2020; Rehm et al. 2021). More recently, focus has been put on identifying year-class strength of Walleye within Noxon Reservoir. Monitoring activities in 2022 will included fall gillnetting, bass tournament monitoring, and Walleye sampling. In 2022, we may increase Walleye sampling by setting up to five large mesh gillnets after annual monitoring has concluded in the fall. Finally, we will continue to promote recreational fishing in Sanders county by holding two kids fishing days.

Fall Gillnetting

Standardized annual fall gillnetting in Noxon and Cabinet Gorge reservoirs provides the most comprehensive index of relative abundance for fish species and fish community composition in both reservoirs. Standardized gillnet surveys are conducted annually in Noxon and Cabinet Gorge reservoirs in early October. The surveys consist of 45 total overnight gillnets sets, 30 in Noxon Reservoir and fifteen in Cabinet Gorge. In Noxon, 19 sites are in the lower portion of the reservoir below Beaver Creek Bay, while the remaining 11 sites are in the upper riverine portion. Originally planned as biennial sampling in 2000, annual sampling was deemed necessary in 2002 because of the expanding population of Walleye. Standardized (i.e., identical) sites have been sampled annually since then. Coldwater sites such as tributary mouths, have been intentionally avoided to reduce Bull Trout by-catch and mortality.

Bass Tournament Monitoring

The status of adult Largemouth and Smallmouth Bass populations has been assessed annually since 1997 through the monitoring of bass tournaments on Noxon Reservoir. In most years, between five and seven two-day bass tournaments occur on Noxon Reservoir. One to three tournaments are monitored each year. Noxon Reservoir bass tournaments required that bass to be weighed-in had a minimum length of 305 mm (12”). Therefore, only bass this size or larger are monitored at tournaments. Indices collected at Noxon tournaments since the 1990s include the percentage of quality fish weighed in (fish greater than 380 mm or 15 inches; Gabelhouse 1984),

mean length of fish weighed in (>305 mm), and proportion of species brought to weigh-in (Smallmouth versus Largemouth bass). All tournaments held on Noxon Reservoir allowed high-grading or culling (i.e., the replacement of smaller fish captured with larger fish after a 5-fish limit was attained) so catch rates can not be accurately estimated.

Spring Walleye Sampling
Walleye were illegally introduced into Noxon Reservoir in the 1980s or early 1990s (WWP 1995, Horn and Tholl 2010). Since 2000, the population of Walleye has become self-sustaining and has increased in abundance relative to other species. Stemming from the illegal introduction in Noxon Reservoir, Walleye have since become established in the downriver waterbodies of Cabinet Gorge Reservoir, Lake Pend Oreille, and the Pend Oreille River through Idaho and into Washington. Based on information obtained during a previous telemetry study (Horn et al. 2009), MFWP began spring surveys for Walleye on suspected spawning grounds in 2012. This work has continued through 2021, primarily using jet-boat electrofishing at night. To coincide with suitable spring spawning temperature and pre-runoff flows, spring Walleye electrofishing is conducted from late March to early May (Willis and Stephen 1987). Efforts occur in two spawning areas directly downstream of Thompson Falls Dam, adjacent to the River's Bend Golf Course and upstream of the Highway 200 bridge. Nighttime electrofishing for Walleye will continue in the spring in order to track year class strength, run timing, and relative abundance of spawning Walleye.

Promote Recreational Fishing
For more than 15 years the CFSA has supported kids fishing days in Sanders county. Historically fishing day were held exclusively at Triangle Pond, however more recently they have been expanded to the Thompson Falls State Park Pond. These fishing days aim at prompting recreational fishing in our youth.

Goal
Accurately monitor species composition, long-term trends in relative abundance, and growth data of fish species in Noxon Reservoir.

Objectives
1. Track the long-term trends in abundance fish populations in Noxon and Cabinet Gorge reservoirs through annual fall gillnetting.

2. Monitor the overall status of the bass fishery in Noxon Reservoir with tournament data.

3. Monitor the population of Walleye in Noxon Reservoir through spring electrofishing, and annual fall gillnetting.

4. Promote recreational fishing in our youth.

Tasks

1. Monitor relative abundance and fish community composition in both Noxon and Cabinet Gorge reservoirs. Standardized gill net sets will occur on both reservoirs in early October.

The surveys consist of 45 total overnight gillnets sets, 30 in Noxon Reservoir and fifteen in Cabinet Gorge. In Noxon, 19 sites are in the lower portion of the reservoir below Beaver Creek Bay, while the remaining 11 sites are in the upper riverine portion.

2. Monitor the bass fishery in Noxon Reservoir. Select bass tournaments (1-3) will be monitored to collect length data and species composition of all tournament caught fish.

3. Nighttime electrofishing of Noxon Reservoir Walleye will consist of multiple nights sampled during several weeks in April and/or May 2021. For complete details on past methodologies, please refer to Kreiner and Tholl 2016.

4. Promote recreational fishing in our youth. The promotion and operation of two kids fishing days will occur on Triangle Pond and the Thompson Falls State Park Pond.

Work Products

- Annual Project Update; 2019 activities; final due May 31, 2022
- Annual Project Update; 2021 activities; final due October 31, 2022
- Annual Work Summary; from Appendix B Aquatic Program Leader to Avista; due December 1, 2022

Permitting Requirements

No permits are required for fisheries sampling work as all work will be conducted and/or overseen by MFWP fisheries biologists.

Endangered Species Act consultation for this project plan is associated with the 2019 Biological Opinion on the effects of continued operation of the Clark Fork Hydroelectric Project on Bull Trout and designated Bull Trout critical habitat (BiOp), and the USFWS-MFWP Cooperative Agreement pursuant to Section 6 of the Act. This project plan is consistent with the analysis and conclusions contained in the 2019 BiOp and the USFWS-MFWP Cooperative Agreement and will adhere to all appropriate Terms and Conditions designed to reduce the extent and effects of incidental take on Bull Trout. Incidental take reporting for this project plan will be included in the annual Biological Opinion report as required by Term and Conditions 15–18 of the 2019 Incidental Take Statement, as well as MFWP's annual Section 6 report to the USFWS.

Cultural/Historic Resource Review

Not applicable for the tasks proposed in this project plan, there are no ground and/or vegetation disturbing activities, or proposed impacts to cultural/historic resources.

Benefit to the Resource

Noxon Reservoir is one of the most popular fisheries in northwest Montana (MFWP 2014). In a recent report, Scarnecchia et al. (2014) caution that while the current fishery is functioning at a level in which predators and prey are more balanced than in the past, continued monitoring is necessary. There is potential for one or more species to reach a level which could be detrimental to the quality of angling, either through dramatic increases in one or more predator species, or a depletion of the prey base. The authors encourage additional sampling protocols for all fish, including Walleye and basses, outside of the standard gillnetting. Appendix B of the CFSA states

that "[Avista] will support and cooperate with the fishery monitoring, enhancement, and management efforts of MFWP on Noxon and Cabinet Gorge Reservoirs", which includes "monitoring fish populations".

Budget

Item	Estimated Carryover[1]	2022 Budget Request
Labor (Technician, 0.6 FTE)	$10,000	$57,000
Technical assistance on the Thompson River	$0	$6,000
Meals (Univ. ID student volunteers)	$0	$4,000
Supplies and maintenance (gill nets, boat repair, daily equip., etc.)	$2,000	$4,000
Fuel	$0	$4,000
Depth finder (jet boat; purchase and installation)	$0	$2,000
Walleye otolith extraction and analysis	$0	$1,000
PIT tags	$3,000	$3,000
Aging equipment	$0	$1,000
Kids fishing day costs	$0	$1,000
Total	$15,000	$83,000
Anticipated Expenditures		$98,000

[1] *Estimated carryover of unexpended, approved funds as of January 1.*

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2022 PROJECT PLAN

Pilot Project: Treatment of Eurasian Watermilfoil Beds with a Mechanical Harvester

Project Contacts

Paul Kusnierz, Avista, (406) 847-1274, paul.kusnierz@avistacorp.com, *and*
Travis Rehm, Montana Fish, Wildlife and Parks (MFWP), (406) 382-3032, travis.rehm@mt.gov

Project History

This is a continuing project for 2022. The project was first approved by the Management Committee (MC) in 2020. In 2020 work was initiated to develop a sampling and evaluation plan, make contact with potential contractors to harvest Eurasian watermilfoil (EWM), and begin the development for an Environmental Assessment. In 2021 the environmental assessment allowing for the use of mechanical treatment of EWM was finalized. While the project was not fully implemented in 2021, substantial effort went into developing the sampling and evaluation plan including observing aquatic plant harvesting equipment in Washington, participating in EWM sampling with MFWP staff, and testing fish sampling methods. After considering the information gathered and observations made in 2021, and the likely high cost to implement the project in a robust manner, and consulting with the Aquatic Implementation Team, the project proponents would like to scale the project down so that it consists of only a comparison of mechanical harvest versus herbicide treatment of EWM. We also propose to change the title from "Pilot Project: Modification of Eurasian Watermilfoil Beds on Noxon Reservoir for Fishery Benefits" to "Pilot Project: Treatment of Eurasian Watermilfoil Beds with a Mechanical Harvester." The scope and budget will be reviewed and approved by the MC annually. It is anticipated that this project will be implemented for up to three years beginning in 2022 depending on runoff timing, contractor availability, permitting, etc.

Background

Eurasian watermilfoil was first confirmed in Noxon Reservoir in 2007. In 2008, the Sanders County Commissioners established the Sanders County Aquatic Invasive Plants Task Force (Task Force) to develop and implement an integrated weed management approach to contain and manage infestations of EWM. Widespread herbicide treatment of EWM in Noxon Reservoir occurred from 2012 to 2016. In 2017 no treatment occurred while the Task Force conducted an alternatives analysis for treatment of EWM in the reservoirs (DeBruyckere and Pennington 2017). Based on this analysis and input from stakeholders, treatment of EWM shifted from reservoir-wide to treatment of priority areas near public and private access sites, including public and private boating access sites and shoreline dock areas, and when funding is available, large, high density shallow access areas with significant boat traffic. In recognition of this shift and the low probability that EWM will be extirpated from Noxon Reservoir, there is interest in managing this invasive plant with techniques other than herbicide treatment and bottom barriers.

Goal

The goal of this project is to develop additional techniques for treatment of EWM beds in Noxon and Cabinet Gorge Reservoirs.

Objectives

1. Establish the feasibility of using mechanical harvesting to reduce EWM coverage and create edge habitat for reservoir fishes and access to the interior of EWM beds for anglers. ***(Completed in 2021)***

2. Evaluate the efficacy of mechanical removal of EWM versus herbicide treatment.

Tasks

1. Work with the Aquatic Implementation Team and the Task Force to establish an EWM mechanical removal monitoring and evaluation plan. (Objective 1)

2. Procure necessary permits to mechanically remove EWM beds. (Objective 1)

3. Procure a contractor to mechanically remove EWM beds in 2022 and provide oversight of contractor's work. (Objective 2)

4. Monitor the effects of mechanical removal of EWM versus herbicide treatment. (Objective 2)

Work Products

- Mid-year report; due to Appendix B Aquatic Program Leader (APL) August 1, 2022
- Annual Work Summary; due to APL November 15, 2022
- Comprehensive Project Report (2022–2024 data); final due May 1, 2025

Permitting Requirements

Exact permitting requirements required are unknown at this time and will vary depending on modification measures used. Contractor(s) performing modification of EWM beds have experience in the area and will be responsible for procuring or assisting with procuring necessary permits.

Endangered Species Act consultation for this project plan is associated with the 2019 Biological Opinion on the effects of continued operation of the Clark Fork Hydroelectric Project on Bull Trout and designated Bull Trout critical habitat (BiOp). This project plan is consistent with the analyses and conclusions contained in the 2019 BiOp and will adhere to all appropriate Terms and Conditions designed to reduce the extent and effects of incidental take on Bull Trout. No incidental take of Bull Trout is anticipated as a result of this project plan; therefore, no take reporting is required.

Cultural/Historic Resource Review

Not applicable for the tasks proposed in this project plan, there are no ground disturbing activities or proposed impacts to cultural/historic resources.

Benefit to the Resource

This pilot project has the potential to improve the treatment of EWM on Noxon and Cabinet Gorge Reservoirs by providing more treatment options. Treatment of EWM benefits both those who recreate and those who live on the reservoirs by providing water access areas free of

macrophytes. Eurasian watermilfoil treatment also reduces the likelihood that it will be transported to other waterbodies where is does not currently exist. This project is consistent with Appendix B of the Clark Fork Settlement Agreement as it is applied research that can be used for effective management and enhancement of the fish resources affected by the operations of Noxon Rapids Dam. In addition, treatment of EWM is consistent with the invasive aquatic plant control adaptive management plan for Noxon and Cabinet Gorge reservoirs (Getsinger et al. 2017) and the alternatives analysis (DeBruyckere and Pennington 2017) because it uses science as the basis for managing EWM in a biologically and recreationally meaningful way.

Budget

Item	Estimated Carryover[1]	2022 Budget Request
Permitting and Mechanical harvesting of EWM (~15 acres)	$28,000	$7,000
Technician (0.1 FTE)	$0	$7,000
Biologist (0.03 FTE)	$2,000	$3,000
Total	$30,000	$17,000
Anticipated Expenditures		$47,000

[1] *Estimated carryover of unexpended, approved funds as of January 1.*

Literature Cited

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2022 PROJECT PLAN

Mountain Lake Fisheries Monitoring Project

Project Contacts

Jason Blakney, Montana Fish, Wildlife and Parks (MFWP), (406) 382-3033, jblakney@mt.gov,
and
Travis Rehm, MFWP, (406) 382-3032, travis.rehm@mt.gov

Project History

This is a continuing project for which the originally intended four-year scope was approved by the Management Committee in 2016. No additional funding or changes to the scope are being requested for this project; although a delay in 2019 sampling due to unrelated injury to personnel resulted in a need to extended sampling of the remaining lakes to 2020, completing the field component of the project. It is being requested that the Comprehensive Project Report completion date be extended from March 1, 2021 to December 31, 2022.

Background

High-mountain lake fisheries represent a unique angling experience in a backcountry setting and are popular summer and fall destinations for many outdoor enthusiasts. The Cabinet and Bitterroot Mountains Ranges located on land administered by the Lolo and Kootenai National forests in northwest Montana offer numerous high-mountain lake angling opportunities with varying levels of access; from remote wilderness lakes that require miles of hiking in steep mountainous terrain to lakes which can be accessed by motor vehicle. Montana Fish, Wildlife and Parks (MFWP) has dedicated considerable resources to stocking these lakes but many of these fisheries have never been evaluated. There is a need to evaluate stocking strategies in these waterbodies as to provide diverse angling experiences based on the potential of a given lake. This evaluation would allow MFWP to develop management objectives (i.e., classification) and adjust stocking strategies for individual lakes according to the findings of the proposed work. Similar high-mountain lakes investigations have been conducted by MFWP staff in Region 2 and will be used as a template for this work. Knotek et al. (2013) provides a comprehensive list of management objectives for high-mountain lakes such as high density/harvested oriented fisheries, quality fisheries, trophy fisheries, self-sustaining fisheries and fishless lakes. Management classifications for individual lakes will be based on size, age structure and condition of fish; catch rates (gill nets and angling); accessibility; angler use; and physical habitat. In turn, these metrics will be used to determine stocking strategies, specifically the number of fish stocked per acre and the frequency of stocking events. Sampling events will also include sub-impoundments fisheries such as the Thompson Falls State Park pond, Frog Pond, Triangle Pond and Quinns Cut.

High-mountain lake fisheries can also present challenges in the management and conservation of native salmonids. Non-native salmonids have been known to invade headwater stream reaches occupied by native salmonids, through downstream dispersal from lake basins which are often located at the upper terminus of stream catchments (Adams 1999; Adams et al. 2001). Brook Trout *Salvelinus fontinalis* in high-mountain lakes are of concern because this species is known to outcompete Cutthroat Trout *Oncorhynchus Clarki spp.* and hybridize with Bull Trout

Salvelinus confluentus. In many western states including Montana, species and subspecies of the *Oncorhynchus* genus have been stocked in mountain lakes outside of their native distribution. In western Montana, Yellowstone Cutthroat Trout *Oncorhynchus clarkii bouvieri* were historically stocked in many drainages occupied by native Westslope Cutthroat Trout *Oncorhynchus clarki lewisi.* The identification of non-native salmonids and *Oncorhynchus* hybrids in mountain lakes is an important component of native fish management. Thus, detection of any non-native fish will be useful in identifying potential future removal projects. Genetic analyses to investigate *Oncorhynchus* species hybridization will be conducted at lakes where stocking records indicate non-native species such as Yellowstone Cutthroat Trout were stocked in the past, or where visual inspection reveals unusual phenotypic characteristics. Mountain lakes may also present an opportunity to be used in the future as refugia for Bull Trout populations, whose distribution is predicted to contract with climate-change (Isaak et al. 2015) and the presence of appropriate habitats will be documented.

This plan is supported by the Clark Fork Settlement Agreement (CFSA) which calls for an evaluation of recreational fisheries. This data will provide management direction for high-mountain lakes fisheries and outline possible threats in important native salmonid drainages. Listed below are direct quotes from the CFSA that pertain to the validity of this proposal.

“MFWP will develop recreational fisheries proposals that meet their organization’s objectives, while in consultation with the Water Resources Technical Advisory Committee and the Management Committee. The Management Committee’s decision to approve funding for these recreational fisheries initiatives will be limited to issues of federal conflict arising between the actions of providing funding under the federal hydropower license, and those of other applicable federal laws (e.g. ESA).” (Avista Corp. 1999, pg. B-10).

“Although the Thompson River is not located in the immediate project vicinity, its proximity to the project area and the limited number of recreational fishery enhancement opportunities in the area make the Thompson River a viable recreation fishery mitigation area.” (Avista Corp.1999, pg. B-5).

Goal
The goal of this project is to evaluate species present, relative abundance, size structure and natural reproduction as well as basic physical lake characteristics to inform future stocking strategies and other management activities.

Objectives
1. Summarize historical information for lakes such as stocking history and past surveys.

2. Describe current biological status of individual lakes including size structure, growth rates, condition, reproductive success, relative abundance of species present, fish diet composition (qualitative), levels of hybridization, amphibian presence; physical lake attributes such as maximum depth, P.H., dissolved oxygen, surface water temperature, surface acreage, elevation, presence of aquatic vegetation; and relevant recreational information such as accessibility and angling pressure.

3. Create future management objectives (stocking density and frequency) based on findings of these surveys.

4. Determine lakes where non-native species or *Oncorhynchus* hybrid presence could threaten native salmonids and what management actions are appropriate.

Tasks

1. Lakes will be sampled from June through October of each year, weather permitting. Fish populations will be sampled with sinking experimental, monofilament gillnets. Basic water quality and physical measurements will be taken at each fish bearing lake. For some lakes it may be hard to determine if the lake is capable of sustaining fish (and should be sampled) until they are visually inspected. A good portion of the smaller lakes are likely shallow and fishless, and thus only basic information would be collected (presence of amphibians, inlet/outlet, etc.). (Objectives 2-4; ***Completed in 2020***).

Work Products

- Annual Work Summary; from Appendix B Aquatic Program Leader to Avista; due December 1, 2022
- Comprehensive Project Report; final due to Avista December 31, 2022

Permitting Requirements

No permits are required for fisheries sampling work as all work will be conducted and/or overseen by MFWP fisheries biologists.

Endangered Species Act consultation for this project plan is associated with the 2019 Biological Opinion on the effects of continued operation of the Clark Fork Hydroelectric Project on Bull Trout and designated Bull Trout critical habitat (BiOp), and the USFWS-MFWP Cooperative Agreement pursuant to Section 6 of the Act. This project plan is consistent with the analysis and conclusions contained in the 2019 BiOp and the USFWS-MFWP Cooperative Agreement, and will adhere to all appropriate Terms and Conditions designed to reduce the extent and effects of incidental take on Bull Trout. Incidental take reporting for this project plan will be included in the annual Biological Opinion report as required by Term and Conditions 15–18 of the 2019 Incidental Take Statement, as well as MFWP's annual Section 6 report to the USFWS.

Cultural/Historic Resource Review

Not applicable for the tasks proposed in this project plan, there are no ground and/or vegetation disturbing activities, or proposed impacts to cultural/historic resources.

Benefit to the Resource

Mountain lakes surveys will allow MFWP to determine the distribution of native and non-native salmonids throughout headwater lakes in the lower Clark Fork River drainage. Such information will in turn be used to formulate strategies for the conservation of native stream dwelling salmonids that occupy particular drainages of importance. Baseline mountain lakes surveys will also allow MFWP to evaluate past stocking strategies based on survey findings and create future management objectives for these recreational fisheries.

Budget

Item	Estimated Carryover[1]	2022 Budget Request
Implement Mountain Lakes Survey reporting, including fish otolith ageing and report preparation	$2,001	$0
Total	$2,001	$0
Anticipated Expenditures		$2,001

[1] *Estimated carryover of unexpended, approved funds as of January 1.*

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2022 PROJECT PLAN

Lower Bull River Day Use Boat Access Site Operation

Project Contacts

Travis Rehm, Montana Fish, Wildlife and Parks (MFWP), (406) 382-3032, travis.rehm@mt.gov,
and
Sean Moran, Avista, (406) 847-1291, sean.moran@avistacorp.com

Project History

This is a continuing Project Plan originally approved in 2019 and incorporating actions that were approved by the Management Committee (MC) during the fall 2018 meeting. This Project Plan is a follow-up to the completed Lower Bull River Day Use Boat Access Plan and Final Design project. In 2017, this property was listed for sale and was acquired through Appendix B following Consent Mail approval of the MC. In 2018, under the Lower Bull River Day Use Boat Access Plan and Final Design project, a site plan was produced by MFWP and design and management considerations were discussed at a meeting with the Bull River Watershed Council. In order to make this site operational as soon as possible, the design was included in a proposal and major construction was completed in the fall of 2018 using funds ($100,000) approved by the MC at the September 25 meeting (Avista 2018). The site management plan was finalized and major construction at the site was completed in 2019. Kiosk and interpretive signs, and picnic tables were installed, and maintenance was performed in 2020. Approach signage on Highway 56 was installed in 2021. Use visitation was recorded in 2020 and 2021 and described a roughly 8% decrease between the two seasons. Quantification of use will be considered and applied to future consideration on whether the installation of vault toilet is needed in light of an unforeseen zoning issue that greatly complicates permitting of such an installation. A porta-potty was installed in the interim and may be sufficient for the foreseeable future.

Background

The Bull River provides an increasingly popular fishery for both native Westslope Cutthroat Trout and non-native salmonids. From 2005 to 2009, angling pressure on the river approximately doubled (MFWP 2009). Due to its location, size (with over 20 miles of floatable channel), and spectacular setting, the Bull River represents a unique recreational opportunity in northwest Montana. Throughout much of its length, the low gradient and sinuous nature of the channel provides for scenic and relaxing floating throughout a variety of flow levels. Because a majority of the channel is too deep to provide wading access, much of the use is by small, non-motorized watercraft. Private land dominates the lower and middle areas of the river and very few public access points existed. This limited access was particularly pronounced along the lower Bull River, in which public access suitable for non-motorized boat launching was limited to the mouth of the East Fork Bull River at approximate river mile 10, and the USFS campground located at Bull River Bay. Not only was access limited, but by having to take out in the bay, floaters were subject to the more hazardous conditions encountered in the lower two miles of the channel.

Accordingly, investigations into the potential purchase of private land along the lower Bull River approximately two river miles upstream from the bay had been investigated under a feasibility

study approved by the MC in 2013. Private disputes between landowners precluded finalizing the purchase of this property until 2017. With the purchase of this property under the Recreational Fishery Enhance Fund (Appendix B) of the Clark Fork Settlement Agreement (CFSA), the site enjoyed its first full season of use in 2020.

Goal
The goal of this project is to maintain the site and assess use for the 2022 recreation season.

Objective
1. Complete necessary maintenance tasks to upkeep the site prior to and during 2022 recreation season (Task 1).

2. Quantify use levels to inform future site plan considerations, including need for a vault toilet. (Task 2)

Tasks
1. Perform required ground maintenance and other efforts to ensure use during the 2022 recreation season. (Objective 1)

2. Continue to use traffic-counting equipment to assess use levels during the 2022 recreation season. (Objective 2)

Work Products
- Annual Work Summary (of site visitation information); from contractor to Appendix B Aquatic Program Leader and Avista; due November 15, 2022
- Annual Work Summary; due December 1, 2022

Permitting Requirements
All necessary permitting has been completed for the current development and use of this site. Continued due-diligence as to required zoning and permitting for potential vault toilet installation is ongoing.

Endangered Species Act consultation for this project plan is associated with the 2019 Biological Opinion on the effects of continued operation of the Clark Fork Hydroelectric Project on Bull Trout and designated Bull Trout critical habitat (BiOp). This project plan is consistent with the analyses and conclusions contained in the 2019 BiOp and will adhere to all appropriate Terms and Conditions designed to reduce the extent and effects of incidental take on Bull Trout. No incidental take of Bull Trout is anticipated as a result of this project plan; therefore, no take reporting is required.

Cultural/Historic Resource Review
This is a carryover project and the cultural/historic resource review was completed in 2018 by the Cultural Resources Management Group. Avista will coordinate site monitoring with Confederated Salish and Kootenai Tribe archeologist prior to initiating any of the ground work for this project plan.

Benefit to the Resource

This project is consistent with the Montana Tributary Habitat Acquisition and Recreational Fishery Enhancement Program, both by facilitating access for sampling associated with implementing, maintaining, and assessing stream habitat and riparian revegetation programs (under the Tributary Habitat Fund) and by increasing public recreational fishery access (under the Recreational Fishery Enhancement Fund). The construction of this project is being funded by Appendix B; however, the Passive Integrated Transponder (PIT) tag array installed in 2018 is also consistent with goals of the Fish Passage/ Native Salmonid Restoration Plan (Appendix C). By providing law enforcement access to the Bull River and, depending on input into the development plan that could entail educational facilities, this project is also consistent with the goals of the Bull Trout Protection and Public Education Program (Appendix D of the CFSA). By providing signage on ongoing revegetation efforts floaters are likely to see, this site also provides out-reach to the Watershed Councils Program (Appendix E) and stream restoration efforts conducted under Appendix B.

Budget

Item	Estimated Carryover[1]	2022 Budget Request
Install visitation monitoring equipment and reporting.	$1,000	$1,500
Avista staff maintenance and 8 mo. porta-potty service	$1,518	$2,000
Total	$2,518	$3,500
Anticipated Expenditures		$6,018

[1] *Estimated carryover of unexpended, approved funds as of January 1.*

Literature Cited

Avista. 2018. Management Committee meeting minutes from September 25, 2018. Avista document identification number 2018-0349. Avista, Noxon, Montana.

MFWP (Montana Fish, Wildlife and Parks). 2009. Angler Pressure Surveys. www.fwp.mt.gov/fishing/anglingPressureSurveys/

2022 PROJECT PLAN

Noxon Reservoir Boat Ramp Improvements

Project Contacts

Travis Rehm, Montana Fish, Wildlife and Parks (MFWP), (406) 382-3032, travis.rehm@mt.gov
and
Sean Moran, Avista, (406) 847-1291, sean.moran@avistacorp.com

Project History

This is a carryover project that was approved by the Management Committee in 2017. Progress on ramp improvements is underway; however, full implementation may require adoption of a management plan addendum to Montana Fish Wildlife and Parks' Thompson Falls State Park. Accordingly, approval for this change in scope and budget is being requested.

Background

In 2015, 2016 and 2018, unseasonably warm early spring weather, combined with increased angler interest in the upper reach of Noxon Reservoir, resulted in a number of angler complaints regarding the lack of boat access. Two boat ramps exist in the upper reach of Noxon Reservoir, Flat Iron Ridge and Thompson Falls State Park. In 2015 and 2016, low snowpack and decreased run-off, combined with Avista's ability to draft Noxon Reservoir up to 10 feet between October 1 and May 14, has limited the ability to a launch motorized boats in the upper reach of Noxon Reservoir.

The current ramp at Thompson Falls State Park has been extended to allow function at low recreation and non-recreation season pool levels or river flows (FIGURE 1). At low flows and low reservoir elevations, the Flatiron Boat ramp is often unusable due to sedimentation (FIGURE 2). Currently, the ramp area is dredged every five to eight years to remove sediment and improve access.

Following investigations into potential liability, constraints imposed by the physical attributes of each location, and logistical considerations, representatives from MFWP and Avista met at Thompson Falls State Park and Flatiron boat ramps in October 2020 to discuss a path forward. At this meeting it was decided to extend the Thompson Falls State Park ramp and to continue periodic dredging of the Flatiron site. Also during this meeting, the potential to install gating to allow for spring use of the ramp prior to the park's April 29th opening date was discussed. Preliminary designs, cost estimates, permitting, and construction of the Thompson Falls State Park ramp extension were completed in 2021. Requests for permitting of periodic dredging of the Flat Iron Boat Ramp and investigation of alternative dredging methods are ongoing.

Goal

The goal of this project is to increase boater access to upper Noxon Reservoir during periods of low flow.

FIGURE 1. Sixteen-foot concrete ramp extension at the Thompson Falls State Park November 2021.

FIGURE 2. Boat ramp at Flat Iron Ridge Fishing Access Site during low-water in 2016.

Objective

1. Identify most appropriate means of providing suitable deep water boat access in upper Noxon Reservoir.

Tasks

1. Evaluate options for improving boat access at Flat Iron Ridge and/or Thomson Falls State Park. Avista and MFWP, with input from Northwest Energy, will agree upon an improvement potentially including the redesign of the Thompson Falls State Park boat ramp, potential redesign Flat Iron Ridge boat ramp (Figure 4), design of a new low-water boat ramp at Flatiron Ridge, and/or dredging of Flat Iron Ridge. The evaluation will also consider compliance with the Recreation Resource Management Plan (CFSA Appendix H), need, feasibility, environmental impacts, permitting (including cultural resource survey), cost (both construction and operation and maintenance), as well as legal obligation and liability. (Objective 1; ***Completed 2020***)

2. Once preferred alternative(s) are identified, engineering support may be required to design the ramp modifications. In addition, permits will be required prior to constructing or dredging, and contractors will be required to execute the preferred alternative(s). (Objective 1; ***ramp extension Completed in 2021, although permitting request for dredging and investigation of alternative dredging methods at the Flat Iron site is ongoing***)

3. Under coordination with MFWP State Park administration, develop a management plan addendum to provide for spring access prior to the typical late-April opening date of the park (Objective 1).

4. Provided the addendum, with the addition of restrictive gating is amenable to MFWP, install gating across access roads within the park limiting public access to the boat ramp (FIGURE 3; Objective 1).

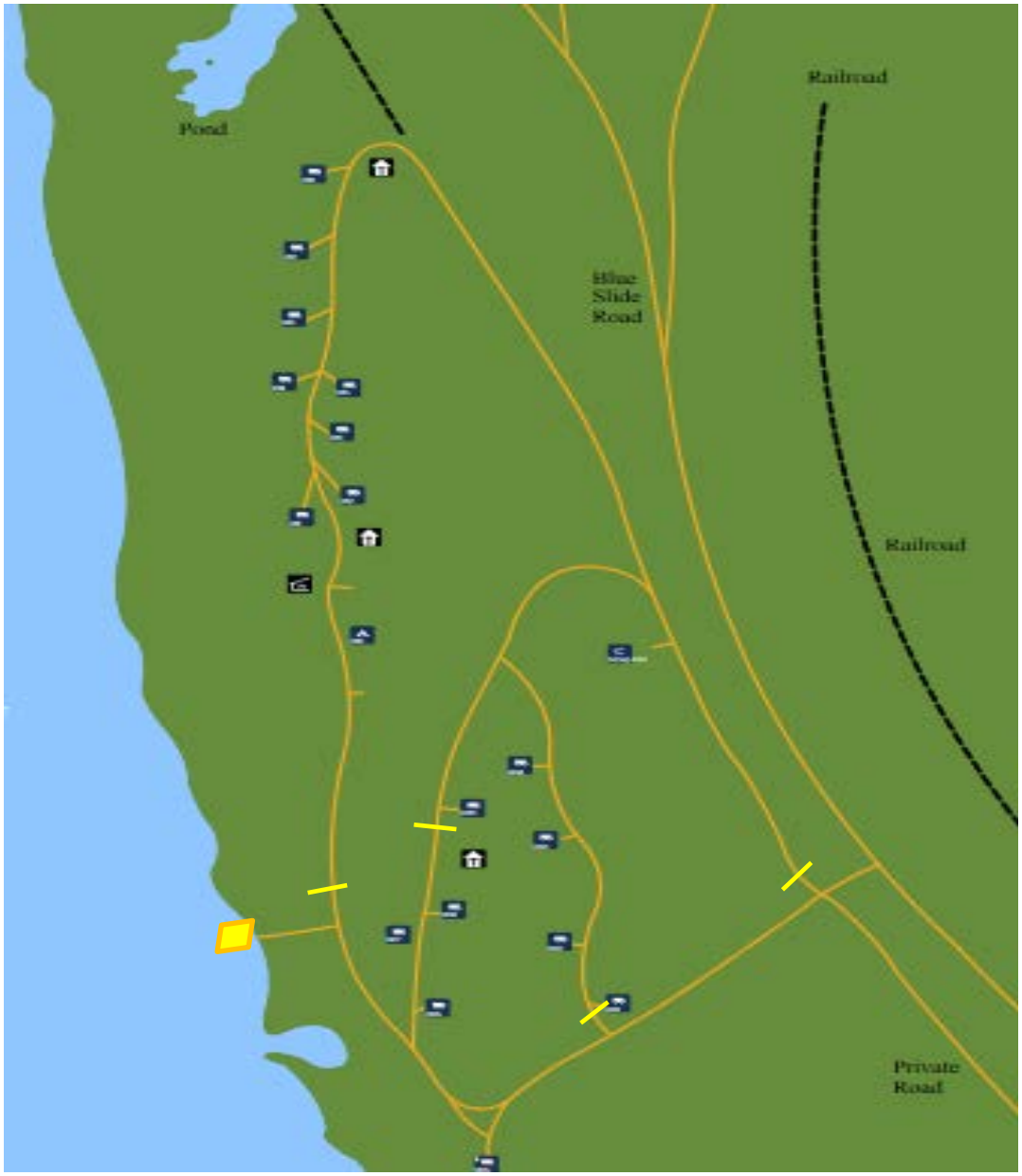

FIGURE 3. Thompson Falls State Park with proposed seasonal gating (yellow) limiting vehicle access to boat ramp in the early spring prior to campground opening date.

Work Products

- Early spring Thompson Falls State Park Management Plan addendum; Technical memorandum or other appropriate work product listing associated development options, including site plan(s) and cost estimates; due April 1, 2022
- Annual Work Summary; due December 1, 2022

Permitting Requirements
Permitting requirements will be determined after preferred alternative(s) are identified and approved. Permitting will likely consist of a U.S. Army Corps of Engineers Joint Aquatic Resource Permit Application ("JARPA").

Endangered Species Act consultation for this project plan is associated with the 2019 Biological Opinion on the effects of continued operation of the Clark Fork Hydroelectric Project on Bull Trout and designated Bull Trout critical habitat (BiOp). This project plan is consistent with the analyses and conclusions contained in the 2019 BiOp and will adhere to all appropriate Terms and Conditions designed to reduce the extent and effects of incidental take on Bull Trout. No incidental take of Bull Trout is anticipated as a result of this project plan; therefore, no take reporting is required.

Cultural/Historic Resource Review
Avista cultural staff will coordinate a cultural/historic resource review for the project. The work product for this review will be confidential due to the sensitive nature of the content.

Benefit to the Resource
Noxon Reservoir is one of the most popular fisheries in northwest Montana and supports a diverse and dynamic recreational fishery. Assuring access at lower water levels to the upper reservoir not only facilitates recreational enjoyment but is also consistent with efforts of the Recreational Fisheries component of Appendix B to support fishery monitoring, enhancement, and management efforts of MFWP on Noxon and Cabinet Gorge reservoirs.

Budget

Item	Estimated Carryover[1]	2022 Budget Request
Upper Noxon Reservoir boat ramp improvements; plans and construction	$4,250	$0
Gating (4 @ $1,200 ea.)	$0	$4,800
Labor to install gating	$0	$3,000
Total	$4,250	$7,800
Anticipated Expenditures		$12,050

[1] *Estimated carryover of unexpended, approved funds as of January 1.*

2022 PROJECT PLAN

Managing Aquatic Invasive Plants on Noxon and Cabinet Gorge Reservoirs

Project Contact

Kim McMahon, Sanders County Aquatic Invasive Plants Task Force Facilitator, (406) 546-2447, kim.pinnacle.research@gmail.com

Project History

This is a continuing project implemented by the Sanders County Aquatic Invasive Plants Task Force (Task Force) to manage the infestation of Eurasian watermilfoil (EWM) in the Noxon and Cabinet Gorge reservoirs. The Management Committee (MC) originally approved this project in 2008 with funding from Appendices G and H. Also in 2008, the MC approved a small amount of funding from Appendix B for reservoir mapping of EWM. The MC first approved funds for treatment of EWM (from Appendix B) in 2014. Following consideration of the Alternatives Analysis in 2017, a change in scope to focus treatment on high use areas and access points was adopted. The Task Force is requesting up to $40,000 from the Appendix B Recreational Fishery Enhancement Program for control of EWM in 2022. The work to control EWM is complemented by monitoring, education and research, which is being funded through other avenues (e.g., CFSA Appendix G; Montana Fish, Wildlife & Parks, and grants).

Background

Eurasian watermilfoil and curlyleaf pondweed (CLP)[1] were confirmed in Noxon and Cabinet Gorge reservoirs in 2007; this was the first identified infestation of EWM in Montana. Initial studies indicated that EWM covered 247 acres in Noxon and 117 acres in Cabinet.

Eurasian watermilfoil is an aggressive, non-native aquatic weed that poses a serious threat to Montana's rivers and lakes. When introduced into a waterbody, EWM spreads quickly and forms thick beds with dense canopies that crowd out native aquatic plants and threaten fisheries, water quality, drinking and irrigation water supplies and recreational uses. Once established, dense EWM beds can deplete oxygen needed by fish and other aquatic organisms (Madsen 2014). With the exception of bottom barriers, control measures selectively target EWM, thereby maintaining populations of native coontail, elodea, pondweeds and white water buttercup.

The Sanders County Commissioners established the Task Force in 2008 to develop and implement an integrated weed management approach to contain and manage infestations of EWM. The annual program has included the following components:

- Controlling priority areas of invasive EWM stands through a combination of aquatic herbicide treatments, diver dredging (hand removal) in small narrow plots where herbicides have proven to be less effective, and the use of bottom barriers at high-use

[1] Although CLP is present in the Lower Clark Fork reservoirs, EWM is the targeted plant species in this project due to: 1) EWM's known impacts to aquatic environments, 2) high risk of its spread to other non-infested water bodies in Montana, and 3) relatively low amount of infested acreage which allows for containment. CLP will only be treated where it exists within beds targeted for EWM control.

docks/ramps (public and private) to reduce the risk of boats transporting weed fragments.

- Conducting pre- and post-treatment monitoring to verify treatment effectiveness on targeted invasive species and re-colonization of native aquatic plant species at treated sites.
- Monitoring littoral zones of Noxon and Cabinet Gorge reservoirs to determine if and how the composition and density of submersed vegetation and the location of invasive plant stands is changing over time.
- Implementing a public awareness and education program about aquatic invasive plants that targets boaters, anglers and the general public and demonstrates specific ways that people can help slow the spread of aquatic weeds.
- Coordinating with Montana Fish, Wildlife & Parks and Idaho Department of Agriculture on mandatory boat check stations to prevent invasive aquatic plants from being transported to non-infested areas.
- Meeting monthly to evaluate program results and guide adaptive management techniques. Technical expertise includes aquatic resource professionals and representatives of federal, state and local government agencies, nonprofits, tribes and others with knowledge in fisheries, aquatic plant ecology, water resources, water quality and aquatic plant management. A Scientific Advisory Panel was established in 2018 to further assist the Task Force with review of monitoring results and consideration of control options.

Widespread herbicide treatment began as a control measure in the reservoirs in 2012 with the intention of achieving a maintenance level within a few years, when large-scale herbicide treatments would no longer be needed. While treatments in 2012 through 2014 saw measurable improvements, in 2015 there was a resurgence of EWM, with re-expansion into already treated plots and the establishment of several new infestations in Noxon Rapids Reservoir.
In 2016, the Task Force received funding from the Montana Department of Natural Resources and Conservation (DNRC) to conduct an alternatives analysis (DeBruyckere and Pennington 2017) to examine management methods for reducing infestations. The study was initiated due to the variability in treatment success and the lack of longer term positive gains in EWM reduction. The analysis determined that successful management of EWM in Sanders County would be the containment and control of existing aquatic invasive species (AIS) populations and prevention of new introductions of AIS within the Noxon and Cabinet Gorge reservoirs. The top priority for control was determined to be near public and private access sites, including public and private boating access sites and shoreline dock areas. The second priority for control are large, high density shallow access areas with significant boat traffic.

Control methods for the priority areas are to be determined by a Scientific Advisory Panel. The panel evaluates annual monitoring data and surveys to determine the extent and location of management methods. Beginning in 2018, monitoring of EWM was conducted by MFWP as an in-kind contribution to the program. MFWP has conducted monitoring annually since 2018 and is expected to continue to provide monitoring in 2022.

The Analysis of Treatment Alternatives calls for an adaptive management strategy using a suite of appropriate tools. In 2017, Sanders County did not treat the reservoirs with herbicides due to lack of funding and a desire among project partners to explore alternatives. In 2018, Sanders County treated approximately 31 acres of EWM with aquatic herbicide in high priority areas of

the reservoirs. Herbicide treatments have followed each year since. In 2021, 64.71 acres of EWM were treated with liquid endothall and liquid diquat. The $77,108.26 cost was covered by $42,000 in grant funds, and $35,108.26 from Appendix B.

Funding from Appendix B will ensure that there are sufficient funds to treat all Priority 1 areas in the reservoirs in 2022. Sanders County is applying for a $20,000 grant through the Montana Aquatic Invasive Species Council, which could reduce the amount of funds needed through Appendix B. Preliminary estimates are that approximately 31 acres will require herbicide treatment or other control measures. The actual acreage will be determined following the July 2022 survey. The estimated acreage does not include EWM beds identified for the companion harvester pilot project described in a separate project plan proposal.

Goal
The goals of this project are to sustain recreational opportunities in the reservoirs as well as native plants and species that rely on riparian and littoral areas and habitats.

Objectives
1. Manage aquatic invasive species according to the Sanders County Aquatic Invasive Plant Management Plan.

2. Improve access to land- and water-based recreational opportunities.

3. Maintain water quality at acceptable levels, considering turbidity, water temperature, and dissolved oxygen, as well as localized and reservoir-wide water exchange.

4. Manage aquatic invasive plant populations in the context of regional natural resources to help sustain local economies that depend on recreation.

Tasks
1. Control Planning: Based on review of 2021 monitoring, surveys, recreation data and reservoir maps, the Scientific Advisory Panel will propose control measures – including type, extent and locations - for the field season in spring 2022. Herbicide treatments are the most likely control measure to be recommended. Survey work will be conducted by MFWP and will occur in July. (Objectives 1-4)
2. Control Measures: Herbicide treatments utilize a variable-depth water injection system to ensure precision treatment, and applications are calibrated with boat speed and plant stand depth for exact delivery to the targeted submersed plant stands. Exact acreages and locations of control measures will be based on information from pre-treatment surveys, with public access and recreation sites taking priority. Herbicide treatment will occur in early August. (Objectives 1-4)
3. Quality control and project oversight: The Task Force and professional contractors maintain the scientific integrity of all work performed. The Task Force facilitator will coordinate development of the final control plan, assist the county with selecting a contractor, and provide all necessary public and agency notifications. (Objectives 1–4)

Work Products
• Mid-year report; due to the Appendix B Aquatic Program Leader (APL) August 1, 2022

- Annual Work Summary; due to the APL November 15, 2022

Permitting Requirements
A Montana Pesticide Discharge Permit is required for the use of herbicides to treat aquatic invasive species. Sanders County is updating its permit, and it should be in effect through May 1, 2026.

Potential treatment is limited in scope, and would occur during the mid-to-late summer along shallow warm areas, and herbicides use would quickly degrade; therefore, Endangered Species Act consultation for this project plan is associated with the 2019 Biological Opinion on the effects of continued operation of the Clark Fork Hydroelectric Project on Bull Trout and designated Bull Trout critical habitat (BiOp). This project plan is consistent with the analyses and conclusions contained in the 2019 BiOp and will adhere to all appropriate Terms and Conditions designed to reduce the extent and effects of incidental take on Bull Trout. No incidental take of Bull Trout is anticipated as a result of this project plan; therefore, no take reporting is required.

Cultural/Historic Resource Review
When the Environmental Assessment was scoped for EWM herbicide treatments, it was determined that treatments would not involve any new disturbance; therefore, no cultural resource surveys were required.

Benefit to the Resource
Key objectives of this project focus on sustaining the reservoirs' recreational fisheries, improving access to water-based recreational opportunities, maintaining or improving aesthetic values, and protecting sensitive and important resources of Noxon and Cabinet reservoirs. As such, this project supports the CFSA Appendix B Recreational Fishery Enhancement Program (recreational fishery management); CFSA Appendix G Implementation of the Land Use Management Plan (protection and maintenance of sensitive resources, including shorelines); and CFSA Appendix H Implementation of the Recreation Resource Management Plan (management and preservation of recreation resources and public access).

With a focus on control, prevention and education, project activities dovetail with aquatic invasive species efforts on-going across Montana, Idaho and regionally. This project is consistent with the 2016 Montana Invasive Species Framework (Montana Invasive Species Council 2016) control objective to "ensure that invasive species control restores the desired ecological, economic and cultural values to the land that is being managed." The program is consistent with the Montana Aquatic Nuisance Management Plan, which seeks to minimize the harmful ecological, economic, and social impacts of aquatic nuisance species through prevention and management, population growth, and dispersal into, within, and from Montana (Montana ANS Technical Committee 2002). The program is also consistent with the state's Wildlife Action Plan, which seeks to avoid spread of aquatic invasive species (Montana Fish, Wildlife and Parks 2015) and the state Aquatic Invasive Species Program, which "seeks to minimize the harmful ecological, economic, and social impact of AIS through prevention and management of introduction, population growth and dispersal of AIS" (DeBruyckere and Pennington 2017).

Budget

Item	Estimated Carryover[1]	2022 Budget Request
Herbicide treatments; not to exceed requested amount. (Task 2)	$4,500	$40,000
Total	$4,500	$40,000
Anticipated Expenditures		$44,500

[1] *Estimated carryover of unexpended, approved funds as of January 1.*

Literature Cited

DeBruyckere, L. A., and T. Pennington. 2017. Analysis of Treatment Alternatives for Invasive Watermilfoil in Noxon Rapids and Cabinet Gorge Reservoirs, Sanders County, Montana.

Madsen, J. D. 2014. Eurasian Watermilfoil. *In* Biology and Control of Aquatic Plants, A Best Management Practices Handbook. L. A. Gettys, W. T. Haller, and D. G. Petty, editors. Aquatic Ecosystem Restoration Foundation.

Montana Aquatic Nuisance Species (ANS) Technical Committee. 2002. Montana Aquatic Nuisance Species Management Plan. 142pp.

Montana Fish, Wildlife and Parks. 2015. Montana's State Wildlife Action Plan. Helena, MT.

Montana Invasive Species Council. 2016. Montana Invasive Species Framework.

2022 PROJECT PLAN

Dreissenid Mussel Sampling on Noxon and Cabinet Gorge Reservoirs

Project Contacts
Paul Kusnierz, Avista, (406) 847-1274, paul.kusnierz@avistacorp.com

Project History
This is a continuing project for 2022. The project was first approved by the Management Committee (MC) in 2021. The scope and budget for this project are reviewed by the MC annually.

Background
Dreissenid (i.e., zebra and quagga) mussels are a threat to fisheries and infrastructure as they can alter the trophic status and food web of a waterbody (Miehls et al. 2009; Higgins and Zanden 2010; Madenjian et al. 2015), negatively affect fish populations (Hoyle et al. 2008), and clog piping (MacIsaac 1996). Once established, dealing with dreissenid mussels has a substantial economic cost (Strayer 2009; Connelly et al. 2007; Chakraborti et al. 2016; Nelson 2019).

In the fall of 2016, dreissenid mussel veligers were detected in Tibor Reservoir with a "suspect" sample coming from Canyon Ferry Reservoir. Both reservoirs are located east of the Continental Divide in Montana and contain popular fisheries. With this discovery, a concerted effort to prevent further introduction of dreissenid mussels into Montana and to monitor for early detection of any introduction was implemented. This effort has involved expanding days and hours of operation at aquatic invasive species inspection stations, educational programs, and statewide sampling for dreissenid mussels. The statewide mussel sampling includes collection of water samples from Noxon and Cabinet Gorge reservoirs to look for veligers. In 2020, Montana Fish, Wildlife and Parks (MFWP) collected at least eight samples from each reservoir between May and October. In addition, Avista voluntarily collected a sample from the forebay of each reservoir in August after receiving a request from the Whitefish Lake Institute to collect samples that would supplement those collected by MFWP. The purpose of this project plan is to continue supplemental sampling with funds from Appendix B.

Goal
The goal of this project is to provide information about dreissenid (zebra and/or quagga) mussel presence/absence in the event of invasive mussel establishment in the Clark Fork River system.

Objectives
1. Contribute to the dreissenid mussel sampling program being implemented by MFWP.

Task
1. Sample Noxon and Cabinet Gorge reservoirs twice during 2022 (late July and late August), following the protocols found in MFWP (2019a). (Objective 1)

Work Products
- Mid-year report; due to Appendix B Aquatic Program Leader (APL) August 1, 2022

- Sampling status report (likely memorandum); due September 30, 2022
- Annual Work Summary; due to the APL November 15, 2022

Permitting Requirements
Not applicable for the tasks proposed in this project plan.

Endangered Species Act consultation for this project plan is associated with the 2019 Biological Opinion on the effects of continued operation of the Clark Fork Hydroelectric Project on Bull Trout and designated Bull Trout critical habitat (BiOp). This project plan is consistent with the analyses and conclusions contained in the 2019 BiOp and will adhere to all appropriate Terms and Conditions designed to reduce the extent and effects of incidental take on Bull Trout. No incidental take of Bull Trout is anticipated as a result of this project plan; therefore, no take reporting is required.

Cultural/Historic Resource Review
Not applicable for the tasks proposed in this project plan, there are no ground and/or vegetation disturbing activities, or proposed impacts to cultural/historic resources.

Benefit to the Resource
This project is being implemented to help with the early detection of dreissenid mussels in Noxon and/or Cabinet Gorge reservoirs. Early detection will help MFWP develop procedures that will limit the likelihood of these reservoirs serving as sources for invasion to other waterbodies. In addition, early detection may provide the opportunity to implement control efforts that will minimize the impact of a dreissenid mussel invasion on the trophic status and food webs within the reservoirs. This project is consistent with Appendix B of the Clark Fork Settlement Agreement as it provides information that can be used for effective management of the fish resources affected by the operations of Noxon Rapids and Cabinet Gorge dams. This project is also consistent with the "2019-2027 Statewide Fisheries Management Program and Guide" (MFWP 2019b), as it will provide fisheries managers with reservoir-specific information that can be used to improve current aquatic invasive species management strategies and potentially be applied elsewhere in Montana.

Budget

Item	Estimated Carryover[1]	2022 Budget Request
Technician (0.02 FTE)	$0	$1,500
Biologist (0.004 FTE)	$0	$640
Total	$0	$2,140
Anticipated Expenditures		$2,140

[1] *Estimated carryover of unexpended, approved funds as of January 1.*

Literature Cited
Chakraborti, R. K., S. Madon, and J. Kaur. 2016. Costs for controlling dreissenid mussels affecting drinking water infrastructure: case studies. Journal of the American Water Works Association 108:442–453.

Connelly, N. A., C. R. O'Neill, B. A. Knuth, and T. L. Brown. 2007. Economic impacts of zebra mussels on drinking water treatment and electric power generation facilities. Environmental Management 40:105–112.

Higgins, S. N., and M. V. Zanden. 2010. What a difference a species makes: a meta–analysis of dreissenid mussel impacts on freshwater ecosystems. Ecological monographs 80:179–196.

Hoyle, J. A., J. N. Bowlby, and B. J. Morrison. 2008. Lake whitefish and walleye population responses to dreissenid mussel invasion in eastern Lake Ontario. Aquatic Ecosystem Health & Management 11:403–411.

MacIsaac, H. J. 1996. Potential abiotic and biotic impacts of zebra mussels on the inland waters of North America. American zoologist 36:287–299.

Madenjian, C. P., D. B. Bunnell, D. M. Warner, S. A. Pothoven, G. L. Fahnenstiel, T. F. Nalepa, H. A. Vanderploeg, I. Tsehaye, R. M. Claramunt, and R. D. Clark Jr. 2015. Changes in the Lake Michigan food web following dreissenid mussel invasions: a synthesis. Journal of Great Lakes Research 41:217–231.

MFWP (Montana Fish, Wildlife and Parks). 2019a. Aquatic invasive species management program field sampling and laboratory standard operating procedures. Montana Fish, Wildlife and Parks, Helena, Montana.

MFWP (Montana Fish, Wildlife and Parks). 2019b. 2019-2027 Statewide Fisheries Management Program and Guide. Montana Fish, Wildlife and Parks, Helena, Montana.

Miehls, A. L. J., D. M. Mason, K. A. Frank, A. E. Krause, S. D. Peacor, and W. W. Taylor. 2009. Invasive species impacts on ecosystem structure and function: A comparison of Oneida Lake, New York, USA, before and after zebra mussel invasion. Ecological Modelling 220:3194–3209.

Nelson, N. M. 2019. Enumeration of potential economic costs of dreissenid mussels infestation in Montana. Flathead Lake Biological Station, Polson, MT.

Strayer, D. L. 2009. Twenty years of zebra mussels: lessons from the mollusk that made headlines. Frontiers in Ecology and the Environment 7:135–141.

2022 PROJECT PLAN

Noxon Reservoir Bathymetry Update

Project Contact

Travis Rehm, Montana Fish, Wildlife and Parks, (406) 382-3032, Travis.Rehm@mt.gov,
Sean Moran, Avista, (406) 847-1291, Sean.Moran@avistacorp.com, *and*
Eric Oldenburg, Avista (406) 847-1290, Eric.Oldenburg@avistacorp.com

Project History

This is a new project being proposed to commence in 2022; however, the production of a Noxon Reservoir bathymetric map was originally approved through Appendix B of the Clark Fork Settlement Agreement (CFSA) in 2002 and completed in 2003. This project was not ranked because it is being conducted through the "Recreational Fishery Enhancement" component of Appendix B. This is being proposed as a multi-year project. The goal and objectives for the entire project are included in this project plan; however, the tasks and budget request are specific to the 2022 work.

Background

A Noxon Reservoir bathymetric map was produced through Appendix B of the CFSA and made publicly available in 2003 (hard-copy format). This map has been popular and valued by the recreating public and CFSA stakeholders.

The inventory of existing Noxon Reservoir bathymetric maps is getting low. Rather than reprinting the original maps, there is a desire to update some of the messaging and supplemental information that is included on the hard-copy maps. Examples may include things such as species identification, fish consumption advisories, *Dreissenid* mussel and other invasive species information, dam and reservoir safety information, and other messaging or information pertinent to the goals of the CFSA and related agency objectives.

In addition to updating the messaging on hard-copy maps, this is also an opportunity to update the bathymetric data itself. The original files from the 2003 survey were retained; however, the saved data were in the form of shape files and are of limited usability. In addition, we now have the opportunity to collect and present the information at a higher resolution (i.e., run tighter transects) as compared to the original survey as well as capture anything that may have changed over the past 20 years (e.g., siltation in the Finley Flats area). This will also allow the opportunity to explore different formats through which we can disseminate the bathymetric information. In addition to hard-copy maps, we now have the ability to produce files that will display on Lowrance and Hummingbird GPS/sonar units and produce files that can be displayed as layers in Google Earth. At a minimum, these files will be useful for internal use by CFSA partners to increase the safety and effectiveness of projects on Noxon Reservoir. In addition, we will work through legal questions with a goal of also making the latter two formats publicly available (Noxon Reservoir bathymetry is not commercially available on GPS/sonar unit "chips").

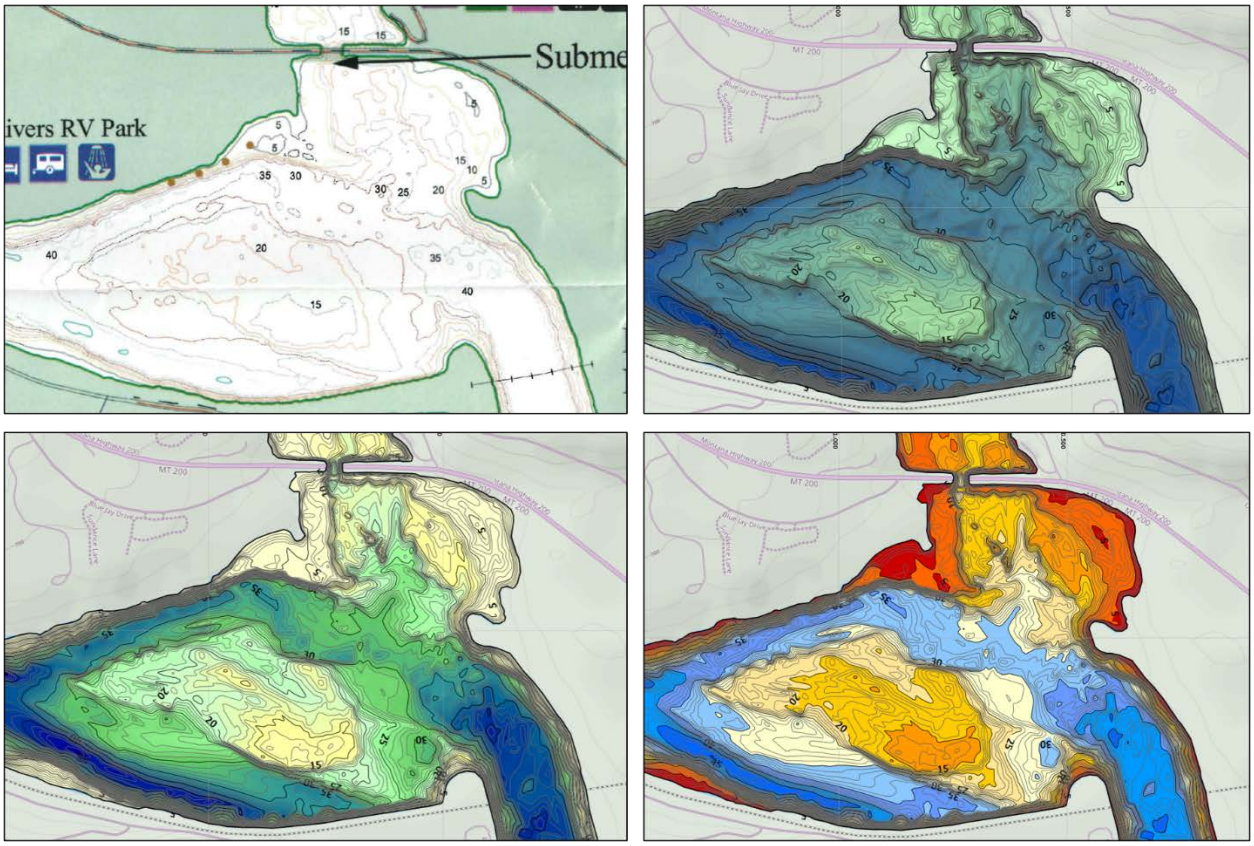

Figure 1. Examples of the existing bathymetric map (upper left), and maps produced using recently collected data and plotted using ReefMaster 2.0. Displayed are shaded relief (upper right), flat raster (lower left), and isobath (lower right) options. Note that contour intervals and color schemes are customizable. Also note that the above is from Cabinet Gorge Reservoir for demonstration purposes.

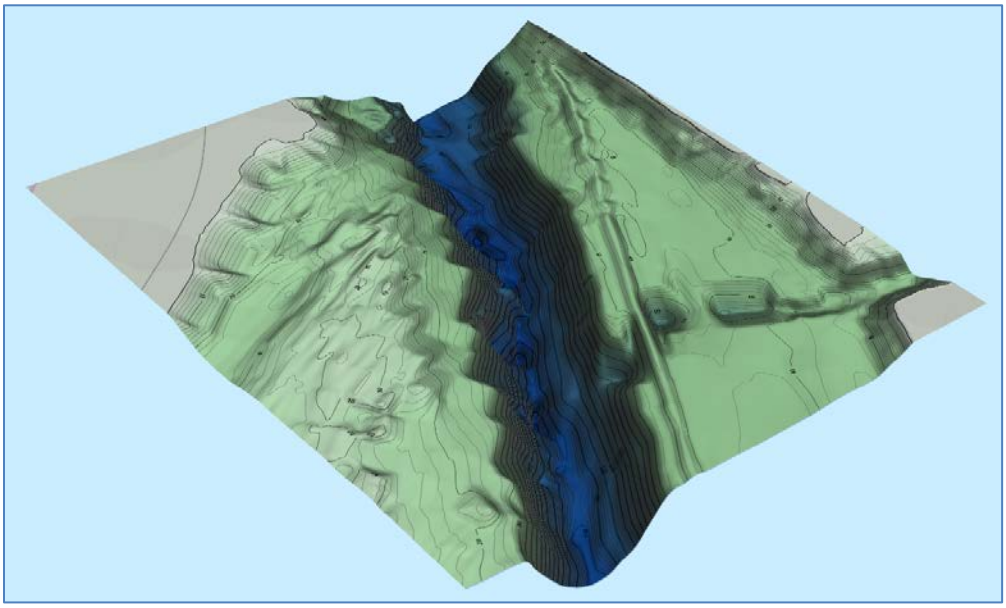

Figure 2. Example three-dimensional view of an area of Noxon Reservoir recently surveyed and plotted

using ReefMaster 2.0. Note the old highway bed adjacent to the main channel.

Goal
Provide high-resolution bathymetric information for Noxon Reservoir to (1) increase the safety and effectiveness of reservoir activities for managers, implementers of CFSA projects, and the recreating public; and (2) include refreshed messaging on bathymetric maps related to the goals of the CFSA and agency management objectives.

Objectives
1. Collect remaining bathymetric data necessary to produce a high-resolution map for Noxon Reservoir and construct an internal use only base map in multiple formats using ReefMaster 2.0.

2. Determine formats through which the bathymetric maps will be disseminated publicly (e.g., hard copies, files compatible with GPS/sonar units, Google Earth layers).

3. Develop new messaging pertaining to agency and CFSA objectives to be included on the hard-copy maps.

4. Hire a consultant for final design and production of hard-copy maps.

5. Produce appropriate maps for internal and public use.

Tasks
1. Purchase and install a Lowrance Elite or HDS unit and calibrate to survey boat. (Objective 1)

2. Develop survey transects to obtain remaining data for Noxon Reservoir. (Objective 1)

3. Complete transect surveys. Transects will be broken into increments no greater than 30 minutes in duration to enable maximum resolution for water surface elevation corrections. Each transect will be corrected to Noxon Reservoir full pool elevation (2,331.0 feet). Transect surveys will be conducted strategically to minimize interference from aquatic macrophytes. All transects will be surveyed at speeds less than six miles per hour. (Objective 1)

4. Construct and optimize the bathymetric map in ReefMaster 2.0. (Objective 1)

5. Work with interested “internal” stakeholders (CFSA partners) to develop and test the maps in multiple formats (e.g., hard copy; files for sonar units; Google Earth). (Objective 1)

6. Save the raw bathymetric transect data files (“.sl2”) in a long-term data repository to be available for future use. (Objective 1)

7. Conduct internal (Avista) legal review of concerns related to liability and making maps publicly available. (precursor to Objectives 2, 3, 4 and 5)

Work Products

- Internal-use map; due December 31, 2022
- Annual Work Summary; due December 1, 2022

Permitting Requirements

Not applicable for the tasks proposed in this project plan.

Endangered Species Act consultation for this project plan is associated with the 2019 Biological Opinion on the effects of continued operation of the Clark Fork Hydroelectric Project on Bull Trout and designated Bull Trout critical habitat (BiOp). This project plan is consistent with the analyses and conclusions contained in the 2019 BiOp and will adhere to all appropriate Terms and Conditions designed to reduce the extent and effects of incidental take on Bull Trout. No incidental take of Bull Trout is anticipated as a result of this project plan; therefore, no take reporting is required.

Cultural/Historic Resource Review

Not applicable for the tasks proposed in this project plan, there are no ground and/or vegetation disturbing activities, or proposed impacts to cultural/historic resources.

Benefit to the Resource

The bathymetric information disseminated through this project will help CFSA implementers to be more safe, effective, and efficient in conducting future projects. For example, having the bathymetric data on GPS/sonar units will help implementers to avoid underwater hazards while operating on the reservoir. This will be particularly helpful for new folks as they become familiar to the area and for nighttime and other low-visibility boating operations. This information will also be useful for future projects as a means to quantify certain reservoir attributes (e.g., shallow water habitat) or inform the design of future sampling efforts (e.g., gillnetting or electrofishing). In addition, this information will be valued by the recreating public both from the navigation and boating safety perspective as well as identifying certain types of habitat for angling. As such this project is consistent with the goals of Appendix B and Montana Fish, Wildlife and Parks to enhance recreational fisheries and opportunities in Noxon Reservoir.

Budget

The below budget covers the costs to develop internal-use only bathymetric maps for Noxon Reservoir (Objective 1). Costs associated with developing this information in publicly available formats (e.g., designing and printing maps and/or publicly available files compatible with sonar units) will likely be proposed for 2023.

Item	Estimated Carryover[1]	2022 Budget Request
Lowrance Elite or HDS sonar unit purchase and installation	$0	$1,500
ReefMaster 2.0 user license	$0	$400
Transect surveys (technician 0.08 FTE)	$0	$8,700
Boat fuel and maintenance	$0	$1,500
Bathymetry development for internal use (technician 0.04 FTE)	$0	$4,350
Total	$0	$16,450
Anticipated Expenditures		$16,450

[1] *Estimated carryover of unexpended, approved funds as of January 1.*

An Avista staff member has already collected approximately one-quarter of the Noxon bathymetric data, established shorelines, and started constructing the map in ReefMaster 2.0 at no cost to the CFSA.

2022 ANNUAL IMPLEMENTATION PLAN SUMMARY – APPENDIX C

Clark Fork Project, FERC No. 2058
Cabinet Gorge and Noxon Rapids Hydroelectric Developments

Title
Fish Passage/Native Salmonid Restoration Plan

Implementation Staff Lead
Shana Bernall, Avista, (406) 847-1293, Shana.Bernall@avistacorp.com

Background
The purpose of the Fish Passage/Native Salmonid Restoration Plan is "…to mitigate the continuing effects of the project as obstructions to fish passage, and to achieve the goal of increasing the long term population viability of native salmonids in the Lake Pend Oreille-lower Clark Fork River system" (FERC Order, Article 406). This goal is to be accomplished through the aggressive implementation of the Clark Fork River Native Salmonid Restoration Plan (NSRP).

The NSRP addresses a number of issues influencing availability of native fish stocks suitable for fish passage. Genetics, pathogens, exotic fish species, fish abundance and tributary and mainstem habitat are all discussed in the NSRP. Consideration of these factors is important in determining if fish passage is the most effective tool to increase native salmonid populations. A number of projects have been identified as activities needed for implementation in 2022 to achieve the goals of the Fish Passage/Native Salmonid Restoration Plan. The locations where all program components will be implemented are within the Avista project area, located downstream of Thompson Falls Dam, Montana proceeding downstream to Lake Pend Oreille, Idaho.

2022 Project Plans
Annual Operations
1. Upstream Fish Passage Program
2. Westslope Cutthroat Trout Transport Evaluation (***New***)
3. Tributary Trapping and Downstream Juvenile Bull Trout Transport Program
4. PIT-Monitoring Station Operation and Maintenance
5. Non-native Fish Suppression Project in the East Fork Bull River
6. Evaluation of Potential Actions for Reducing Non-native Threats to Native Salmonid Populations

Facilities
7. Fish Capture Facilities Operation, Development, and Testing
8. Graves Creek Permanent Weir Trap Enhancements

Work Products
Upstream Fish Passage Program
- Annual Work Summary; due December 1, 2022
- Comprehensive Project Report; Upstream Fish Passage Program (2001 – 2021 data);

final due December 1, 2022 (including Upstream Fish Passage Program 2019, 2020 and 2021 data)
- Annual Project Update; Upstream Fish Passage Program (2022 data); final due December 1, 2023
- Annual Project Update; Abernathy Fish Technology Center Genetics Report (2021 data); final due November 1, 2022
- Annual Project Update; Abernathy Fish Technology Center Genetics Report (2022 data); final due November 1, 2023
- Annual Project Update; Idaho Fish Health Center Pathogen Report (2021 data); final due July 1, 2022
- Annual Project Update; Idaho Fish Health Center Pathogen Report (2022 data); final due July 1, 2023

Westslope Cutthroat Trout Transport Evaluation
- Mid-year report; due to the Appendix C Implementation Staff Lead August 1, 2022
- Annual Work Summary; due to the Appendix C Implementation Staff Lead November 15, 2022
- University of Montana Conservation Genetics Laboratory Report; final due May 1, 2023
- Project Completion Report; final due December 31, 2024

Tributary Trapping and Downstream Juvenile Bull Trout Transport Program
- Comprehensive Project Report; Downstream Program (2018-2021 data; final due July 1, 2022 and includes Graves Creek permanent weir trap monitoring and evaluation plan report)
- Annual Project Update; Downstream Program (2022 data; final due October 1, 2023 and includes Graves Creek permanent weir trap monitoring and evaluation plan report)
- Temperature monitoring data for the seven long-term sites as well as sites monitored through the Bull Trout Emigration Study; due December 1, 2022
- Annual Work Summary; Downstream Program; due December 1, 2022

PIT-Monitoring Station Operation and Maintenance
- Annual Work Summary; PIT Technology (2022); due December 1, 2022

Non-native Fish Suppression Project in the East Fork Bull River
- Project Completion Report; Non-native Fish Suppression Project in the East Fork Bull River Drainage, Montana: 2007–2020; final due September 1, 2022
- Annual Work Summary; due December 1, 2022

Evaluation of Potential Actions for Reducing Non-native Threats to Native Salmonid Populations
- Final memorandum; due March 1, 2022
- Annual Work Summary; due December 1, 2022

Fish Capture Facilities Operation, Development, and Testing
- Annual Work Summary; Fish Capture Facilities (2022); due December 1, 2022
- As-built drawings (CGDF); due December 1, 2022
- FHF Project Closeout items (O&M manual; As-built drawings); due March 1, 2022

Graves Creek Permanent Weir Trap Enhancements
- Revegetation site plan (LCFWG; likely memo); due March 1, 2022
- As-built drawings (R2); due March 1, 2022
- Annual Work Summary; due December 1, 2022

2022 Appendix C Annual Operations Fund Budget

Budget Summary	
Unexpended funds with interest	$1,305,617
2022 contribution (including GDP inflation rate)	$849,826
Total available	**$2,155,443**
2022 MC-approved budget	$1,576,786
Unobligated funds	**$578,657**

2022 Project	Carryover[1]	2022 Budget
Upstream Fish Passage Program	$85,000	$730,620
Westslope Cutthroat Trout Transport Evaluation	$0	$46,800
Tributary Trapping and Downstream Juvenile Bull Trout Transport Program	$124,150	$468,292
PIT-Monitoring Station Operation and Maintenance	$7,000	$37,963
Non-native Fish Suppression Project in the East Fork Bull River	$26,700	$4,000
Evaluation of Potential Actions for Reducing Non-native Threats to Native Salmonid Populations	$6,169	$0
Three 3' circular PIT antennas (approved at the fall 2021 MC meeting)	$35,000	$0
Stream Gage Monitoring (cost share; see Appendix B project plan)	$0	$5,092
Total	**$284,019**	**$1,292,767**
MC-approved budget		**$1,576,786**

[1] *Estimated carryover of unexpended, approved funds as of January 1.*

2022 Appendix C Facilities Fund Budget

Budget Summary	
Unexpended funds with interest[1]	-$30,909,091
2022 contribution (including GDP inflation rate)	$616,937
Total available[1]	**-$30,292,154**
2022 MC-approved budget	$6,911,686
Unobligated funds[1]	**-$37,203,840**

[1] Negative figures represent the amount that Avista has spent in excess of the sum of the annual contributions to date. Pursuant to the CFSA, Avista will fund the actual cost of permanent fish passage facility construction in the event the facilities budget is not adequate.

2022 Project	Carryover[1]	2022 Budget
Fish Capture Facilities Operation, Development, and Testing	$4,343,748	$2,390,795
Graves Creek Permanent Weir Trap Enhancements	$177,143	$0
Total	**$4,520,891**	**$2,390,795**
MC-approved budget		**$6,911,686**

[1] Estimated carryover of unexpended, approved funds as of January 1.

2022 PROJECT PLAN

Upstream Fish Passage Program

Project Contact
Shana Bernall, Avista, (406) 847-1293, Shana.Bernall@avistacorp.com

Project History
The Upstream Fish Passage Program is a continuing project that was originally approved by the Management Committee (MC) in 2001. The scope and budget for this project are reviewed by the MC annually. Bull Trout have been transported upstream annually since 2001 and Westslope Cutthroat Trout have been transported upstream annually since 2015.

Background
Bull Trout have been captured downstream of Cabinet Gorge Dam and transported upstream of lower Clark Fork River mainstem dams annually since 2001. Bull Trout are transported upstream and released at designated locations based on either a genetic assignment or other approved transport criteria.

Bull Trout were initially transported upstream of Cabinet Gorge Dam as part of an experiment that was conducted from 2001 through 2003. Over 100 adult Bull Trout were transported upstream of Cabinet Gorge Dam with release into Cabinet Gorge Reservoir during this time frame. In 2004, Avista worked closely with a genetics laboratory that was able to use genetic testing to determine a Bull Trout's most likely tributary of origin, and this method has been utilized annually since then to help guide upstream transport decision making (DeHaan et al. 2011). During the early years of experimental transport, radio-tagged Bull Trout were observed migrating into tributaries during the spawning period, providing evidence to continue the transport program. In addition, a genetic study implemented from 2008 through 2010 and again in 2020 in two Montana tributaries confirmed the reproductive contribution of Bull Trout following upstream transport (DeHaan and Bernall 2013, Adams and Bernall 2021).

The experimental transport of Westslope Cutthroat Trout upstream of Cabinet Gorge Dam was initiated in 2015 and has been approved annually by the MC since that time. The goal for this program is to reestablish connectivity for Westslope Cutthroat Trout utilizing Lake Pend Oreille, Idaho for growth and rearing and attempting to return to Montana tributaries to spawn. Transported fish were implanted with radio transmitters from 2015 through 2018 to monitor the movements of these fish following upstream transport. The primary indicator of the success of this project was documenting Westslope Cutthroat Trout entering potential spawning tributaries to Cabinet Gorge Reservoir during the spring spawning period. The percentage of Westslope Cutthroat Trout that entered spawning tributaries in the spring, following release from mid-March through June, ranged from 23 percent in 2015 to 40 percent in 2016 (Bernall et. al 2021). Based on these results, and evaluations of movements of fish at different release locations and different times of the year, the decision was made to begin moving Westslope Cutthroat Trout upstream of Cabinet Gorge Dam without radio transmitters in 2019. All Westslope Cutthroat Trout released in Cabinet Gorge Reservoir since 2019 were implanted with Passive Integrated Transponders (PIT) tags to monitor movement into the Bull River and fallback downstream of

Cabinet Gorge Dam. Seventeen percent in 2019, 25 percent in 2020, and 6 percent in 2021 were detected ascending the Bull River during the spawning period following their release (Avista, unpublished data).

The primary methods used to capture Bull Trout downstream of Cabinet Gorge Dam up until 2022 were night electrofishing, the Cabinet Gorge Hatchery ladder trap, and hook-and-line sampling. Only night electrofishing and hook-and-line sampling have been used to capture Westslope Cutthroat Trout. A permanent fish trap has been constructed below Cabinet Gorge Dam and will be operational in the spring of 2022. This trap "the Cabinet Gorge Dam Fish Passage Facility (FPF) will be operated and tested in 2022. One of the testing mechanisms is the implementation of the FPF Monitoring and Evaluation (M&E) Plan. The FPF will be the primary method used to capture Bull Trout and Westslope Cutthroat Trout downstream of Cabinet Gorge Dam for upstream transport. Other capture methods will be used in 2022 to provide an opportunity to PIT tag additional fish to better understand the number of Bull Trout in the lower Clark Fork River.

Pathogen testing of species targeted for upstream transport has occurred annually since 2013. Avista is required to conduct this testing in order to obtain an import permit that allows transport of target fish from the lower Clark Fork River, Idaho upstream into the state of Montana. Bull Trout captured as bycatch during Lake Pend Oreille, Idaho Lake Trout suppression efforts are used annually to fulfill this requirement for Bull Trout transport. Westslope Cutthroat Trout, Rainbow Trout, Westslope Cutthroat Trout and Rainbow Trout hybrids, and up to 30 kokanee are collected annually in the lower Clark Fork River to fulfill the requirement for Westslope Cutthroat Trout transport.

Goal

Reconnect migratory native salmonid populations in the lower Clark Fork River in an effort to increase the viability of these populations (Bull Trout and Westslope Cutthroat Trout) in the lower Clark Fork River, its tributaries, and Lake Pend Oreille.

Objectives

1. Capture adult Bull Trout downstream of Cabinet Gorge Dam and transport those deemed appropriate upstream to Montana tributaries.

2. Capture mature Westslope Cutthroat Trout downstream of Cabinet Gorge Dam and transport those deemed appropriate upstream of Cabinet Gorge Dam.

3. Implement the FPF M&E Plan to evaluate and improve the effectiveness of the FPF.

4. Quantify Rainbow Trout and Yellowstone Cutthroat Trout introgression levels in the group of Westslope Cutthroat Trout transported and released upstream of Cabinet Gorge Dam.

5. Conduct pathogen testing required for upstream transport of Bull Trout and Westslope Cutthroat Trout in 2023.

6. Maintain a PIT tag database that includes information on all PIT tagged fish in the Avista Project area to allow transfer of information among various Avista programs.

7. Continue to develop a lower Clark Fork River fish capture database.

Tasks

1. Operate the FPF in the spring (late-March/early April) through mid-October (dependent on environmental conditions) as defined in the M&E Plan (except during periods where lower Clark Fork River flows exceed 52,000 cfs). When lower Clark Fork River flows exceed 52,000 cfs the FPF will be shut down until flows stabilize below 52,000 cfs (Objectives 1, 2 and 3)

2. Coordinate genetic analysis of fin tissue samples for "rapid response" and other projects with the Abernathy Fish Technology Center (AFTC). Fin tissue samples will be collected from all Bull Trout captured downstream of Cabinet Gorge Dam and will be sent to AFTC for processing. In addition, approximately 200 juvenile Bull Trout fin tissue samples will be collected and sent to AFTC for annual baseline updates. Fin tissue samples collected from Westslope Cutthroat Trout transported upstream of Cabinet Gorge Dam will also be analyzed. A contract with AFTC for the proposed genetics work along with additional analyzes proposed under this or other Appendices will be developed. (Objectives 1, 2 and 4)

3. Provide upstream transport for appropriate adult Bull Trout captured downstream of Cabinet Gorge Dam. Utilize the FPF to capture adult Bull Trout (≥ 300 mm in length) in the Clark Fork River downstream of Cabinet Gorge Dam. Adult Bull Trout will be held at the Cabinet Gorge Fish Handling Facility located at the Cabinet Gorge Hatchery. Fish that genetically assign to Montana populations, or were previously captured as juveniles in Montana tributaries, or as deemed appropriate, will be transported upstream. Bull Trout transported to Region 2 (Cabinet Gorge Reservoir or tributaries) will be released in Bull River Bay until temperatures exceed 16°C or intermittency issues are a concern. At that time fish will be released into the Bull River, East Fork Bull River or Rock Creek depending on the tributary they genetically assign to and the time of year. Bull Trout transported to Region 3 (Noxon Reservoir tributaries) will be released directly into the tributary they genetically assign to. Transport and release of Bull Trout to Region 4 (upstream of Thompson Falls Dam) will be coordinated with Montana Fish, Wildlife and Parks (MFWP). (Objective 1)

4. Bull Trout genetically assigning to Lightning Creek and its tributaries (Region 1) that are captured downstream of Cabinet Gorge Dam during time periods when the mouth of Lightning Creek is dry will be transported and released into the East Fork Bull River. (Objective 1)

5. Implement the FPF M&E Plan and if deemed appropriate and agreed to by the FPF subgroup adjust operation of the FPF to optimize the capture of Bull Trout. Implementation of the M&E Plan will include installation and operation of submersible PIT antennas in the lower Clark Fork River and the use of other methods (e.g., night

electrofishing, Cabinet Gorge Hatchery ladder trap, etc.) to capture and PIT tag additional fish to help evaluate the FPF. (Objective 3)

6. Water temperature in the FPF will be monitored as denoted in Table 1.

Table 1. Location of temperature monitoring equipment in the FPF.

Stream	Site name	River km	Latitude	Longitude
Lower Clark Fork River	FPF	14.4	48.085704	-116.058163

7. Westslope Cutthroat Trout (≥ 340 mm in total length) captured in the FPF in the spring will be transported upstream and released near the Big Eddy boat ramp in Cabinet Gorge Reservoir through the end of May, dependent on environmental conditions. These fish will be implanted with a 23 mm Full Duplex (FDX) PIT tag, unless they already have a 12 mm FDX PIT tag. Then they will be implanted with a 23 mm Half Duplex (HDX) PIT tag. All other Westslope Cutthroat Trout captured downstream of Cabinet Gorge Dam will be implanted with a 12 mm FDX PIT tag and will be released near their capture location. A photo will be taken, and a fin tissue sample will be collected from all transported Westslope Cutthroat Trout. Any Westslope Cutthroat Trout that are recaptured downstream of Cabinet Gorge Dam during the transport period will be transported upstream a maximum of two times in 2022. (Objective 2)

8. The required number of fish, of the appropriate species, identified by the Pathogen Technical Subcommittee, will be tested for pathogens in 2022. The results will be used to apply for a MFWP import permit in 2023. (Objective 5)

9. Maintain a PIT tag database and process data requests for all PIT tagged fish in the Avista project area. (Objective 6)

10. Work with outside contractor and internal personnel to continue to develop a database that houses information on all fish capture events in the lower Clark Fork River downstream of Cabinet Gorge Dam (night electrofishing, Cabinet Gorge Hatchery ladder trap, hook-and-line sampling, Twin Creek weir, waterfall trap, mobile trap and other experimental traps). (Objective 7)

Work Products

- Annual Work Summary; due December 1, 2022
- Comprehensive Project Report; Upstream Fish Passage Program (2001 – 2021 data); final due December 1, 2022 (including Upstream Fish Passage Program 2019, 2020 and 2021 data)
- Annual Project Update; Upstream Fish Passage Program (2022 data); final due December 1, 2023
- Annual Project Update; Abernathy Fish Technology Center Genetics Report (2021 data); final due November 1, 2022
- Annual Project Update; Abernathy Fish Technology Center Genetics Report (2022 data); final due November 1, 2023

- Annual Project Update; Idaho Fish Health Center Pathogen Report (2021 data); final due July 1, 2022
- Annual Project Update; Idaho Fish Health Center Pathogen Report (2022 data); final due July 1, 2023

Permitting Requirements
A MFWP import permit is required to transport Bull Trout and Westslope Cutthroat Trout into Montana. A collection permit and fish transport permit are required from Idaho Department of Fish and Game (IDFG) to target and collect Bull Trout and Westslope Cutthroat Trout downstream of Cabinet Gorge Dam.

Endangered Species Act consultation for this project plan is associated with the 2019 Biological Opinion on the effects of continued operation of the Clark Fork Hydroelectric Project on Bull Trout and designated Bull Trout critical habitat. Incidental take reporting for this project plan will be included in the annual Biological Opinion report as required by Term and Conditions 15–18 of the 2019 Incidental Take Statement.

Cultural/Historic Resource Review
Not applicable for the tasks proposed in this project plan, there are no ground and/or vegetation disturbing activities, or proposed impacts to cultural/historic resources.

Benefit to the Resource
This program aligns with Avista's responsibility in complying with the Clark Fork Settlement Agreement (CFSA) and Native Salmonid Restoration Plan (NSRP) (Kleinschmidt and Pratt 1998). The NSRP identified a need to "establish and maintain connectivity in the Clark Fork Basin for migratory trout" with Bull Trout and Westslope Cutthroat Trout listed as the primary target species (Avista 1999, Kleinschmidt and Pratt 1998). The NSRP also called for conducting experimental upstream passage of adult fish to test the feasibility of larger-scale programs and permanent fish passage facilities. Montana Fish, Wildlife and Parks and IDFG are supportive of Bull Trout and Westslope Cutthroat Trout passage as detailed in their current state-wide management plans (MFWP 2019, IDFG 2019). Additionally, the U. S. Fish and Wildlife Service describes fragmentation of the lower Clark Fork River by mainstem dams as one of the primary threats to Bull Trout under their Columbia Headwaters recovery unit implementation plan (U. S. Fish and Wildlife Service 2015). Bull Trout are listed as "threatened" under the Endangered Species Act and Westslope Cutthroat Trout are a "species of special concern" (MFWP and IDFG designation). Implementation of Bull Trout and Westslope Cutthroat Trout upstream passage programs re-establishes connectivity for migratory populations in the lower Clark Fork River which allows access to quality spawning and rearing habitat in Montana tributaries.

Budget

Item	Estimated Carryover[1]	2022 Budget Request
Labor for operation of the FPF, implementation of the FPF M&E Plan, fish transport, data entry and analysis and report writing (statistician assistance) (1 biologist FTE, 3 technician FTE, 3 seasonal employees and $20,000 for statistician help)	$60,000	$587,500
FPF/FHF: unforeseen minor maintenance needs	$0	$30,000
Electrical, phone, cell, and internet: FPF and FHF	$3,000	$25,000
Riverwatcher Daily (first year subscription covered; 3 mo. expires 4/15/2022) (Annual fee $2,600); plus cell booster	$0	$2,000
Genetic Analysis: contract with AFTC (Bull Trout and Westslope Cutthroat Trout transports and baseline analysis)	$0	$39,120
Pathogen sampling: USFWS contract ($6,500) and Avista time (0.01 technician FTE)	$0	$14,500
Equipment: camera, waders, rain gear, In Reach charges, etc.	$0	$5,000
Equipment for fish work up: PIT tag reader, laptop/monitor, PIT tags, syringes, Aqui-S 20E ($700 annual fee), measuring board, etc.	$0	$5,000
Vehicle and boat: maintenance, repair, new generator, and fuel	$0	$20,000
Database development: contract and labor	$20,000	$0
Meetings and Training	$2,000	$2,500
Total	$85,000	$730,620
Anticipated Expenditures		$815,620

[1] *Estimated carryover of unexpended, approved funds as of January 1.*

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2022 PROJECT PLAN

Westslope Cutthroat Trout Transport Evaluation

Project Contact
Travis Rehm, Montana Fish, Wildlife and Parks (MFWP), (406) 382-3032, rehm.travis@mt.gov

Project History
This is a new project and has not been ranked. The scope and budget will be reviewed and approved by the MC annually. It is anticipated that this project will be implemented for up to three years beginning in 2022.

Background
Cabinet Gorge Dam blocks upstream fish passage into tributaries within the lower Clark Fork River in Montana that were historically available to Westslope Cutthroat Trout. Pratt and Huston (1993) interviewed locals that lived in Sanders County concerning fisheries in the area prior to when the hydroelectric dams were built on the mainstem Clark Fork River. Large, presumably migratory Westslope Cutthroat Trout or “redbellies” were common in most Montana tributaries of the lower Clark Fork River and were directly mentioned as being present in several Cabinet Gorge tributaries including the Blue Creek, Elk Creek, Bull River, Pilgrim Creek and Rock Creek (Pratt and Huston 1993). Currently stream-resident, non-hybridized Westslope Cutthroat Trout populations occur in all major drainages to Cabinet Gorge Reservoir as well as some of the minor tributaries. Prior to this experimental passage, migratory (fluvial) Westslope Cutthroat Trout were only present in the Bull River drainage, post dam construction. (WWP 1996; Chadwick 2000; Moran 2006; Moran and Storaasli 2015).

The experimental transport of Westslope Cutthroat Trout upstream of Cabinet Gorge Dam was initiated in 2015 and has occurred in the lower Clark Fork River drainage over the last seven years (2015-2021), as part of the Upstream Fish Passage Program. The goal for this program is to reestablish connectivity for Westslope Cutthroat Trout utilizing Lake Pend Oreille, Idaho for growth and rearing and attempting to return to Montana tributaries to spawn. Westslope Cutthroat Trout have been captured in the lower Clark Fork River in Idaho in the vicinity of Cabinet Gorge Dam and subsequently transported into Cabinet Gorge Reservoir in Montana.

Over this period, 244 Westslope Cutthroat Trout have been transported into Montana. Transported fish were implanted with radio transmitters from 2015 through 2018 to monitor the movements of these fish following upstream transport. These radio-tagged Westslope Cutthroat Trout were observed migrating into tributaries during the spawning period. The percentage of Westslope Cutthroat Trout passed into Cabinet Gorge Reservoir that entered a spawning tributary over those years ranged from 23-40%, with a mean of 31% (2015= 23%, 2016= 40%, 2017= 37.5%, 2018= 25%; Bernall and Johnson 2016, 2017, 2018). Fish were documented entering Blue Creek, Bull River, Pilgrim Creek and Rock Creek. Each year that Westslope Cutthroat Trout were tracked, at least five fish entered the Bull River drainage, 3 of 4 years at least one fish has entered Rock Creek and Pilgrim Creek, and 2 of 4 years one fish entered Blue Creek. The percentage of fish passed into CGR that have been detected entered the Bull River has ranged from 13-25%, with a mean of 20% (2015= 13% (n=5), 2016= 25% (n=9), 2017= 22%

(n=9), 2018= 21% (n=5)).

All Westslope Cutthroat Trout released in Cabinet Gorge Reservoir in 2019-2021 were implanted with Passive Integrated Transponders (PIT) tags to monitor movement into the Bull River and fallback downstream of Cabinet Gorge Dam. Seventeen percent in 2019 (n=4), 25 percent in 2020 (n=10), and 6 percent in 2021 (n=1) were detected ascending the Bull River during the spawning period following their release (Avista, unpublished data). Since 2015, a total of 45 fish have been detected moving into the Bull River during the spawning period. Offspring of migratory life histories of Westslope Cutthroat remain in their natal stream from 1-4 years (McIntyre and Rieman 1995). If an adfuvial life history persist in offspring of transported Westslope Cutthroat we could detect fish from year-classes between 2018-2021.

To date, there has been no evaluation of transported Westslope Cutthroat Trout potential reproduction in Montana tributaries or their contribution to recreational fisheries. This project will facilitate the collection of baseline data at current levels of passage of Westslope Cutthroat Trout into Montana. Cabinet Gorge Fishway will begin operation in spring 2022, it is likely that numbers of Westslope Cutthroat Trout transported upstream of Cabinet Gorge Dam will increase as a result. Results of this project will help inform future passage decisions associated with weighing the benefits to Westslope Cutthroat Trout populations and recreational fisheries against risks of disease transmission upstream of Cabinet Gorge Dam.

Goal
Monitor the efficacy of the Upstream Fish Passage Program to reconnect migratory Westslope Cutthroat Trout populations in the Lower Clark Fork River.

Objectives
1. Determine if any Westslope Cutthroat Trout transported upstream of Cabinet Gorge Dam have successfully reproduced in the Bull River.

2. Determine the contribution of Westslope Cutthroat Trout upstream transported over Cabinet Gorge Dam to recreational fisheries in Montana.

Methods
Genetic Monitoring
Genetic monitoring will occur at sites in Bull River and its tributaries. Specifically, sampling will be focused on areas identified as spawning locations for Westslope Cutthroat Trout transported above Cabinet Gorge Dam (Bernall et al. *In prep.*), the mainstem Bull River downstream of those areas, and Bull River tributary sites being monitored by the *Habitat Restoration Monitoring and Native Salmonid Abundance Monitoring Plan.* The primary methods used to capture fish in Montana tributaries will be drift-boat mounted and backpack electrofishing with the possibility to use hook-and-line sampling in the mainstem of the Bull River. Tissue samples (up to 1000) from all Westslope Cutthroat Trout captured during these activities will be collected in 2022. Activities conducted under the Montana Tributary Habitat Acquisition and Recreational Fishery Enhancement Program (Appendix B), *Habitat Restoration Monitoring and Native Salmonid Abundance Monitoring Plan* will also be used to help facilitate collection of tissue samples. Coordination of genetic analysis of fin tissue samples collected in 2022 will be made

with University of Montana Fish Conservation Genetics Lab. Tissue samples of all Westslope Cutthroat Trout passed over Cabinet Gorge Dam (2015-present) were taken at the time of transfer. The transfer of tissue samples from all Westslope Cutthroat Trout passed over Cabinet Gorge Dam from Abernathy Fish Technology Center to the University of Montana Fish Conservation Genetics Lab will be coordinated. Parentage-based tagging, a widely used method to describe reproductive success of known origin salmonid fish throughout the Columbia River basin (e.g., Steele et al. 2019), will be used to determine if any fish collected in 2022 are offspring of those transport fish. All individual fish will be genotyped using a RAD Capture (Ali et al. 2015) panel specifically designed for Westslope Cutthroat Trout; that panel includes more than 500 polymorphic SNPs for parentage in this region, thereby providing high power for accurate parentage inference. Furthermore, the panel also includes more than 1600 species diagnostic markers (i.e., Westslope, Rainbow and Yellowstone) to assess individual ancestry of all migratory adults and juveniles sampled in tributaries (a secondary added benefit of project activities).

Fisheries Monitoring
Floy tags will be deployed in all Westslope Cutthroat Trout transported upstream of Cabinet Gorge Dam in 2022. A subsample of Westslope Cutthroat Trout will also be Floy tagged in the Bull River. Tag return rates of both sets of tagged fish will be used to evaluate angler catch rates of transported Westslope Cutthroat Trout. A pre-existing tag line will be printed on all tags for anglers to report their catches. Additionally, a news release about the project and signage at traditional access points will be utilized to inform anglers and encourage tag reporting. Local outfitters will also be contacted, made aware of the project, and encouraged to participate in angler return and reporting of any tags encountered.

Work Products

- Mid-year report; due to the Appendix C Implementation Staff Lead August 1, 2022
- Annual Work Summary; due to the Appendix C Implementation Staff Lead November 15, 2022
- University of Montana Conservation Genetics Laboratory Report; final due May 1, 2023
- Project Completion Report; final due December 31, 2024

Permitting Requirements
No permits are required for fisheries sampling work as all work will be conducted and/or overseen by MFWP fisheries biologists.

Endangered Species Act consultation for this project plan is associated with the 2019 Biological Opinion on the effects of continued operation of the Clark Fork Hydroelectric Project on Bull Trout and designated Bull Trout critical habitat (BiOp), and the USFWS-MFWP Cooperative Agreement pursuant to Section 6 of the Act. This project plan is consistent with the analysis and conclusions contained in the 2019 BiOp and the USFWS-MFWP Cooperative Agreement and will adhere to all appropriate Terms and Conditions designed to reduce the extent and effects of incidental take on Bull Trout. Incidental take reporting for this project plan will be included in the annual Biological Opinion report as required by Term and Conditions 15–18 of the 2019 Incidental Take Statement, as well as MFWP's annual Section 6 report to the USFWS.

Cultural/Historic Resource Review
Not applicable for the tasks proposed in this project plan, there are no ground and/or vegetation disturbing activities, or proposed impacts to cultural/historic resources.

Benefit to the Resource
This project is primarily being implemented to evaluate the effectiveness of the experimental transport of Westslope Cutthroat Trout upstream of Cabinet Gorge Dam implemented under Avista's CFSA Native Salmonid Restoration Plan (Kleinschmidt and Pratt 1998). The goal of the Upstream Fish Passage Program is to establish and maintain connectivity in the Clark Fork River basin for migratory trout. Westslope Cutthroat Trout are a "species of special concern" in both Idaho and Montana. Montana Fish, Wildlife and Parks and Idaho Department of Fish and Game are supportive of reconnecting Bull Trout and Westslope Cutthroat Trout populations in their current state-wide management plans (MFWP 2019, IDFG 2019).

Budget

Item	Estimated Carryover[1]	2022 Budget Request
Genetics Analysis	$0	$40,000
Genetic vials, boxes, and ethanol	$0	$2,500
Boat: maintenance, repair, and set up	$0	$1,000
Field gear (e.g., nets, waders, scales)	$0	$2,000
Tagging equipment (e.g., floy tags, tag guns)	$0	$1,000
Signs and news release	$0	$300
Total	$0	$46,800
Anticipated Expenditures		$46,800

[1] *Estimated carryover of unexpended, approved funds as of January 1.*

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2022 PROJECT PLAN

Tributary Trapping and Downstream Juvenile Bull Trout Transport Program

Project Contact
Eric Oldenburg, Avista, (406) 847-1290, eric.oldenburg@avistacorp.com

Project History
The Tributary Trapping and Downstream Juvenile Bull Trout Transport Program (hereafter, "Downstream Program") is a continuing project that was originally approved by the Management Committee (MC) in 2000. The scope and budget for this project are reviewed by the MC annually.

Background
The original goal of the Downstream Program was to test the feasibility of tributary trapping and downstream transport of emigrating juvenile Bull Trout, and subsequently, to assess if such actions resulted in higher returns of adult Bull Trout following maturation in Lake Pend Oreille. Since that time, through annual evaluation of the program and an experimental study, it has been generally agreed upon that the transport and release of juvenile Bull Trout downstream of Cabinet Gorge Dam results in greater adult returns to natal streams (due, in part, to the Upstream Fish Passage Program) when compared to the volitional emigration of juvenile fish out of natal streams. Therefore, in 2012, the MC approved the transport of all trapped, downstream-moving juvenile Bull Trout to the Clark Fork River downstream of Cabinet Gorge Dam.

In 2000, juvenile transport operations were conducted in the Bull River and Rock Creek drainages. The program was expanded to the Vermilion River, Swamp, Pilgrim, and Graves creeks in 2002 and 2003, and to the Prospect Creek drainage in 2005. At present, data suggests the East Fork Bull River, Graves Creek, and Vermilion River are the only Montana tributaries within the Avista project area containing meaningful numbers of Bull Trout that naturally exhibit an adfluvial life history (Oldenburg 2017; Lacy et al. 2016; Oldenburg et al. 2015; Zymonas 2006; hereafter, these three tributaries are collectively referred to as the "Montana adfluvial streams"). Transport operations are currently limited to the Montana adfluvial streams.

Traditionally, tributary trapping has been conducted with temporary weir and screw traps. Following a feasibility investigation, Avista constructed a reinforced, concrete-bedded weir trap (hereafter, "permanent weir") in Graves Creek in 2012. Operation of the permanent weir began in 2013 and was anticipated to facilitate higher capture efficiencies for emigrating juvenile Bull Trout, particularly during periods of high discharge that proved difficult to trap using temporary weir and screw traps. A Graves Creek Monitoring and Evaluation (M&E) Plan was completed in 2013 and updated in 2016 (Oldenburg et al. 2016). The M&E Plan was designed to evaluate the operation and fish capture effectiveness of the permanent weir. Associated monitoring suggested that the permanent weir improved the capture probability for juvenile Bull Trout, but that additional modifications could further enhance the capture probabilities of both juvenile and adult Bull Trout. Thus, the permanent weir has been iteratively evaluated and improved since that time. Among these improvements, a prototype drop-height element was incorporated into the downstream-capture component of the trap during 2016. Monitoring during 2016 and 2017

suggested the prototype was extremely effective for capturing both juvenile and adult downstream-moving Bull Trout. During 2017, the Aquatic Implementation Team (AIT) reviewed the performance of the weir and agreed that the prototype was achieving the desired results. Avista began working with engineers to develop plans to replace the prototype with a more robust engineered version of this concept. Design for the permanent weir trap enhancements was finalized during 2019. During 2020, a contractor was selected and started fabricating the trap parts. Installation occurred during the fall of 2021 and the enhanced trap became operational on November 3. In addition, the Graves Creek Fish Handling Facility was completed in early 2021.

East Fork Bull River trapping was conducted using two weir traps and two screw traps during 2021. A drop-height element similar to the permanent weir prototype was integrated into the weir trap at the primary East Fork Bull River trap site (upper south channel) from 2017 through 2021. Results from this experimental trap were inconclusive in 2017 because very few fish were captured in any East Fork Bull River traps suggesting relatively few juvenile fish emigrated during 2017. In 2018, 2019, and 2020 more juvenile Bull Trout were captured in the experimental trap than in any of the previous eight years, despite relatively low abundances of Bull Trout documented upstream of the traps. A more robust entrance for the south channel trap was constructed in 2020 which further increased efficiency. In 2021, a more robust trap box with lifting frame and five pipe supports were constructed to increase the effectiveness and ease of operation of the trap, as well as to prevent mink from entering the trap box. The new components were very efficient for the short duration they were fished before being blown out by extreme fall weather events. The new components will be again fished in the south channel during 2022 and similar components will likely be constructed for the north channel. Fall stream electrofishing to augment East Fork Bull River juvenile transports occurred beginning in 2021 and will be continued during 2022.

As in the past few years, the Vermilion River will be electrofished during late October or early November for the purpose of capturing juvenile transports. A new electrofishing unit was purchased for this purpose and first utilized during 2020. The primary goal behind the new unit was to reduce the number of fish injured and killed by stream electrofishing. Despite a new record high number of Bull Trout captured in 2020, no fish were injured or killed. In addition, anecdotally, the new unit appears to have just as great or greater capture probability when compared to the old unit.

The methods used to capture juvenile Bull Trout also capture other juvenile and adult fishes. These data provide important life history information, such as the timing and magnitude of upstream and downstream movements, trends in fish size, condition, and abundance among years, and the verification of movement for fish transported under other programs. The Downstream Program has also assisted in the implementation of the Non-Native Fish Suppression Project in the East Fork Bull River from 2007 through the present time.

Goal

Protect and enhance migratory Bull Trout local populations in the East Fork Bull River, Vermilion River, and Graves Creek by transporting appropriate individuals captured within these streams downstream to rear and grow in Lake Pend Oreille.

Objectives

1. Capture and transport juvenile Bull Trout and post-spawn adult Bull Trout that were transported under the Upstream Fish Passage Program to the Clark Fork River downstream of Cabinet Gorge Dam.

2. Evaluate and implement the Graves Creek M&E Plan to evaluate and improve permanent weir trap capture and passage probabilities.

3. Provide support to related projects including the Bull Trout Emigration Study; East Fork Bull River Morphology, Connectivity, and Habitat Enhancement Project; Graves Creek Permanent Weir Trap Enhancements; Non-Native Fish Suppression Project in the East Fork Bull River; and, Upstream Fish Passage Program, and implementation of the EFBR beaver management plan.

Tasks

1. All sites: Procure equipment and acquire necessary permits to install and operate fish traps in Graves Creek and East Fork Bull River, and to electrofish in the Vermilion River and East Fork Bull River. (Objectives 1 and 2)

2. All sites: If deemed necessary, consult statistician for help with varying data analyses. (Objectives 1 and 2)

3. General protocols: Unless otherwise specified, the following general protocols will be followed. All Bull Trout greater than 99 mm in length that are captured through Downstream Program efforts will be implanted with a *full-duplex* PIT tag (unless a previous PIT tag is detected). Those fish less than 350 mm will receive a 12-mm tag. Those fish greater than 349 mm will receive a 23-mm tag. If a greater than 349 mm Bull Trout is captured that only has a 12-mm PIT tag, a 23-mm PIT tag of the opposite technology (i.e., half duplex versus full duplex) will be implanted. Juvenile transports will be held in tanks at the Cabinet Gorge Fish Handling Facility and acclimated to lower Clark Fork River water for about 24 hours prior to release during those times in which the facility is operational. All fish will be scanned prior to release to ensure PIT tags were retained. Adult Bull Trout captured in traps will be released in the appropriate direction (or transported to the Clark Fork River downstream of Cabinet Gorge Dam) depending on their origin (reservoir type or upstream transport), direction of travel, and time of year (pre-spawn or post-spawn). The release location downstream of Cabinet Gorge Dam will be adjacent to the Cabinet Gorge Fish Handling Facility for all transports during all times of the year. All non-Bull Trout fish that are implanted with a PIT tag will also receive an adipose fin clip. (Objectives 1 and 2)

4. General protocols: Work with the AIT and evaluate the juvenile transport release location. If deemed prudent, some or all fish may be released at the Cabinet Gorge Dam Fish Passage Facility rather than the hatchery. In addition, the concept of developing a “safe space” for fish to acclimate following release will be evaluated.

5. Graves Creek: Conduct permanent weir trapping and transport operations in Graves

Creek from mid-March through July 1 and August 29 through November 23 (dates may be slightly modified by the AIT or due to environmental conditions; the AIT may choose to trap the period from November 28 until December 18; traps will be disabled during the Labor Day and Thanksgiving holidays). Transport eligible (i.e., 120–250 mm and captured moving downstream) Bull Trout to the Clark Fork River downstream of Cabinet Gorge Dam. With regard to adult upstream transports that are captured in the permanent weir trap following the spawn, the AIT will evaluate data to determine whether these fish should be released on site or transported back to Lake Pend Oreille (the default will be to release half on site and transport half to Lake Pend Oreille). Among fish captured in the permanent weir trap that do not have a PIT tag at the time of capture, all Bull Trout greater than 99 mm and Mountain Whitefish and Westslope Cutthroat Trout greater than 299 mm will be implanted with a full-duplex PIT tag. A block design will be implemented in which the trap will be operated with no volitional passage versus volitional upstream passage on alternating weeks. (Objectives 1 and 2)

6. Graves Creek: The AIT will evaluate the Graves Creek M&E Plan during 2022 and modify it (if warranted due to trap enhancements). Implement the Graves Creek M&E Plan. Collect data to evaluate fish behavior upstream and downstream of the trap and iteratively apply operational or physical design modifications to overcome any documented problems. Operate baited minnow traps within Graves Creek between the permanent weir trap and Graves Creek Falls as the weather allows and as deemed prudent by the management agencies. (Objective 2)

7. Graves Creek: Develop the gage height-discharge relationship using the real-time pressure sensor that was installed and integrated into the Biomark system in 2021.

8. Graves Creek: Provide support for the Graves Creek Permanent Weir Trap Enhancement project. (Objective 3)

9. East Fork Bull River: Conduct trapping operations in the East Fork Bull River from late March through July 1 and August 29 through November 23 (dates may be slightly modified by the AIT or due to environmental conditions; the AIT may choose to trap the period from November 28 until December 18; traps will be disabled during the Labor Day and Thanksgiving holidays). During periods of high discharge, two screw traps will be operated in the south channel. If a suitable location can be identified, one of these traps may be moved to the north channel. When discharge declines to appropriate levels, the screw traps will be removed and temporary weir traps will be installed and operated within both channels. The weir trap with the drop-height feature will fished at the upper south channel site and further evaluated. The AIT may elect to slightly move the upper north channel trapping site pursuant to appropriate permits. Rather than run exclusion weir traps at the lower sites in the fall, the weir traps at the upper sites may include additional fortification and more frequent cleaning. All non-native fishes captured in East Fork Bull River traps will be transported to the lower Bull River property. Among fish captured in tributary traps that do not have a PIT tag at the time of capture, all Bull Trout greater than 99 mm and Mountain Whitefish and Westslope Cutthroat Trout greater than 299 mm will be implanted with a full-duplex PIT tag. All captured post-spawn adult Bull

Trout that were formerly upstream transports will be transported back to Lake Pend Oreille. (Objectives 1and 3)

10. East Fork Bull River: If the new south channel trap components continue to meet expectations in 2022 we will fabricate similar components for the north channel. In the event similar components are not deemed necessary for the north channel, new all-aluminum boxes will be fabricated for the north channel to reduce or eliminate mink predation.

11. East Fork Bull River: Conduct backpack stream electrofishing to capture and transport eligible (i.e., 120-250 mm) Bull Trout from the East Fork Bull River. Electrofishing will be conducted during mid to late October or November following the Bull Trout spawn. Electrofishing will not occur: (1) within 30 yards of Bull Trout redds; (2) if any adult Bull Trout are observed in the area; or (3) around complex structures where visibility may be poor (e.g., large logjams or deep undercut banks). Electrofishing will be conducted for five days and all eligible Bull Trout will be transported to Idaho. (Objective 1)

12. East Fork Bull River: Provide support for the East Fork Bull River Morphology, Connectivity, and Habitat Enhancement Project and implementation of the beaver management plan. In 2022 this will primarily be comprised of periodically monitoring for new beaver activity and taking action when appropriate. (Objective 3)

13. East Fork Bull River: Work with the U.S. Forest Service and, if approved, perform minor road maintenance and install a gate on the road to the East Fork Bull River upper south channel trap site.

14. Vermilion River: Conduct crawdad stream electrofishing to capture and transport eligible (i.e., 120–250 mm) Bull Trout from the Vermilion River downstream of China Gorge to the confluence with Noxon Reservoir. Electrofishing will be conducted during mid to late October or November following the Bull Trout spawn. Electrofishing will not occur: (1) within 30 yards of Bull Trout redds; (2) if adult Bull Trout are observed in the area; or (3) around complex structures where visibility may be poor (e.g., large logjams or deep undercut banks). Electrofishing will be conducted for 10 days and all eligible Bull Trout will be transported to Idaho. The AIT may or may not elect to implement additional capture effort in the interest of increasing the number of juvenile Bull Trout transported to Lake Pend Oreille. (Objective 1)

15. Provide funding to cover publication costs for the Bull Trout Emigration Study if those manuscripts are accepted for publication.

16. Monitor water temperature at the locations listed in Table 1.

Table 1. Location of temperature data loggers on Graves Creek, Vermilion River, Bull River, and East Fork Bull River.

Stream	Site	River Kilometer	Latitude	Longitude
Graves Creek	PIT-monitoring station	0.6	47.685435	-115.405419
Vermilion River	PIT-monitoring station	2.8	47.827698	-115.533157
Bull River	Above beaver activity	39.0	48.192860	-115.824100
	Below beaver activity	35.9	48.187670	-115.856460
	PIT-monitoring station	4.4	48.056506	-115.824622
East Fork Bull River	North channel trap site	0.7	48.113290	-115.776710
	South channel trap site	0.7	48.112850	-115.775180

Work Products

- Comprehensive Project Report; Downstream Program (2018-2021 data; final due July 1, 2022 and includes Graves Creek permanent weir trap monitoring and evaluation plan report)
- Annual Project Update; Downstream Program (2022 data; final due October 1, 2023 and includes Graves Creek permanent weir trap monitoring and evaluation plan report)
- Temperature monitoring data for the seven long-term sites as well as sites monitored through the Bull Trout Emigration Study; due December 1, 2022
- Annual Work Summary; Downstream Program; due December 1, 2022

Permitting Requirements

Several permits are required to implement the Downstream Program. A scientific collection permit is required from MFWP and an import permit is required by Idaho Department of Fish and Game. These applications are submitted annually during January or February. In addition, USFS Special Use Authorizations and Montana Department of Environmental Quality (Green Mountain Conservation District) 310 permits are maintained for tributary traps and PIT tag array(s).

Endangered Species Act consultation for this project plan is associated with the 2019 Biological Opinion on the effects of continued operation of the Clark Fork Hydroelectric Project on Bull Trout and designated Bull Trout critical habitat. Incidental take reporting for this project plan will be included in the annual Biological Opinion report as required by Term and Conditions 15–18 of the 2019 Incidental Take Statement.

Cultural/Historic Resource Review

If the need for ground or vegetation disturbances arises, Avista cultural staff will coordinate a cultural/historic review for the project. The work product for this review will be confidential due to the sensitive nature of the content.

Benefit to the Resource

Appendix C of the Clark Fork Settlement Agreement calls for implementation of the Native Salmonid Restoration Plan and associated Five-Year Plan. The Five-Year Plan specifically calls for implementation of the Downstream Program. The capture and downstream transport of juvenile Bull Trout appears to have directly increased the number of adult Bull Trout that return downstream of Cabinet Gorge Dam by reconnecting their historic migratory corridor and

increasing survival during migrations through the lower Clark Fork River and into Lake Pend Oreille. In addition to completing the migratory life cycle, downstream transported juvenile Bull Trout that reach Lake Pend Oreille are known to grow at an increased rate, attain larger sizes, and contain more eggs than fish that complete their life cycle within the reservoirs. Continued evaluation and modification of tributary-specific capture techniques has increased the efficacy of these techniques and presumably increased the overall survival among Bull Trout within these systems. The Graves Creek permanent weir trap has increased the period of weir operation and increased the annual number of juvenile Bull Trout captured. Monitoring fish population trends and timing of fish movements throughout the system with tributary traps and PIT arrays allows managers to gain additional information to adaptively manage these populations.

These efforts are consistent with direction from the U.S. Fish and Wildlife Service through the Bull Trout Recovery Plan, Biological Opinion for the Clark Fork Projects FERC license, and informal consultation through the CFSA process. These actions also align with MFWP management plan and dual mission by reducing conflict between managing for the recovery of native species while also managing for popular sport fisheries in Noxon and Cabinet Gorge reservoirs. Increasing the number of sub-adult Bull Trout in Lake Pend Oreille directly supports the Idaho Fish and Game goal of maintaining and enhancing this metapopulation.

Budget

Item	Estimated Carryover[1]	2022 Budget Request
Labor: 0.80 biologist and 2.50 technician FTEs	$75,000	$295,040
0.50 FTE database technician support	$9,500	$38,012
Four professional conferences	$1,000	$3,000
Four professional trainings	$1,000	$3,000
Crew safety: InReach subscription	$0	$480
Permitting labor and fees	$0	$5,000
Mileage and vehicle maintenance	$2,000	$40,000
Aqui-S (fish anesthesia)	$0	$200
PIT tags (10 pre-load trays)	$0	$2,910
Tributary trap maintenance (e.g., replacement parts)	$3,000	$5,000
EFBR entrance, trap box, and pipe support fabrication	$0	$35,000
Develop gage height-discharge curve for new Graves sensor	$0	$15,000
Field gear (e.g., nets, traps, waders, scales, efishing handles)	$2,000	$5,000
Evaluate juvenile transport release site and “cage”	$0	$10,000
East Fork Bull River road improvement	$0	$10,000
Graves Creek HOA fees	$650	$650
Statistical consultation	$20,000	$0
Bull Trout Emigration Study publication costs	$10,000	$0
Total	$124,150	$468,292
Anticipated Expenditures		$592,442

[1] *Estimated carryover of unexpended, approved funds as of January 1.*

Staff time budgeted through this project plan will also assist with the related projects outlined in Objective 3.

Literature Cited

Lacy, S. D., J. R. Stover, and E. W. Oldenburg. 2016. Tributary Trapping and Downstream Juvenile Bull Trout Transport Program annual progress report — 2015. Avista document identification number 2016-0390. Avista, Noxon, Montana.

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Oldenburg, E., J. Blakney, K. Bouwens, and W. Fredenberg. 2016. Graves Creek permanent weir trap monitoring and evaluation plan. Fish Passage/Native Salmonid Restoration Program. Avista document identification number 2016-141700. Avista Corporation, Spokane, Washington.

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Zymonas, N. D. 2006. Age structure, growth, and factors affecting relative abundance of life history forms of Bull Trout in the Clark Fork River drainage, Montana and Idaho. Master's Thesis, Montana State University, Bozeman.

2022 PROJECT PLAN

PIT-Monitoring Station Operation and Maintenance

Project Contact
Eric Oldenburg, Avista, (406) 847-1290, Eric.Oldenburg@avistacorp.com

Project History
This is a continuing project that was first approved by the Management Committee (MC) in 2019. The scope and budget for this project are reviewed by the MC annually.

Background
Passive Integrated Transponder (PIT) monitoring stations have been installed and operated at a number of locations under various Clark Fork Settlement Agreement (CFSA) programs. These stations are installed for various reasons; although, the primary reason is to passively monitor movements of fish in tributaries. These movements help delineate migration timing for fish and can also be used to evaluate trap capture efficiency by monitoring movements of fish near tributary traps. The operation and maintenance of PIT-monitoring stations includes costs associated with power, fiber, communications, permitting, and operation and maintenance costs. This project plan was developed to compile all costs associated with operation and maintenance of monitoring stations into one project plan. This eliminates the need to break out charges on invoices to multiple projects and allow for the tracking of costs associated with the use of this technology.

Goal
Monitor movements of PIT-tagged fish in key tributaries to the lower Clark Fork River.

Objectives
1. Operate and maintain PIT-monitoring stations in tributaries to the lower Clark Fork River, in Montana.

Tasks
1. Pay all invoices associated with operation of PIT-monitoring stations in Graves Creek, East Fork Bull River, Bull River, and Vermilion River (i.e., electric use, internet fees, Biomark data service fees, Graves Creek cellular internet fees, and permit fees). The Prospect Creek station was cooperatively purchased with NorthWestern Energy who paid all associated fees during the first two years. The Biomark data service fee was funded through this project plan in 2021 and is proposed through this project again in 2022. (Objective 1)

2. Repair damage to PIT-monitoring stations, if necessary. (Objective 1)

3. Purchase additional antennas or hardware as needed. (Objective 1)

Work Products
- Annual Work Summary; PIT Technology (2022); due December 1, 2022

Permitting Requirements
If maintenance or repair of a PIT array is required, Avista personnel will determine which, if any, permits are required for the proposed work.

Endangered Species Act consultation for this project plan is associated with the 2019 Biological Opinion on the effects of continued operation of the Clark Fork Hydroelectric Project on Bull Trout and designated Bull Trout critical habitat. Incidental take reporting for this project plan will be included in the annual Biological Opinion report as required by Term and Conditions 15–18 of the 2019 Incidental Take Statement.

Cultural/Historic Resource Review
If maintenance and/or repair of a PIT-monitoring station will cause ground disturbance, Avista will coordinate a cultural/historic resource review for the project. The work product for this review will be confidential due to the sensitive nature of the content.

Benefit to the Resource
Restoration of Bull Trout and Westslope Cutthroat Trout populations is an important component of Avista's Native Salmonid Restoration Plan (NSRP) which is an integral part of the CFSA. The NSRP addresses issues affecting native salmonid populations in the lower Clark Fork River, and actions needed to improve their habitat and likelihood of persistence. The NSRP also identifies a need to "establish and maintain connectivity in the Clark Fork Basin for migratory trout" in an effort to increase native salmonid numbers in tributaries to the Clark Fork River. The use of PIT arrays is a valuable tool that allows passive monitoring of movements of fish in the project area. Fish that are tagged and detected at arrays provide information that that can be used to evaluate and improve programs that are currently being implemented under the CFSA. This leads to more effective implementation and more efficient use of funds available for these programs.

Budget

Item	Estimated Carryover[1]	2022 Budget Request
PIT-monitoring station maintenance	$5,000	$20,000
Biomark BioLogic plus cell (Graves; 12 mo. exp. 4/15/2023)	$0	$1,716
Biomark BioLogic (Bull; 12 mo. expires 4/15/2023)	$0	$1,512
Biomark BioLogic (EFBR; 12 mo. expires 4/15/2023)	$0	$1,512
Biomark BioLogic (Vermilion; 12 mo. expires 4/15/2023)	$0	$1,512
Biomark BioLogic plus cell (Prospect; 12 mo. exp. 4/15/2023)	$0	$1,716
Biomark BioLogic plus cell (CGFPF; 15 mo. exp. 4/15/2023)	$0	$2,145
Electric use (Northern Lights bills for all sites except Prospect)	$1,000	$4,400
Internet use (Blackfoot bills for Bull, EFBR, and Vermilion)	$1,000	$3,300
Montana DNRC land-use permit annual fee (Bull River)	$0	$150
Total	$7,000	$37,963
Anticipated Expenditures		$44,963

[1] *Estimated carryover of unexpended, approved funds as of January 1.*

The Prospect Creek PIT-monitoring station was purchased through Appendix B and Northwestern Energy. Thus, operation and maintenance for this station is cost share and Northwestern Energy funded BioLogic and electric use in 2019 and 2020.

2022 PROJECT PLAN

Non-native Fish Suppression Project in the East Fork Bull River

Project Contact

Sean Moran, Avista, (406) 847-1291, sean.moran@avistacorp.com, *and*
Paul Kusnierz, Avista, (406) 847-1274, paul.kusnierz@avistacorp.com,

Project History

The Non-native Fish Suppression Project in the East Fork Bull River is a continuing project that was originally approved by the Management Committee (MC) in 2007. The scope and budget for this project are reviewed by the MC annually. Previously approved reporting periods had specified that the preliminary assessment (i.e., draft project completion report) and the final project completion report completion dates of September 1 and November 1, 2021. A draft project completion report is currently in preparation and it is being requested to extend completion dates for the draft to July 1, with a final project completion report due date of September 1, 2022.

Background

This 2022 Project Plan represents an extension of the reporting phase of the Non-native Fish Suppression Project in the East Fork Bull River (EFBR). The period evaluated would be from the initial year of implementation in 2007 through the four-year continuation (i.e., 2015-2018) of the less-intensive non-native fish suppression methods with the addition of subsequent data including electrofishing data collected during sampling for the Bull Trout Emigration Study in 2020. Monitoring data collected from established electrofishing sections conducted over the duration of this project, as well as annual fish trap capture, fish transport, and redd survey data will be used to assess the effectiveness of this effort.

In addition to the evaluation and reporting, we propose continuation of the less-intensive protocols of transporting and releasing all non-native trout captured at fish traps and sub-sampling eggs removed from Brown Trout redds during this evaluation phase extension. These efforts are proposed as tasks under the Tributary Trapping and Downstream Juvenile Bull Trout Transport Project and the Redd Surveys in Montana Tributaries Project, respectively. This continuation would help to maintain a lower rate of non-native recolonization during the period when potential future actions are considered.

Goal

The goal of this assessment period is to investigate and attempt to identify the effect that this project has had on native salmonids, principally juvenile Bull Trout. This analysis would be used to assess whether continued implementation of a non-native suppression effort is an appropriate management effort to pursue in the EFBR.

Objective

1. Provide a draft report including analysis of the 14-year (i.e., 2007–2020) suppression project to the Aquatic Implementation Team (AIT) by July 1 for finalization by September 1.

Tasks

1. Compile, analyze, and summarize 14 years of data collected during implementation of the Non-native Fish Suppression Project in the EFBR.

2. Contract consultant for statistical assistance (if necessary). (Objective 1)

Work Products

- Project Completion Report; Non-native Fish Suppression Project in the East Fork Bull River Drainage, Montana: 2007–2020; final due September 1, 2022
- Annual Work Summary; due December 1, 2022

Permitting Requirements

Not applicable for the tasks proposed in this project plan.

Endangered Species Act consultation for this project plan is associated with the 2019 Biological Opinion on the effects of continued operation of the Clark Fork Hydroelectric Project on Bull Trout and designated Bull Trout critical habitat. Incidental take reporting for this project plan will be included in the annual Biological Opinion report as required by Term and Conditions 15–18 of the 2019 Incidental Take Statement.

Cultural/Historic Resource Review

Not applicable for the tasks proposed in this project plan, there are no ground and/or vegetation disturbing activities, or proposed impacts to cultural/historic resources.

Benefit to the Resource

Bull Trout, listed as threatened under the Endangered Species Act, and Westslope Cutthroat Trout, a "species of special concern" (state designation) are the primary species identified in the Native Salmonid Restoration Plan (NSRP) for consideration for fish passage and associated Protection Mitigation and Enhancement Efforts (PM&E) measures. The NSRP identified "introduced or exotic fish species distribution and control programs" as potentially needed actions in support of fish passage activities. Insight provided by the project completion report for this project is anticipated to support continued native species PM&E activities for the EFBR and may identify areas or aspects that may warrant additional efforts.

Budget

Item	Estimated Carryover[1]	2022 Budget Request
Biologist: report finalization, etc. (0.25 FTE)	$15,200	$4,000
Technician: Assist with report preparation (0.05 FTE)	$1,500	$0
Analytic Consultation (0.05 FTE)	$10,000	$0
Total	$26,700	$4,000
Anticipated Expenditures		$30,700

[1] *Estimated carryover of unexpended, approved funds as of January 1.*

2022 PROJECT PLAN

Evaluation of Potential Actions for Reducing Non-native Threats to Native Salmonid Populations

Project Contacts

Travis Rehm, Montana Fish, Wildlife and Parks (MFWP), (406) 382-3032, travis.rehm@mt.gov,
Kevin Aceituno, U.S. Fish and Wildlife Service, (406) 758-6871, kevin_aceituno@fws.gov, *and*
Sean Moran, Avista, (406) 847-1291, sean.moran@avistacorp.com

Project History

The Evaluation of Potential Actions for Reducing Non-native Threats to Native Salmonid Populations is a carryover project approved by the Clark Fork Settlement Agreement (CFSA) Management Committee (MC) in 2020. This project was not completed in 2021. A draft was distributed in September 2021 and will be finalized in March 2022, with no change in scope and no additional funding requested.

Background

A large component of the CFSA is the Appendix C Fish Passage/Native Salmonid Restoration Plan (NSRP). The goal of the NSRP is to mitigate the continuing effects of Avista's Clark Fork River dams as obstructions to fish passage, and to achieve the goal of increasing the long-term population viability of native salmonids in the Lake Pend Oreille–lower Clark Fork River system. At present, data suggests the East Fork Bull River, Graves Creek, and Vermilion River are the only Montana tributaries to the Clark Fork River within the Avista project area containing meaningful numbers of Bull Trout that exhibit an adfluvial life history (Oldenburg 2017, Lacy et al. 2016; Oldenburg et al. 2015; Zymonas 2006; hereafter, these three tributaries are collectively referred to as the "Montana adfluvial streams"). Therefore, Appendix C Bull Trout enhancement efforts are generally focused on the Montana adfluvial streams.

Non-native salmonids can have deleterious effects on native salmonids in Montana tributaries to the lower Clark Fork River. Past monitoring and sampling of Montana tributaries has documented several of these effects including hybridization and lost spawning potential, competition, and predation. A modeling exercise utilizing CFSA data suggested that one of the more effective management efforts to increase the persistence of migratory Bull Trout would be a large reduction in sympatric tributary populations of non-native salmonids (Peterson et al. 2015). Over the past 20 years, only one non-native suppression project has been implemented in the Montana adfluvial streams in the interest of enhancing native salmonid populations. This mechanical removal project occurred in the East Fork Bull River. Efforts to reduce non-native fish abundances in the East Fork Bull River were very successful (nearly 90% reduction in biomass); however, the desired response of a lasting increase in native salmonid abundances was not realized (Moran and Storaasli 2015).

Unfortunately, at present, we do not fully understand why there was not a response in Bull Trout abundance and/or distribution associated with the non-native reductions in the East Fork Bull River; although reduced spawning input and environmental stochasticity may have played a role (Moran et al. *in prep.*). Some research suggests that Brown Trout colonization into areas once

inhabited by Bull Trout represented replacement as opposed to displacement (i.e., changing habitat conditions caused Bull Trout to decline and Brown Trout subsequently thrived under the new conditions; Al-Chokhachy et al. [2014]). If this is the case within the East Fork Bull River, suppression of non-native species is not likely to benefit Bull Trout. However, it is also possible non-native species were displacing Bull Trout in the East Fork Bull River but other factors (e.g., lack of connectivity, recruitment, or survival during other life stages) limited Bull Trout and prevented a response in abundance and distribution following the suppression project.

Despite the aforementioned uncertainty, it is worthwhile to continue to develop strategies that could potentially be used to enhance native salmonid populations in the future. With regard to the East Fork Bull River, it may be prudent to maintain lower non-native densities as we enhance our understanding of what is limiting native populations within that stream. Similarly, Bull Trout appear to be declining in abundance in the Vermilion River and the cause of decline is unknown. Lastly, the local population of Bull Trout in Graves Creek appears to be increasing. It would be prudent to develop strategies to address non-native species concerns in Graves Creek. This may be particularly important as the climate changes and streams presumably continue to warm.

As opposed to being reactive or opportunistic, the purpose of this project is to identify and evaluate potential actions with regard to non-native species that could benefit native salmonid populations in the Montana adfluvial streams. The first step of this process will be to compile abundance and distribution data for the Montana adfluvial streams and identify threats non-native species may present to native salmonids now, or in the future. The second step will be to identify a suite of potential actions that could be used to reduce such threats. Potential actions could range from simply monitoring distributions to the exclusion, translocation, or suppression of non-native species. The next step will be to evaluate the efficacy of potential actions as well as benefits and concerns with each action. To be clear, no management actions are being proposed through this project. The end result of this project will be a list of potential actions and associated information. This list will be used to facilitate discussions among CFSA stakeholders and help MFWP and the U.S. Fish and Wildlife Service determine which (if any) actions they believe would be consistent with agency policy and directives. Any resultant actions will be proposed through a future CFSA project plan.

Goal
Enhance and protect native salmonid populations in tributaries to the lower Clark Fork River in Montana by addressing threats posed by non-native species.

Objective
1. Develop a prioritized list of potential actions that could be taken to protect and enhance native salmonid populations in tributaries to the lower Clark Fork River in Montana.

Tasks
1. Compile and summarize historic and trend data regarding native and non-native fish distributions in the Montana adfluvial streams and identify potential threats that may be of concern now, or in the future. ***(Completed in 2021)***

2. Identify potential actions that could be used to minimize or eliminate these threats. ***(Completed in 2021)***

3. Evaluate the anticipated efficacy as well as benefits and concerns with each potential action. ***(Completed in 2021)***

4. Develop a memorandum summarizing the findings of Tasks 1–3.

Work Products

- Final memorandum; due March 1, 2022
- Annual Work Summary; due December 1, 2022

Permitting Requirements

Not applicable for the tasks proposed in this project plan.

Endangered Species Act consultation for this project plan is associated with the 2019 Biological Opinion on the effects of continued operation of the Clark Fork Hydroelectric Project on Bull Trout and designated Bull Trout critical habitat (BiOp). This project plan is consistent with the analyses and conclusions contained in the 2019 BiOp and will adhere to all appropriate Terms and Conditions designed to reduce the extent and effects of incidental take on Bull Trout. No incidental take of Bull Trout is anticipated as a result of this project plan; therefore, no take reporting is required.

Cultural/Historic Resource Review

Not applicable for the tasks proposed in this project plan, there are no ground and/or vegetation disturbing activities, or proposed impacts to cultural/historic resources.

Benefit to the Resource

This project is primarily intended to benefit Bull Trout, listed as “Threatened” under the Endangered Species Act, and Westslope Cutthroat Trout, a “Species of Special Concern” (Montana designation). This project is consistent with the goals of both appendices B and C. More specifically, the sections of the NSRP 5-year plan associated with both of these appendices call to, “identify, evaluate, and if appropriate, address non-native species concerns”. In addition, this project is consistent with the 2019 Biological Opinion in which one Reasonable and Prudent Measure and two associated Terms and Conditions address managing non-native species in a manner that is beneficial for Bull Trout.

These efforts are consistent with direction from the U.S. Fish and Wildlife Service through the Bull Trout Recovery Plan, 2019 Biological Opinion for the Clark Fork Projects FERC license, and informal consultation through the CFSA process. These actions also align with MFWP management plan and dual mission by reducing conflict between managing for the recovery of native species while also managing for popular sport fisheries in Noxon and Cabinet Gorge reservoirs.

Budget

Item	Estimated Carryover[1]	2022 Budget Request
Biologist: facilitate, data compilation and summarization, reporting, etc. (0.05 FTE)	$4,000	$0
Technician: data compilation and summarization (0.10 FTE)	$2,169	$0
Total	$6,169	$0
Anticipated Expenditures		$6,169

[1] *Estimated carryover of unexpended, approved funds as of January 1.*

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2022 PROJECT PLAN

Fish Capture Facilities Operation, Development, and Testing

Project Contact
Shana Bernall, Avista, (406) 847-1293, Shana.Bernall@avistacorp.com

Project History
The Fish Capture Facilities Operation, Development, and Testing is a continuing project. The scope and budget for this project are reviewed by the Management Committee (MC) annually.

Background
The Clark Fork River Native Salmonid Restoration Plan provides an outline for experimenting with adult fish passage techniques, which in turn has led to development and testing of fish capture and transport systems (Kleinschmidt Associates and Pratt 1998). The ultimate outcome of evaluations of these capture and transport systems has been a proposal to develop a permanent adult fish collection facility below Cabinet Gorge Dam. As part of this facility, Avista constructed a fish handling facility near the Cabinet Gorge Fish Hatchery in 2015. The Cabinet Gorge Fish Handling Facility (FHF) is used annually to hold Bull Trout and Westslope Cutthroat Trout prior to transport upstream of the Clark Fork River dams. The FHF will also be used to process and sort fish captured at the fish passage facility being constructed below Cabinet Gorge Dam. The FHF was enclosed in 2021 and other upgrades included adding an office and bathroom space, enclosing the electrical room, adding a heating and ventilation system, addition of a third packed column aerator and adding additional fish holding tanks.

Support for the development of a permanent fish collection facility below Cabinet Gorge Dam was codified in the MC approved Amendment No. 1 to the Clark Fork Settlement Agreement (CFSA) (Amendment) on September 26, 2017 (Avista 2017a). The approval of the Amendment provided stakeholder agreement to move forward with final design, permitting, and construction of a permanent fish collection facility below Cabinet Gorge Dam, referred to as the Cabinet Gorge Dam Fishway (CGDF). Following the approval of the Amendment, Avista submitted an application to the Federal Energy Regulatory Commission (FERC) for a license amendment to construct and operate the CGDF (Avista 2017b). The FERC order amending Avista's License to include construction and operation of the CGDF was issued on August 8, 2019, and includes an amendment of the License to incorporate the updated terms and conditions of the February 6, 2019 Biological Opinion, submitted by the USFWS under section 7 of the Endangered Species Act (FERC 2019).

Construction of the CGDF was initiated in 2019. A contractor was selected for the project and mobilized on site to begin construction in March of 2019. All permits required for construction of the CGDF were received, and construction of the cofferdam for the CGDF was initiated in July of 2019. The cofferdam was complete at the end of 2019. In early 2020, excavation within the cofferdam was halted due to FERC concerns related to the stability of the thrustblock, thrustblock extension, and structure excavation. A new stability analysis was completed, and FERC gave the approval to move forward with excavation, ultimately resulting in a three-month delay to the project. High flows in the spring of 2020 caused damage to the cofferdam,

compounding the delays to the project. The cofferdam was repaired in 2020 and excavation continued in the fall along with pouring of concrete for various components of the fish trap that were complete prior to spill in 2021. Additional work including the construction of the control building, installation of siphon piping, and removal of the cofferdam were completed during 2021.

The CGDF will be complete and ready for operation in 2022, with commissioning planned to occur pre spill. Operation and evaluation (including implementation of the Monitoring and Evaluation Plan) of the CGDF is described in the 2022 Appendix C "Upstream Fish Passage Program" project plan. There is funding allocated through this Project Plan to cover project close out costs.

There may be a need to make minor modifications to the CGDF once it becomes operational. As defined in the Amendment, the cost of proposed modifications (engineering, design, labor and materials) shall not exceed a combined total of 5% of the construction cost of the CGDF fishway itself (not including the coffer dam, railroad crossing, or other non-fishway costs), or $500,000, whichever is greater.

The development of a permanent fish collection facility below Noxon Rapids Dam has also been contemplated since the signing of the CFSA. Based on past evaluations, and as codified in the Amendment, the MC had decided that "a decision related to the final design and the need to construct a permanent fish collection facility below Noxon Rapids Dam, shall be deferred for an interim period ending no sooner than December 31, 2021". During the interim period, the MC may consider and approve alternative(s) to a permanent fish collection facility. With 2022 being the first year of operation of the CGDF and continuing to refine capture and transport of juvenile Bull Trout from Montana tributaries, discussion of a fish collection facility at Noxon Rapids Dam will not be initiated in 2022. Rather it will be postponed to a future date once there is a better understanding of the effectiveness of the ongoing activities. In the interim, stakeholders will work to establish a date to reinitiate these conversations.

Goal
Develop, operate, and test the feasibility of permanent fish passage facilities as an option for fish passage at Cabinet Gorge and Noxon Rapids dams to provide safe, timely, and efficient upstream passage for native salmonids.

Objectives
1. Complete construction of the CGDF below Cabinet Gorge Dam.

2. Make minor modifications to the CGDF, as deemed appropriate to improve Bull Trout capture efficiency.

3. Obtain stakeholder agreement on date to reinitiate discussions on the need for a fish passage facility at Noxon Rapids Dam.

Tasks
1. Work with the selected contractor to complete construction and commissioning of the

CGDF. It is anticipated that the CGDF may be operational and ready for commissioning by April of 2022. (Objective 1)

2. Work with appropriate stakeholders to develop a monitoring and evaluation plan and transport protocol for the CGDF, and any other documents that need to be updated in preparation for operation of the CGDF. (Objective 1)

3. Submit monthly construction reports as required by permitting and approval agencies (i.e., FERC Portland Regional Office). (Objective 1)

4. Provide required project completion reporting (including FERC reporting) for completion of the CGDF. (Objective 1)

5. If needed, make minor modifications to the CGDF to improve capture and retention of native salmonids. (Objective 2)

6. Determine and gather information needed to decide on a new date to reinitiate discussions on the need for a fish passage facility at Noxon Rapids Dam. Obtain MC approval of the new date to reinitiate discussions related to the Noxon Rapids Dam Fish Passage Facility.

Work Products

- Annual Work Summary; Fish Capture Facilities (2022); due December 1, 2022
- As-built drawings (CGDF); due December 1, 2022
- FHF Project Closeout items (O&M manual; As-built drawings); due March 1, 2022

Permitting Requirements

Avista has acquired the permits and approvals needed for construction of the CGDF. The FERC Order License Amendment requires permanent erosion and sediment control measures installed in a manner that will provide long-term sediment and erosion control from spillage during fish transfer activities on staging areas and the haul road in the vicinity of the river. For more information contact the project contact.

Endangered Species Act consultation for this project plan is associated with the 2019 Biological Opinion on the effects of continued operation of the Clark Fork Hydroelectric Project on Bull Trout and designated Bull Trout critical habitat. Incidental take reporting for this project plan will be included in the annual Biological Opinion report as required by Term and Conditions 15–18 of the 2019 Incidental Take Statement.

Cultural/Historic Resource Review

The original design for the CGDF was approved by the Idaho State Historic Preservation Office in 2013 and the revised design was approved by Idaho and Montana State Historic Preservation offices in early 2018.

Benefit to the Resource

Efforts outlined under this project plan are in line with Avista's requirement under the CFSA to test the feasibility of permanent fish passage facilities as an option for fish passage. Permanent fish passage facilities are proposed to be built in an effort to capture a larger number of fish for upstream transport which is an important part of Avista's Native Salmonid Restoration Plan (Kleinschmidt and Pratt 1998). The target species for fish passage in the lower Clark Fork River are Bull Trout and Westslope Cutthroat Trout. Bull Trout are listed as "threatened" under the Endangered Species Act and Westslope Cutthroat Trout are a "species of special concern" in both Idaho and Montana. Montana Fish, Wildlife and Parks (MFWP) and IDFG are supportive of reconnecting Bull Trout and Westslope Cutthroat Trout populations in their current state-wide management plans (MFWP 2019, IDFG 2019). Additionally, the U. S. Fish and Wildlife Service describes fragmentation of the lower Clark Fork River by mainstem dams as one of the primary threats to Bull Trout under their Columbia Headwaters recovery unit implementation plan (U. S. Fish and Wildlife Service 2015). The capture of a larger number of Bull Trout and Westslope Cutthroat Trout through the operation of the CGDF will result in an increase in the number of fish transported upstream and reconnected to upstream populations. Increasing the number of migratory Bull Trout and Westslope Cutthroat Trout available to spawn in Montana tributaries will likely increase the abundance of these species in upstream populations and enhance the migratory life-history of these species.

Budget

Item	Estimated Carryover[1]	2022 Budget Request
Construction of CGDF (includes permitting, engineering and project management, construction, and overhead costs)	$4,343,748	$2,390,795*
Total	$4,343,748	$2,390,795
Anticipated Expenditures		$6,734,543

[1] *Estimated carryover of unexpended, approved funds as of January 1.*

*This is an estimated amount for April 2022 – March 2023. An Estimated cost, as defined in Appendix U of the CFSA, states that Avista will pay the actual costs of implementation, as approved by the MC. Due to FERC and cofferdam related delays, some project costs have slipped into the 2022 budget request year. Total cost for construction of the CGDF (2019–2022) is estimated at over $60 million.

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2022 PROJECT PLAN

Graves Creek Permanent Weir Trap Enhancements

Project Contact
Eric Oldenburg, Avista, (406) 847-1290, eric.oldenburg@avistacorp.com

Project History
This is a continuing project that was originally approved through the consent mail process on December 9, 2019. Additionally, the Management Committee (MC) approved funding the design for this project through the 2017 and 2018 Tributary Trapping and Downstream Juvenile Bull Trout Transport Program (hereafter, "Downstream Program") project plans as well as a 2018 consent mail (November 7). Funding for the construction of the Graves Creek Fish Handling Facility was also supplemented through a July 31, 2020 consent mail. The Graves Creek Fish Handling Facility was mostly completed last winter and is fully functional. The permanent weir trap enhancements were complete to the point the trap was fully operational on November 3, 2021. This project plan is remaining open in 2022 to finish the revegetation work, as-built drawings, and several miscellaneous minor fabrication tasks. No additional funding is being requested.

Background
A fundamental goal of the Fish Passage/Native Salmonid Restoration Plan [Appendix C of the Clark Fork Settlement Agreement (CFSA)] is to restore mainstem connectivity for local populations of adfluvial Bull Trout for which migrations would otherwise be blocked by Noxon Rapids and Cabinet Gorge dams. Two problems must be addressed to achieve this goal: (1) safely pass returning adult Bull Trout so they can spawn in their natal streams, and (2) safely pass outmigrating juvenile Bull Trout around the dams and reservoirs to Lake Pend Oreille where growth and survival rates are high. The Downstream Program was developed to address the latter.

Traditionally, weir traps and screw traps have been utilized to capture outmigrating juvenile Bull Trout to transport to Lake Pend Oreille. Weir traps are highly effective for capturing fish; however, they cannot be reliably fished through high flow or high debris (e.g., leaves) events. Screw traps float on pontoons and can effectively fish through the aforementioned events; however, they only capture a small proportion of the fish swimming past their location. Thus, weir traps have traditionally been fished before and after spring runoff and screw traps have been fished in the spring and during fall heavy rain events when flow and debris loads are high.

Generally, trapping efforts have begun in late March and continued into December. To date, 83% of all captures have occurred from September through November and the majority of those have been associated with fall rain events and resulting increases in flow and debris loads. Because most fish emigrate in the fall and rain events tend to be the trigger for downstream movements, we have missed substantial numbers of emigrating fish because weir traps were disabled by flow and debris, or, because we were fishing inefficient screw traps. To address this problem in Graves Creek, a permanent weir trap was constructed which became operational in 2013. The permanent weir trap is configured similarly to conventional weir traps except the weir panels are

attached to a concrete slab and continue to function through the fall rain events. As a result, more than two and a half times more fish were annually captured in Graves Creek during the first six years of permanent weir trap operation as compared to the six previous years.
While the permanent weir trap has been successful at capturing a greater proportion of outmigrating juvenile Bull Trout, two problems and opportunities to enhance the performance of the trap have been identified. First, the trap has been relatively ineffective at capturing upstream-moving fish. A few adult Bull Trout have been detected within Graves Creek that were not captured and did not otherwise successfully pass upstream of the trap during the time of the spawn (a few redds have been observed downstream from the trap location in generally poor habitat). Initially, it was believed that these fish were exhibiting "trap shy" behavior (i.e., reluctant to approach the trap site). Subsequent research and monitoring has suggested that trap shyness is not a problem, but that retention within the trap box as well as the physical ability of fish to enter the trap box were problems. The trap box retention issue was partially addressed utilizing "one-way gates" within the trap entrance; however, it is possible the one-way gates exacerbate the problem of some fish not successfully getting into the trap box. Currently, upstream moving fish must navigate a short drop (jump) into a "jet" of water into the narrow entrance and push through the one-way gate (or swim around it in the case of juvenile fish). Thus, there remains the need to enhance capture and/or passage efficiencies for upstream-moving fish.

The second opportunity for enhancement is with regard to the capture of downstream-moving fish. Monitoring fish movements using strategically-placed passive integrated transponder (PIT) antennas demonstrated that downstream-moving fish (both adult and juvenile) have also been able to swim in and out of the trap box. This resulted in delaying the transport/migration of some fish, and, has also led to some fish not being captured due to the increased time it takes to capture a fish which increases the likelihood they will find another way past the trap (e.g., passing the trap during the once per week 24-h volitional passage window). We attempted to address this problem using numerous one-way gates; however, these attempts were largely unsuccessful due to flow holding the one-way gates open. In 2016, a new solution to address capture efficiency for downstream-moving fish was developed and a prototype constructed. Rather than being guided to the trap box, downstream-moving fish were guided to a 10-inch diameter pipe. The pipe runs downstream approximately 50 feet where there is a short outfall into a trap box that is situated in the engineered hole. Since that time, we have successfully retained 100% of the downstream-moving fish that have entered the pipe (including adult Bull Trout). Thus, the prototype is extremely efficient; however, it is vulnerable to being disabled by high-flow events.

In 2018, we approached R2 Resource Consultants, Inc. (hereafter, "R2") about designing enhancements to the permanent weir trap (R2 designed the original permanent weir). We presented R2 with numerous design criteria. The first criteria was to address upstream fish passage. Specifically, we wanted to eliminate the drop on the downstream side of the trap box as well as the "jet" of water leaving the entrance by pooling water immediately downstream of the trap box. Associated with enhancing upstream capture efficiency, we also wanted to utilize the entire footprint of the original trap box strictly for capturing upstream-moving fish. Lastly with regard to upstream passage, recognizing the capture and retention of upstream-moving fish may still present challenges, we tasked R2 with integrating the ability for the trap to allow upstream-

moving fish to pass volitionally without compromising capture efficiency for downstream-moving fish.

There were several design criteria to address downstream-fish passage. The first was to design a robust version of the prototype pipe (or at least utilize the lessons learned from the pipe). Associated with this, we decided to remove the trap box from the stream and rather, build a shore-based vault to house the trap box. The primary reason for this was to make the trap more robust to high flows (the trap box often gets washed out during high flows). The final major design change came through discussions with R2, the Aquatic Implementation Team, and a U.S. Fish and Wildlife Service engineer. Everyone recognized that it would be desirable to send as much water as possible toward the trap box. Thus, we integrated a flume with two dewatering sections rather than a pipe into the design. This allows a greater proportion of the overall streamflow to be directed down the flume with some of the water being bled from the flume at two locations. As a result, the flume is robust to changes in flow and can pass greater overall flow than could a fixed-diameter pipe.

Three additional enhancements need to be made to the permanent weir trapping site beyond enhancements to the trap itself. First, we will need to modify our PIT-monitoring equipment both to facilitate construction as well as to ensure we are monitoring key areas of the enhanced trap. Second, we are proposing to construct a fish handling facility on the property (i.e., 20 foot by 32 foot building). The most eminent need for this structure is to ensure fish that are captured in the trap are handled safely, efficiently, and with minimal stress. In 2019 and 2020, Bull Trout densities within Graves Creek were the highest ever observed. Similarly, capture rates within the permanent weir trap were nearly three times higher than the previous record. For reference, in one day we captured 71 Bull Trout comprised of 2 adults and 69 juveniles. All evidence suggests that 2019 was not an anomalously high year; rather, the Graves Creek population is growing as a direct result of the permanent weir trap. Thus, we anticipate even greater numbers into the future. Due to the increased number of fish and time it takes to work them all up, we need a greater volume of water in which to hold fish as well as the ability to aerate and/or add flow-through water. Due to the disparity in sizes among fish, we need the ability to segregate fish by size during holding (we have documented adults eating juveniles within holding tanks as well as juveniles [e.g., ages 3 or 4] eating other juveniles [e.g., ages 0 or 1]). Additionally, technicians are now spending multiple hours a day working up fish at Graves Creek. Providing a more controlled environment will allow the crew to continue collecting and recording high-quality data. Thus, within the structure we will install multiple temporary holding tanks, an anesthesia tank, and a fish work-up table. Additionally, we will use the structure to store Graves Creek trapping equipment and we will move our Biomark equipment into the building for increased security and longevity.

The last enhancement we are proposing is to do revegetation work at the trap site. We would like to establish additional riparian vegetation in the area, establish some larger trees in the adjacent areas, as well as plant any areas disturbed by this work with native grasses and vegetation, as appropriate.

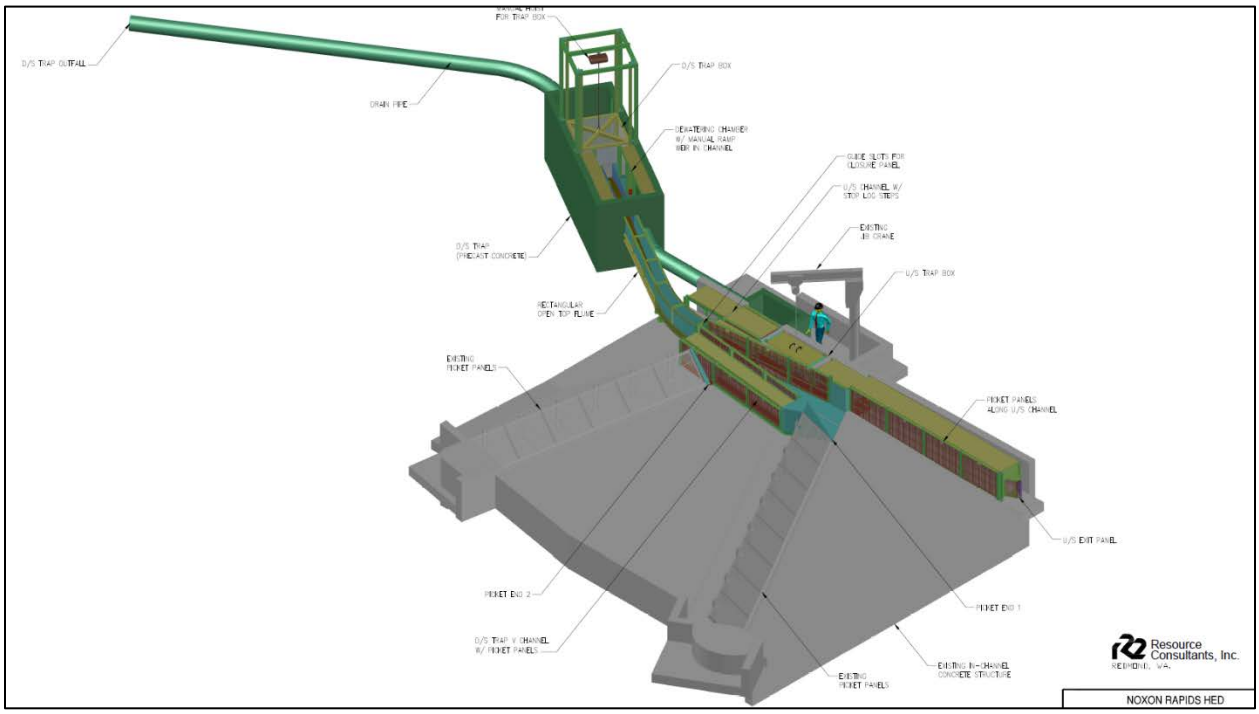

Figure 1. Isometric view of the proposed enhancements to the Graves Creek permanent weir trap.

Goal

The goal of this project is to enhance the effectiveness and efficiency of the Graves Creek permanent weir trap and other infrastructure in the interest of safely capturing, handling, and transporting Bull Trout from Graves Creek to Lake Pend Oreille.

Objectives

1. Construct enhancements to the Graves Creek permanent weir trap.

2. Add and modify existing PIT-monitoring station equipment to facilitate construction and to strategically monitor key areas of the enhanced trap.

3. Construct a fish handling and storage building at the Graves Creek trap site.

4. Enhance riparian and upland vegetation at the Graves Creek trap site.

Tasks

1. Work with R2 to finalize bid-ready design. (***Completed***)

2. Competitively bid and select contractor(s) to construct the permanent weir trap enhancements. (***Completed***, Neal Structural Repair has been selected)

3. Work with Avista permitting and cultural resources specialist to obtain all necessary permits and cultural reviews to construct enhancements to the permanent weir trap, modifications to the PIT-monitoring station, construct the fish handling and storage facility, and complete the revegetation work. Work with Water & Environmental

Technologies (WET) to obtain water rights for each point of diversion (flume and fish handling and storage building). (***Completed***)

4. Neal Structural Repair started the part fabrication process in the fall of 2020 and installation is scheduled to occur in July and August of 2021. (Objective 1) (***Completed***)

5. Work with Avista engineer and supporting staff as well as R2 for engineering services during construction (ESDC). Specific tasks include project and budget management, oversight and correspondence with contractor, responding to submittals and requests for information, site visits, and inspections. (Objective 1)

6. Add and modify existing PIT-monitoring station equipment. Purchase and install two new flat plate antennas, one new 10-foot antenna, and two receivers. Temporarily remove antenna 2 as well as cabling to antenna 1 to facilitate construction. Move the Master Controller and associated electronics into the fish handling and storage building. (Objective 2) (***Completed***)

7. Construct the fish handling and storage building. Pour a concrete slab and have a 20 foot by 36 foot building constructed. Potentially insulate the building. Have power run to the building. Purchase and install fish holding tanks and plumbing and a fish work-up table as well as associated infrastructure. Move Master Controller and associated equipment into the building. (Objectives 2 and 3) (***Completed***)

8. Work with Lower Clark Fork Watershed Group to develop a revegetation site plan. (Objective 4)

9. Implement the revegetation site plan. (Objective 4)

Work Products

- Revegetation site plan (LCFWG; likely memo); due March 1, 2022
- As-built drawings (R2); due March 1, 2022
- Annual Work Summary; due December 1, 2022

Permitting Requirements

Avista has acquired all permits for the project including the Joint Application for Proposed Work in Montana's Streams, Wetlands, Floodplains, and Other Waterbodies (JARPA). The JARPA includes a 310 review with the Green Mountain Conservation District, Section 404 review by the U.S. Army Corps of Engineers, and 318/401 review by Montana Department of Environmental Quality. The site is not in the floodplain; thus, we will not be applying for a floodplain permit. Two water rights were obtained for this project. Avista acquired all appropriate permissions from the Steep River Ranch Homeowners Association ensuring all activities and structures are consistent with setbacks and other covenants.

Endangered Species Act consultation for this project plan is associated with the 2019 Biological Opinion on the effects of continued operation of the Clark Fork Hydroelectric Project on Bull Trout and designated Bull Trout critical habitat. Incidental take reporting for this project plan

will be included in the annual Biological Opinion report as required by Term and Conditions 15–18 of the 2019 Incidental Take Statement.

Cultural/Historic Resource Review
In 2005, the Cultural Resources Management Group reviewed the Graves Creek land acquisition and in 2010 they reviewed the original Graves Creek permanent weir trap design. This is a carryover project and the cultural/historic resource review for enhancements to the permanent weir trap site was completed in 2020 by the Coultural Resources Management Group.

Benefit to the Resource
Appendix C of the calls for implementation of the Native Salmonid Restoration Plan and associated Five-Year Plan. The Five-Year Plan specifically calls for implementation of the Downstream Program. Additionally, permanent downstream tributary traps, as appropriate, were called for in Amendment No. 1 to the CFSA. The capture and downstream transport of juvenile Bull Trout appears to have directly increased the number of adult Bull Trout that return downstream of Cabinet Gorge Dam by reconnecting their historic migratory corridor and increasing survival during migrations through the lower Clark Fork River and into Lake Pend Oreille. In addition to completing the migratory life cycle, downstream transported juvenile Bull Trout that reach Lake Pend Oreille are known to grow at an increased rate, attain larger sizes, and contain more eggs than fish that complete their life cycle within the reservoirs. Continued evaluation and enhancements to the permanent weir trap have increased the efficacy of the trap and presumably increased the overall survival for this local population of Bull Trout (i.e., the local population is growing). The Graves Creek permanent weir trap has increased the period of weir operation and increased the annual number of juvenile Bull Trout captured.

These efforts are consistent with direction from the U.S. Fish and Wildlife Service through the Bull Trout Recovery Plan, Biological Opinion for the Clark Fork Projects FERC license, and informal consultation through the CFSA process. These actions also align with Montana Fish, Wildlife & Parks management plan and dual mission by reducing conflict between managing for the recovery of native species while also managing for popular sport fisheries in Noxon and Cabinet Gorge reservoirs. Increasing the number of sub-adult Bull Trout in Lake Pend Oreille directly supports the Idaho Fish and Game goal of maintaining and enhancing the robustness of this metapopulation.

Budget

Item	Estimated Carryover[1]	2022 Budget Request
Trap enhancements: construction contract	$97,700	$0
Avista construction management, labor, etc.	$37,843	$0
R2 Engineering Services During Construction (ESDC)	$15,000	$0
Permitting and cultural	$1,000	$0
WET consultation and water right fees	$3,000	$0
Fish Handling Facility misc. equipment	$5,000	$0
Revegetation site plan development (LCFWG)	$1,300	$0
Revegetation implementation	$16,300	$0
Total	$177,143	$0
Anticipated Expenditures		$177,143

[1] *Estimated carryover of unexpended, approved funds as of January 1.*

There is ambiguity within Amendment No. 1 to the CFSA with regard to how enhancements to an existing permanent trapping facility should be funded (new construction and maintenance are specifically contemplated). Initially, this project was proposed to be funded partially through the Annual Operations Fund and partially through the Facilities Fund. After further consideration, the entire cost of this project will be paid for through the Facilities Fund.

2022 ANNUAL IMPLEMENTATION PLAN SUMMARY – APPENDIX D

Clark Fork Project, FERC No. 2058
Cabinet Gorge and Noxon Rapids Hydroelectric Developments

Title
Bull Trout Protection and Public Education Project

Implementation Staff Lead
Sean Moran, Avista, (406) 847-1291, sean.moran@avistacorp.com

Background
The purpose of this project is to protect Bull Trout, a federally listed species (threatened), through a combination of enhanced law enforcement efforts by the states of Idaho and Montana, coupled with a public education outreach program. This will increase the numbers and population viability of Bull Trout by reducing intentional and incidental illegal harvest and increased public awareness concerning Bull Trout life history, habitat needs, identifying characteristics, and the potential for adverse impacts due to land use and other human activities.

Bull Trout are a key-target resource associated with the Lake Pend Oreille–lower Clark Fork River system. Widespread declines in numbers and distribution resulted in the 1998 listing of the species as threatened under the Endangered Species Act. During the consultation process for the relicensing of the Cabinet Gorge and Noxon Rapids projects, the State of Idaho identified illegal harvest of the highly vulnerable Bull Trout spawning run as a significant threat to the Lake Pend Oreille (LPO) population(s).

Given the immediate and ongoing threat that illegal harvest represented to the LPO Bull Trout populations, Idaho requested and the Clark Fork Relicensing Team agreed that an enhanced and focused law enforcement effort be supported and funded by Avista in 1998, and be considered as a relicensing Protection, Mitigation, and Enhancement (PM&E) measure. Avista subsequently provided Idaho Department of Fish and Game (IDFG) with funding which, along with additional funds provided by other groups, allowed for two years (1998 and 1999) of enhanced law enforcement effort focused on protecting LPO Bull Trout. It was also agreed that a plan should be developed for continuing this enforcement effort on a long-term basis, and it should include a specific public education and outreach component. Therefore, in addition to the second year of enhanced law enforcement effort that IDFG implemented in 1999, Avista also supported the development of a plan for a longer-term Bull Trout Protection and Public Education Project that was approved by the Management Committee (MC) and began implementation in the year 2000.

In 2004, IDFG, Montana Fish, Wildlife and Parks (MFWP), Panhandle Chapter Trout Unlimited (PCTU), and Avista began the revision of the 2000 Implementation Plan for the Bull Trout Protection and Public Education Project while incorporating aspects of the 2000 Cooperative Action Plan for the Bull Trout Protection and Public Education Project in the Lower Clark Fork – Pend Oreille Basin. In March of 2005, 2010, 2015, and again in 2020, the MC approved updated Five-year Implementation Plans for the Bull Trout Protection and Public Education Project.

Previously grouped components of each of the three implementers of the Bull Trout Enforcement and Public Education Project (i.e., MFWP, IDFG, and PCTU) annual Project Plans have been broken-out as individual Project Plans to better account for cost-by-task associated with each and of the Program as a whole. Beginning in 2021, as per the latest MC-approved 5-year implementation plan, a Project Evaluation and Ranking Criteria that has been reviewed and scored by the WRTAC has been added to each Appendix D Project Plan.

2022 Project Plans

1. Idaho Bull Trout Protection and Education Officer Support
2. Montana Bull Trout Education and Communication Support
3. Montana Bull Trout Education Outreach Support
4. Montana Game Warden Support
5. Trout Unlimited Outreach Coordination
6. Pend Oreille Water Festival

Work Products

Idaho Bull Trout Protection and Education Officer Support

- Mid-year report; due to Avista; August 1, 2022
- Annual Work Summary; due to Ken Bouwens, IDFG; November 15, 2022

Montana Bull Trout Education and Communication Support

- Mid-year report; due to Avista; August 1, 2022
- Annual Work Summary; due to Avista; November 15, 2022

Montana Bull Trout Education Outreach Support

- Mid-year report; due to Avista; August 1, 2022
- Annual Work Summary; due to Avista; November 15, 2022

Montana Game Warden Support

- Mid-year report; due to Avista; August 1, 2022
- Annual Work Summary; due to Avista; November 15, 2022

Trout Unlimited Outreach Coordination

- Mid-year report; due to Avista; August 1, 2022
- Annual Work Summary; due to Ken Bouwens, IDFG; November 15, 2022

Pend Oreille Water Festival

- Mid-year report; due to Avista; August 1, 2021
- Annual Work Summary; due to Ken Bouwens, IDFG; November 15, 2022

2022 Appendix D Budget

Budget Summary	
Unexpended funds with interest	$167,485
2022 contribution (including GDP inflation rate)	$190,223
Total available	**$357,708**
2022 MC-approved budget	$224,892
Unobligated funds	**$132,816**

2022 Project	Carryover[1]	2022 Budget
Idaho Bull Trout Protection and Education Officer Support	$27,395	$105,086
Montana Bull Trout Education and Communication Support	$0	$6,496
Montana Bull Trout Education Outreach Support	$21,835	$25,335
Montana Game Warden Support	$0	$0
Trout Unlimited Outreach Coordination	$12,760	$21,390
Pend Oreille Water Festival	$0	$4,595
Total	**$61,990**	**$162,902**
MC-approved budget		**$224,892**

[1] *Estimated carryover of unexpended, approved funds as of January 1.*

2022 PROJECT PLAN

Idaho Bull Trout Protection and Education Officer Support

Project Contact
Dustin Masin, Idaho Department of Fish and Game (IDFG), (208) 608-8651; Dustin.Masin@idfg.idaho.gov, *and*
Ken Bouwens IDFG, (208) 769-1414; ken.bouwens@idfg.idaho.gov

Project History
This is a continuing project that was initially developed through the 1999 Clark Fork Settlement Agreement (CFSA). The scope and budget for this project are reviewed by the Management Committee (MC) annually. Beginning with the 2020 project plan, this position is provided under a cost share arrangement with CFSA Appendix F5. This change in funding and scope reflects the changing nature of this position, in which a significant proportion of the officer's time is spent patrolling and contacting anglers pursuing other recreationally important and/or native species in the Lower Clark Fork River – Lake Pend Oreille area. This time still has value for Bull Trout protection and education, but also represents an opportunity for enforcement of other important fisheries regulations and an opportunity to inform the angling public of ongoing CFSA-sponsored management efforts in the area.

Background
The Idaho CFSA Protection and Education (P&E) Officer position was created in 1999 to address illegal Bull Trout harvest through direct law enforcement action taken on Lake Pend Oreille (LPO) and its tributaries. The CFSA recognized that illegal harvest of Bull Trout was a significant threat; specifically, poaching of spawning fish could greatly impact the spawning population of a stream. It was determined that in addition to traditional enforcement action, public education would be an effective approach to reduce illegal and inadvertent harvest of Bull Trout (Avista 1999). Education currently comprises approximately 35% of the annual work performed by the P&E Officer. The evaluation and the adaptive management of this project is outlined in a Five-Year Implementation Plan.

The combination of targeted law enforcement and Bull Trout-specific education has been highly effective in reducing Bull Trout harvest. Although few violations are detected annually, enforcement patrols continue to be an important component of this program. Officer presence in areas known to be poaching hot spots has deterred illegal activities in these areas. Although also difficult to quantify, it is apparent this project has shown a measurable reduction in accidental and illegal Bull Trout harvest through Bull Trout identification education. For example, in 2006 the Lake Trout Angler Incentive Program (AIP) produced 49 Bull Trout that were unwittingly submitted by anglers to the program. Since that time, the total number of anglers submitting Bull Trout to the AIP has dropped to a handful each year, despite angler reports stating that Bull Trout are commonly caught incidentally in the Lake Trout fishery. It is important to continue this highly successful program to maintain the current level of compliance.

Goal
The goal of this project is to reduce the intentional and unintentional harvest of Bull Trout in the Idaho portion of the project area through directed law enforcement and public education.

Objectives
1. Patrol LPO tributaries known to support Bull Trout.

2. Patrol the LPO, Clark Fork River, and Pend Oreille River fisheries in areas where Bull Trout may be encountered by anglers.

3. Increase anglers' knowledge of LPO specific fishing regulations, especially with respect to Bull Trout.

4. Educate the public on the topics relating to Bull Trout such as effective catch and release techniques, distinguishing characteristics from other LPO fishes, and their life history and habitat requirements.

5. Develop educational materials, both physical and electronic, to educate the public on fishery management practices and fish identification.

Tasks
1. Continue to focus enforcement efforts, possibly including undercover and/or plain clothes surveillance patrols, on vulnerable Bull Trout tributary locations such as staging holes and spawning areas. (Objective 1)

2. Place electronic monitoring equipment at locations along tributaries with a known history of Bull Trout poaching activity. Document violations and pursue avenues of locating and charging violators as appropriate. (Objective 1)

3. Continue to conduct enforcement patrols on LPO to monitor regulation compliance, catch rates, and incidental harvest. Focus time and efforts at vulnerable locations for Bull Trout such as near tributary mouths. (Objective 2)

4. Continue to help monitor streams and riparian habitat for unlawful development or alterations. (Objectives 1 and 2)

5. As allowed by CDC guidelines, continue student-focused educational programs in local classrooms, the Pend Oreille and Coeur d'Alene Water Festivals, the Waterlife Discovery Center, and the Trestle Creek Interpretive Site. Include messages regarding Bull Trout identification characteristics, life history of Bull Trout, and catch-and-release methods at these events. (Objective 3 and 4)

6. As allowed by CDC guidelines, attend research efforts, events, or trainings to better understand dynamics of the Pend Oreille fishery, impacts on Bull Trout in the system, and to be more informed when educating the public about Bull Trout. (Objectives 1- 4)

7. Develop electronic and physical media elements for interpretive panels, trailer materials, handouts, swag, online videos, and teacher resources to be made available for area school districts, homeschooled students, and recreators. (Objective 3, 4, and 5)

Work Products

- Mid-year report; due to Avista; August 1, 2022
- Annual Work Summary; due to Ken Bouwens, IDFG; November 15, 2022

Permitting Requirements

Not applicable for the tasks proposed in this project plan.

Endangered Species Act consultation for this project plan is associated with the 2019 Biological Opinion on the effects of continued operation of the Clark Fork Hydroelectric Project on Bull Trout and designated Bull Trout critical habitat (BiOp), and the USFWS-IDFG Cooperative Agreement pursuant to Section 6 of the Act. This project plan is consistent with the analysis and conclusions contained in the 2019 BiOp and the USFWS-IDFG Cooperative Agreement and will adhere to all appropriate Terms and Conditions designed to reduce the extent and effects of incidental take on Bull Trout. Incidental take reporting for this project plan will be included in the annual Biological Opinion report as required by Term and Conditions 15–18 of the 2019 Incidental Take Statement, as well as IDFG's annual Section 6 report to the USFWS. No incidental take is expected as part of the implementation of this plan.

Cultural/Historic Resource Review

Not applicable for the tasks proposed in this project plan, there are no ground and/or vegetation disturbing activities, or proposed impacts to cultural/historic resources.

Benefit to the Resource

Reducing Bull Trout mortality by anglers is consistent with the Idaho Tributary Habitat Acquisition and Fishery Enhancement Program (Appendix A of the CFSA). As such, it is also consistent with goals of the Fish Passage/Native Salmonid Restoration Plan Protection Mitigation, and Enhancement measure (Appendix C), and the Dissolved Gas Supersaturation Control, Mitigation, and Monitoring Program (Appendix F5). Providing an enforcement presence in the area also supports programs conducted under the terrestrial portions of the CFSA.

This proposed project is entirely consistent with the Idaho Department of Fish and Game Fisheries Management Plan (IDFG 2019), the Management Plan for the Conservation of Westslope Cutthroat Trout in Idaho (IDFG 2013), Columbia Headwaters Recovery Unit Implementation Plan for Bull Trout (*Salvelinus confluentus*) (USFWS 2015), and the Native Salmonid Restoration Plan (NSRP) (Kleinschmidt and Pratt 1998), as it supports the enforcement and management of the LPO fishery, especially with respect to Bull Trout and Westslope Cutthroat Trout conservation.

Budget

Item	Estimated Carryover[1]	2022 Budget Request
Payroll (0.75 FTE)	$13,000	$45,060
IDFG (benefits)	$5,300	$20,780
Payroll and benefits overhead, estimated at 34.65%	$5,800	$22,820
Communication Services	$260	$1,088
Training	$140	$563
Travel (Hotels, Per Diem, Etc.)	$220	$900
Specific use supplies (gear, education materials, etc.)	$800	$3,750
Promotional materials	$0	$1,500
Renting Operating leases and Maintenance (Boat and vehicle)	$1,875	$7,500
Avista support (<0.05 FTE)	$0	$1,125
Total	$27,395	$105,086
Anticipated Expenditures		$132,481

[1] *Estimated carryover of unexpended, approved funds as of January 1.*

As proposed, it is anticipated that approximately 75% of the Idaho P&E Officer's time will be dedicated to Bull Trout-specific activities (Appendix D) and 25% of their time will be dedicated to broader LPO issues, focusing on those species that are expected to directly benefit from other CFSA-sponsored projects (Appendix F5).

Literature Cited

Avista Corporation. 1999. Settlement Agreement (Clark Fork Settlement Agreement (CFSA)). Volume III, Application for New License, submitted to the Federal Energy Regulatory Commission (FERC). Avista Corporation, Spokane, Washington.

IDFG (Idaho Department of Fish and Game). 2013. Management Plan for the Conservation of Westslope Cutthroat Trout in Idaho. Fisheries Bureau, Boise, ID.

IDFG (Idaho Department of Fish and Game). 2019. Fisheries Management Plan 2019-2024. Boise, ID.

Kleinschmidt Associates and K. L. Pratt. 1998. Clark Fork River Native Salmonid Restoration Plan. Report to Washington Water Power Co., Spokane, Washington.

USFWS (United States Fish and Wildlife Service). 2015. Columbia Headwaters Recovery Unit Implementation Plan for Bull Trout (*Salvelinus confluentus*). Prepared by Montana Ecological Services Office and Northern Idaho Field Office, Portland, Oregon.

As approved by the Management Committee on 3/15/2022

2022 PROJECT PLAN

Montana Bull Trout Education and Communication Support

Project Contact

Dillon Tabish, Montana Fish, Wildlife and Parks (MFWP), Regional Information/Education Program Manager, (406) 751-4564, dillon.tabish@mt.gov, *and*
Travis Rehm, MFWP, (406) 382-3032, travis.rehm@mt.gov

Project History

This is a component of a continuing project that has been annually reviewed and approved by the Management Committee (MC) since 2001. No changes to the scope are being requested; however, a slight modification to the budget is being requested and are described in the Background section. This project was ranked by the WRTAC in 2021.

Background

Public education and outreach are outlined in the Clark Fork Settlement Agreement (CFSA) Appendix D as appropriate PM&E efforts. Following adoption of the expanded PM&E in 2001, the MC has approved updated 5-year Implementation plans for the Project for IDFG, MFWP, and PCTU in 2005, 2010, 2015 and 2020. As per the original PM&E, these 5-year plans have specified that resources for law enforcement will be distributed between IDFG and MFWP and that no less than 15% of annual funding be dedicated to public education.

This Project Plan is a yearly goal setting document to guide MFWP efforts in public education of Bull Trout through radio announcements, social media ads, and website information. A component of the education and outreach aspect of this project has been the annual purchase of informational radio advertisements from local radio broadcasters. This effort is being updated to include social media as an information and education tool to reach anglers of different demographics. The budgetary modification is in response to MFWP-required overhead charges figured on actual expenditures. Additionally, the annual electricity cost to run the state line transmitter has been added to this Project Plan.

Goal

The goal of this Education Component Project Plan of the Bull Trout Protection and Public Education Program – MFWP is to increase the areas' knowledge of Bull Trout identification, regulations, proper catch-and-release techniques, and habitat requirements to decrease angler mortality and increase appreciation for this threatened species.

Objective

1. Reduce angler mortality on vulnerable Bull Trout populations by educating the fishing public, students, and others regarding Bull Trout identification, biology, and management. Additionally, continue to bolster youth interest in fishing and the outdoors through angling programs to instill a conservation ethic into younger generations.

Tasks

1. Continue media contacts (radio and/or newspaper) in Sanders County to keep the restoration efforts before the public.

2. Monitor the Bull Trout identification/testing section on the MFWP website and improve its effectiveness in helping anglers properly identify Bull Trout.

3. Continue consultation and cooperation with Avista, IDFG, and PCTU in public education on Bull Trout and native fish conservation as required in the contractual agreement.

4. Inform and educate anglers through targeted radio spots and social media advertising in spring, summer and fall.

Work Products

- Mid-year report; due to Avista; August 1, 2022
- Annual Work Summary; due to Avista; November 15, 2022

Permitting Requirements

Not applicable for the tasks proposed in this project plan.

Endangered Species Act consultation for this project plan is associated with the 2019 Biological Opinion on the effects of continued operation of the Clark Fork Hydroelectric Project on Bull Trout and designated Bull Trout critical habitat (BiOp). This project plan is consistent with the analyses and conclusions contained in the 2019 BiOp and will adhere to all appropriate Terms and Conditions designed to reduce the extent and effects of incidental take on Bull Trout. No incidental take of Bull Trout is anticipated as a result of this project plan; therefore, no take reporting is required.

Cultural/Historic Resource Review

Not applicable for the tasks proposed in this project plan, there are no ground and/or vegetation disturbing activities, or proposed impacts to cultural/historic resources.

Benefit to the Resource

Enforcement and Education are outlined in Appendix D of the CFSA as appropriate PM&E efforts. This plan also supports native salmonid benefitting actions conducted under appendices B and C and supports State of Montana and U.S Fish and Wildlife Service laws and management plans for Bull Trout and other fish in the area. This project strives to educate the fishing public, students, and others regarding Bull Trout identification, biology and management. Through yearly implementation of the project, a community awareness of the value of Bull Trout conservation is fostered.

Benefit to the Resource

Education and Communication are outlined in Appendix D of the CFSA as appropriate Protection Mitigation and Enhancement (PM&E) efforts. This plan also supports native salmonid benefitting actions conducted under appendices B and C and supports State of Montana and U.S Fish and Wildlife Service laws and management plans for Bull Trout and other fish in the area.

This project strives to educate the fishing public, students, and others regarding Bull Trout biology and management. Through yearly implementation of the project, a community awareness of the value of Bull Trout conservation is fostered.

Budget

Item	Estimated Carryover[1]	2022 Budget Request
771 radio spots (Boners Ferry, Sandpoint, Noxon, TFalls)	$0	$2,520
396 radio spots (Flathead and Mission Valleys	$0	$1,386
Social media advertising (targeted Facebook posts)	$0	$1,500
Annual electricity to power state line radio message transmitter	$0	$420
Overhead (11.5%)	$0	$670
Total	$0	$6,496
Anticipated Expenditures		$6,496

[1] *Estimated carryover of unexpended, approved funds as of January 1.*

As approved by the Management Committee on 3/15/2022

2022 PROJECT PLAN

Montana Bull Trout Education Outreach Support

Project Contacts

Abigail Maddigan, Montana Fish, Wildlife and Parks (MFWP), (406) 382-3034, abigail.maddigan@mt.gov,
Dillon Tabish, MFWP, (406) 751-4564, dillon.tabish@mt.gov, *and*
Travis Rehm, MFWP, (406) 382-3032, travis.rehm@mt.gov

Project History

This is a continuing project that has been annually reviewed and approved by the Management Committee (MC) since 2001. Periodic evaluation and adjustment of this and the other principal components of this Protection Mitigation and Enhancement (PM&E) measure implemented by Idaho Department of Fish and Game (IDFG) and the Panhandle Chapter of Trout Unlimited (PCTU) are outlined in a 5-year plan for this program, the last of which, for the 2020– 2024 period, was approved by the MC in March 2020.

Background

Enforcement and Enhancement are outlined in the Clark Fork Settlement Agreement (CFSA) Appendix D as appropriate PM&E measure efforts. Following adoption of the expanded PM&E measure in 2001, the MC has approved updated 5-year implementation plans for the Project for IDFG, MFWP, and PCTU in 2005, 2010, 2015, and 2020. As per the original PM&E measure, these 5-year plans have specified that resources for law enforcement will be distributed between IDFG and MFWP and that no less than 15% of annual funding be dedicated to public education.

This Project Plan for Bull Trout Protection and Public Education is a yearly goal setting document to guide MFWP efforts in public education, restoration, and protection of Bull Trout. Listed below are the objectives and tasks for the year 2022. A component of the education aspect of this project has been the annual outreach and education to area schoolchildren through classroom visitation and exercises, fishing days, area festival and fair exhibits, and updating Bull Trout identification signage along popular angler access sites in the area. Hooked on Fishing dollars are used to provide educational materials in classrooms. Additionally, the Hooked on Fishing curriculum presented throughout MFWP Region 1 incorporates Bull Trout education and is complimentary to the educational program of Appendix D. Listed below are the objectives and tasks for the year 2022. Included in the below tasks and budget are additional signs and outreach materials to further educational efforts in the project area.

Goal

The goal of this Project Plan is to increase the areas' schoolchildren and angling public's knowledge of Bull Trout identification, regulations, proper catch-and-release techniques, and habitat requirements to decrease angler mortality of Bull Trout and increase appreciation for this threatened species.

Objective

1. Reduce angler caused mortality to vulnerable Bull Trout populations by educating the fishing public, students, and others regarding Bull Trout identification, biology, and management. Additionally, continue to bolster youth interest in fishing and the outdoors through angling programs to instill a conservation ethic into younger generations.

Tasks

1. Review the educational efforts conducted for Bull Trout in the lower Clark Fork drainage and adjust to improve future educational efforts methods in 2022.

2. Continue consultation and cooperation with Avista, IDFG, and PCTU in public education on Bull Trout and native fish conservation as required in the contractual agreement.

3. Involve a minimum of three public schools in Sanders County in the Hooked-On-Fishing Program in 2022.

4. Make a minimum of six public (or virtual) presentations at schools and/or civic groups in Sanders County, Montana in 2022.

5. Provide public educational outreach in a booth at the Trout Creek Huckleberry Festival and Sanders County Fair 2022.

6. Work with appropriate landowners to install and maintain "Anglers You're in Bull Trout Country" signs at public access sites.

7. Work with MFWP biologists to post signs on key Bull Trout tributaries alerting anglers to bait and harvest restrictions, as well as the legality of building small dams in the creeks.

8. Continue maintenance and improvements to the Bull Trout Education Trailer (i.e., awnings, banners, trailer graphics, and interior repainting) in 2022.

9. Cooperatively with other MFWP, Avista, and USFS staff, hold annual Kid's Fishing Day on June 4, 2022 at Triangle Pond.

Work Products

- Mid-year report; due to Avista; August 1, 2022
- Annual Work Summary; due to Avista; December 1, 2022

Permitting Requirements

Montana Fish, Wildlife and Parks will acquire all necessary permits for the tasks proposed in this project plan.

Endangered Species Act consultation for this project plan is associated with the 2019 Biological Opinion on the effects of continued operation of the Clark Fork Hydroelectric Project on Bull Trout and designated Bull Trout critical habitat (BiOp). This project plan is consistent with the

analyses and conclusions contained in the 2019 BiOp and will adhere to all appropriate Terms and Conditions designed to reduce the extent and effects of incidental take on Bull Trout. No incidental take of Bull Trout is anticipated as a result of this project plan; therefore, no take reporting is required.

Cultural/Historic Resource Review
Montana Fish, Wildlife and Parks will coordinate Montana State Historic Preservation Office review for those tasks that may require ground disturbance prior to implementing the project. The work product for this review will be confidential due to the sensitive nature of the content.

Benefit to the Resource
Enforcement and Enhancement are outlined in Appendix D of the CFSA as appropriate Protection Mitigation and Enhancement (PM&E) measure efforts. This plan also supports native salmonid benefitting actions conducted under appendices B and C, and supports State of Montana and U.S Fish and Wildlife Service laws and management plans for Bull Trout and other fish in the area. This project strives to educate the fishing public, students, and others regarding Bull Trout biology and management. Through yearly implementation of the project potential sources of Bull Trout mortality are reduced and a community awareness of the value of Bull Trout conservation is fostered. Additionally, angling programs strive to increase youth involvement and fishing and the outdoors which is necessary to ensure that conservation is a priority of future generations.

Budget

Item	Estimated Carryover[1]	2022 Budget Request
Education Travel: 2,000 miles @ .31/mile + $249.60/monthly base rate	$500	$1,120
624 hours salary and benefits (0.3 FTE, education)	$19,200	$19,500
Bull Trout Country signs/swimming hole dams	$0	$200
Sign hanging materials/hardware (both)	$0	$100
Huckleberry Festival Event Sponsorship	$0	$200
Outreach booth at Sanders County Fair	$0	$215
Miscellaneous classroom supplies	$0	$200
Promotion items (koozies, stickers, etc.) to hand out at events	$0	$1,500
Overhead (11.5%)	$2,135	$2,300
Total	$21,835	$25,335
Anticipated Expenditures		$47,170

[1] *Estimated carryover of unexpended, approved funds as of January 1.*

2022 PROJECT PLAN

Montana Game Warden Support

Project Contacts

Travis Johnson, Montana Fish, Wildlife and Parks (MFWP), (406) 240-2271, travis.johnson2@mt.gov, Dillon Tabish, MFWP, (406) 751-4564, dillon.tabish@mt.gov, *and* Travis Rehm, MFWP, (406) 382-3032, travis.rehm@mt.gov

Project History

This is a component of a continuing project that has been annually reviewed and approved by the Management Committee (MC) since 2001. Beginning in 2021, as per the MC-approved 5-year implementation plan, this project was ranked by the WRTAC.

In 2021, MFWP, while committed to providing enforcement presence in the project area and working closely with Avista, did so without utilizing Clark Fork Settlement Agreement (CFSA) funds as approved by CFSA Management Committee in March 2021. Wardens patrolled the area and documented contacts and violations and will continue to do so but have no longer tracked Avista-specific hours and expenses for reimbursement. Annual reporting will follow MFWP format but will be included in Avista's annual reporting for this project to document compliance of this enforcement effort.

Background

Public education and outreach are outlined in the Clark Fork Settlement Agreement (CFSA) Appendix D as appropriate Protection, Mitigation and Enhancement (PM&E) efforts. Following adoption of the expanded PM&E measure in 2001, the MC has approved updated 5-year implementation plans for the Project for Idaho Department of Fish and Game (IDFG), MFWP, and Panhandle Chapter Trout Unlimited (PCTU) in 2005, 2010, 2015, and 2020. As per the original PM&E measure, these 5-year plans have specified that resources for law enforcement will be distributed between IDFG and MFWP and that no less than 15% of annual funding be dedicated to public education.

This Project Plan is a yearly goal setting document to guide MFWP efforts in public education and protection of Bull Trout. This Project Plan represents the enforcement component of this project. Enforcement is implemented by committed warden time patrolling area waters by a variety of means with an emphasis on visiting areas and/or patrolling in particular seasons when Bull Trout are known to be particularly susceptible to angling.

Goal

The goal of this Project Plan is to decrease intentional and unintentional angler caused mortality of Bull Trout in the Montana waters of the Lower Clark Fork River; while at the same time through angler contact, to increase the angling public's knowledge of Bull Trout identification, regulations, proper catch-and-release techniques, and habitat requirements.

Objective

1. Reduce angler caused mortality of vulnerable Bull Trout populations and illegal impacts to habitats by targeted enforcement presence throughout the Montana portion of the Avista Project Area.

Tasks

1. Conduct uniformed and plain-clothes patrols in the project area.

2. Continue use of specialized remote video/camera surveillance equipment as required. Wardens will continue to work with MFWP and Avista biologists and technicians to keep informed of current Bull Trout movements, staging areas, suspect mortalities, trapping sites and other areas of concern to provide for more effective patrols.

3. Monitor in mid-to-late-summer for "swimming hole" type small-scale dams and investigate other potential illegal activities in Bull Trout drainages.

Work Products

- Mid-year report; due to Avista; August 1, 2022
- Annual Work Summary; due to Avista; November 15, 2022

Permitting Requirements

Not applicable for the tasks proposed in this project plan.

Endangered Species Act consultation for this project plan is associated with the 2019 Biological Opinion on the effects of continued operation of the Clark Fork Hydroelectric Project on Bull Trout and designated Bull Trout critical habitat (BiOp). This project plan is consistent with the analyses and conclusions contained in the 2019 BiOp and will adhere to all appropriate Terms and Conditions designed to reduce the extent and effects of incidental take on Bull Trout. No incidental take of Bull Trout is anticipated as a result of this project plan; therefore, no take reporting is required.

Cultural/Historic Resource Review

Not applicable for the tasks proposed in this project plan, there are no ground and/or vegetation disturbing activities, or proposed impacts to cultural/historic resources.

Benefit to the Resource

Enforcement and Enhancement are outlined in Appendix D of the CFSA as appropriate PM&E efforts. This plan also supports native salmonid benefitting actions conducted under appendices B and C and supports State of Montana and U.S Fish and Wildlife Service laws and management plans for Bull Trout and other fish in the area. Providing an enforcement presence in the area also supports programs conducted under appendices G, H and K of the CFSA. The enforcement portion of the project provides a deterrent to illegal harvest or harassment of Bull Trout. In addition, enforcement provides the option of directly stopping illegal harvest and saving individual Bull Trout, which are highly vulnerable in small spawning streams or in the cool water plumes of tributary mouths.

Budget

Item	Estimated Carryover[1]	2022 Budget Request
Patrols/operations travel, per diem and other support items covered by MFWP	$0	$0
Total	$0	$0
Anticipated Expenditures		$0

[1] *Estimated carryover of unexpended, approved funds as of January 1.*

This budget request covers the period of April 1, 2022 through March 31, 2023 and Montana Fish, Wildlife and Parks wardens will not charge for warden support from CFSA Appendix D funds.

2022 PROJECT PLAN

Trout Unlimited Outreach Coordination

Project Contact

Bill Love, Panhandle Chapter Trout Unlimited, (208) 597-1710, info@panhandlechaptertu.org,
and
Ken Bouwens, Idaho Department of Fish and Game (IDFG), (208) 769-1414,
ken.bouwens@idfg.idaho.gov

Project History

This is a continuing project that was originally approved in its current form for funding from Appendix D by the Management Committee (MC) in 2021. The scope and budget for this project are reviewed by the MC annually.

Background

This project plan is guided by the Implementation Plan for the Bull Trout and Public Education Project 2020-2024 (Avista et al. 2020), which was developed by the primary implementation partners; Avista, IDFG, MFWP and PCTU, and approved by the MC in March 2020. The purpose of this plan is to support the overall education goals of the implementation plan, namely to reduce the incidental harvest of Bull Trout and increase public awareness concerning the life history, habitat needs, identifying characteristics and potential vulnerability to human activities of Bull Trout and other native fish. This is done through multipronged and engaging outreach to anglers, students and the general public with information about Bull Trout and Westslope Cutthroat Trout identification efforts, proper catch-and-release techniques, and sound, science-based fisheries management (including ongoing predatory species management) information. This effort augments other programs funded under the Clark Fork Settlement Agreement that are intended to result in greater numbers of Bull Trout in the Lower Clark Fork River and Lake Pend Oreille basin than would otherwise be the case, and support other efforts to protect and restore the basin's aquatic resources.

Over the past decade, the PCTU has contracted with a Bull Trout Education Coordinator to organize the Trout and About Festival, organize and staff booths at other events, conduct on-line outreach, and procure promotional materials to help spread educational messages about Bull Trout and native fish habitat. The festival was suspended during 2021 due to time constraints caused by a transition in leadership as well as the unpredictability of COVID-19 protocol and restrictions. As a result of the disruption caused by COVID-19, PCTU and other implementation partners have discussed restructuring options.

In general, the emphasis will shift from specific events to coordination of field trips at locations such as the Trestle Creek interpretive site and the Waterlife Discovery Center, and identifying and staffing opportunities to reach other audiences with the assistance of the teaching tools and materials provided by the Native Fisheries Education Trailer. The education outreach efforts will focus on the areas of emphasis in the latest five-year implementation plan (Avista et al. 2020). The PCTU Bull Trout Education Coordinator will work with the IDFG officer to organize and schedule field trips for student groups, and identify opportunities to reach other target audiences,

such as visiting anglers. Visiting anglers have been responsible for recent cases of misidentification of Bull Trout, and therefore are an area of emphasis in the implementation plan (Avista et al. 2020). In addition, the PCTU coordinator will work with the IDFG officer to develop curriculum that can be used on the Idaho Bull Trout website, and help spread Bull Trout and native fisheries education messaging through social media and other on-line or printed media outlets. Finally, the PCTU Coordinator will develop and order educational promotional materials and distribute those promotional items during outreach events, or through partner outlets, such as North 40's fly shop, marine shops, and boat inspection stations.

To assess the efficacy of this effort, the total number of contacts made at each field trip and outreach event will be recorded and reported. Promotional materials distribution will be tracked, as well. Online metrics will be recorded to determine the level of engagement in social media posts or on-line curricula.

Goal
The goal is to increase Bull Trout abundance through decreased angler induced mortality, and to promote advocacy for the species and its habitat, and to create a culture of public awareness that continually supports these efforts.

Objectives
1. Develop a student-oriented strategy/curriculum with a focus on field trips. Coordinate field trips for student groups and assist in instruction.

2. Develop an adult on-line and in-person education strategy/curriculum, with a focus on visiting anglers.

3. Incorporate Native Fisheries Education Trailer in overall outreach strategy.

4. Coordinate in-person and on-line outreach with IDFG Bull Trout Education and Enforcement Officer (officer).

5. Develop sustainable outreach plan in partnership with IDFG officer.

6. Provide Bull Trout merchandise (stickers, coozies, and other materials free to public) to further the message of Bull Trout protection.

Tasks
1. Hire new PCTU Bull Trout Education Coordinator. (Objectives 1-6)

2. Regular planning meetings with IDFG Bull Trout Education Officer (Objectives 4-5)

3. Coordinate with schools and IDFG officer to schedule field trips (Objectives 1, 3 and 4)

4. Develop curriculum for in-person outreach and/or on-line (Objectives 1 and 2)

5. Conduct on-line outreach using social media, websites (Objectives 2 and 4)

6. Develop/order merchandise for outreach (Objective 6)

7. Administration and reporting (Objectives 1-6)

Work Products

- Mid-year report; due to Avista; August 1, 2022
- Annual Work Summary; due to Ken Bouwens, IDFG; November 15, 2022

Permitting Requirements

Not applicable for the tasks proposed in this project plan.

Endangered Species Act consultation for this project plan is associated with the 2019 Biological Opinion on the effects of continued operation of the Clark Fork Hydroelectric Project on Bull Trout and designated Bull Trout critical habitat (BiOp), and the USFWS-IDFG Cooperative Agreement pursuant to Section 6 of the Act. This project plan is consistent with the analysis and conclusions contained in the 2019 BiOp and the USFWS-IDFG Cooperative Agreement, and will adhere to all appropriate Terms and Conditions designed to reduce the extent and effects of incidental take on Bull Trout. Incidental take reporting for this project plan will be included in the annual Biological Opinion report as required by Term and Conditions 15–18 of the 2019 Incidental Take Statement, as well as IDFG's annual Section 6 report to the USFWS.

Cultural/Historic Resource Review

Not applicable for the tasks proposed in this project plan, there are no ground and/or vegetation disturbing activities, or proposed impacts to cultural/historic resources.

Benefit to the Resource

Reducing angler mortality to Bull Trout and instilling the importance of habitat preservation is important to realize the potential of other ongoing CFSA PM&E measures including the Fish Passage/Native Salmonid Restoration Plan (Appendix C) and the Idaho Tributary Habitat Acquisition and Fishery Enhancement Program (Appendix A). The efforts of this continuing program support IDFG and U.S Fish and Wildlife Service (USFWS) management plans for Bull Trout in the Lake Pend Oreille (LPO) area. This project provides direct benefits to conservation of Bull Trout being managed by Avista, MFWP, IDFG, and USFWS by reducing the incidence of unintentional mortality to Bull Trout due to misidentification and/or improper angling and release techniques, and increasing public awareness on the importance of high quality habitat.

Budget

Item	Estimated Carryover[1]	2022 Budget Request
Bull Trout Education Coordination, 620 hours @ $20/hr	$7,200	$12,400
Promotional and Educational materials	$3,250	$1,500
Field Trip Supplies	$0	$1,500
Website maintenance	$660	$1,200
Mileage & Trailer Towing Expenditure	$0	$2,000
Administration & Reporting (15%)	$1,650	$2,790
Total	$12,760	$21,390
Anticipated Expenditures		$34,150

[1] *Estimated carryover of unexpended, approved funds as of January 1.*

The PCTU had a membership of 340 and is committed to involving its members and other volunteers in outreach efforts and estimates contributing 360 hours of volunteer labor, valued at $8,114 over the course of the year. Volunteers would assist with field trips, outreach/trailer events, and administration.

Literature Cited

Avista; Idaho Department of Fish and Game; Montana Fish, Wildlife and Parks; Panhandle Chapter Trout Unlimited, 2020. Implementation Plan for the Bull Trout Protection and Public Education Project 2020-2024.

2022 PROJECT PLAN

Pend Oreille Water Festival

Project Contact
Gail Bolin, Bonner Soil & Water Conservation District (BSWCD), (208) 627-3292, Waterfestival.bonner@gmail.com, *and*
Ken Bouwens, Idaho Department of Fish and Game (IDFG), (208) 769-1414
ken.bouwens@idfg.idaho.gov

Project History
This is a continuing project that was originally approved for funding from Appendix D by the Management Committee (MC) in 2021. The scope and budget for this project are reviewed by the MC annually.

Background
The Water Festival is an annual multidisciplinary water resource education program for all fifth grade students (approximately 450) from private and public schools in Bonner County, Idaho. The Water Festival includes interactive in-class lessons and culminates with a two-day outdoor field trip in mid-May at Riley Creek Recreation Area on the Pend Oreille River.

The first Water Festival in Bonner County was held in May 1996. It was a joint effort between the Pend Oreille Conservation District in Newport, WA, and BSWCD in Sandpoint, Idaho. The steering committee was organized and coordinated by Ruth Watkins, director of Tri-States Water Quality Council. Later the joint Water Festival separated into two separate programs, and Tri-States became the lead organization for the Water Festival in Bonner County. Tri-States closed in 2012 and the Water Festival then came under the direction of BSWCD.

The Water Festival's unique outdoor classroom provides students the opportunity to gain first-hand experience and creatively think about the dynamic world around them. Approximately 450 fifth graders (225 each day) from 16 public and private schools attend. Over two days, these young people will have the opportunity to engage with over 90 professionals focusing on the area's water resources and the Clark Fork-Pend Oreille Watershed. The Water Festival provides students the opportunity to learn through hands-on, interactive, and fun activities. Sandpoint High Schools students under the direction of their teacher, John Hastings, act as guides and mentors as they rotate through five educational stations.

- **Fisheries**: Bull Trout and other fish identification using real fish, migration patterns, habitat needs, life cycles, food and survival requirements.
- **Water Quality**: Using live macroinvertebrates students learn classification methods, the physical, chemical, and biological properties that determine water quality as well as impacts caused by aquatic invasive species.
- **Watersheds**: An EnviroScape model is used to visualize a watershed, pollutants that may be found there, create rain and runoff, and demonstrate erosion and pollution impacts on water quality.

- **Animal Tracks**: Animal gait/track identification, wildlife dependence on water resources, students create a track guide by stamping life-size animal tracks onto bandanas that they take home.
- **Fur Trapping Era**: Explores the lives and impacts of the early fur traders in the Northwest through demonstrations complete with traps, beaver pelts, and an antique musket rifle.

All students attending the Water Festival live in rural Bonner County where over half of all elementary students qualify for free or reduced lunches. Because this is a low-income community, funding for creative out-of-the classroom science-based education, such as the Water Festival provides is extremely limited. Bonner County is rich in water, and the Water Festival offers dynamic lessons of how to be good stewards of this resource and what actions students and their families might take to protect water quality for current and future generations.

Additionally, the Water Festival provides the framework to generate enthusiasm and spark an interest in the sciences for our area's youth at no cost (to the students or to the school districts). Through exposure to hands-on and fun outdoor science lab experiences, we anticipate that some of these young students will become interested in pursuing natural resource careers.

Over time, the Water Festival has become a mainstay in the science curriculum of fifth grade classrooms throughout the county. Teachers appreciate and utilize the diverse lesson plans in the traveling Watershed Education Trunk and value the in-class presentation as well as the Water Festival's unique outdoor classroom. They repeatedly comment that the educational value of the program is exceptional.

To measure the educational effectiveness of the Festival, all fifth grade students are given pre-festival and post-festival tests. Test questions are keyed to correspond with concepts taught during the in-class lessons and the outdoor field trip. All tests are graded. The results from the 2021 Water Festival showed a significant improvement in knowledge after attending the Water Festival. Pre-test results showed 28.7% scored 80% or above. Post-test results showed 79.4% scored 80% or above. Additionally, field trip instructors and fifth grade teachers post-evaluate the event's instructional topics, logistics, and educational effectiveness. These evaluations are used by the steering committee to make any needed adjustments in the program for the following year.

Goal
To empower children with the knowledge to appreciate, respect and protect our water resources.

Objectives
1. Build knowledge, appreciation, and a culture of stewardship of the area's water resources and their benefits.

2. Promote community collaboration by involving a cross-section of natural resource professionals, teachers, students, parents, and community members in a shared environmental educational event.

Tasks

1. Setting the date in coordination with US Army Corps of Engineers for the use of Riley Creek Recreational Area. (Objectives 1 and 2), October 2021.
2. Contacting schools for participation, (Objectives 1 and 2), October 2021–November 2021.
3. Planning, budgeting, and securing financial resources to support the Water Festival, and scheduling steering committee meetings (Objectives 1 and 2), October 2021–May 2022.
4. Securing permit from the US Army Corps of Engineers for use of Riley Creek Recreation area (Objectives 1 and 2), January–March 2022.
5. Coordinating and teaching in-classroom presentations (Objectives 1 and 2), March–May 2022.
6. Recruiting volunteer instructors for Water Festival (Objectives 1 and 2), January–May 2022
7. Securing adequate materials and supplies (Objectives 1), January–April 2022.
8. Coordinating volunteers and schools for Water Festival (Objectives 1 and 2), February–May 2022.
9. Post-evaluating, sending thank you letters to donors, grant reporting, and holding wrap-up meeting (Objectives 1 and 2), May–June 2022.

Work Products

- Mid-year report; due to Avista: August 1, 2022
- Annual Work Summary; due to Ken Bouwens, IDFG; November 15, 2022

Permitting Requirements

The Water Festival Coordinator will acquire the permit for the use of Riley Creek Campground from the US Army Corps of Engineers.

Endangered Species Act consultation for this project plan is associated with the 2019 Biological Opinion on the effects of continued operation of the Clark Fork Hydroelectric Project on Bull Trout and designated Bull Trout critical habitat (BiOp). This project plan is consistent with the analyses and conclusions contained in the 2019 BiOp and will adhere to all appropriate Terms and Conditions designed to reduce the extent and effects of incidental take on Bull Trout. No incidental take of Bull Trout is anticipated as a result of this project plan; therefore, no take reporting is required.

Cultural/Historic Resource Review

Not applicable for the tasks proposed in this project plan, there are no ground and/or vegetation disturbing activities, or proposed impacts to cultural/historic resources.

Benefit to the Resource

Reducing angler mortality to Bull Trout and instilling the importance of habitat preservation is important to realize the potential of other ongoing CFSA PM&E measures including the Fish Passage/Native Salmonid Restoration Plan (Appendix C) and the Idaho Tributary Habitat Acquisition and Fishery Enhancement Program (Appendix A). The efforts of this continuing program support IDFG and U.S Fish and Wildlife Service (USFWS) management plans for Bull Trout in the Lake Pend Oreille (LPO) area. This project provides direct benefits to conservation

of Bull Trout being managed by Avista, MFWP, IDFG, and USFWS by reducing the incidence of unintentional mortality to Bull Trout due to misidentification and/or improper angling and release techniques, and increasing public awareness on the importance of high quality fish habitat.

Budget

Item	Estimated Carryover[1]	2022 Budget Request
Festival Coordination ($23/hour for 150 hours)	$0	$3,450
Mileage	$0	$400
Supplies, refreshments	$0	$425
Administration (7.5%)	$0	$320
Total	$0	$4,595
Anticipated Expenditures		$4,595

[1] *Estimated carryover of unexpended, approved funds as of January 1.*

The anticipated budget for the 2022 Water Festival is $10,550. Other funding is expected from the following sources: Angels Over Sandpoint ($400 pending); Bonner County Sportsmen ($100 pending); Cloudsledge Conservation Trust ($1,000 pending); Cocolalla Lake Association ($100 pending), Community Assistance League ($700 pending); Idaho Fish & Wildlife foundation ($750 pending) Individual Contributions ($400 pending); Equinox Foundation ($2,300 secured); Northern Lights ($100 pending); Panhandle Alliance for Education ($300 secured); and Selkirk Realtors ($400 secured).

The Water Festival also benefits from in-kind contributions of time and materials with an estimated value of $16,000 from state, local federal agencies as well as non-profits and local businesses: U.S. Army Corps of Engineers, Natural Resources Conservation Services, Idaho Fish & Game, UI-Extension Water Resources, US Forest Service, Kaniksu Land Trust, Lakes Commission, Pack River Watershed Council, Panhandle Health District, Bonner County Emergency Management, Idaho Dept. of Agriculture, Lake Pend Oreille Waterkeepers, Idaho Master Naturalists – Pend Oreille Chapter, and Trout Unlimited – Panhandle Chapter.

2022 ANNUAL IMPLEMENTATION PLAN SUMMARY – APPENDIX E

Clark Fork Project, FERC No. 2058
Cabinet Gorge and Noxon Rapids Hydroelectric Developments

Title
Watershed Councils Program

Implementation Staff Lead
Sean Moran, Avista, (406) 847-1291, sean.moran@avistacorp.com

Background
The purpose of this program is to facilitate the protection and restoration of tributary stream habitat in the Lake Pend Oreille – lower Clark Fork River watershed. This will improve conditions for aquatic life, including macroinvertebrate communities and the native fish species (i.e., Bull Trout, Westslope Cutthroat Trout, and Mountain Whitefish) most affected by the construction and continued operation of the Clark Fork Projects.

Prior to 1999, two watershed councils (WCs) already existed within the lower Clark Fork River drainage, one in the Elk Creek drainage (tributary to Cabinet Gorge Reservoir) and one in the Prospect Creek drainage (tributary to Noxon Reservoir). The Elk Creek WC had already implemented a number of stream assessment, protection and enhancement measures. The degree of local stakeholder interest and success of this WC was a catalyst for developing and establishing this Watershed Councils Program. The Prospect Creek WC began on-the-ground restoration in 1999, in part through funds from the Montana Tributary Habitat Acquisition and Recreational Fishery Enhancement Program (Appendix B of the Clark Fork Settlement Agreement [CFSA]).

This Watershed Councils Program was initiated in 1999. In the initial year of implementation for this program, efforts focused on developing and disseminating informational materials about WCs and this program, designing a decision-making process for reviewing WC related funding needs and requests and new WC formation. Since 1999, Rock Creek, Whitepine Creek, Trout Creek, Pilgrim Creek, Little Beaver Creek, and the Bull River WCs were formed. Beginning in 2000, Avista entered into an agreement with the Green Mountain Conservation District (GMCD), which allowed GMCD to directly administer these program funds in Montana.

In 2001, the Pack River WC formed in Idaho. Subsequently in 2002, Avista entered into an agreement with Bonner Soil and Water Conservation District (BSWCD), which allowed BSWCD to directly administer these program funds for the Pack River WC.

The Lower Clark Fork Watershed Group (LCFWG, an umbrella and organizational group for the Montana WCs) was officially formed early in 2004 and received its 501-3C status from the IRS in 2005. The LCFWG now facilitates all activities for the Montana WCs, helps coordinate Avista's restoration efforts with other state and/or federal activities, as well as seeking non-CFSA funding for watershed activities.

If needed, developed ranking criteria can be utilized to prioritize providing administrative funding or other support to facilitate the formation and initial development of new WC and to support existing WC.

2022 Project Plans

1. Pack River Watershed Council, Bonner Soil and Water Conservation District
2. Lower Clark Fork Watershed Council Projects

Work Products

Pack River Watershed Council, Bonner Soil and Water Conservation District

- Mid-year report; due to Avista; August 1, 2022
- Annual Newsletter (Fall 2022)
- Annual Work Summary (including financial report); due to Avista; November 15, 2022

Lower Clark Fork Watershed Council Projects

- Mid-year report; due to Avista; August 1, 2022
- Annual Work Summary; due to Avista; November 15, 2022

2022 Appendix E Budget

Budget Summary	
Unexpended funds with interest[1]	$17,942
2022 contribution (including GDP inflation rate)	$15,217
Total available	**$33,159**
2022 MC-approved budget	$15,505
Unobligated funds	**$17,654**

[1] Pursuant to the CFSA, unexpended funds with interest in any one year shall not exceed $20,000.

2022 Project	**Carryover[1]**	**2022 Budget**
Pack River Watershed Council, Bonner Soil and Water Conservation District	$666	$4,400
Lower Clark Fork Watershed Council Projects	$0	$10,439
Total	**$666**	**$14,839**
MC-approved budget		**$15,505**

[1] Estimated carryover of unexpended, approved funds as of January 1.

2022 PROJECT PLAN

Pack River Watershed Council, Bonner Soil and Water Conservation District

Project Contact

Sarah Garcia, Bonner Soil and Water Conservation District, (208) 263-5310 x100, Sarah.Garcia@id.nacdnet.net, *and*
Jessica Erickson, Watershed Coordinator, Pack River Watershed Council, bluedeleeuw@gmail.com

Project History

This is a continuing project that, as administered by Bonner County Soil and Water Conservation District (BSWCD), was originally approved by the Management Committee (MC) in 2002. The scope and budget for this project are reviewed by the MC annually.

Background

The Tri-State Water Quality Council, in conjunction with the Bonner Soil and Water Conservation District and the Natural Resources Conservation Service (NRCS), formed the Pack River Watershed Council (PRWC) in the spring of 2001. The PRWC is the only active watershed council in the Lake Pend Oreille area. As such, it provides coordination between private landowners and various agencies towards the continued development of stream habitat improvement and watershed restoration opportunities in this important Lake Pend Oreille tributary. The PRWC received initial grant funding from Environmental Protection Agency (EPA) and the River Network in 2001, and funding from Avista (through Appendix E of the Clark Fork Settlement Agreement) from 2002 through 2021.

We are requesting funding assistance for PRWC in 2022. Watershed coordination work will include continuing our partnership with the U.S. Forest Service, U.S. Fish and Wildlife Service, and Avista to develop a channel restoration project in Grouse Creek. The PRWC will also continue to work closely with the NRCS to connect with willing landowners who would be interested in fisheries habitat enhancement projects. Additional efforts will focus on continuing to develop outreach strategies to identify and engage willing landowners in conservation efforts and habitat enhancement projects in the Pack River watershed as identified in recent habitat assessments (GeoEngineers 2019, 2020).

Goal

The mission of the PRWC is to improve water quality and riparian habitat in the Pack River watershed for people, fish, and wildlife through education, collaboration, and cooperative projects.

Objectives

1. Address the PRWC's management actions identified by the Technical Advisory Council in the Pack River Watershed Management Plan to enhance the quality of the Pack River watershed's natural resources, increase available habitat, and ensure the success of restoration efforts.

2. Engage stakeholders, landowners, and the public in watershed enhancement projects in the Pack River watershed.

3. Coordinate communication, activities, education, and funding between landowners and agencies.

4. Identify available resources to support watershed projects in the Pack River watershed.

Tasks

1. Promote the development and implementation of watershed restoration/enhancement /conservation projects. (Objectives 1, 2, and 3).

2. Promote education on healthy watersheds. (Objectives 1, 2, and 3).

3. Continue community outreach efforts: including an annual newsletter and maintaining a PRWC link on the Bonner Soil and Water Conservation District website. (Objectives 1, 2, and 3).

4. Facilitate meetings between stakeholders and landowners; prepare meeting agendas, and compose meeting summaries. (Objectives 1, 2, and 3).

5. Provide general administrative work to support the development and implementation of watershed projects. (Objectives 1, 2, 3, and 4).

6. Collaborate with the Clark Fork Grant writer to leverage funding for watershed projects in the Pack River watershed. (Objective 4).

7. Attend relevant training opportunities, conferences, and meetings to improve the coordinator's ability to complete the above tasks. (Objectives 1, 2, 3, and 4).

Work Products

- Mid-year report; due to Avista; August 1, 2022
- Annual Newsletter (Fall, 2022)
- Annual Work Summary (including financial report); due to Avista; November 15, 2022

Permitting Requirements

Not applicable for the tasks proposed in this project plan.

Endangered Species Act consultation for this project plan is associated with the 2019 Biological Opinion on the effects of continued operation of the Clark Fork Hydroelectric Project on Bull Trout and designated Bull Trout critical habitat (BiOp). This project plan is consistent with the analyses and conclusions contained in the 2019 BiOp and will adhere to all appropriate Terms and Conditions designed to reduce the extent and effects of incidental take on Bull Trout. No incidental take of Bull Trout is anticipated as a result of this project plan; therefore, no take reporting is required.

Cultural/Historic Resource Review
Not applicable for the tasks proposed in this project plan, there are no ground and/or vegetation disturbing activities, or proposed impacts to cultural/historic resources.

Benefit to the Resource
This project is consistent with the Watershed Councils Program (Appendix E), as well as the Idaho Tributary Habitat Acquisition and Fishery Enhancement Program (Appendix A), as education and outreach from this project facilitates the development of tributary habitat enhancement projects and identification of future enhancement opportunities. The Pack River is the second largest tributary to Lake Pend Oreille and is ranked as a high-priority for restoration and protection under the lake's Key Watershed Bull Trout Problem Assessment (PBTAT 1998). The assessment also ranks the Pack River as having a high potential to increase Bull Trout numbers. Because the Pack River watershed is impaired and largely in private ownership, maintaining landowner involvement in the PRWC and TMDL implementation process (BSWCD 2006) is critical to successful restoration efforts.

Budget

Item	Estimated Carryover[1]	2022 Budget Request
Watershed Coordination	$666	$3,500
Bulk mail, postage & processing	$0	$400
Meeting supplies; copies	$0	$100
Administration Fee (10%)	$0	$400
Total	$666	$4,400
Anticipated Expenditures		$5,066

[1] *Estimated carryover of unexpended, approved funds as of January 1.*

Literature Cited
BSWCD (Bonner Soil and Water Conservation District, Pack River Technical Advisory Committee, Pack River Watershed Council). 2006. Pack River Watershed Management Plan and TMDL Implementation Plan.

GeoEngineers. 2019. Habitat Prioritization Evaluation for Caribou and Hellroaring Creeks. Report to IDFG and Avista. Avista Document Number 2019-0216.

GeoEngineers. 2020. Habitat Prioritization Evaluation for McCormick Creek and Upper Pack River. Report to IDFG and Avista. Avista Document Number 2020-0171.

PBTAT (Panhandle Bull Trout Technical Advisory Team). 1998. Lake Pend Oreille Key Watershed Bull Trout Problem Assessment. Prepared for Lake Pend Oreille Watershed Advisory Group and the State of Idaho. Boise, Idaho.

As approved by the Management Committee on 3/15/2022

2022 PROJECT PLAN

Lower Clark Fork Watershed Council Projects

Project Contact
Brita Olson, Lower Clark Fork Watershed Group (LCFWG), (208) 304-3852, brita@lcfwg.org

Project History
The LCFWG was formed in 2004, and has received continuing support from Clark Fork Settlement Agreement (CFSA) Appendix E in addition to funding under Appendix B as annually approved by the Management Committee.

Background
The organization began as an umbrella group to assist the eight watershed councils in the Lower Clark Fork (LCF): Elk Creek, Prospect Creek, Rock Creek, Whitepine Creek, Bull River, Trout Creek, Pilgrim Creek and Little Beaver Creek. As local landowner involvement waxes and wanes, the LCFWG provides consistent follow-through and is instrumental in bringing local landowners and other resources to the table to assist Avista Corporation (Avista) and other technical agencies with planning, developing, and implementing fish habitat and watershed restoration projects in the CFSA project area. The LCFWG provides administrative support, coordination, technical assistance, and resources to area landowners and watershed councils, and other stakeholders in the LCF project area.

The work load associated with each task (outlined below) is variable depending on activities in the watershed in a given year. The LCFWG requests that funding for each task is kept flexible in order to maximize the productivity achieved with these dollars. The work of the LCFWG is ongoing, in support of many other projects going on in the LCF watershed. It is most closely tied to funding received from CFSA Appendix B for the coordination of LCF projects. Historically, there has been much overlap between these two proposals, and while effort was made in 2017 to distinguish the proposals, there will inevitably continue to be some overlap. For example, this project will fund some grant writing activities, which are often closely tied to the coordination of LCF projects funded by Appendix B.

Additionally, we work to leverage other resources for our work in the LCF watershed. This allows us to expand our capacity and improve the quality of our work. Outside resources and administration funds will complement the work funded through this project.

Goal
The goal of this project plan is to support the ongoing engagement of LCF watershed stakeholders collaborating in support of the CFSA, leverage additional administrative, technical and financial resources, and increase the effectiveness of LCF projects through greater collaboration.

Objectives
1. Engage stakeholders, landowners, and public in watershed projects in the LCF watershed.

2. Facilitate collaboration by providing a forum for watershed stakeholders to interact, work together and share ideas, experiences, and knowledge.

3. Communicate with stakeholders and partners regarding watershed projects and opportunities in the LCF watershed.

4. Leverage resources for LCF projects.

Tasks

1. Hold formal biannual LCFWG meetings, generally in late spring/early summer and late fall/early winter to provide an opportunity for watershed partners to review upcoming work and/or annual accomplishments. In 2022, this will be a deviation from the group's historic tradition of holding quarterly meetings, and a response to changing work environments/expectations brought on by the COVID pandemic. One of the most valuable aspects of regular more frequent (quarterly) meetings has long been not the meeting content, but informal networking invited by an in-person meeting environment. As the world has gone virtual, this benefit has been difficult to sustain on a web conference platform. Instead, biannual meetings will focus on content delivery suitable for a web conference or hybrid platform, and the (still extremely important) networking aspect of these meetings will be fostered under Task 2. (Objectives 1, 2, and 3)

2. When opportunity arises or impetus exists, coordinate additional stakeholder meetings for partners, landowners, or public. In 2022, in addition to project or need specific meetings, the LCFWG will also focus on testing out new models for foster regular networking and community building among watershed partners, such as informal happy hours, picnic lunches, or other meet-ups, that can adapt to the interest of landowner contacts and watershed partners as well as public health concerns. (Objectives 1, 2, and 3)

3. Collaborate with Clark Fork Grant writer to leverage funding to support LCF projects or coordination of LCF activities. (Objective 4)

4. Provide general administrative work in support of LCF watershed projects or watershed council activities. (Objectives 1, 2, 3, and 4)

5. Coordinator will attend appropriate training opportunities, conferences, and meetings to acquire skills to improve her ability to complete the above tasks and to bring knowledge into the LCF watershed to better projects and work products. A focus in the 2022 will be completing online training and implementing some improved technological upgrades/solutions to help support and improve LCFWG's capacity for project management and coordination. Additionally in 2022, this Task will also be matched by a capacity grant from the Montana Watershed Coordination Council Watershed Fund, "Expanding the Restoration Toolkit for the Bull River", aimed at supporting research to further ongoing restoration efforts in the Bull River drainage. The Bull River drainage is where the LCFWG has been most successful at maintaining consistent and ongoing engagement from private landowners in the Lower Clark Fork Watershed. (Objectives 1, 2, 3, and 4)

6. Develop outreach efforts in the local community: develop press releases on current activities, website updates, mailings, events, or other deliverables as appropriate. (Objectives 1, 2, and 3)

7. Continue supporting and developing a Private Land Stewardship Program, in collaboration with the Green Mountain Conservation District (GMCD), Natural Resource Conservation Service (NRCS), and other stakeholders. In 2022, this ongoing program will be supported by a grant from the Department of Natural Resources Watershed Management Grant Program. (Objectives 1, 3, and 4)

Work Products

- Mid-year report; due to Avista; August 1, 2022
- Annual Work Summary; due to Avista; November 15, 2022

Permitting Requirements

Not applicable for the tasks proposed in this project plan.

Endangered Species Act consultation for this project plan is associated with the 2019 Biological Opinion on the effects of continued operation of the Clark Fork Hydroelectric Project on Bull Trout and designated Bull Trout critical habitat (BiOp). This project plan is consistent with the analyses and conclusions contained in the 2019 BiOp and will adhere to all appropriate Terms and Conditions designed to reduce the extent and effects of incidental take on Bull Trout. No incidental take of Bull Trout is anticipated as a result of this project plan; therefore, no take reporting is required.

Cultural/Historic Resource Review

Not applicable for the tasks proposed in this project plan, there are no ground and/or vegetation disturbing activities, or proposed impacts to cultural/historic resources.

Benefit to the Resource

This project is consistent with the Watershed Councils Program (Appendix E), as well as the Montana Tributary Habitat Acquisition and Recreational Fishery Enhancement Program (Appendix B) of the CFSA, as tasks from this project facilitates the development of tributary habitat enhancement projects and identification of future enhancement opportunities. This project exists to support stream protection and enhancement projects in the LCF watershed. The LCFWG serves as a point of contact for long-term follow through with landowners and past projects as well as helps leverage resources to maximize the positive impact of CFSA dollars in the watershed. By facilitating projects that improve riparian and instream habitat, this project also benefits Appendices C and K, state water quality prescriptions, and when located along streams with native salmonids, are consistent with Federal and State of Montana management plans for these species.

Budget

Item	Estimated Carryover[1]	2022 Budget Request
LCFWG staff time, approx. 160 hours (Task 1-5)	$0	$5,280
LCFWG staff time, approx. 40 hours (Task 6)	$0	$1,320
LCFWG staff time, approx. 80 hours (Task 7)	$0	$2,640
Miscellaneous materials and supplies (All tasks)	$0	$250
Administration fee, 10%	$0	$949
Total	$0	$10,439
Anticipated Expenditures		$10,439

[1] *Estimated carryover of unexpended, approved funds as of January 1.*

Task 5 will be complemented by:

- In-kind contributions from Sandpoint Computers (providing technical support and training resources), and
- Montana Watershed Coordination Council Watershed Fund ($3,500 available through 2022)

Task 7 will also be matched by the following sources:

- Montana Department of Natural Resources Watershed Management Grant Program ($17,500 available over two years through December 31, 2023)

2022 ANNUAL IMPLEMENTATION PLAN SUMMARY– APPENDIX F1

Clark Fork Project, FERC No. 2058
Cabinet Gorge and Noxon Rapids Hydroelectric Developments

Title
Clark Fork River Water Quality Monitoring Program

Implementation Staff Lead
Paul Kusnierz, Avista, (406) 847-1274, paul.kusnierz@avistacorp.com

Background
The purpose of this measure is to provide for the systematic, long-term monitoring of nutrients and metals in the lower Clark Fork River as part of the former Tri-State Water Quality Council (TSWQC) Monitoring Program. Excessive nutrient loading and metals contamination in the middle and upper portions of the Clark Fork River were cause for water quality concerns in the lower Clark Fork River - Lake Pend Oreille (LCFR-LPO) system. Interest in monitoring long-term trends in the quality of water entering and exiting the reservoirs, and a desire for a better understanding of how the reservoirs may be functioning as nutrient or metals "sinks" led to consensus that a systematic, long-term, and coordinated nutrient and metals monitoring program for the lower Clark Fork waters should be implemented.

During the collaborative relicensing process and development of the Settlement Agreement, it was agreed that support and use of the TSWQC program to meet the long-term water quality monitoring needs associated with the Clark Fork projects would facilitate a coordinated approach to long-term water quality monitoring of the LCFR-LPO system.

As part of the overall TSWQC program, Appendix F1 supported data collection, analysis and reporting of nutrient and metals data at three sampling locations on the lower Clark Fork River. This included: monthly sampling above Noxon Reservoir, downstream of Noxon Rapids Dam and downstream of Cabinet Gorge Dam, and additional peak flow sampling (six samples during the peak flow period each year) at the Cabinet Gorge site. This data, along with data generated at 29 other sites on the Clark Fork River, was used to assess the status of and trends in water quality (utilizing concentrations and loads) basin-wide. A monitoring program report was prepared annually that summarizes data collection and analysis for each field season (calendar year), and at every five-year interval an evaluation of the data was conducted to assess water quality trends and the effectiveness of water quality measures in the watershed.

In addition, data collected at the Cabinet Gorge site was used to estimate nutrient loading to Lake Pend Oreille from the Clark Fork (Montana) watershed. The Montana/Idaho Border Nutrient Load Agreement (2002) sets a target for total phosphorus to protect open lake water quality of Lake Pend Oreille and also sets load allocations for Montana and local Idaho sources to meet that target. For the purposes of determining that the allocation for Montana (259,500 kg/year total phosphorus) is not being exceeded, the Agreement sets forth monitoring objectives for evaluating nutrient data from the Clark Fork River at the border (i.e., the Cabinet Gorge site).

Therefore, the samples collected below Cabinet Gorge Dam are integral to achieving key objectives of the Clark Fork-Pend Oreille watershed management plan.

At every five-year interval, a review of data is conducted to evaluate water quality trends and the effectiveness of water quality measures in the watershed. These 'trend reports' were completed in 2004, 2008, 2012, and 2019. These evaluations resulted in an analysis of spatial trends in concentration and load, time series trends, statistical comparisons with applicable water quality targets, and an overall interpretation of the water quality health of the three-state basin. Avista staff participated on the TSWQC Monitoring Committee (since 2012 on the Clark Fork River Water Quality Monitoring Committee; CFRWQMC) and assisted in the design and scope of work of the five-year evaluations to ensure consistency with the long-term water quality monitoring needs of the Clark Fork projects.

Because of past exceedances of water quality standards, Idaho Department of Environmental Quality (DEQ) developed and adopted Total Maximum Daily Loads (TMDL) for the Lower Clark Fork River sub-basin in 2007. In order to support TMDL-related data needs as well as monitor potential impacts of future activities that could impact the water quality of the Lower Clark Fork River, Idaho DEQ and other members of the TSWQC Monitoring Committee, including Avista staff, identified metals of concern as copper, zinc, and cadmium to be included in the 2008–2012 monitoring program. These metals have not been collected since 2012.

In October 2012 TSWQC officially closed its doors. This closure was due in large part to decreasing administrative dollars as well as state and federal grants, and also affected the 2012 monitoring program with no monthly sampling occurring in September through November. Without the coordination and facilitation functions once provided by the TSWQC, it was now incumbent upon those active monitoring participants to continue the three state water quality monitoring activities.

In December 2012, the CFRWQMC consisting of Montana DEQ, Idaho DEQ, Missoula Wastewater Treatment Facility, University of Montana, and Avista met to review the previous monitoring program and to devise a more sustainable program. The Washington Department of Ecology continued to maintain their two monitoring sites on the Pend Oreille River. Plum Creek Timber Company and the U.S. Forest Service no longer contribute funds to the program. This group continues to meet annually to review the previous year's sampling efforts, review annual work products, coordinate the upcoming monitoring season, and plan future activities. Beginning in 2015, through a contractual agreement between Montana DEQ and the Clark Fork Coalition (CFC), the CFC has now taken the lead for the group's coordination, facilitation, and the production of the annual water quality reports.

In recent years, irregularities in the discharge hydrograph have occurred in the lower Clark Fork River at the Montana-Idaho border as measured at U.S. Geological Survey (USGS) Gaging Station 12391950 Clark Fork River below Cabinet Gorge Dam. The irregularities include runoff beginning earlier than historically "normal" and a stunted peak flow. These irregularities have spurred discussion among the group regarding the number and timing of sample collection during peak flow monitoring. In 2016, the group requested the contractor conduct an analysis to review historical data to address concerns and provide recommendations on how to move

forward with the peak flow monitoring. In 2017 the CFRWQMC agreed to the following changes in Avista's sampling plan: 1) water quality sampling downstream of Thompson Falls Dam (site number CFR 28) and Noxon Rapids Dam (site number CFR 29) will only occur July–September, and 2) the annual field quality control review will be discontinued. These changes were implemented in a manner to reduce costs to a level that are congruent to Avista's Appendix F1 obligation without the loss of important water quality data.

2022 Project Plans

1. Clark Fork River Water Quality Monitoring Program

Work Products

Clark Fork River Water Quality Monitoring Program

- Estimate of 2021 nutrient loads from the Clark Fork River into Lake Pend Oreille, technical memorandum; final due June 1, 2022
- Annual Project Update: 2021 monitoring report to be prepared by the Clark Fork Coalition; final due October 1, 2022
- Annual Work Summary; due December 1, 2022

2022 Appendix F1 Budget

Budget Summary	
Unexpended funds with interest	$11,322
2022 contribution (including GDP inflation rate)	$22,828
2022 periodic contribution[1]	$10,000
Total available	**$44,150**
2022 MC-approved budget	$44,150
Unobligated funds	**$0**

[1]The Appendix F1 periodic contribution is made available once every five years. This funding is for a private sector consultant to assist in evaluating the monitoring results. Money is being made available through the 2022 AIP process so that work can commence in early 2023.

2022 Project	**Carryover[1]**	**2022 Budget**
Clark Fork River Water Quality Monitoring Program	$4,520	$39,630
Total	**$4,520**	**$39,630**
MC-approved budget		**$44,150**

[1] Estimated carryover of unexpended, approved funds as of January 1.

As approved by the Management Committee on 3/15/2022

2022 PROJECT PLAN

Clark Fork River Water Quality Monitoring Program

Project Contact
Paul Kusnierz, Avista, (406) 847-1274, paul.kusnierz@avistacorp.com

Project History
The Clark Fork River Water Quality Monitoring Program is a continuing project that has been implemented since 1998. The scope and budget for this project are reviewed by the Management Committee (MC) annually.

Background
The purpose of this measure is to provide for the systematic, long-term monitoring of nutrients and metals in the lower Clark Fork River as part of the former Tri-State Water Quality Council Monitoring Program. Excessive nutrient loading and metals contamination in the middle and upper portions of the Clark Fork River were cause for water quality concerns in the lower Clark Fork River - Lake Pend Oreille system. Interest in monitoring long-term trends in the quality of water entering and exiting the reservoirs, and a desire for a better understanding of how the reservoirs may be functioning as nutrient or metals "sinks" led to consensus that a systematic, long-term, and coordinated nutrient and metals monitoring program for the lower Clark Fork waters should be implemented.

Data collected at the Cabinet Gorge site are used to estimate nutrient loading to Lake Pend Oreille from the Clark Fork (Montana) watershed. The 2002 Montana/Idaho Border Nutrient Load Agreement (https://www.deq.idaho.gov/media/468512-_water_data_reports_surface_water_water_bodies_pend_oreille_lake_nutrient_moa.pdf) sets a target for total phosphorus to protect open lake water quality of Lake Pend Oreille and also sets load allocations for Montana and local Idaho sources to meet that target. Therefore, the samples collected below Cabinet Gorge Dam are integral to achieving key objectives of the Clark Fork-Pend Oreille watershed management plan.

At every five-year interval, a review of data is conducted to evaluate water quality trends and the effectiveness of water quality measures in the watershed. These trend reports were completed in 2004, 2008, 2012, and 2019. These evaluations contain analysis of spatial trends in concentration and load, time series trends, statistical comparisons with applicable water quality targets, and an overall interpretation of the water quality health of the three-state basin.

Goal
The goal of this project is to provide for systematic, long-term monitoring of nutrients which enter, are retained in, and which pass the Noxon Rapids and Cabinet Gorge Projects.

Objectives
1. Provide a long-term dataset for nutrients in the lower Clark Fork River.

2. Collect nutrient data that can be used to estimate nutrient loading to Lake Pend Oreille.

Tasks

1. Continue to implement, in an *ad-hoc* fashion, the overall nutrient monitoring effort by collecting the water quality constituents listed in Table 1. (Objectives 1 and 2)

Table 1. Water quality constituents collected from the Clark Fork River for this project plan.

Analyte	Method	Project Required Quantitation Limit
Total Phosphorus (TP)	EPA 365.1	2 µg/l
Total Persulfate Nitrogen (TPN)	A4500 N-C	50 µg/l
Soluble Nitrate + Nitrite-Nitrogen (NO_2+NO_3-N)	EPA 353.2	2 µg/l
Soluble Ammonia-Nitrogen (NH_3+NH_4-N)	EPA 350.1	10 µg/l
Soluble Reactive Phosphorus (SRP)	EPA 365.1	2 µg/l

2. Continue funding and personnel needs for the water quality sampling program which includes monthly March through November sampling and peak flow sampling at CFR Station 30 and monthly July through September sampling at CFR Station 28 and CFR Station 29, QA/QC assistance (contract assistance), sample shipment, and water sample analysis (contract assistance).

Specific methods for this project can be found in MDEQ (2020). (Objectives 1 and 2)

Work Products

- Estimate of 2021 nutrient loads from the Clark Fork River into Lake Pend Oreille, technical memorandum; final due June 1, 2022
- Annual Project Update: 2021 monitoring report to be prepared by the Clark Fork Coalition; final due October 1, 2022
- Annual Work Summary; due December 1, 2022

Permitting Requirements

Not applicable for the tasks proposed in this project plan.

Endangered Species Act consultation for this project plan is associated with the 2019 Biological Opinion on the effects of continued operation of the Clark Fork Hydroelectric Project on Bull Trout and designated Bull Trout critical habitat (BiOp). This project plan is consistent with the analyses and conclusions contained in the 2019 BiOp and will adhere to all appropriate Terms and Conditions designed to reduce the extent and effects of incidental take on Bull Trout. No incidental take of Bull Trout is anticipated as a result of this project plan; therefore, no take reporting is required.

Cultural/Historic Resource Review

Not applicable for the tasks proposed in this project plan, there are no ground and/or vegetation disturbing activities, or proposed impacts to cultural/historic resources.

Benefit to the Resource

This project is the direct implementation of Appendix F1 under the Clark Fork Settlement Agreement (Avista 1999). It also provides data that the states of Montana and Idaho can use in implementation of the Federal Clean Water Act.

Idaho water quality standards are based upon support of beneficial uses, and in particular "Cold Water Aquatic Life." Continued water quality monitoring is critical to evaluating the health of all native fisheries in the lower Clark Fork River and Lake Pend Oreille.

Budget

Item	Estimated Carryover[1]	2022 Budget Request
Technician (0.04 FTE)	$1,500	$3,696
Biologist (0.01 FTE)	$0	$1,130
Supplies	$0	$1,000
Laboratory Analysis	$2,000	$10,000
QA/QC, Nutrient Load Evaluation, Meetings and Technical Consultation	$1,020	$13,804
2018–2022 5-year trends analysis	$0	$10,000
Total	$4,520	$39,630
Anticipated Expenditures		$44,150

[1] *Estimated carryover of unexpended, approved funds as of January 1.*

Literature Cited

Avista Corporation. 1999. Application for New License, Volume III Settlement Agreement. Avista Corporation. Spokane, Washington.

MDEQ (Montana Department of Environmental Quality). 2020. Clark Fork River-Pend Oreille Watershed Water Quality Monitoring Program from Headwaters to Below Cabinet Gorge Dam – Quality Assurance Project Plan (QAPP), Update for 2018-2022 Sampling Program. Montana Department of Environmental Quality: Helena, Montana.

2022 ANNUAL IMPLEMENTATION PLAN SUMMARY – APPENDIX F2

Clark Fork Project, FERC No. 2058
Cabinet Gorge and Noxon Rapids Hydroelectric Developments

Title
Monitoring of Noxon Reservoir Stratification and Mobilization of Sediment Nutrients/Metals

Implementation Staff Lead
Paul Kusnierz, Avista, (406) 847-1274, paul.kusnierz@avistacorp.com

Background
The purpose of this monitoring effort is to collect data concerning the potential for nutrients or metals deposited in Noxon Reservoir sediments to remobilize back into the water column during periods of reservoir stratification.

Elevated nutrient levels and metals contamination are high-priority water quality concerns within the Clark Fork River – Lake Pend Oreille (CFR-LPO) system. The available information on sediment, nutrient, and metals transport and deposition in the CFR-LPO system indicates that Noxon Reservoir acts as a beneficial sediment, nutrient, and metals "sink" of varying efficiency, limiting the degree to which they are transported downstream into Lake Pend Oreille. The Water Resources Work Group, now known as the Water Resources Technical Advisory Committee (WRTAC), identified an information need related to whether low oxygen conditions in deeper waters of the reservoir during the rare periods of reservoir stratification might allow for the remobilization of nutrients or metals previously deposited and retained in reservoir sediments. Therefore, it was decided that, in conjunction with the Tri-State Water Quality Council (TSWQC) monitoring program, a better understanding of the stratification related limnologic processes in Noxon Reservoir would further improve the overall understanding and management of water quality issues, concerns, and needs in the CFR-LPO system. Appendix F2 called for the monitoring to be conducted three times during the term of the FERC license.

As per this appendix, average daily inflows to Noxon Reservoir are monitored, via the USGS website, during the July 1 through September 30 period. If outflow from Noxon is equal to or less than 8,000 cfs for at least 4 out of 7 consecutive days during the noted time period, water column monitoring will commence. This monitoring "trigger" was first reached on August 22, 2000. Avista contracted with PBS&J, Inc. (formerly Land & Water Consulting, Inc.), the same contractor involved in the overall TSWQC monitoring program, to: a) monitor reservoir stratification, b) develop water sampling protocols, c) perform analytical quality assurance and quality controls, and d) perform data management and reporting. Reservoir water column monitoring continued throughout the month of September 2000. The reservoir did thermally stratify; however, low dissolved oxygen conditions were not detected at depth, the trigger for intensive nutrient and metals sampling.

Based upon the 2000 sampling effort, and considering the low flow situation in 2001, a similar sampling effort began on July 26, 2001, before the predetermined flow trigger was met. This

2001 sampling effort detected both thermal and oxygen stratification, and therefore nutrient and metals samples were taken, and subsequently analyzed (Noxon Rapids Reservoir, Fall 2001 Stratification Monitoring Results, September 2002, Land & Water Consulting, Inc.). Listed below are several of PBS&J's conclusions:

- The potential for widespread mobilization of nutrients or metals from reservoir sediments due to reducing conditions associated with stratification appeared to be low.
- Ongoing monthly surface water monitoring by the Tri-State Water Quality Council will continue to document upstream and downstream differences in nutrient concentrations at the Noxon HED, thus independent summer stratification monitoring by Avista for nutrient components is probably unnecessary.
- Metals mobilization from reservoir sediments did not appear to be an issue of concern in Noxon Rapids HED. Consequently, further sampling for metals does not appear justified and the Avista stratification monitoring for metals effects should be discontinued.

As per this appendix, collection of additional data, concerning the potential for nutrients or metals deposited in Noxon Reservoir sediments to remobilize back into the water column during periods of reservoir stratification, was to occur as many as three different years of stratified reservoir conditions over the term of the new license. Reservoir sampling occurred in 2000 and 2001. In 2022, stratification sampling will occur in Noxon Reservoir if outflow from Noxon Rapids Dam is less than or equal to 8,000 cfs on 2 out of 7 consecutive days when inflow and flow forecasts indicate that the average daily outflow of equal to or less than 8,000 cfs for 4 out of 7 consecutive days will be met. The trigger must be met between July 1 and August 7.

2022 Project Plans

1. Monitoring of Noxon Reservoir Stratification and Mobilization of Sediment Nutrients/Metals

Work Products

Monitoring of Noxon Reservoir Stratification and Mobilization of Sediment Nutrients/Metals

- Annual Work Summary; due December 1, 2022
- Comprehensive Project Report (if stratification sampling occurs); final due May 1, 2023

2022 Appendix F2 Budget

Budget Summary	
Unexpended funds with interest	$0
2022 contribution (estimate)[1]	$55,107
Total available	**$55,107**
2022 MC-approved budget	$55,107
Unobligated funds	**$0**

[1] *Estimated costs are projections made now; however, Avista will pay the actual costs as approved by the Management Committee.*

2022 Project	Carryover[1]	2022 Budget
Monitoring of Noxon Reservoir Stratification and Mobilization of Sediment Nutrients/Metals	$55,107	$0
Total	**$55,107**	**$0**
MC-approved budget		**$55,107**

[1] *Estimated carryover of unexpended, approved funds as of January 1.*

2022 PROJECT PLAN

Monitoring of Noxon Reservoir Stratification and Mobilization of Sediment Nutrients/Metals

Project Contact

Paul Kusnierz, Avista, (406) 847-1274, paul.kusnierz@avistacorp.com

Project History

This is a continuing project that has been implemented since 1999 with stratification sampling occurring in 2000 and 2001. The scope and budget for this project are reviewed by the Management Committee (MC) annually. We are requesting that the project plan for the stratification sampling be carried forward in 2022. In 2017, Avista contracted with HydroSolutions, Inc to perform the work outlined in this project plan. The quality assurance project plan for the stratification sampling was completed in September of 2017 (Hydrosolutions 2017). The flow trigger was not met by the required time period in any year 2017–2021 and as a result no stratification sampling occurred. The sampling will occur in 2022 if the flow trigger is met.

Background

Appendix F2 of the Clark Fork Settlement Agreement (Avista 1999) called for stratification monitoring of Noxon Reservoir to be conducted three times during the term of FERC license no. 2058. The purpose of this monitoring effort is to collect data concerning the potential for nutrients or metals deposited in Noxon Reservoir sediments to remobilize back into the water column during periods of reservoir stratification. Sampling for this appendix occurred in 2000 and 2001 with the data suggesting that there is low potential for widespread mobilization of nutrients or metals from Noxon Reservoir sediments (Land & Water 2002).

Data collected in 2000 suggested that stratification of Noxon Reservoir occurs prior to the flow trigger (outflow from Noxon Rapids Dam is equal to or less than 8,000 cfs for at least 4 out of 7 consecutive days) being met. In keeping with sampling performed in 2001, when outflow from Noxon Rapids Dam is equal to or less than 8,000 cfs for at least 2 out of 7 consecutive days when inflow and flow forecasts indicate that the average daily outflow of equal to or less than 8,000 cfs for 4 out of 7 consecutive days will be met, reservoir stratification sampling will commence. The outflow value of equal to or less than 8,000 cfs must be due to flow conditions and not due to work at one of the dams or other non-flow-related event. In 2017, the timing requirements for the flow trigger to initiate stratification sampling were changed by the MC via Consent Mail. This change specified that the time period during which the flow trigger must occur to commence stratification sampling will be from July 1 to August 7. If the third stratification sampling event has not occurred within 10 years prior to the FERC license expiring, the Water Resources Technical Advisory Committee will re-evaluate having this constraint placed on the sampling trigger and make change recommendations to the MC.

In 15 of the 21 years since 2001, the flow trigger (outflow from Noxon Rapids Dam equal to or less than 8,000 cfs for at least 4 out of 7 consecutive days during July 1 through September 30) has been reached. This project plan calls for stratification sampling if the flow trigger is expected to be achieved in 2022. If stratification sampling yields a surface to bottom temperature

differential greater than 5 °C and dissolved oxygen concentration less than 4.0 mg/l near the bottom, nutrients and metals sampling will occur as well.

Goal

The goal of this project is to perform the final of the three stratification monitoring events called for in Appendix F2 of the Clark Fork Settlement Agreement.

Objectives

1. Document whether mobilization of nutrients and metals occurs in Noxon Reservoir when low flow, temperature, and dissolved oxygen triggers are achieved.

Methods

Outflow from Noxon Rapids Dam will be monitored from July 1 through September 30. Reservoir stratification sampling will first occur within 7 days of flow being equal to or less than 8,000 cfs for at least 2 out of 7 consecutive days. Stratification sampling will occur every 10-14 days thereafter with no more than 2 sampling events occurring each month. This sampling will continue until Noxon Reservoir average daily outflow increases to greater than 12,000 cfs for 4 out of 7 consecutive days or September 30, whichever comes first. This will result in 0–6 stratification sampling events occurring depending on when and if the flow trigger is reached in 2022.

Sampling will consist of collecting vertical profiles of water temperature, dissolved oxygen, pH, and conductivity and a Secchi disk depth at three sites on Noxon Reservoir in 2022 (T27A, RRxing, and MT Hwy 200; Figure 1). These three sites were among five established during reservoir stratification sampling in 2000 (Land & Water 2001) and were sampled again in 2001 (Land & Water 2002). These three sites have been specifically selected for this project because they are the three deepest, had the greatest temperature differentials in 2001 sampling and were the only three to have dissolved oxygen less than 4.0 mg/l in 2001 (Land & Water 2002). This third sampling event will be the final sampling needed to fulfill Avista's mitigation obligation for Clark Fork Settlement Agreement Appendix F2 and FERC License Article 410.

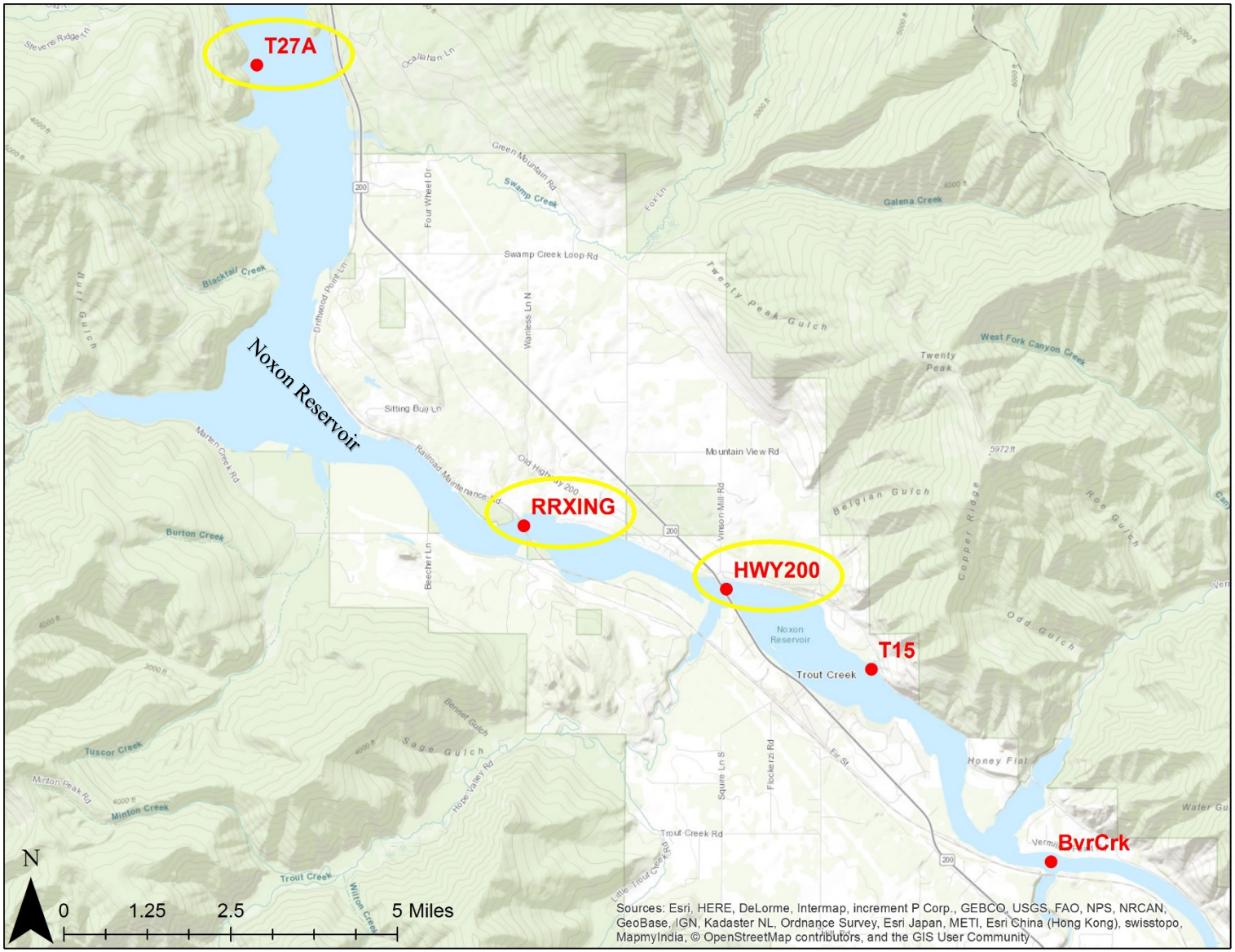

FIGURE 1. Five sites established for reservoir stratification sampling in 2000. The three sites within the yellow ovals are proposed for sampling in 2022 if the flow trigger occurs.

When reservoir stratification monitoring at a site yields a surface to bottom temperature differential greater than 5 °C and dissolved oxygen concentration less than 4.0 mg/l near the bottom, nutrients and metals samples will also be collected. No more than two water sampling efforts will be conducted at a station in the same year.

Nutrients and metals samples (Table 1) will be collected by a contractor from two water depths:

1) A grab sample at 2 m above the bottom; and
2) A composite sample from within the near surface zone equal to twice the observed Secchi depth.

These samples will then be shipped to a laboratory for analysis.

TABLE 1. Proposed analyte list for 2022 nutrient and metals sampling.

Analyte[1]	Method[2]	Required Reporting Limit (µg/l)[3]
Total phosphorus	EPA 365.1	3
Soluble Reactive Phosphorus	EPA 4500-P-G	2
Total Persulfate Nitrogen	SM 4500-N(C)	40
Total Ammonia Nitrogen	EPA 350.1	50
Nitrate + Nitrite-Nitrogen	EPA 353.2	10
Arsenic	EPA 200.8	1
Cadmium	EPA 200.8	0.03
Copper	EPA 200.8	1
Lead	EPA 200.8	0.3
Zinc	EPA 200.7	8
Chlorophyll-a	A 10200H 2	Not listed

[1] Metals samples will be collected for both total recoverable and dissolved fractions.
[2] With the exception of soluble reactive phosphorus these are the preferred methods listed in MDEQ (2012).
[3] With the exception of soluble reactive phosphorus these are the required reporting limits listed in MDEQ (2012).

Work Products

- Annual Work Summary; due December 1, 2022
- Comprehensive Project Report (if stratification sampling occurs); final due May 1, 2023

Permitting Requirements

Not applicable for the tasks proposed in this project plan.

Endangered Species Act consultation for this project plan is associated with the 2019 Biological Opinion on the effects of continued operation of the Clark Fork Hydroelectric Project on Bull Trout and designated Bull Trout critical habitat (BiOp). This project plan is consistent with the analyses and conclusions contained in the 2019 BiOp and will adhere to all appropriate Terms and Conditions designed to reduce the extent and effects of incidental take on Bull Trout. No incidental take of Bull Trout is anticipated as a result of this project plan; therefore, no take reporting is required.

Cultural/Historic Resource Review
Not applicable for the tasks proposed in this project plan, there are no ground and/or vegetation disturbing activities, or proposed impacts to cultural/historic resources.

Benefit to the Resource
This project is the direct implementation of Appendix F2 under the Clark Fork Settlement Agreement (Avista 1999). It also provides data that the states of Montana and Idaho can use in implementation of the Federal Clean Water Act.

Idaho and Montana water quality standards are based upon support of beneficial uses, and in particular "Cold Water Aquatic Life." In addition there are fish consumption advisories for both Noxon and Cabinet Gorge reservoirs related to metals. A third year of stratification sampling in Noxon Reservoir will further clarify whether anoxic conditions resulting from stratification in Noxon Reservoir result in the release of nutrients and metals from reservoir sediments. Understanding the dynamics of this potential occurrence is important to evaluating the health of fishes and other aquatic life in the lower Clark Fork River and Lake Pend Oreille.

Budget

Item	Estimated Carryover[1]	2022 Budget Request
Contractor Stratification Sampling, Laboratory Analysis, and Reporting	$55,107	$0
Total	$55,107	$0
Anticipated Expenditures		$55,107

[1] *Estimated carryover of unexpended, approved funds as of January 1.*

Literature Cited
Avista Corporation. 1999. Application for New License, Volume III Settlement Agreement. Avista Corporation. Spokane, Washington.

Hydrosolutions. 2017. Noxon Reservoir Stratification Sampling: Sampling and Analysis Plan Quality Assurance Project Plan. Hydrosolutions: Helena, Montana.

Land & Water (Land & Water Consulting, Inc.). 2001. Avista Noxon Reservoir, Fall 2000 Stratification Monitoring Results. Land & Water Consulting, Inc.: Missoula, Montana.

Land & Water (Land & Water Consulting, Inc.). 2002. Noxon Rapids Reservoir, Fall 2001 Stratification Monitoring Results. Land & Water Consulting, Inc.: Missoula, Montana.

MDEQ (Montana Department of Environmental Quality). 2012. Water Quality Planning Bureau Field Procedures Manual for Water Quality Assessment Monitoring. Montana Department of Environmental Quality: Helena, Montana.

2022 ANNUAL IMPLEMENTATION PLAN SUMMARY – APPENDIX F3

Clark Fork Project, FERC No. 2058
Cabinet Gorge and Noxon Rapids Hydroelectric Developments

Title
Aquatic Organism Tissue Analysis

Implementation Staff Lead
Paul Kusnierz, Avista, (406) 847-1274, paul.kusnierz@avistacorp.com

Background
The purpose of this measure is to provide for a commitment on the part of Avista to fund the collection and analysis of fish or other aquatic organism tissue samples from Noxon or Cabinet Gorge reservoirs for the presence of heavy metals or other substances of concern. While the Water Resources Technical Advisory Committee (WRTAC) agreed that tissue analysis was not warranted in reservoir waters on a routine basis, they were interested in seeing metals analysis included in the former Tri-State Water Quality Council's monitoring along the lower Clark Fork River (provided for in Appendix F1). Therefore, this appendix retains a commitment from Avista to fund tissue analysis should public health or other concerns arise in the future.

In 2004, and in response to a previous WRTAC request, an annotated bibliography on Clark Fork River-Lake Pend Oreille bed sediment and fish tissue information was produced and distributed. Information from the state of Montana pertaining to acceptable toxin levels in fish tissue was also made available. Also in 2004, fish were collected during the fall Noxon Reservoir sampling conducted through Appendix B activities and the 2003/2004 experimental trap netting operations on Lake Pend Oreille conducted through Appendix F5 activities. Based upon results (non-Clark Fork Settlement Agreement funded) obtained in 2005, both Montana Fish, Wildlife, and Parks (MFWP) and Idaho Department of Health and Welfare issued fish consumption advisories to the angling public based upon fish tissue mercury and/or PCB levels.

During the fall 2010 reservoir sampling conducted through Appendix B activities, MFWP staff collected fish and crayfish tissue samples from both Noxon and Cabinet Gorge reservoirs for mercury analysis. Based upon results (non-Clark Fork Settlement Agreement funded) obtained in 2011, MFWP updated fish consumption advisories (see: fwp.mt.gov) to the angling public based upon fish and crayfish tissue mercury and/or PCB levels.

During spring 2014, MFWP and Avista staff collected Northern Pike, Walleye, Smallmouth Bass, and Yellow Perch tissue samples from Noxon Reservoir for PCB's dioxin and furan analysis, with a final report produced by MFWP in 2015.

During the spring and fall 2015 reservoir sampling, MFWP and Avista staff again collected Northern Pike, Walleye, Smallmouth Bass and Yellow Perch tissue samples from both Noxon and Cabinet Gorge reservoirs for mercury (Hg) analysis, with a final report being produced in December, 2017.

2022 Project Plans

1. Noxon and Cabinet Gorge Reservoirs Fish Mercury Study

Work Products

Noxon and Cabinet Gorge Reservoirs Fish Mercury Study

- Annual Work Summary; due December 1, 2022
- Lab report on fish tissue analysis; final due May 1, 2022
- Comprehensive Project Report; final due November 1, 2022
- Incorporation of results into Montana's fish consumption guidelines; final due May 1, 2022 (if Montana's new online system is available)

2022 Appendix F3 Budget

Budget Summary	
Unexpended funds	$15,000
2022 contribution (periodic)[1]	$0
Total available	**$15,000**
2022 MC-approved budget	$10,000
Unobligated funds	**$5,000**

[1] Avista will pay the actual costs in an amount not to exceed $15,000 during any five-year period, as defined in the CFSA. The $15,000 for the current five-year cycle was first made available in 2020.

2022 Project	Carryover[1]	2022 Budget
Noxon and Cabinet Gorge Reservoirs Fish Mercury Study	$10,000	$0
Total	**$10,000**	**$0**
MC-approved budget		**$10,000**

[1] Estimated carryover of unexpended, approved funds as of January 1.

As approved by the Management Committee on 3/15/2022

2022 PROJECT PLAN

Noxon and Cabinet Gorge Reservoirs Fish Mercury Study

Project Contacts

Jason Blakney, Montana Fish, Wildlife and Parks (MFWP), (406) 382-3033, jblakney@mt.gov
and
Trevor Selch, MFWP, (406) 444-5686, tselch@mt.gov

Project History

This is a continuing project that has been implemented on a recurring basis with funding approved by the Management Committee (MC) in 2005, 2010, 2014, and 2015. The scope and budget for this project are reviewed by the MC each time the project is submitted. This project was not implemented in 2020 due to COVID-19 concerns preventing gillnetting of Noxon and Cabinet Gorge reservoirs. It was implemented as planned in 2021.

Background

The reservoirs on the lower Clark Fork River are "sinks" for contaminants, largely mercury (Hg). Elevated Hg levels found in fish are due to many factors, including the physio-chemical dynamics of the reservoirs, and the food habits and growth rates in fish. Unfortunately, Noxon and Cabinet Gorge reservoirs contain fish with some of the highest Hg concentrations in Montana. Analyses from 2015 found Hg concentrations as high as 2.6 ppm in large Walleye (Selch 2017). Any fish Hg concentration greater than 1.18 ppm is considered unsafe for consumption for women and children.

Sampling waterbodies that contain fish with elevated Hg concentrations routinely is important to understand the risks to human health from fish consumption and assess the variability that occurs between sampling events. Mercury accumulation in fishes is influenced primarily by their diet. As a result, seasonal and ontogenetic changes in diet composition and prey contaminant levels can have an important influence on Hg concentration in predatory fishes. Typically, as young, piscivorous fish switch from small, invertebrate prey to larger, vertebrate prey (e.g., other fishes), their Hg consumption (and accumulation) increases. Some populations of piscivorous fish (e.g., Walleye, bass) rely heavily on benthic sources throughout their life cycle particularly when fish prey are limited. In these cases, Hg concentrations can be variable, depending on prey contaminant levels and consumption rates by the predator.

Seasonal-related variation in Hg concentration of fishes can have important implications for standardized monitoring efforts and fish consumption advisories. Spring-spawning fish allocate the majority of their energy into reproductive growth during the fall and winter months. Mercury consumed during this time period is stored in the muscle tissue (protein) with no dilution occurring through somatic growth, often resulting in elevated spring Hg concentrations compared to summer and fall. Thus, seasonal patterns of Hg in fish can be highly variable between systems and a single annual Hg sample is not representative of the population throughout the year and should be accounted for when classifying and comparing lakes, or when developing standardized sampling protocols.

Noxon Walleye generally had higher Hg concentrations in 2005 and 2015 than in 2010 (Figure 1). However (and based on a smaller sample size), Cabinet Gorge Walleye had higher concentrations in 2010. Northern Pike samples were more consistent over time, although Hg concentrations in the two largest size groups declined in 2015. Additionally, spring and fall samples were collected for the first time in 2015. In 14 of the 17 species/size groups which were compared, between season mean values were higher in the spring (Selch 2017). However, only in four of those groups would more restrictive guidelines have resulted.

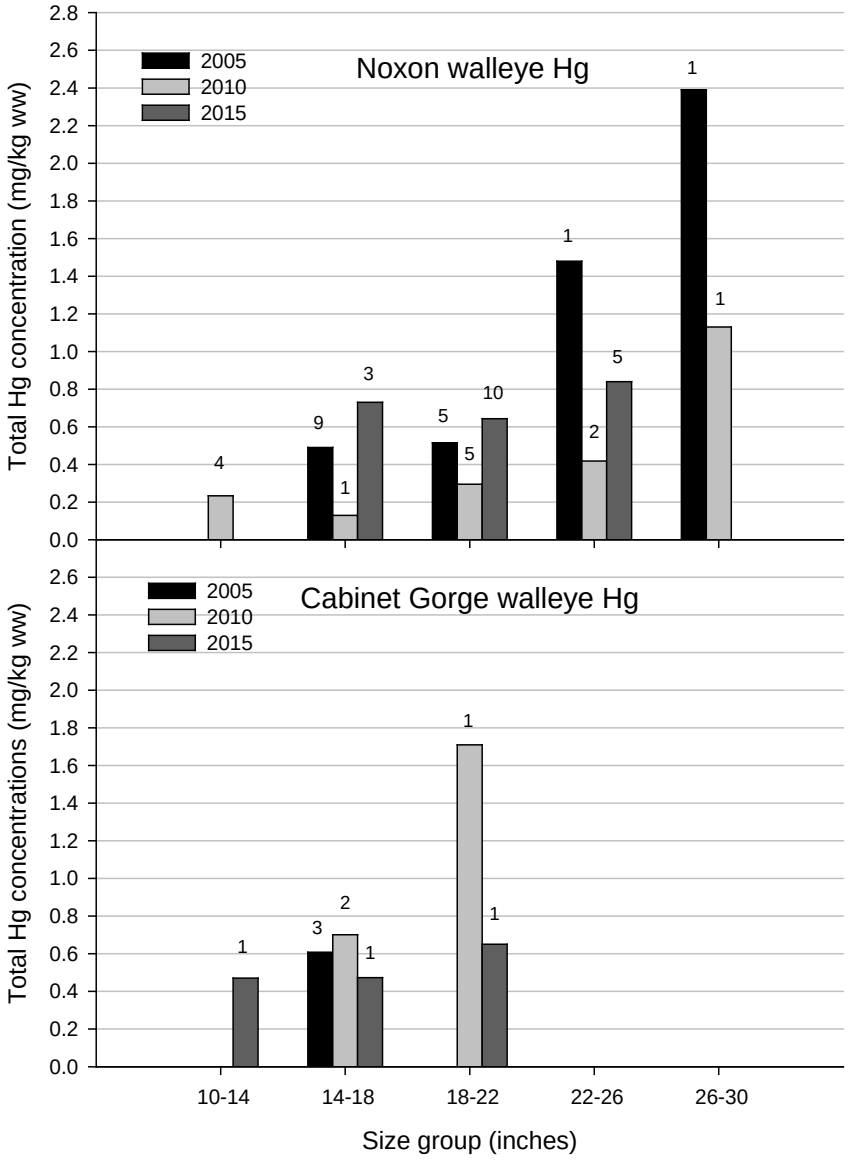

FIGURE 1. Mean fall total mercury (Hg) concentrations from Noxon (upper) and Cabinet Gorge (lower) reservoirs Walleye for five, four-inch size groups. Numbers above each bar represent the fish sample size.

Goal
The goal of this project is to document Hg concentrations in different size groups of popular sport fish in Noxon and Cabinet Gorge reservoirs.

Objectives
1. Collect fish from Noxon and Cabinet Gorge reservoirs for Hg testing.

Methods
The field season of 2020 represented five-years since the last Hg sample events on Noxon and Cabinet Gorge reservoirs. However, sampling did not occur in 2020. Sampling all available size groups of Smallmouth Bass, Northern Pike, Walleye, and Yellow Perch in the fall 2021 would allow us to compare changes in fish Hg concentrations over a 15-year period. Most fish will be collected during routine fall gillnetting in both reservoirs. We will also opportunistically collect fish during spring electrofishing to continue to evaluate some seasonal differences.

Specific targets for this project are as follows:
(1) Collect (10–15) Northern Pike from each of 6 size groups, including 10–14, 14–18, 18–22, 22–26, 26–30, and 30+ inches. Within each size group, fish muscle tissues will be excised and composited in groups for analysis (3 composites of 5 fish).
(2) Collect (10–15) Smallmouth Bass from each of 3 size groups, including 10–14, 14–18, and 18–22 inches. Within each size group, fish muscle tissues will be excised and composited in groups for analysis (3 composites of 5 fish).
(3) Collect (10–15) Walleye from each of 5 size groups, including 10–14, 14–18, 18–22, 22–26, 26–30 inches. Within each size group, fish muscle tissues will be excised and composited in groups for analysis (3 composites of 5 fish). Attempts will be made to capture Largemouth Bass of similar size groups to compare between the two species, given their diets are likely not analogous for at least portions of the year. However, attempts to capture an adequate number of Largemouth Bass via electrofishing and using gillnets have be unsuccessful in the past.
(4) Collect (10–15) Yellow Perch from each of 2 size groups, including 6–10, and 10–14 inches. Within each size group, fish muscle tissues will be excised and composited in groups for analysis (3 composites of 5 fish).

Work Products
- Annual Work Summary; due December 1, 2022
- Lab report on fish tissue analysis; final due May 1, 2022
- Comprehensive Project Report; final due November 1, 2022
- Incorporation of results into Montana's fish consumption guidelines; final due May 1, 2022 (if Montana's new online system is available)

Permitting Requirements
Not applicable for the tasks proposed in this project plan. Fish will be collected during existing MFWP sampling.

Endangered Species Act consultation for this project plan is associated with the 2019 Biological Opinion on the effects of continued operation of the Clark Fork Hydroelectric Project on Bull

Trout and designated Bull Trout critical habitat (BiOp), and the USFWS-MFWP Cooperative Agreement pursuant to Section 6 of the Act. This project plan is consistent with the analysis and conclusions contained in the 2019 BiOp and the USFWS- MFWP Cooperative Agreement, and will adhere to all appropriate Terms and Conditions designed to reduce the extent and effects of incidental take on Bull Trout. Incidental take reporting for this project plan will be included in the annual Biological Opinion report as required by Term and Conditions 15–18 of the 2019 Incidental Take Statement, as well as MFWP's annual Section 6 report to the USFWS.

Cultural/Historic Resource Review
Not applicable for the tasks proposed in this project plan, there are no ground and/or vegetation disturbing activities, or proposed impacts to cultural/historic resources.

Benefit to the Resource
Sampling waterbodies that contain fish with elevated Hg concentrations recurrently (e.g., every five years) is important to understand the risks to human health from fish consumption and assess the variability that occurs between sampling events. The reservoirs created by Avista's dams have created mercury "sinks" which have exacerbated the concentrations of these contaminants. They have also enhanced habitats for non-native piscivores which are typically sought after for food, but which accumulate contaminants at a high rate. Appendix F3 of the Clark Fork Settlement Agreement was created specifically for this purpose.

Budget
The maximum total cost if all size groups are sampled in the spring and fall would be $10,000. In most years, only about two-thirds of those size groups have been filled, so the actual cost may be less.

Item	Estimated Carryover[1]	2022 Budget Request
Lab analysis of 50–100 composites Yellow Perch, Northern Pike, Walleye, and Smallmouth Bass from Noxon and Cabinet Gorge reservoirs[2]	$10,000	$0
Total	$10,000	$0
Anticipated Expenditures		$10,000

[1] *Estimated carryover of unexpended, approved funds as of January 1.*
[2] *Largemouth Bass may also be incorporated into this lab analysis if an adequate sample size can be obtained.*

Literature Cited
Selch, T. 2017. Mercury and Selenium Assessment in Fish from Noxon Rapids and Cabinet Gorge Reservoirs. Project Completion Report. Aquatic Organism Tissue Analysis, Appendix F3. Prepared for Avista and Montana Fish, Wildlife and Parks.

2022 ANNUAL IMPLEMENTATION PLAN SUMMARY – APPENDIX F4

Clark Fork Project, FERC No. 2058
Cabinet Gorge and Noxon Rapids Hydroelectric Developments

Title
Water Quality Protection and Monitoring Plan for Maintenance, Construction, and Emergency Activities

Implementation Staff Lead
Eric Oldenburg, Avista, (406) 847-1290, eric.oldenburg@avistacorp.com

Background
In the past, greater than normal reservoir drawdown and/or restricted discharge at the Cabinet Gorge Project have occasionally been required during emergency situations (e.g., drowning or a vehicle in the river) or for maintenance purposes (e.g., tailrace and dam inspections). In discussing the types of activities that have required unusual project operations in the past or that might require them in the future, the WRTAC agreed that a standardized set of policies and procedures for dealing with these activities would help to ensure that impacts to water quality or aquatic resources are minimized or avoided.

The purpose of this measure was to provide for the development and implementation of a Water Quality Protection and Monitoring Plan for Maintenance, Construction, and Emergency Activities (Plan). The goal of the Plan is to minimize or eliminate negative effects associated with project related maintenance, construction, and emergency activities on Clark Fork River water quality and associated resources. The intent was to have clearly defined policies and plans for notification of, and consultation with, resource agencies prior to undertaking planned maintenance or construction activities that require a change from normal project discharge or reservoir levels (i.e., other than as provided for in the General Operating Limits for Noxon Rapids, and Cabinet Gorge, Project Operations Package PM&E, Settlement Agreement Appendix T). The Plan was also to include standardized agency notification guidelines, as well as water quality and resource protection and monitoring actions that will be implemented in the event of unforeseen and sudden changes to project operations due to emergency or other unforeseen circumstances.

After nearly 16 months of work by Avista staff and involved WRTAC members, the Management Committee (MC) approved the final Plan in September of 2001. As part of Avista's required annual reporting process, the MC approved Plan was submitted to FERC on April 15, 2002, which also began Plan implementation.

In 2010, Avista believed it was time to revise the original 2002 Plan and the MC concurred at their March 2010 meeting. At their September 2010 meeting, the WRTAC decided to have the original WRTAC entities (USFS, Kalispel Tribe, IDFG, MFWP, Idaho DEQ, and Montana DEQ) that worked on producing the first plan review the 2010 final draft Plan. The MC approved the revised 2010 Plan via consent mail on December 3, 2010. The FERC approved the 2010 Plan by Order dated June 23, 2011.

Implementation of the Water Quality Protection and Monitoring Plan for Maintenance, Construction, and Emergency Activities is limited to a small number of tasks and all costs are borne by Avista. Thus, all required elements are listed below and a formal Project Plan is not necessary.

2022 Project Plans

- Avista Hydro Generation and Production and Environmental Affairs staff will regularly communicate to review and discuss planned maintenance and/or construction activities that may affect Cabinet Gorge minimum flow and/or reservoir elevation general operating limits.
- Pursuant to USFS 4(e) Condition 6 in Avista's FERC license, Avista will identify those activities which may affect recreational use or access and provide notification no less than 60 days prior to construction activities, 30 days prior to maintenance activities, and as soon as possible for emergency activities. Proper implementation of the Water Quality Protection and Monitoring Plan ensures this condition will be met.
- In the event that standard operating procedures for the Clark Fork Project (minimum flow and/or reservoir elevations) are interrupted, implement the MC approved, Water Quality Protection and Monitoring Plan for Maintenance, Construction, and Emergency Activities at the Cabinet Gorge and Noxon Rapids HEDs, including its protocol for agency notification, monitoring, and Best Management Practices.
- Annually update the designated contacts for the Plan, as needed.

Work Products

- There are no reports or work products associated with the Water Quality Protection and Monitoring Plan for Maintenance, Construction, and Emergency Activities.

2022 Appendix F4 Budget

Budget Summary	
Unexpended funds	$0
2022 contribution	$0
Total available[1]	**$0**
2022 MC-approved budget	$0
Unobligated funds	**$0**

[1] *Costs associated with monitoring and best management practice implementation will be borne by Avista.*

2022 ANNUAL IMPLEMENTATION PLAN SUMMARY – APPENDIX F5

Clark Fork Project, FERC No. 2058
Cabinet Gorge and Noxon Rapids Hydroelectric Developments

Title
Dissolved Gas Supersaturation Control, Mitigation, and Monitoring

Implementation Staff Leads
Paul Kusnierz, Avista, (406) 847-1274, paul.kusnierz@avistacorp.com *and*
Ken Bouwens, Idaho Department of Fish and Game (IDFG), (208) 770-3766,
ken.bouwens@idfg.idaho.gov

Background
The purpose of this measure is to provide for the study, control, mitigation, and monitoring of gas supersaturation and the associated impacts to biological resources in the lower Clark Fork River-Lake Pend Oreille (LCFR-LPO) system related to spill at the Clark Fork Projects. In 1999, this measure committed Avista to multiple actions and activities for achieving this purpose, including: 1) selective use of specific spillways at both Noxon Rapids and Cabinet Gorge dams, 2) a comprehensive total dissolved gas (TDG) monitoring program, 3) intensive study of the effects of gas supersaturation to fish inhabiting the LCFR-LPO system, 4) a comprehensive feasibility analysis of structural alterations or other engineering alternatives for reducing excessive TDG levels due to spill at Cabinet Gorge Dam, and 5) development and implementation of a Gas Supersaturation and Control Program that addresses the issue of excessive TDG levels downstream of the Cabinet Gorge Dam.

Through 2002, Avista worked with IDFG, Idaho DEQ, Montana DEQ, Idaho Rivers United, the Kalispel Tribe and the USFWS on all aspects of this Program, including physical and biological TDG monitoring efforts and interpretation of results, engineering alternatives and subsequent engineering options, and continued efforts on the finalization of the Gas Supersaturation and Control Program (GSCP). As per the requirements of this Program, in December of 2002 Avista submitted a proposed GSCP to Idaho DEQ for their "… review, modification, and approval." As per other FERC requirements, the proposed GSCP was also submitted to the USFWS and FERC. Per an agreement dated February 10, 2004, Idaho DEQ approved the GSCP, as did the USFWS by letter dated February 25, 2004. Avista began implementation of the GSCP in 2004, even though FERC did not issue the order approving the GSCP until January 1, 2005.

The GSCP included the continued annual TDG monitoring and results reporting at the three permanent TDG monitoring locations, the phased construction of two water conveyance tunnels, and an associated annual mitigation program. The original river bypass tunnels used at the Cabinet Gorge site were planned to be reconstructed into the water conveyance tunnels, thus decreasing the level of spill.

At an August 2007 Workshop at ENSR's labs with the experts from the Project Design Team, the Gas Supersaturation Subcommittee (GSSC) determined by consensus that performance indicators demonstrated that the construction and operation of the bypass tunnel would not meet

the TDG performance levels in the Clark Fork River below Cabinet Gorge Dam anticipated in the GSCP. Design development results indicated there was a 'fatal flaw' in the 'final control and default strategies' and the tunnels should not be reconstructed. The September 2008 final Design Development Report for the Cabinet Gorge Bypass Tunnels Project documented these final results. The Management Committee agreed with the GSSC conclusion that the GSCP needed to be revised and directed the GSSC to amend the GSCP, such that alternatives were selected that incrementally reduced, offset, or otherwise mitigated TDG due to spill at Cabinet Gorge Dam. At their September 2009 meeting, the Management Committee approved the Final 2009 Addendum to the GSCP, with subsequent FERC approval by Order dated February 19, 2010.

The GSCP Addendum abandoned the original concept of reopening the two diversion tunnels and instead requires Avista to evaluate and, if feasible over the next few years, construct a variety of smaller-capacity options to abate TDG. Feasibility studies on the top five abatement alternatives were completed in 2011, and based upon those studies Avista initiated work on the top two alternatives, power generation on the existing bypass tunnels and spillway modifications. An engineering study for the power generation on the existing bypass tunnel was completed in 2013.

The spillway modification project involves modifying gate bays on the spillway by adding precast-concrete roughness elements (baffle blocks) on the spillway ogee downstream of the gate, configured for maximum effectiveness at a fixed gate opening of approximately 6,000 cfs. A five foot long flip bucket extension to the existing crest was also added. In 2013, a field prototype for the spillway 2 modifications was tested and confirmed a positive performance in reducing TDG downstream of the dam. Cavitation repairs were completed on spillway 2 in 2014. Modeling and engineering of refinements to the spillway 2 design were conducted in 2014.

Construction of modifications on spillways 4 and 5 was initiated in 2015 and completed in spring 2016. The performance of spillways 4 and 5 was tested and confirmed a positive performance in 4 reducing TDG downstream of the dam, but the results for 5 were inconclusive. The river depth is substantially shallower below spillway 5 than 1 through 4 and as a result there may be less of a reduction in TDG when there is minimal spill such as what occurred in 2016. Construction of modifications on spillways 1 and 3 was initiated in July 2017 and completed in October 2017. Performance testing of spillways 1 and 3 was completed in July 2018.

2022 Project Plans

Operations

1. There is no project plan for operations; however, Avista will continue to utilize spillway operations at Noxon Rapids and Cabinet Gorge dams as outlined in the GSCP, amended in 2009 to include operation of the Ice and Trash spillways, amended in 2013 to include operation of the modified spillway 2 during spill, amended in 2016 to include use of spillways 4 and 5, and amended in 2018 to include use of spillways 1 and 3. The results of the ongoing TDG monitoring program will be utilized to evaluate the effectiveness of the selective spillway usage for reducing TDG levels, and identify any potential changes in spillway usage.

TDG Mitigation and Monitoring Program

1. Total Dissolved Gas Monitoring
2. Project Scoping Allocation
3. Analysis of Gas Bubble Disease Monitoring Data
4. Mapping the Potential for Fish to Compensate for Total Dissolved Gas in the Lower Clark Fork River (***New***)
5. Nutrient Level Impacts on Salmonid Populations in the Lower Clark Fork River (***New***)
6. Temperature Monitoring Data Compilation
7. Walleye Geochemistry Study
8. Trophic Monitoring in Lake Pend Oreille and Pend Oreille River Idaho
9. Box Canyon Reservoir Northern Pike Suppression
10. Lake Pend Oreille Experimental Walleye Angler Incentive Program
11. Lake Pend Oreille/Clark Fork River Walleye Population Assessment
12. Lake Pend Oreille Lake Trout Angler Incentive Program
13. Lake Pend Oreille Lake Trout Netting Program
14. Demography of Adfluvial Bull Trout in Lake Pend Oreille
15. Lake Pend Oreille Bull Trout Population Monitoring and Evaluation
16. Lake Pend Oreille Nearshore Index Netting
17. Idaho Protection and Education Officer Support
18. Lake Pend Oreille Tributary PIT-Monitoring Station Installation
19. Lake Pend Oreille Tributary PIT-Monitoring Station Operation and Maintenance
20. Clark Fork River Population Monitoring
21. Lightning Creek Delta Connectivity Project
22. Lower Clark Fork River Flow Model (***New***)
23. Lake Pend Oreille and Pend Oreille River Creel Survey (***New***)
24. Gas Supersaturation Control Program Total Dissolved Gas Abatement

Work Products

Operations

- Annual Work Summary; due December 1, 2022

Total Dissolved Gas Monitoring

- Memorandum summarizing discharge, operations, and total dissolved gas; final due November 1, 2022
- Temperature monitoring data for the three sites; due December 1, 2022
- Annual Work Summary; due December 1, 2022

Project Scoping Allocation

- Annual Work Summary; due December 1, 2022

Analysis of Gas Bubble Disease Monitoring Data

- Annual Project Update – 2021; final due August 1, 2022
- Annual Work Summary; due December 1, 2022
- Annual Project Update – 2022; final due April 1, 2023 (if sampling occurs)

Mapping the Potential for Fish to Compensate for Total Dissolved Gas in the Lower Clark Fork River

- Annual Work Summary; due December 1, 2022
- Project Completion Report; final due November 30, 2023

Nutrient Level Impacts on Salmonid Populations in the Lower Clark Fork River
- Annual Work Summary; due December 1, 2022
- Project Completion Report; final due April 1, 2023

Temperature Monitoring Data Compilation
- Updated database (2021 data); final due June 1, 2022
- Updated database (2022 data); final due June 1, 2023
- Annual Work Summary; due December 1, 2022

Walleye Geochemistry Study
- Project Completion Report or manuscript for publication; final due July 1, 2022
- Annual Work Summary; due December 1, 2022

Trophic Monitoring in Lake Pend Oreille and Pend Oreille River Idaho
- Annual Work Summary; due December 1, 2022

Box Canyon Reservoir Northern Pike Suppression
- Annual Project Update; final due November 1, 2022
- Annual Work Summary; due November 15, 2022
- Comprehensive Project Report 2012–2024; final due November 1, 2024

Lake Pend Oreille Experimental Walleye Angler Incentive Program
- Annual Project Update – 2021; final due November 1, 2022
- Annual Work Summary; due December 1, 2022
- Annual Project Update – 2022; final due November 1, 2023

Lake Pend Oreille/Clark Fork River Walleye Population Assessment
- Annual Project Update – 2021; final due November 1, 2022
- Annual Work Summary; due December 1, 2022
- Annual Project Update – 2022; final due November 1, 2023

Lake Pend Oreille Lake Trout Angler Incentive Program
- Annual Project Update – 2021; final due November 1, 2022
- Annual Work Summary; due December 1, 2022
- Annual Project Update – 2022; final due November 1, 2023

Lake Pend Oreille Lake Trout Netting Program
- Annual Project Update – 2021; final due November 1, 2022
- Annual Work Summary; due December 1, 2022
- Annual Project Update – 2022; final due November 1, 2023

Demography of Adfluvial Bull Trout in Lake Pend Oreille
- Project Completion Report outlining the findings for Objectives 1–3; final due August 1, 2022
- Publication of model and results in peer reviewed literature; submission due December 1, 2022
- Annual Work Summary; due December 1, 2022

Lake Pend Oreille Bull Trout Population Monitoring and Evaluation
- Annual Work Summary; due December 1, 2022
- Comprehensive Project Report; final due November 1, 2024

Lake Pend Oreille Nearshore Index Netting
- Annual Work Summary; due December 1, 2022
- Project Completion Report; final due December 1, 2023

Idaho Protection and Education Officer Support

- Mid-year report; due to Avista; August 1, 2022
- Annual Work Summary; due to Ken Bouwens, IDFG; November 1, 2022

Lake Pend Oreille Tributary PIT-Monitoring Station Installation

- Annual Work Summary; due December 1, 2022

Lake Pend Oreille Tributary PIT-Monitoring Station Operation and Maintenance

- Temperature monitoring data for the six sites; due December 1, 2022
- Annual Work Summary; due December 1, 2022

Clark Fork River Population Monitoring

- Annual Project Update; 2018 and 2021 Lower Clark Fork River Population Monitoring; final due November 1, 2022
- Annual Project Update; 2022 Lower Clark Fork River Population Monitoring; final due November 1, 2023
- Comprehensive Project Report; Lower Clark Fork River Population Monitoring (through 2021); final due November 1, 2022
- Annual Work Summary; due December 1, 2022

Lightning Creek Delta Connectivity Project

- Technical memoranda describing project progress at appropriate intervals
- Design submittals at 30%, 60%, and 90% review. The 60% submittal will include hydraulic model results and will be used to initiate the permitting process; due date to be determined
- Final stamped design drawings for channel construction to occur in 2022; due date to be determined
- Final gravel mining plan; due date to be determined
- Annual Work Summary; due December 1, 2022

Lower Clark Fork River Flow Model

- Annual Work Summary; due December 1, 2022
- Model files including GIS input data and R code; due November 1, 2023
- Comprehensive Project Report; Flow analysis and modeling in the Clark Fork River; final due November 1, 2023

Lake Pend Oreille and Pend Oreille River Creel Survey

- Annual Work Summary; due December 1, 2022
- Comprehensive Project Report; final due November 1, 2023

Gas Supersaturation Control Program Total Dissolved Gas Abatement

- Annual Work Summary; due December 1, 2022

2022 Appendix F5 Mitigation and Monitoring Fund

Budget Summary	
Section 3.1 funding[1]	
Unexpended funds with interest	$1,841,535
2022 contribution (including GDP inflation rate)[2]	$625,000
Total available	**$2,466,535**
2022 MC-approved budget	$2,571,998
Balance (to be paid from Section 3.2 funding)	-$105,463
Unobligated funds	**$0**
Section 3.2 funding[3]	
Unexpended funds	$0
2022 contribution	$932,612
Total available	**$932,612**
2022 MC-approved budget (balance from Section 3.1 funding)	-$105,463
Unobligated funds	**$827,149**

[1] "Section 3.1 funding" refers to the funding mechanism defined in Section 3.1 of the "2022 Phase III of the Final Gas Supersaturation Control Program Addendum for the Clark Fork Project" (hereafter, "Phase III agreement"; approved by the MC on 3/15/2022). Pursuant to the Phase III agreement, all Appendix F5 projects will be funded through Section 3.1. If the 'total available" Section 3.1 funds are exceeded during any given year, the balance will be funded through Section 3.2 funding.

[2] Pursuant to the Phase III agreement, the Gross Domestic Product Implicit Price Deflator (GDP-IPD) annual adjustment will be made to the Section 3.1 annual contribution beginning in 2023.

[3] "Section 3.2 funding" refers to the funding mechanism defined in Section 3.2 of the Phase III agreement. The annual contribution associated with this funding is not subject to GDP inflation and unexpended funds are not subject to interest.

2022 Project	Carryover[1]	2022 Budget
Total Dissolved Gas Monitoring	$10,000	$33,716
Project Scoping Allocation	$1,000	$9,000
Analysis of Gas Bubble Disease Monitoring Data	$4,500	$15,500
Mapping the Potential for Fish to Compensate for Total Dissolved Gas in the Lower Clark Fork River	$0	$20,000
Nutrient Level Impacts on Salmonid Populations in the Lower Clark Fork River	$0	$12,500
Temperature Monitoring Data Compilation	$1,166	$13,000
Walleye Geochemistry Study	$77,906	$0
Trophic Monitoring in Lake Pend Oreille and Pend Oreille River Idaho	$4,940	$16,400
Box Canyon Reservoir Northern Pike Suppression	$25,840	$64,625
Lake Pend Oreille Experimental Walleye Angler Incentive Program	$9,000	$118,750
Lake Pend Oreille/Clark Fork River Walleye Population Assessment	$2,000	$130,000
Lake Pend Oreille Lake Trout Angler Incentive Program	$10,000	$148,000
Lake Pend Oreille Lake Trout Netting Program	$0	$454,626
Demography of Adfluvial Bull Trout in Lake Pend Oreille	$0	$0
Lake Pend Oreille Bull Trout Population Monitoring and Evaluation	$40,000	$100,000
Lake Pend Oreille Nearshore Index Netting	$0	$79,500
Idaho Protection and Education Officer Support	$11,925	$39,532
Lake Pend Oreille Tributary PIT-Monitoring Station Installation	$131,000	$366,000
Lake Pend Oreille Tributary PIT-Monitoring Station Operation and Maintenance	$17,496	$49,496
Clark Fork River Population Monitoring	$24,756	$155,500
Lightning Creek Delta Connectivity Project	$17,621	$97,824
Lower Clark Fork River Flow Model	$0	$63,000
Lake Pend Oreille and Pend Oreille River Creel Survey	$0	$100,000
Gas Supersaturation Control Program for Total Dissolved Gas Abatement	$0	$50,000
Idaho Native Fisheries Education Trailer (approved by consent mail in January 2021)	$3,379	$0
Idaho Field Station Operation and Maintenance (cost share; see Appendix A project plan)	$0	$17,500
Two 3' circular PIT antennas (approved at the fall 2021 MC meeting)	$25,000	$0
Total	**$417,529**	**$2,154,469**
MC-approved budget		**$2,571,998**

[1] *Estimated carryover of unexpended, approved funds as of January 1.*

2022 PROJECT PLAN

Total Dissolved Gas Monitoring

Project Contact
Paul Kusnierz, Avista, (406) 847-1274, paul.kusnierz@avistacorp.com

Project History
Total dissolved gas (TDG) monitoring in the lower Clark Fork River during the spring runoff season is a required activity under FERC License No. 2058. This project is a continuation of work that has occurred in the Clark Fork River since 1996 (Latona 2014). The 2004 Gas Supersaturation Control Program (GSCP; Avista 2004) and 2009 GSCP Addendum (Avista 2009) identify the fixed-station TDG monitoring as separate from other aspects of the program (i.e., construction and implementation, mitigation). As such this monitoring has its own fund. The scope and budget for this project are reviewed by the Management Committee annually.

Background
During the spring runoff season, flow in the lower Clark Fork River can exceed the hydraulic capacity of Cabinet Gorge Dam. When this occurs, it is necessary to spill water over the dam. The physical characteristics of Cabinet Gorge Dam, in particular the deep (about 70 ft) plunge pool and the way in which spill aerates water released from the powerhouse, can lead to TDG supersaturation. Implementation of the TDG monitoring program provides data that informs Avista and Clark Fork Settlement Agreement (CFSA) stakeholders of the circumstances that lead to high TDG and verifies the effectiveness of spillway modifications for TDG reduction.

Goal
The goal of this project is to monitor total dissolved gas in the Lake Pend Oreille-lower Clark Fork River system to inform the study, control, and mitigation of gas supersaturation and associated biological resource effects.

Objective
1. Track the TDG conditions throughout the spring runoff season at Cabinet Gorge Dam and collect data that can be used to evaluate modifications made to the Cabinet Gorge Dam spillways and minimize TDG production at Cabinet Gorge Dam.

Tasks
1. Continue to monitor, in an *ad-hoc* fashion, TDG (temperature is also collected) in the Cabinet Gorge Dam forebay and about one mile downstream of Cabinet Gorge Dam[1] (Table 1) during the spill season (approximately April through July). (Objective 1)

2. Monitor TDG during tests of modified Cabinet Gorge Dam spillways. (Objective 1)

3. If data indicate it is appropriate, make shore-based monitoring station permanent. (Objective 1)

[1] The monitoring equipment formerly located at the Noxon Rapids Dam forebay has been located about one mile downstream of Cabinet Gorge Dam and providing duplicative data at this site since 2015 as per DosSantos (2014).

Table 1. Sampling locations for TDG and temperature in 2022.

Stream	Site name	River km	Latitude	Longitude
Clark Fork River	Cabinet Gorge Dam Forebay	14.5	48.087813	-116.056333
Clark Fork River	Downstream Cabinet Gorge	12.7	48.086621	-116.079265
Clark Fork River	Downstream Cabinet Gorge Shore Station	12.6	48.086725	-116.080346

A brief synopsis of the type of monitoring equipment used for this project and TDG probe placement can be found in Latona (2014). In addition, a protocol for sampling under high flow conditions can be found in Kusnierz (2018).

Work Products

- Memorandum summarizing discharge, operations, and total dissolved gas; final due November 1, 2022
- Temperature monitoring data for the three sites; due December 1, 2022
- Annual Work Summary; due December 1, 2022

Permitting Requirements

Not applicable for the tasks proposed in this project plan.

Endangered Species Act consultation for this project plan is associated with the 2019 Biological Opinion on the effects of continued operation of the Clark Fork Hydroelectric Project on Bull Trout and designated Bull Trout critical habitat (BiOp). This project plan is consistent with the analyses and conclusions contained in the 2019 BiOp and will adhere to all appropriate Terms and Conditions designed to reduce the extent and effects of incidental take on Bull Trout. No incidental take of Bull Trout is anticipated as a result of this project plan; therefore, no take reporting is required.

Cultural/Historic Resource Review

Not applicable for the tasks proposed in this project plan, there are no ground and/or vegetation disturbing activities, or proposed impacts to cultural/historic resources.

Benefit to the Resource

This project is the direct implementation of a portion of Appendix F5 under the CFSA (Avista 1999). It also provides data that can be used to guide operation of Cabinet Gorge Dam so that exceedances of the TDG water quality standard are minimized.

Idaho water quality standards are based upon support of beneficial uses, and in particular “Cold Water Aquatic Life.” Continued TDG monitoring is critical to evaluating the health of all native fisheries in the lower Clark Fork River and Lake Pend Oreille.

Budget

Item	Estimated Carryover[1]	2022 Budget Request
Technician labor (0.13 FTE)	$0	$12,000
Supplies	$10,000	$10,000
Annual Project Update and professional consultation	$0	$10,000
Biomark BioLogic plus cell (12 months)	$0	$1,716
Total	$10,000	$33,716
Anticipated Expenditures		$43,716

[1] *Estimated carryover of unexpended, approved funds as of January 1.*

Literature Cited

Avista Corporation. 1999. Application for New License, Volume III Settlement Agreement. Avista Corporation. Spokane, Washington.

Avista Corporation. 2004. Final Gas Supersaturation Control Program for the Clark Fork Project. Avista Corporation. Spokane, Washington.

Avista Corporation. 2009. Final 2009 Addendum Final Gas Supersaturation Control Program for the Clark Fork Project. Avista Corporation. Spokane, Washington.

DosSantos, J. 2014. TDG Monitoring Program – Proposed 2015 Changes. Memorandum to the Gas Supersaturation Subcommittee, December 30, 2014.

Kusnierz, P. 2018. Proposed total dissolved gas monitoring protocol during high flow conditions. Memorandum to the Gas Supersaturation Subcommittee, October 3, 2018.

Latona (Latona Consulting Services, LLC). 2014. Final Report Total Dissolved Gas Monitoring 2014 Cabinet Gorge and Noxon Rapids Dams. Latona Consulting Services, LLC: Seattle, Washington.

2022 PROJECT PLAN

Project Scoping Allocation

Project Contact
Paul Kusnierz, Avista, (406) 847-1274, paul.kusnierz@avistacorp.com

Project History
This is a continuing project for 2022. This project was originally ranked by the WRTAC on January 21, 2020. The project was first approved by the Management Committee (MC) in 2020. The scope and budget for this project will be reviewed by the MC annually.

Background
The Appendix F5 mitigation program is "focused on the protection and enhancement of the fishery resources that might be affected by the future occurrence of elevated total dissolved gas levels downstream of the Cabinet Gorge HED (Hydroelectric Development)" (Avista 2004). New project development is an involved scoping process requiring the identification and integration of information regarding management concerns, associated biological limitations, and study design. This allocation will be used to develop full project proposals for MC review and approval.

Goal
Provide assistance with the development of future Appendix F5 mitigation program projects.

Objective
1. Provide funding for an Avista fisheries biologist to develop Appendix F5 mitigation program project plans.

Tasks
Specific tasks will be identified as necessary, but will be performed as part of project plan development.

Work Products
- Annual Work Summary; due December 1, 2022

Permitting Requirements
Not applicable for the tasks proposed in this project plan.

Endangered Species Act consultation for this project plan is associated with the 2019 Biological Opinion on the effects of continued operation of the Clark Fork Hydroelectric Project on Bull Trout and designated Bull Trout critical habitat (BiOp). This project plan is consistent with the analyses and conclusions contained in the 2019 BiOp and will adhere to all appropriate Terms and Conditions designed to reduce the extent and effects of incidental take on Bull Trout. No incidental take of Bull Trout is anticipated as a result of this project plan; therefore, no take reporting is required.

Cultural/Historic Resource Review
Not applicable for the tasks proposed in this project plan, there are no ground and/or vegetation disturbing activities, or proposed impacts to cultural/historic resources.

Benefit to the Resource
Projects developed using this allocation will benefit the fishes (specifically migratory Bull and Westslope Cutthroat trout) inhabiting Lake Pend Oreille and the lower Clark Fork River. This project plan is appropriate under the Clark Fork Settlement Agreement because it assists in the development of projects that will benefit fishes exposed to elevated total dissolved gas. As such, these projects will also be consistent with goals of the Native Salmonid Restoration Plan (AIT 2018) to restore and enhance migratory forms of native salmonids.

Tasks conducted under this allocation will also be consistent with other established plans including the Lake Pend Oreille Bull Trout Conservation Plan (Resource Planning Unlimited 1999), the USFWS Bull Trout recovery plan (USFWS 2015), and the Idaho Department of Fish and Game Fisheries Management Plan 2019-2024 (IDFG 2019).

Project plan-specific benefits will be identified as a result of the use of this allocation.

Budget

Item	Estimated Carryover[1]	2022 Budget Request
Biologist labor (0.06 FTE)	$1,000	$9,000
Total	$1,000	$9,000
Anticipated Expenditures		$10,000

[1] *Estimated carryover of unexpended, approved funds as of January 1.*

Literature Cited
AIT (Aquatic Implementation Team). 2018. Clark Fork River native salmonid restoration plan five-year plan (2019–2023). Prepared for the Clark Fork Management Committee. 40 pages + appendices.

Avista. 2004. Final Gas Supersaturation Control Program for the Clark Fork Project. Avista Corporation: Spokane, Washington. 90 pages + appendices.

IDFG (Idaho Department of Fish and Game). 2019. Fisheries Management Plan 2019-2024. Boise, Idaho.

Resource Planning Unlimited. 1999. Lake Pend Oreille Bull Trout Conservation Plan. State of Idaho. Boise, Idaho.

USFWS (U.S. Fish and Wildlife Service). 2015. Recovery plan for the coterminous United States population of bull trout (*Salvelinus confluentus*). Portland, Oregon. xii + 179 pages.

2022 PROJECT PLAN

Analysis of Gas Bubble Disease Monitoring Data

Project Contact
Paul Kusnierz, Avista, (406) 847-1274, paul.kusnierz@avistacorp.com

Project History
This is a continuing project for 2022. Gas bubble disease (GBD) data have been collected from the lower Clark Fork River during ten spill seasons since 1997 (1997–2000, 2006, 2008, and 2017–2021). The Water Resources Technical Advisory Committee scored this project in 2018 on January 23. The scope and budget for this project are reviewed annually by the Management Committee.

Background
Gas bubble disease occurs in fish when water becomes supersaturated with gases. This disease causes damage to tissues when gas bubbles form in gills, fins, and eyes. It can lead to death if tissue damage becomes too severe. Gas bubble disease is a concern on the Clark Fork River downstream of Cabinet Gorge Dam because during periods of substantial spill (i.e., high spring flows) the river becomes supersaturated and total dissolved gas (TDG) levels can be in excess of 120% saturation. More than a decade ago Weitkamp et al. (2003a) published a journal article reporting the incidence of GBD in the lower Clark Fork River. In this study they found that the occurrence of GBD in fish collected from the lower Clark Fork River was lower than expected given the TDG levels observed. The authors hypothesized that fish were spending time at depths that can compensate for the effects of GBD and noted the presence of refugia from high TDG levels in tributaries of the lower Clark Fork River and Lake Pend Oreille (Weitkamp et al. 2003a; 2003b).

In 2006, 2008, 2017, and 2018 additional GBD data were collected from fish captured by means of electrofishing in the lower Clark Fork River. In 2018, GBD data from the lower Clark Fork River downstream of Cabinet Gorge Dam in 1997–2000 were combined with data collected in 2006, 2008, 2017, and 2018 into a single spreadsheet. In 2018, these data were combined and used in whole to describe the incidence of GDB in the lower Clark Fork River (Kusnierz 2019). This project plan provided funding to continue GBD data collection as part of night electrofishing activities 2017–2021. Results from this sampling indicate generally low levels of GDB even when TDG values exceed 110% saturation for an extended period of time (Kusnierz 2020; P. Kusnierz, *unpublished data*). This project plan proposes to suspend GBD collection as part of regular night-time electrofishing and instead collect it when new or rare conditions (e.g., fish kill, kokanee trawl, extremely high TDG [>140%]) occur. In addition, funding will facilitate annually updating the GBD database and performing analyses when GBD data are collected.

Goal
The goal of this project is to provide a means to evaluate the health effects of high TDG on fish in the lower Clark Fork River and Lake Pend Oreille and examine whether the relationship between spill, TDG, and GBD incidence has changed over time.

Objective

1. Maintain lower Clark Fork River GBD data collection, organization, and analysis.

Tasks

1. Collect GBD data when new or rare conditions (e.g., fish kill, kokanee trawl, extremely high TDG [>140%]) occur. (Objective 1)

2. Update GBD database annually (if sampling occurs). (Objective 1)

3. Produce a report that updates the analyzes the results of any GBD data collected. (Objective 1)

Work Products

- Annual Project Update – 2021; final due August 1, 2022
- Annual Work Summary; due December 1, 2022
- Annual Project Update – 2022; final due April 1, 2023 (if sampling occurs)

Permitting Requirements

An Idaho Department of Fish and Game collection permit is required for sampling fish in the lower Clark Fork River. This permit will be obtained as part of the Upstream Fish Passage Program permitting requirements.

Endangered Species Act consultation for this project plan is associated with the 2019 Biological Opinion on the effects of continued operation of the Clark Fork Hydroelectric Project on Bull Trout and designated Bull Trout critical habitat. Incidental take reporting for this project plan will be included in the annual Biological Opinion report as required by Term and Conditions 15–18 of the 2019 Incidental Take Statement.

Cultural/Historic Resource Review

Not applicable for the tasks proposed in this project plan, there are no ground and/or vegetation disturbing activities, or proposed impacts to cultural/historic resources.

Benefit to the Resource

This project compliments the required monitoring of TDG on the lower Clark Fork River as described in Appendix F5 under the CFSA (Avista 1999) and is consistent with the use of the "TDG Alternative Mitigation Fund" described in Section 4.3.2 of the Gas Supersaturation Control Plan (Avista 2004). This project will provide a means to evaluate the health effects of high TDG on fish in the lower Clark Fork River and examine whether the relationship between spill, TDG, and GBD incidence has changed over time. It will also result in a single dataset for GDB incidence in fish captured via electrofishing in the lower Clark Fork River that can be updated annually as data are collected and used to help provide guidance on how Appendix F5 mitigation dollars can be best utilized to benefit the fisheries resources affected by high TDG.

Budget

Item	Estimated Carryover[1]	2022 Budget Request
Technician labor (0.1 FTE)	$0	$10,000
Data compilation, analysis, and summary report (0.03 FTE)	$4,500	$5,500
Total	$4,500	$15,500
Anticipated Expenditures		$20,000

[1] *Estimated carryover of unexpended, approved funds as of January 1.*

Literature Cited

Avista Corporation. 1999. Application for New License, Volume III Settlement Agreement. Avista Corporation. Spokane, Washington.

Avista Corporation. 2004. Final Gas Supersaturation Control Program for the Clark Fork Project. Avista Corporation. Spokane, Washington.

Kusnierz, P. 2019. Analysis of gas bubble disease Monitoring data. Annual project update. Avista, Noxon, Montana.

Kusnierz, P. 2020. Analysis of gas bubble disease monitoring data. Annual Project Update – 2020.

Weitkamp, D. E., R. D. Sullivan. T. Swant, and J. DosSantos. 2003a. Gas bubble disease in resident fish of the lower Clark Fork River. Transactions of the American Fisheries Society 132:865–876.

Weitkamp, D. E., R. D. Sullivan. T. Swant, and J. DosSantos. 2003b. Behavior of resident fish relative to total dissolved gas supersaturation in the lower Clark Fork River. Transactions of the American Fisheries Society 132:856–864.

2022 PROJECT PLAN

Mapping the Potential for Fish to Compensate for Total Dissolved Gas in the Lower Clark Fork River

Project Contact
Paul Kusnierz, Avista, (406) 847-1274, paul.kusnierz@avistacorp.com

Project History
This is a new project for 2022. This project was scored by the WRTAC on 1/19/2022 and the Evaluation and Ranking Criteria scores are included as the last page of this project plan.

Background
During periods of substantial spill (i.e., high spring discharge), the Clark Fork River downstream of Cabinet Gorge Dam becomes supersaturated with air and total dissolved gas (TDG) levels can be in excess of 120% saturation. This is of concern because high TDG can cause gas bubble disease in fish. This disease causes damage to tissues when gas bubbles form in gills, fins, and eyes and can lead to death. More than a decade ago Weitkamp et al. (2003a) published a journal article reporting the incidence of GBD in the lower Clark Fork River. In this study they found that the occurrence of GBD in fish collected from the lower Clark Fork River was lower than expected given the TDG levels observed. The authors hypothesized that fish were spending time at depths that can compensate for the effects of GBD and noted the presence of refugia from high TDG levels in tributaries of the lower Clark Fork River and Lake Pend Oreille (Weitkamp et al. 2003a, 2003b).

Fish can compensate for high levels of TDG by heading to deeper water. The rate of compensation is about 10% of saturation per meter meaning that a fish in water with TDG of 110% saturation at a depth of 1 m will experience 100% saturation. This project would build upon the work of Weitkamp et al. (2003a, 2003b) by quantifying habitat in the lower Clark Fork River that is available to fish where they can compensate for elevated TDG and demonstrating how the availability changes with discharge. All data used for the proposed project was previously collected and is housed by Avista and the Idaho Department of Fish and Game (IDFG).

Goal
The goal of this project is to understand the amount of habitat in the lower Clark Fork River where fish can compensate for elevated TDG and how it changes as discharge and TDG vary.

Objective
1. Use previously collected depth and bathometric data from the lower Clark Fork River to evaluate the amount of habitat where fish can compensate for elevated TDG at a variety of discharges.

Tasks
1. Procure and organize lower Clark Fork River depth, bathometric, TDG and discharge data collected by Avista and IDFG. (Objective 1)

2. Use either HEC-RAS (or a similar model) or a GIS-based model to identify areas of the lower Clark Fork River where fish can effectively compensate for high TDG values.

3. Use model data to create tables and figures that describe the amount and location of habitat where fish can compensate for elevated TDG at a variety of TDG and discharge values.

4. Produce a report with the results of the analysis and a discussion of potential management implications and actions.

Work Products

- Annual Work Summary; due December 1, 2022
- Project Completion Report; final due November 30, 2023

Permitting Requirements

Not applicable for the tasks proposed in this project plan.

Endangered Species Act consultation for this project plan is associated with the 2019 Biological Opinion on the effects of continued operation of the Clark Fork Hydroelectric Project on Bull Trout and designated Bull Trout critical habitat (BiOp). This project plan is consistent with the analyses and conclusions contained in the 2019 BiOp and will adhere to all appropriate Terms and Conditions designed to reduce the extent and effects of incidental take on Bull Trout. No incidental take of Bull Trout is anticipated as a result of this project plan; therefore, no take reporting is required.

Cultural/Historic Resource Review

Not applicable for the tasks proposed in this project plan, there are no ground and/or vegetation disturbing activities, or proposed impacts to cultural/historic resources.

Benefit to the Resource

This project will facilitate a better understanding of the potential effects of TDG on fishes in the lower Clark Fork River. It could lead to the development of management actions that facilitate stabilization or increases in fish abundance. The proposed activities are consistent with the Dissolved Gas Supersaturation Control, Mitigation, and Monitoring Program (Appendix F5) and the use of the "TDG Alternative Mitigation Fund" described in Section 4.3.2 of the Gas Supersaturation Control Plan (Avista 2004) as they are focused on fish species that are exposed to elevated total dissolved gas levels when spill occurs at Cabinet Gorge Dam. They are also consistent with goals of the Fish Passage/Native Salmonid Restoration Plan (Appendix C), and the Idaho Tributary Habitat Acquisition and Fishery Enhancement Program (Appendix A), through assessment of native salmonid populations, including Bull Trout and Westslope Cutthroat Trout. This project will compliment the efforts of the *Clark Fork River Population Monitoring* project plan and its goal of evaluating potential changes in fish abundance in association with discharge, total dissolved gas, and other environmental variables. It also compliments the *Analysis of Gas Bubble Disease Monitoring Data* project plan and its goal of evaluating the health effects of high TDG on fish in the lower Clark Fork River and Lake Pend Oreille. This project will utilize river depth and bathometric data collected under the *Clark Fork*

River Water Quality Monitoring Program project plan and TDG and discharge data collected under the *Total Dissolved Gas Monitoring* project plan. Finally, this work is consistent with the Lake Pend Oreille Bull Trout Conservation Plan (Resource Planning Unlimited 1999) and the Idaho Department of Fish and Game Fisheries Management Plan (IDFG 2019).

Budget

Item	Estimated Carryover[1]	2022 Budget Request
Data compilation, analysis, and summary report (0.2 FTE)	$0	$20,000
Total	$0	$20,000
Anticipated Expenditures		$20,000

[1] *Estimated carryover of unexpended, approved funds as of January 1.*

Literature Cited

Avista Corporation. 2004. Final Gas Supersaturation Control Program for the Clark Fork Project. Avista Corporation. Spokane, Washington.

IDFG (Idaho Department of Fish and Game). 2019. Fisheries Management Plan 2019-2024. Boise, Idaho.

Resource Planning Unlimited. 1999. Lake Pend Oreille Bull Trout Conservation Plan. State of Idaho. Boise, Idaho.

Weitkamp, D. E., R. D. Sullivan. T. Swant, and J. DosSantos. 2003a. Gas bubble disease in resident fish of the lower Clark Fork River. Transactions of the American Fisheries Society 132:865–876.

Weitkamp, D. E., R. D. Sullivan. T. Swant, and J. DosSantos. 2003b. Behavior of resident fish relative to total dissolved gas supersaturation in the lower Clark Fork River. Transactions of the American Fisheries Society 132:856–864.

Appendix F5 Mitigation Fund
Project Evaluation and Ranking Criteria score sheet

As scored by the WRTAC on 1/19/2022

Project Title: Mapping the potential for fish to compensate for total dissolved gas in the lower Clark Fork River

Criteria	Score			
	3	**2**	**1**	**0**
A. Population exposure	**Routinely in LPO or LCFR**	Routinely from Dover to Box Canyon	Intermittently or occasionally	Population not exposed
B. Species to benefit	**Bull Trout and Westslope Cutthroat Trout**	Bull Trout or Westslope Cutthroat Trout	Target species but not Bull Trout or Westslope Cutthroat Trout	None
C. Mitigate or evaluate	Mitigates	**Evaluates**	NA	Not applied to resources affected by TDG
D. Project effectiveness	Solves primary problem	Partially solves or provides all information	**Provides some information**	Does not address primary problem
E. Cost/benefit	Benefit exceptional relative to cost	Benefit high relative to cost	**Benefit consistent with cost**	Cost exceeds benefit
F. Outside funding	≥ 50%	25–49%	≤ 24%	**Entirely CFSA funded**

Scoring Instructions:

- When ranking proposals that do not involve on-the-ground implementation but are necessary to the scope of physical projects (e.g., applied research, watershed assessments, NEPA analyses), score them with regard to the "expected" or "average" resultant physical project.
- **A score of "0" in any of the criteria does not necessarily mean the project is ineligible for CFSA funding.** Rather, a score of "0" should be considered an indication that this aspect of the project needs to be thoroughly discussed and considered.
- Although total scores for each proposed project can be summed to get a general idea of the relative strength of each project, **the scoring system should be viewed as an ordinal rather than absolute ranking system**. In light of this and in the interest of maintaining a simple and objective scoring system, only whole numbers will be utilized (e.g., no half points).

2022 PROJECT PLAN

Nutrient Level Impacts on Salmonid Populations in the Lower Clark Fork River

Project Contact
Paul Kusnierz, Avista, (406) 847-1274, paul.kusnierz@avistacorp.com
and
Ken Bouwens, Idaho Department of Fish and Game, (208) 769-1414,
ken.bouwens@idfg.idaho.gov

Project History
This is a new project for 2022. This project was scored by the WRTAC on 1/19/2022 and the Evaluation and Ranking Criteria scores are included as the last page of this project plan.

Background
Fish abundance monitoring has occurred periodically on the lower Clark Fork River since 1999. This sampling was performed to evaluate a minimum flow change from 3,000 cfs to 5,000 cfs below Cabinet Gorge Dam. A 10-year study (Ryan and Jakubowski 2012) found no significant changes in abundance and in 2018 the minimum flow requirement was changed back to 3,000 cfs. Although recent surveys suggest increases in trout abundances (Bouwens and Jakubowski 2017, Baker et al. 2018), they are not high enough to support a robust recreational fishery.

The *Clark Fork River Population Monitoring* project plan seeks to continue periodic fish abundance monitoring on the lower Clark Fork River as well as perform a comprehensive evaluation of the last 20+ years of data collected. The proposed project seeks to compliment this established project plan by providing comparisons of potential controlling variables of fish abundance to other locations with known robust salmonid populations. The key variable in this study will be nutrients, which have been collected by Avista below Cabinet Gorge Dam for more than 20 years as part of the *Clark Fork River Water Quality Monitoring Program* (Appendix F1). All data used for the proposed project was previously collected and is housed in U.S. Environmental Protection Agency; Idaho Department of Fish and Game; Montana Fish, Wildlife and Parks; U.S. Geological Survey; and Avista databases.

Goal
The goal of this project is to evaluate the potential for nutrients to be limiting the population size of salmonids in the lower Clark Fork River.

Objective
1. Use previously collected nutrients (potential nutrients include total phosphorus, orthophosphate, total nitrogen, ammonia, and nitrate + nitrite) and fish population data from the lower Clark Fork River and multiple rivers in Montana to evaluate the potential for nutrient limitation in the lower Clark Fork River.

Tasks
1. Procure and organize nutrients data housed on the U.S. Environmental Protection Agency STORET website; flow and temperature data collected by Avista and the U.S. Geological

Survey; and salmonid abundance data collected by the Idaho Department of Fish and Game and Montana Fish, Wildlife and Parks. (Objective 1)

2. Analyze the data using the following techniques:

    a. Figures comparing the variables across all locations.
    b. Kruskal-Wallis test with *post hoc* testing for differences in variables between locations.
    c. A model describing what variables affect fish abundance at the selected locations.

3. Produce a report with the results of the analysis and a discussion of potential management actions.

Work Products

- Annual Work Summary; due December 1, 2022
- Project Completion Report; final due April 1, 2023

Permitting Requirements

Not applicable for the tasks proposed in this project plan.

Endangered Species Act consultation for this project plan is associated with the 2019 Biological Opinion on the effects of continued operation of the Clark Fork Hydroelectric Project on Bull Trout and designated Bull Trout critical habitat (BiOp). This project plan is consistent with the analyses and conclusions contained in the 2019 BiOp and will adhere to all appropriate Terms and Conditions designed to reduce the extent and effects of incidental take on Bull Trout. No incidental take of Bull Trout is anticipated as a result of this project plan; therefore, no take reporting is required.

Cultural/Historic Resource Review

Not applicable for the tasks proposed in this project plan, there are no ground and/or vegetation disturbing activities, or proposed impacts to cultural/historic resources.

Benefit to the Resource

This project will evaluate factors that could be limiting fish abundance in the Clark Fork River downstream of Cabinet Gorge Dam and could lead to management actions that facilitate increases in fish abundance. The proposed activities are consistent with the Dissolved Gas Supersaturation Control, Mitigation, and Monitoring Program (Appendix F5) and the use of the "TDG Alternative Mitigation Fund" described in Section 4.3.2 of the Gas Supersaturation Control Plan (Avista 2004) as they are focused on fish species that are exposed to elevated total dissolved gas levels when spill occurs at Cabinet Gorge Dam. They are also consistent with goals of the Fish Passage/Native Salmonid Restoration Plan (Appendix C), and the Idaho Tributary Habitat Acquisition and Fishery Enhancement Program (Appendix A), through assessment of native salmonid populations, including Bull Trout and Westslope Cutthroat Trout. This project will compliment the efforts of the *Clark Fork River Population Monitoring* project plan and its goal of evaluating potential changes in fish abundance in association with flow, total dissolved gas, and other environmental variables. It will also utilize nutrients data collected under the

Clark Fork River Water Quality Monitoring Program project plan. Finally, this work is consistent with the Lake Pend Oreille Bull Trout Conservation Plan (Resource Planning Unlimited 1999) and the Idaho Department of Fish and Game Fisheries Management Plan (IDFG 2019).

Budget

Item	Estimated Carryover[1]	2022 Budget Request
Data compilation, analysis, and summary report (0.1 FTE)	$0	$10,000
One professional conference	$0	$2,500
Total	$0	$12,500
Anticipated Expenditures		$12,500

[1] *Estimated carryover of unexpended, approved funds as of January 1.*

Literature Cited

Avista Corporation. 2004. Final Gas Supersaturation Control Program for the Clark Fork Project. Avista Corporation. Spokane, Washington.

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Appendix F5 Mitigation Fund
Project Evaluation and Ranking Criteria score sheet

As scored by the WRTAC on 1/19/2022

Project Title: Nutrient Level Impacts on Salmonid Populations in the Lower Clark Fork River

Criteria	Score			
	3	**2**	**1**	**0**
A. Population exposure	**Routinely in LPO or LCFR**	Routinely from Dover to Box Canyon	Intermittently or occasionally	Population not exposed
B. Species to benefit	**Bull Trout and Westslope Cutthroat Trout**	Bull Trout or Westslope Cutthroat Trout	Target species but not Bull Trout or Westslope Cutthroat Trout	None
C. Mitigate or evaluate	Mitigates	**Evaluates**	NA	Not applied to resources affected by TDG
D. Project effectiveness	Solves primary problem	Partially solves or provides all information	**Provides some information**	Does not address primary problem
E. Cost/benefit	Benefit exceptional relative to cost	Benefit high relative to cost	**Benefit consistent with cost**	Cost exceeds benefit
F. Outside funding	≥ 50%	25–49%	≤ 24%	**Entirely CFSA funded**

Scoring Instructions:

- When ranking proposals that do not involve on-the-ground implementation but are necessary to the scope of physical projects (e.g., applied research, watershed assessments, NEPA analyses), score them with regard to the "expected" or "average" resultant physical project.
- **A score of "0" in any of the criteria does not necessarily mean the project is ineligible for CFSA funding.** Rather, a score of "0" should be considered an indication that this aspect of the project needs to be thoroughly discussed and considered.
- Although total scores for each proposed project can be summed to get a general idea of the relative strength of each project, **the scoring system should be viewed as an ordinal rather than absolute ranking system**. In light of this and in the interest of maintaining a simple and objective scoring system, only whole numbers will be utilized (e.g., no half points).

2022 PROJECT PLAN

Temperature Monitoring Data Compilation

Project Contact
Paul Kusnierz, Avista, (406) 847-1274, paul.kusnierz@avistacorp.com

Project History
This is a continuing project for 2022. The Water Resources Technical Advisory Committee ranked this project on January 22, 2019. The project was first approved by the Management Committee (MC) in 2019. The scope and budget will be reviewed annually by the MC. The 2022 scope and budget is similar to 2021. The temperature database described in this project plan was constructed in 2020. In 2021, the database was updated with data collected through 2020.

Background
Continuous temperature data have been collected as part of projects funded by the Clark Fork Settlement Agreement (CFSA; Avista Corporation 1999) since implementation began in 1999. These data have been collected as part of electrofishing and reservoir sampling data collection in Montana, fish movement and temperature studies in Idaho, and total dissolved gas monitoring downstream of Cabinet Gorge Dam. Up to now, these data have not been housed in a single database, there has been no standard protocol for collecting temperature data using data loggers, and no suite of long-term temperature monitoring sites has been defined. The work in the project plan is proposed to be performed in consultation with the Aquatic Implementation Team (AIT) to ensure that all appropriate datasets are incorporated into a single database and can be effectively accessed. Table 1, found at the end of this project plan contains a list of all sites where temperature monitoring will occur in 2022, the project plan title associated with the site, and the due date for these data to be available for database entry.

Goal
The goal of this effort is to ensure quality and meaningful data are collected, stored, and readily available to inform restoration and fisheries research and management activities in the lower Clark Fork River and Lake Pend Oreille watershed.

Objectives
1. Compile historical CFSA-associated temperature data and place them in a single Access database and update the database annually.

Tasks
1. Enter 2021 data into the updated temperature database. (Objective 1)
2. Enter 2022 data into the updated temperature database. (Objective 1)

Work Products
- Updated database (2021 data); final due June 1, 2022
- Updated database (2022 data); final due June 1, 2023
- Annual Work Summary; due December 1, 2022

Permitting Requirements
Not applicable for the tasks proposed in this project plan.

Endangered Species Act consultation for this project plan is associated with the 2019 Biological Opinion on the effects of continued operation of the Clark Fork Hydroelectric Project on Bull Trout and designated Bull Trout critical habitat (BiOp). This project plan is consistent with the analyses and conclusions contained in the 2019 BiOp and will adhere to all appropriate Terms and Conditions designed to reduce the extent and effects of incidental take on Bull Trout. No incidental take of Bull Trout is anticipated as a result of this project plan; therefore, no take reporting is required.

Cultural/Historic Resource Review
Not applicable for the tasks proposed in this project plan, there are no ground and/or vegetation disturbing activities, or proposed impacts to cultural/historic resources.

Benefit to the Resource
This project will involve compiling data collected by at least four Appendices of the CFSA and storing it in a single database where it can be updated annually. These data will be easily queried and linked to appropriate metadata describing general sampling techniques and QA/QC performed. The final database will allow CFSA implementers to more easily identify and obtain temperature data. This will increase the ability to use the data to identify locations that could benefit from stream restoration or preservation as well as evaluate the relationships between stream temperature and the fisheries resources of the lower Clark Fork River watershed.

Budget

Item	Estimated Carryover[1]	2022 Budget Request
Technician labor (0.10 FTE)	$1,166	$9,500
Biologist labor (0.02 FTE)	$0	$3,500
Total	$1,166	$13,000
Anticipated Expenditures		$14,166

[1] *Estimated carryover of unexpended, approved funds as of January 1.*

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Table 1. Temperature monitoring site name, site type, project plan title, and data due date for 2022.

Stream and site name	Site type	Project Plan title	Data due date
Prospect Creek 17-mile	Long-term	Habitat Restoration Monitoring and Native Salmonid Abundance Monitoring Plan	December 1, 2022
Prospect Creek below Crow	Long-term	Habitat Restoration Monitoring and Native Salmonid Abundance Monitoring Plan	December 1, 2022
Cooper Gulch below Chipmunk	Long-term	Habitat Restoration Monitoring and Native Salmonid Abundance Monitoring Plan	December 1, 2022
Cooper Gulch above long-term site #1	Long-term	Habitat Restoration Monitoring and Native Salmonid Abundance Monitoring Plan	December 1, 2022
Crow Creek below confluence at 2007 restoration reach	Long-term	Habitat Restoration Monitoring and Native Salmonid Abundance Monitoring Plan	December 1, 2022
West Fork Crow Creek 2-3 minutes up WF trail	Long-term	Habitat Restoration Monitoring and Native Salmonid Abundance Monitoring Plan	December 1, 2022
East Fork Crow Creek just upstream of culvert	Project	Habitat Restoration Monitoring and Native Salmonid Abundance Monitoring Plan	December 1, 2022
West Fork Trout Creek lower below 1st creek crossing	Long-term	Habitat Restoration Monitoring and Native Salmonid Abundance Monitoring Plan	December 1, 2022
West Fork Trout Creek middle above Robin Run	Long-term	Habitat Restoration Monitoring and Native Salmonid Abundance Monitoring Plan	December 1, 2022
West Fork Trout Creek upper below South Branch confluence	Long-term	Habitat Restoration Monitoring and Native Salmonid Abundance Monitoring Plan	December 1, 2022
Vermilion River near mouth	Long-term	Habitat Restoration Monitoring and Native Salmonid Abundance Monitoring Plan	December 1, 2022
Vermilion River PIT array	Long-term	Tributary Trapping and Downstream Juvenile Bull Trout Transport Program	December 1, 2022
Vermilion River between Roe Gulch and Canyon Creek	Project	Habitat Restoration Monitoring and Native Salmonid Abundance Monitoring Plan	December 1, 2022
Canyon Creek below bridge	Project	Habitat Restoration Monitoring and Native Salmonid Abundance Monitoring Plan	December 1, 2022
Vermilion River below Cataract Creek	Long-term	Habitat Restoration Monitoring and Native Salmonid Abundance Monitoring Plan	December 1, 2022
Vermilion River ~1.1 km down from Grouse Creek	Project	Habitat Restoration Monitoring and Native Salmonid Abundance Monitoring Plan	December 1, 2022
Sims Creek near mouth access from spur road	Project	Habitat Restoration Monitoring and Native Salmonid Abundance Monitoring Plan	December 1, 2022
Vermilion River above Chapel Slide	Long-term	Habitat Restoration Monitoring and Native Salmonid Abundance Monitoring Plan	December 1, 2022
Vermilion River below Willow Creek	Project	Habitat Restoration Monitoring and Native Salmonid Abundance Monitoring Plan	December 1, 2022
Vermilion River below Frosty/Charred creeks	Project	Habitat Restoration Monitoring and Native Salmonid Abundance Monitoring Plan	December 1, 2022
Vermilion River below Miller Creek	Project	Habitat Restoration Monitoring and Native Salmonid Abundance Monitoring Plan	December 1, 2022
Vermilion River at mouth of Control Creek	Project	Habitat Restoration Monitoring and Native Salmonid Abundance Monitoring Plan	December 1, 2022
Happy Gulch near mouth	Project	Habitat Restoration Monitoring and Native Salmonid Abundance Monitoring Plan	December 1, 2022

Stream and site name	Site type	Project Plan title	Data due date
Miller Creek near mouth	Project	Habitat Restoration Monitoring and Native Salmonid Abundance Monitoring Plan	December 1, 2022
Graves Creek PIT array	Long-term	Tributary Trapping and Downstream Juvenile Bull Trout Transport Program	December 1, 2022
Graves Creek above falls	Long-term	Habitat Restoration Monitoring and Native Salmonid Abundance Monitoring Plan	December 1, 2022
Graves Creek upstream of 2nd USFS bridge	Project	Habitat Restoration Monitoring and Native Salmonid Abundance Monitoring Plan	December 1, 2022
Graves Creek at Lawn Lake trailhead	Project	Habitat Restoration Monitoring and Native Salmonid Abundance Monitoring Plan	December 1, 2022
Rock Creek above West Fork	Long-term	Habitat Restoration Monitoring and Native Salmonid Abundance Monitoring Plan	December 1, 2022
Rock Creek upstream of trail bridge	Long-term	Habitat Restoration Monitoring and Native Salmonid Abundance Monitoring Plan	December 1, 2022
Rock Creek upper cascade		Habitat Restoration Monitoring and Native Salmonid Abundance Monitoring Plan	December 1, 2022
Lower Bull River PIT array	Long-term	Tributary Trapping and Downstream Juvenile Bull Trout Transport Program	December 1, 2022
Upper Bull River between the upstream-most beaver activity and forks	Long-term	Tributary Trapping and Downstream Juvenile Bull Trout Transport Program	December 1, 2022
Upper Bull River between the downstream-most beaver activity and springs	Long-term	Tributary Trapping and Downstream Juvenile Bull Trout Transport Program	December 1, 2022
East Fork Bull River North Channel Trap Site	Long-term	Tributary Trapping and Downstream Juvenile Bull Trout Transport Program	December 1, 2022
East Fork Bull River South Channel Trap Site	Long-term	Tributary Trapping and Downstream Juvenile Bull Trout Transport Program	December 1, 2022
South Fork Bull ~30 m above mouth	Long-term	Habitat Restoration Monitoring and Native Salmonid Abundance Monitoring Plan	December 1, 2022
East Fork Blue Creek	Long-term	Habitat Restoration Monitoring and Native Salmonid Abundance Monitoring Plan	December 1, 2022
E.F. Lightning Creek 1	Project	Fish Resource Monitoring, Enhancement, and Management Plan	December 1, 2022
Porcupine Creek 1	Project	Fish Resource Monitoring, Enhancement, and Management Plan	December 1, 2022
Rattle Creek 1	Project	Fish Resource Monitoring, Enhancement, and Management Plan	December 1, 2022
Savage Creek 1	Project	Fish Resource Monitoring, Enhancement, and Management Plan	December 1, 2022
Wellington Creek 1	Project	Fish Resource Monitoring, Enhancement, and Management Plan	December 1, 2022
North Gold Creek 1	Project	Fish Resource Monitoring, Enhancement, and Management Plan	December 1, 2022
Trestle Creek PIT array	Long-term	Lake Pend Oreille PIT-Monitoring Station Operation and Maintenance	December 1, 2022
Granite Creek PIT array	Long-term	Lake Pend Oreille PIT-Monitoring Station Operation and Maintenance	December 1, 2022
South Gold Creek PIT array	Long-term	Lake Pend Oreille PIT-Monitoring Station Operation and Maintenance	December 1, 2022
Upper Pack River PIT array	Long-term	Lake Pend Oreille PIT-Monitoring Station Operation and Maintenance	December 1, 2022

Stream and site name	Site type	Project Plan title	Data due date
Lower Pack River PIT array	Long-term	Lake Pend Oreille PIT-Monitoring Station Operation and Maintenance	December 1, 2022
Grouse Creek PIT array	Long-term	Lake Pend Oreille PIT-Monitoring Station Operation and Maintenance	December 1, 2022
Temperature Station 1/Clark Fork River USGS gage	Long-term	Clark Fork River Population Monitoring	December 1, 2022
Spawning Shelf	Long-term	Clark Fork River Population Monitoring	December 1, 2022
Temperature Station 2	Long-term	Clark Fork River Population Monitoring	December 1, 2022
Cabinet Gorge Dam forebay	Project	Total Dissolved Gas Monitoring	December 1, 2022
Downstream Cabinet Gorge	Project	Total Dissolved Gas Monitoring	December 1, 2022
Downstream Cabinet Gorge Shore Station	Project	Total Dissolved Gas Monitoring	December 1, 2022

2022 PROJECT PLAN

Walleye Geochemistry Study

Project Contacts

Eric Oldenburg, Avista, (406) 847-1290, eric.oldenburg@avistacorp.com,
Ken Bouwens, Idaho Department of Fish and Game (IDFG), (208) 769-1414,
ken.bouwens@idfg.idaho.gov *and*,
Paul Kusnierz, Avista (406) 847-1274, paul.kusnierz@avistacorp.com

Project History

The Walleye Geochemistry Study is a continuing project that was originally approved by the Management Committee (MC) during the 2019 fall meeting. This project was ranked by the Water Resources Technical Advisory Committee (WRTAC) during the fall 2019 meeting. No budget changes are being proposed for 2022; however, the project proponents are will be meeting with the contractor in early 2022 to determine whether further analyses are warranted and to discuss final reporting.

The need and concept for this study were cooperatively identified and developed by IDFG and Avista staff. The project was competitively bid through a request for proposal process. Mainstem Fish Research (MFR; contractor) and the Pacific Northwest National Laboratory (PNNL; subcontractor) were tentatively selected to conduct this research (tentative based on MC approval). Subsequent negotiations between Clark Fork Settlement Agreement (CFSA), MFR, and PNNL staff informed the development of this project plan.

Background

Walleye were illegally introduced into Noxon Reservoir around 1990 and are now well-established within both Noxon and Cabinet Gorge reservoirs. The reservoirs have provided suitable spawning and rearing habitat for Walleye, and it is believed that downstream drift has led to subsequent invasions of Walleye into the Idaho reaches of the Clark Fork River, Lake Pend Oreille (LPO), and the Pend Oreille River. Walleye were first detected in the Pend Oreille River in 2005 and in LPO in 2006, and were initially only observed at low densities in localized habitats. However, the relative abundance of Walleye observed through fall index netting appears to be doubling every three years. These results suggest that the LPO Walleye population is currently experiencing rapid (e.g., exponential) growth.

The expanding Walleye population has the potential to put several fish populations (e.g., Bull Trout, Westslope Cutthroat Trout, kokanee) in LPO at risk through direct predation and competition. Thus, the IDFG is evaluating whether or not Walleye suppression would be a feasible, prudent, and desirable management action, and is currently leading the Appendix F5 "Lake Pend Oreille/Clark Fork River Walleye Population Assessment" and "Lake Pend Oreille Experimental Walleye Angler Incentive Program" projects.

One important knowledge gap exists that has the potential to influence how feasible it may or may not be to suppress Walleye in LPO in the interest of maintaining desirable population abundances. Currently, there is little information regarding the proportion of LPO Walleye

hatched within LPO (or waters directly connected to LPO), versus Walleye that hatched in Noxon or Cabinet Gorge reservoirs and subsequently drifted or swam downstream to LPO. If the majority of LPO Walleye are being produced within LPO, it might be feasible to suppress this population to desirable levels. Alternatively, if a high proportion of LPO Walleye were produced upstream of Cabinet Gorge Dam in Montana, it may not be feasible to effectively control this population through management actions in LPO alone.

This study proposes to identify geochemical markers than can be used to reliably discern between Walleye with provenance upstream versus downstream of Cabinet Gorge Dam. The potential for use of geochemical signatures in bone, scales and otoliths to determine natal origins of fish is well established (Kerr and Campana 2014). These signatures typically include both isotopic (e.g., $^{87}Sr/^{86}Sr$, $\delta^{18}O$, $\delta^{13}C$) and elemental markers (e.g., Sr, Ba). Combinations of elemental markers have been successfully used to identify the origins of Walleye in Arkansas and Missouri (Bickford and Hannigan 2005) and in Missouri River reservoirs in North and South Dakota (Carlson et al. 2016). Assignment accuracy for these studies ranged from 89-94% and 83-93%, respectively. Bigrigg (2008) similarly used Sr to determine natal sites of adult Walleye in Lake Erie and found that homing fidelity ranged from 37-92%. More recently, Chen et al. (2016) showed that natal stream variation in Sr/Ca can be detected in the otoliths of larval Walleye as young as two days old. These studies suggest that elemental markers can serve as useful predictors of natal origins in Walleye, but the probabilities of correct assignment can vary widely. By comparison, isotopic markers such as $^{87}Sr/^{86}Sr$ and $\delta^{18}O$ have also been used extensively to establish provenance in fish because they tend to be more environmentally stable than elemental concentrations and there is typically a strong correlation between the water and otolith ratios (Barnett-Johnson et al. 2008; Zeigler and Whitledge 2010). However, we are not aware of their application to determine natal origins in Walleye. Nevertheless, $^{87}Sr/^{86}Sr$ differs considerably between the Pack River (0.711045–0.713066), the Clark Fork Reservoirs (~0.72541) and north LPO (0.72417) and may thus add a second level of discrimination among these locations (Frawley et al. 2019). The basis for this variation is due, in part, to the surface geology of the Clark Fork River and LPO (Figure 1). The lower Clark Fork River drains primarily from Proterozoic metamorphic rock (2500 to 540 Ma) compared to the mostly Quaternary – Tertiary fluvial deposits around the Pack River (66 Ma to present). These age differences contribute to a higher abundance of radiogenic ^{87}Sr in the older rock and thus a higher $^{87}Sr/^{86}Sr$ ratios. We also anticipate potential variation in oxygen and carbon ($\delta^{18}O$ and $\delta^{13}C$) among the sites because of differences in stream hydrology and land use patterns, respectively, and possibly lead (Pb) as a result of the legacy mining and smelting activities upstream of the reservoirs (Unruh et al. 2000) near Butte and Anaconda, MT.

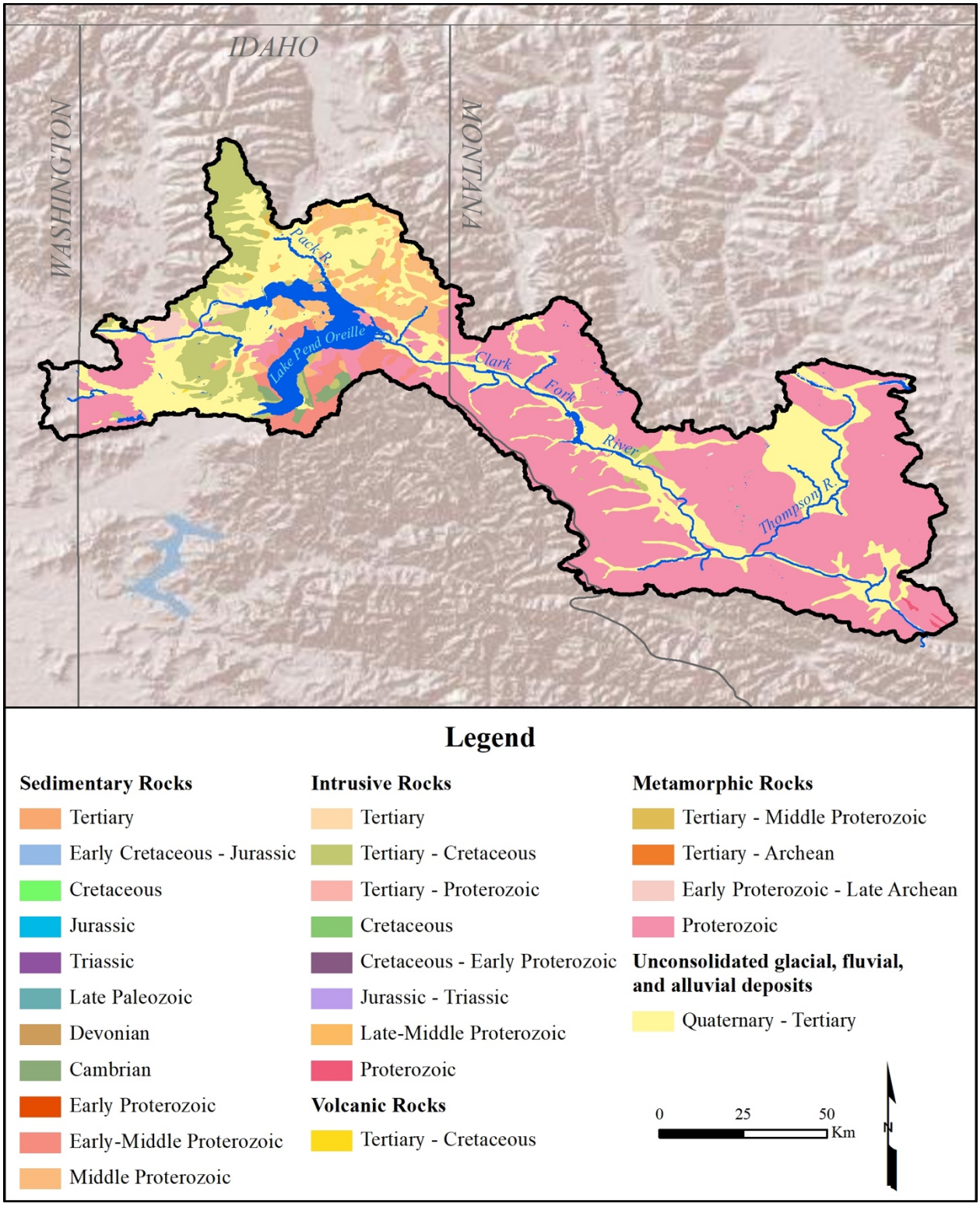

Figure 1. Surface geology of the lower Clark Fork River, Pack River and Lake Pend Oreille.

Goal

The goal of this research is to develop a geochemical marker or suite of markers than can be used to reliably discern between Walleye that hatched in the reservoirs and those that hatched downstream of Cabinet Gorge Dam. A secondary goal that would be favorable but which is not a strict requirement of the project is to develop markers that would allow discernment of provenance at more discrete geographic scales such as fish that hatched in Noxon Reservoir, Cabinet Gorge Reservoir, the Pend Oreille River, or specific areas within LPO (e.g., the lower Clark Fork River and associated delta area versus the Pack River delta/Sunnyside area).

Objectives

1. Evaluate otolith and water samples to quantify the spatial variation of isotopic ($^{87}Sr/^{86}Sr$) and element/Ca markers. (***Complete***)

2. Review data from Objective 1 and meet with CFSA staff to determine if additional markers need to be evaluated to achieve the desired level of discernibility. (***Complete***)

3. Pending the outcome of Objective 2, evaluate otoliths, water samples, and/or opercula bones for additional isotopic and/or element/Ca markers (e.g., $\delta^{18}O$, $\delta^{13}C$, $^{206}Pb/^{204}Pb$, $^{207}Pb/^{204}Pb$, $^{208}Pb/^{204}Pb$, Pb/Ca).

4. Develop an analytical model for discerning provenance among LPO Walleye and summarize findings in technical report and/or manuscript for publication.

Methods

A phased approach will be utilized to identify and develop a suite of markers than can be used to reliably discern provenance among LPO Walleye. The first phase will be analyzing a standard suite of potential markers in the otoliths of up to 100 fish and up to six water samples (Objective 1). Elemental/Ca ratios (e.g., Sr/Ca) that have been shown to effectively discriminate Walleye of different natal origin will be analyzed. The strontium isotopic ratio (i.e., $^{87}Sr/^{86}Sr$) will also be analyzed because of the known difference in the ratio among the presumptive natal sites and its well documented utility as an indicator of provenance and movement in many species of fish. Once the first phase is complete, MFR and PNNL will meet with CFSA personnel to evaluate the data and determine whether or not this suite of potential markers alone will provide adequate discriminatory ability (Objective 2). If so, MFR and PNNL will develop a Project Completion Report or a manuscript for publication (Objective 4).

If it is determined that the desired level of discriminatory ability was not achieved with the first suite of markers, MFR, PNNL, and CFSA personnel will develop a new suite of markers for which a subsample of the original fish structures and/or water samples will be re-analyzed (Objective 3). Potential markers to be analyzed during this phase may include $\delta^{18}O$, $\delta^{13}C$, $^{206}Pb/^{204}Pb$, $^{207}Pb/^{204}Pb$, $^{208}Pb/^{204}Pb$ and Pb/Ca in bone (opercula). The isotopic ratio of oxygen in otoliths has emerged as an effective technique to retrospectively characterize thermal life history because it fractionates in direct relation to water temperature (Thorrold et al. 1997; Høie et al. 2004). Thus, differences in water temperature even among waters of similar oxygen isotopic composition may produce distinct otolith $\delta^{18}O$ signatures. Carbon ($\delta^{13}C$) could provide similar discrimination among watersheds due to variable C sources in the food web (e.g. relative

abundance of C3 and C4 plants) (Ramsay et al. 2012) and fractionation differences in aquatic plants between riverine and lake environments (France 1995). By contrast, we suggest lead could provide discriminatory value because of mining and smelting waste that entered the Clark Fork River from Butte and Anaconda MT in the early 1900's. The lead isotopic composition from these activities are well established (Unruh et al. 2000) and lead is readily taken up by bone (Hodson et al.1982).

Specific analytical procedures (e.g., laser ablation, inductively coupled mass spectrometry; thermal ionization mass spectrometry; laser absorption spectroscopy) and data analysis methods can be provided upon request.

Work Products

- Project Completion Report or manuscript for publication; final due July 1, 2022
- Annual Work Summary; due December 1, 2022

Permitting Requirements

Biological samples will be obtained through the collection authority of IDFG and Montana Fish, Wildlife & Parks. No other permits are required.

Endangered Species Act consultation for this project plan is associated with the 2019 Biological Opinion on the effects of continued operation of the Clark Fork Hydroelectric Project on Bull Trout and designated Bull Trout critical habitat (BiOp). This project plan is consistent with the analyses and conclusions contained in the 2019 BiOp and will adhere to all appropriate Terms and Conditions designed to reduce the extent and effects of incidental take on Bull Trout. No incidental take of Bull Trout is anticipated as a result of this project plan; therefore, no take reporting is required.

Cultural/Historic Resource Review

Not applicable to this project. No ground and/or vegetation disturbing activities that could affect cultural or historic resources are proposed.

Benefit to the Resource

The ultimate goal, and applied use of the information obtained by this study is to help IDFG effectively manage Walleye in the interest of protecting and enhancing populations of kokanee, Bull Trout, Westslope Cutthroat Trout, and other desirable gamefish species as determined by IDFG. All of these species have the potential to be exposed to elevated levels of total dissolved gas produced at Cabinet Gorge Dam which is the priority of Appendix F5 mitigation efforts. This effort is consistent with and complimentary to numerous Appendix F5 projects including the experimental Walleye angler incentive program, Walleye population assessment, Lake Trout angler incentive program, and the netting program. This project is also consistent with the intent of the Appendix C Fish Passage/Native Salmonid Restoration Plan. This research will support efforts to enhance native salmonid populations within LPO and direct tributaries thereto. Additionally, these efforts should enhance the effectiveness of the juvenile Bull Trout downstream transport program and lead to increased numbers of mature Bull Trout being returned to Montana through upstream capture and transport efforts. Lastly, the markers identified through this research will likely be useful to numerous appendices A, B, C, and F5

applied research studies that may be proposed in the near future. For example, geochemistry can likely be used to determine natal streams of Westslope Cutthroat Trout. Additionally, this information may be used to evaluate the accuracy of Bull Trout genetic assignment, and, in concert with genetic information, used to estimate and better understand straying rates among Bull Trout.

This project directly supports IDFG's efforts to understand and effectively manage the Lake Pend Oreille fishery consistent with the management objectives outlined in the Fisheries Management Plan (2019-2024). This project is also consistent with Endangered Species Act direction from the U.S. Fish and Wildlife Service through the Bull Trout Recovery Plan, Biological Opinion for the Clark Fork projects, and informal consultation through the CFSA process.

Budget

Item	Estimated Carryover[1]	2022 Budget Request
Analysis, travel, reporting	$77,906	$0
Total	$77,906	$0
Anticipated Expenditures		$77,906

[1] *Estimated carryover of unexpended, approved funds as of January 1.*

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2022 PROJECT PLAN

Trophic Monitoring in Lake Pend Oreille and Pend Oreille River Idaho

Project Contact

Kristin Lowell, Idaho Department of Environmental Quality, (208) 769-1422,
Kristin.Lowell@deq.idaho.gov

Project History

Trophic monitoring on Lake Pend Oreille (LPO) and Pend Oreille River is a continuing project that has been performed regularly since 2005. This project was ranked by the WRTAC and first approved by the Management Committee (MC) in 2013. It was subsequently approved by the MC 2014–2017. Due to other LPO monitoring priorities, trophic monitoring was not conducted in 2018. To maintain continuity in this monitoring program, the project was again proposed 2019–2021 and approved by the MC. The scope and budget for this project are reviewed by the Management Committee (MC) annually. Modifications to the MC-approved scope/budget are being requested and are described in the Background section.

Background

Existing data suggests that the trophic status of the nearshore areas of the northern region of LPO are progressing to eutrophic conditions more rapidly than the nearshore water in the mid/southern region and open waters and of the lake. The regional trend analysis in the mid- and southern region of the lake shows total phosphorus concentrations and trophic conditions have not changed significantly over time (DEQ 2015a).

The *Total Maximum Daily Load (TMDL) for Nutrients for the Nearshore Waters of the Pend Oreille Lake, Idaho* (Nearshore TMDL) is a prescription for the lake for water quality conditions to support aquatic life (DEQ, 2002). The Nearshore TMDL set an average total phosphorus target of 9.0 µg/L for aquatic life use support. It also set an action threshold target of 12 µg/L that represents an instantaneous total phosphorus concentration to direct future monitoring and to evaluate potential impairment of the monitoring site. A study suggests the TMDL target has not been met in the northern region of the lake but is being met in the southern end of the lake (DEQ 2015a).

After two seasons of a closer look at the northern bays and Pend Oreille River, the Idaho Department of Environmental Quality (DEQ) will return to our long-term trend sampling regime modified from monitoring sites established in the 1990s by Falter et. al (1992). We have also incorporated two Pend Oreille River sites into this long-term trend monitoring plan. Long-term trend monitoring stations are provided in Figure 1 and Table 1. We believe this is the best use of resources and will allow us to build on an already established long-term data set given the few times we go out each year. In addition, we are adding an additional sampling event to give us a more robust data set with which we can run statistics and do reporting. The DEQ will collect water quality data necessary for evaluation of the status and trend in trophic conditions in the long-term trend stations of LPO. The trophic indices will be determined by the Carlson's Trophic Index (Carlson 1977), which is based on concentrations of nutrients, chlorophyll-a, and water clarity. Results of this ongoing investigation will guide implementation of nutrient reduction projects and future National Pollution Discharge Elimination System permitting. Changes in

trophic status can have implications for the LPO foodweb and have the potential to affect fisheries management in the lake.

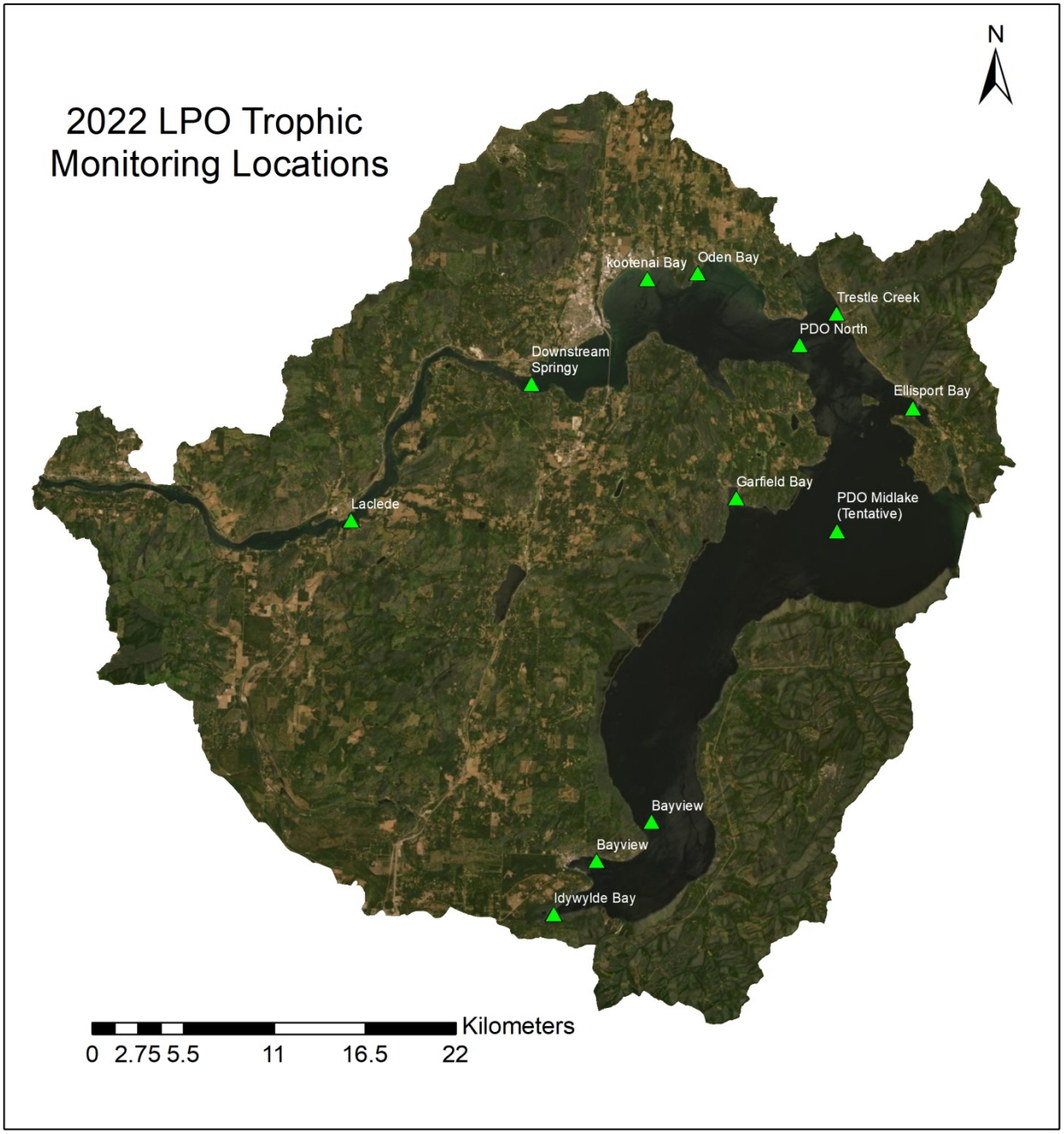

Figure 1. Map of long-term trend trophic monitoring sites.

Table 1. List of long-term trend trophic monitoring sites

Station	Type	lattitude	Longitude
Bayview	Nearshore	47.981638	-116.535863
Bayview	Open Water	48.003872	-116.492177
Garfield Bay	Nearshore	48.181519	-116.431959
Ellisport Bay	Nearshore	48.233333	-116.290278
Idywylde Bay	Nearshore	48.951847	-116.568864
Oden Bay	Nearshore	48.30307	-116.469155
PDO North	Open Water	48.2659	-116.38433
Kootenai Bay	Nearshore	48.298833	-116.509866
Trestle Creek	Nearshore	48.283595	-116.354712
Downstream Springy	River	48.23995	-116.60142
Laclede	River	48.16235	-116.74435
PDO Midlake (Tentative)	Open Water	48.167232	-116.415814

Goal
The goal of this project is to better understand the relationship between nutrients and trophic status and their variability across regions and long-term trend stations in LPO and Pend Oreille River.

Objectives
1. Collect routine chemical and physical data in long-term trend stations in LPO and Pend Oreille River.

2. Collect water quality data to understand nutrient speciation and trophic conditions in long-term trend stations in LPO and Pend Oreille River

3. Compare conditions in the northern region of the lake with the mid- and southern regions of the lake using a long-term data set first established in the 1990s.

Methods
Monitoring conducted by DEQ follows directives outlined in the LPO and River Trophic Monitoring Quality Assurance Project Plan (DEQ 2015b).

Water Quality Monitoring
Idaho Department of Environmental Quality's 2022 monitoring will include seven nearshore stations, three open water stations, and two Pend Oreille River stations during each sampling event. To obtain a more robust data set, monitoring will take place four times July–September 2022. Monitoring events will be at least 15 days apart. The monitoring sites are shown in Figure 1.

The following is a list of water quality data collected under the routine trophic monitoring program:

- Profiles through the water column of chemical and physical parameters including water temperature, pH, dissolved oxygen, conductivity, and Secchi depth.

- A composite of either five samples taken from equal-depth intervals or depth integrated with a peristaltic pump from the lake surface to a depth as directed by stratification of the station and the depth of the photic zone. Samples are taken to the analytical laboratory for analysis of total phosphorus, chlorophyll-a, total kjeldahl nitrogen, and nitrate + nitrite (as N). Additionally, the Idaho Department of Fish and Game has asked for analysis of total dissolved phosphorus be added as it will allow them to evaluate overall lake productivity and provide insight to trophic interactions that affect kokanee.

- If the station is stratified, grab sample at ½ the depth between the hypolimnion knee and the lake bottom. Samples are taken to the analytical laboratory for analysis of total phosphorus, total kjeldahl nitrogen, nitrate + nitrite, and total dissolved phosphorus.

Work Products

- Annual Work Summary; due December 1, 2022

Permitting Requirements

Not applicable for the tasks proposed in this project plan.

Endangered Species Act consultation for this project plan is associated with the 2019 Biological Opinion on the effects of continued operation of the Clark Fork Hydroelectric Project on Bull Trout and designated Bull Trout critical habitat (BiOp). This project plan is consistent with the analyses and conclusions contained in the 2019 BiOp and will adhere to all appropriate Terms and Conditions designed to reduce the extent and effects of incidental take on Bull Trout. No incidental take of Bull Trout is anticipated as a result of this project plan; therefore, no take reporting is required.

Cultural/Historic Resource Review

Not applicable for the tasks proposed in this project plan. There are no ground and/or vegetation disturbing activities, or proposed impacts to cultural/historic resources.

Benefit to the Resource

Fish species that are expected to benefit from the project include Bull Trout (*Salvelinus confluentus*), Westslope Cutthroat Trout (*Oncorhynchus clarkii lewisi*) and kokanee salmon (*Onchrynchus nerka*). This project evaluates the water quality status of habitat affected by elevated total dissolved gas and further develops baseline data against which cumulative impacts can be evaluated. Results from this project could be used to evaluate synergy of trophic status and total dissolved gas on the fish community. Characterizing water quality over time to identify trends helps ensure that project implemented under this protection, mitigation and enhancement measure are optimized for longevity and effectiveness. Water quality monitoring will dovetail with past efforts to track trophic status, nutrient loading, and metals loading from sampling previously approved by the Management Committee. Water quality data will improve

interpretation of success of fishery recovery plans.

Budget

Nutrients: Lab Analysis

Total Events: 4 (four events from July–September)
Total Stations: 12 stations with 4 events = 48 stations

It is anticipated that 24 stations of the 48 during the monitoring season will be iso-thermal.
It is anticipated that 24 stations of the 48 during the monitoring season will be stratified.

The following analyses will be performed on water quality samples collected at each station (Stratified stations have two samples collected for total phosphorus, nitrate + nitrite, total kjeldahl nitrogen and total dissolved phosphorus):

Analysis:
Total phosphorus (method 4500 PE) = $45
Nitrate + Nitrite (as N) = $35
Total Kjeldahl Nitrogen = $45
Total dissolved phosphorus (method 4500 PE) = $45
Chlorophyll-a = $50

Lab Analysis Cost: iso-thermal stations = $220
Total cost for 24 iso-thermal stations = $5,280

Lab Analysis Cost: stratified stations = $390
Total cost for 24 stratified stations = $9,360

Quality Assurance Lab Analysis

Duplicates = 1 each event
Total cost for duplicates x 4 events = $880

Blanks = 1 each event
Total cost per blank x 4 events = $880

Total cost for quality assurance = $1,760

Total Season Lab Costs

24 iso-thermal Stations = $5,280
24 stratified Stations = 9,360
Quality Assurance = $1,760

Grand Total Cost Lab Analysis: $16,400

Item	Estimated Carryover[1]	2022 Budget Request
Nutrient lab analysis	$4,940	$14,640
Nutrient quality assurance lab analysis	$0	$1,760
Total	$4,940	$16,400
Anticipated Expenditures		$21,340

[1] *Estimated carryover of unexpended, approved funds as of January 1.*

A match of $23,000 will be provided by DEQ covering employee time spent sampling and writing a summary report as well as the cost of 3-days use of the boat used for sampling each event.

Literature Cited

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2022 PROJECT PLAN

Box Canyon Reservoir Northern Pike Suppression

Project Contact

Shane Harvey, Kalispel Tribe of Indians Natural Resources Department, (509) 447-7158, sharvey@kalispeltribe.com

Project History

The Box Canyon Reservoir (BCR) Northern Pike (NP) Suppression Project was originally approved by the Management Committee in 2012 and has since been annually approved and funded through the Clark Fork Settlement Agreement (CFSA) Appendix F5 program. Initially the project was ranked as a three-year effort and was therefore not ranked 2013–2014. With a reduced scale of activities proposed, it was approved but not ranked by the Water Resources Technical Advisory Committee in 2015–2021. In 2020, the project netting effort was reduced due to mandated quarantine of staff and as a result, the 2021 effort was increased to a full 8 weeks of suppression. Based on this and increased NP catch in 2021, the 2022 effort is also scheduled to be 8 weeks. There is an increase in the personnel costs in the proposed 2022 budget due to salary and benefit (fringe rate) adjustments within the organization. There is also an increase in the indirect costs in 2022 resulting from an increase in the organization's indirect rate from 12.61 to 23.00 percent of total project costs.

Background

For the purpose of brevity in this proposed Project Plan, background information on NP biology, status in BCR, and management in Washington State are only briefly summarized. For a more complete background and project description see the initial 2012 proposal for this project and subsequent annual summaries and comprehensive reports submitted (2012–2020; 2021 forthcoming) to Avista.

Northern Pike have been widely distributed outside their native range in the western US, including illegal introduction to the Clark Fork River, Montana (Vashro 2011). They migrated further downstream and become firmly established in BCR, a 55mile long impoundment of the Pend Oreille River, WA. First detected in 2004, the BCR population of NP had expanded exponentially from less than 400 individuals in 2006 to over 5,500 individuals in 2010 between Pioneer Park and Riverbend; it was estimated that in excess of 10,000 adult pike existed in the reservoir in 2011(Connor et al. *in prep*). Northern Pike expanded their range within BCR and have continued to expand downstream to Boundary Reservoir, the Pend Oreille and upper Columbia rivers in British Columbia (BC) and Lake Roosevelt (Columbia River) in Washington. Population growth and geographical expansion threatens native species conservation and recovery in the Pend Oreille watershed and the entire Columbia River ecosystem.

In BCR, relative abundance of most other native and non-native fish species declined in the presence of NP. Northern Pike pose threats to Bull Trout (BT) and Westslope Cutthroat Trout (WCT) entrained at Albeni Falls Dam (AFD). No permanent fish passage structure exists at AFD, so temporary upstream passage has been provided since 2007. Northern Pike threatens the survival of these species due to a high degree of habitat overlap, especially when native

salmonids seek thermal refuge within the littoral zones. Extensive efforts to increase relative abundance of native salmonids in the lower Pend Oreille through mainstem fish passage projects, tributary restoration and conservation aquaculture are seriously compromised by NP.

Given the potential impacts of NP, Kalispel Tribe of Indians Natural Resources Department (KNRD) and Washington Department of Fish and Wildlife (WDFW) developed a management position to:

1. Minimize the impacts of NP to native species.
2. Reduce the number of NP in BCR.
3. Reduce the spread of NP downstream and prevent further illegal introduction.

Kalispel Tribe of Indians Natural Resources Department and WDFW developed and implemented measures designed to drastically reduce NP abundance in BCR including the removal of NP as a gamefish in WA, maintaining their designation as a prohibited species, harvest-oriented fishing contests, and implementation of large-scale mechanical suppression projects. Washington Department of Fish and Wildlife also produced a webpage (https://wdfw.wa.gov/species-habitats/invasive/esox-lucius#invasive) to share information on the impacts of NP, the management position, and mechanical suppression/survey results. Thus far mechanical suppression (implemented 2012–2021) has been the primary measure leading to the significant reduction of NP in BCR.

In total, more than 18,600 NP have been removed in the over 5,800 gillnet sets during the ten years of suppression in BCR. Given the decline observed in the catch-per-unit-effort (CPUE) from 2012–2021 Spring Pike Index Netting (SPIN) surveys, the NP population appears to have been largely suppressed in BCR. The adult population south of Riverbend (including sloughs) has been reduced by as much as 93% when compared to pre-suppression levels. However, failure to maintain a depressed population has been shown to increase the recruitment level from an exploited NP population (Colby et al. 1987; Wydoski and Whitney 1999). Reducing the predation risk and competition for available resources has the potential to increase survival rates for juvenile NP.

Monitoring and mechanical suppression of NP is also occurring in the Pend Oreille and Columbia Rivers in BC (AMEC 2017) and Lake Roosevelt (Columbia River in WA; Brent Nichols pers. comm.). Localized spread in disconnected water bodies is also a concern. WDFW has received several reports of lakes containing NP (Randy Osborn and Bill Baker pers. comm.); so far two lakes with NP have been treated with piscicide (Fish Lake in Spokane Co. and Upper/Lower Lead King Lakes in Pend Oreille County). This issue has moved from a localized population problem to a significant regional and international management concern for native and sport fisheries in the blocked area of the Columbia River Basin (above Chief Joseph Dam) and anadromous salmon and steelhead fisheries below the blocked area.

Mechanical suppression of NP, using gillnets, is a well-established management tool (see previous proposals and reports on this project for details). Mechanical suppression of the BCR population of NP began in 2012, with an objective to reduce abundance of the adult population by 87% at the end of 2014. This would occur by reducing the population from 13.2 NP/net night

to <1.73 NP/net night in southern ½ of BCR and from 2.9 NP/net night to <0.5 NP/net night in northern ½ of BCR, in the SPIN survey. Although the initial objective was the reduction in NP abundance, a continued effort would be necessary (2015 – on) to prevent a population rebound to pre-suppression levels.

With the population of NP in BCR currently in a depressed state, sexually mature individuals available to spawn will be limited. Interannual variation in abundance (e.g., increases observed in 2019–2021) is expected periodically, as complete eradication is unlikely in this system. Increases in abundance can lead to potential re-establishment of the population if adequate annual suppression effort is not applied. As such, the level of suppression is modified annually to reflect observed changes in the population or a planned or unexpected decrease in effort, as was the case in the 2020 netting season. Due to the abruptly shortened 2020 season with notable catch, and the increase in NP captured in 2021, it is critical to continue BCR Northern Pike suppression in 2022 at the current level of effort (i.e., 8 weeks, as opposed to the 5 weeks used up through 2020). This effort will also continue to inform any compensatory response in the population, which if observed, may require further in-year or out-year adaptations (e.g., timing, overall effort).

Goal

The goal of the BCR NP Suppression Project is to protect and increase native fish species in the reservoir and adjoining habitats by decreasing predation through the continued implementation of NP suppression.

Objectives

1. Mechanically suppress the BCR NP population to maintain an abundance of <1.7 NP/net night in the core area between Pioneer Park and Riverbend (including all sloughs) and <0.5 NP/net night north of Riverbend, as evaluated during the annual SPIN survey.

2. Monitor any evidence of a NP compensatory response (e.g., increased juvenile survival) to avoid rapid population expansion.

Tasks

1. Obtain necessary permits from WDFW and USFWS. This process will occur outside of the timeframe and funding of this proposed Project Plan but is an integral part of the project. (Objectives 1 and 2).

2. Obtain/prepare equipment: gillnets, buoys/anchors, safety equipment, etc. Gillnets are custom built and along with other equipment will be purchased prior to initiating NP suppression (Objectives 1 and 2).

3. Staff primary field personnel. Two field crews will be required to implement this project. Each field crew consists of a vessel (boat) operator (either Biologist II or Technician III) and two deck crewmen (technicians) (Objectives 1 and 2).

4. Implement mechanical suppression 4 days/week with up to two 3-person crews for a total of 8 weeks. Mechanical suppression will consist of the deployment up to 40 gill nets

daily (24-hr sets) from vessels specifically outfitted for gillnetting; nets will have the same specifications as previous years. Beginning at ice-out of sloughs (early March), netting will occur on a weekly schedule; suppression netting is scheduled for March 7 through April 28, 2022. Ideally a minimum of two complete passes through all known spawning locations will be completed, with a minimum of 2 nets set at each location to assess variability and depletion level. Timing and duration of suppression, location targeting, and netting saturation will be at the discretion of the biologists and field staff on the project (Objectives 1 and 2).

5. Complete SPIN survey to monitor effectiveness of suppression effort. To determine if target abundances of NP have been maintained, A SPIN survey will be implemented May 2–5, 2022; this is an integral component of this project, but not directly funded through the CFSA (Objectives 1 and 2).

6. All NP caught during suppression and SPIN will be selected for biological data collection. Data collection will include total length (mm), weight (g), sex, and maturity. Data will be recorded in the field, then be entered, QA/QC performed, analyzed, and interpreted. All catches will be monitored for an abnormally high percentage of younger (i.e., <350 mm) individuals and potentially, changes in maturation (Objectives 1 and 2).

Work Products

- Annual Project Update; final due November 1, 2022
- Annual Work Summary; due November 15, 2022
- Comprehensive Project Report 2012–2024; final due November 1, 2024

Permitting Requirements

The WDFW Scientific Collection permit application will be submitted December 2021 and will be obtained by March 2022.

Endangered Species Act consultation for this project plan is associated with the 2019 Biological Opinion on the effects of continued operation of the Clark Fork Hydroelectric Project on Bull Trout and designated Bull Trout critical habitat (BiOp), and the Kalispel Tribe's existing permit pursuant to Section 10 of the Act. This project plan is consistent with the analyses and conclusions contained in the 2019 BiOp and the Kalispel Tribe's Section 10 permit and will adhere to all appropriate Terms and Conditions designed to reduce the extent and effects of incidental take on Bull Trout. Incidental take reporting for this project plan will be included in the annual Biological Opinion report as required by Term and Conditions 15–18 of the 2019 Incidental Take Statement, as well as the Kalispel Tribe's annual Section 10 report to the USFWS.

Cultural/Historic Resource Review

Not applicable for the tasks proposed in this project plan, there are no ground and/or vegetation disturbing activities, or proposed impacts to cultural/historic resources.

Benefit to the Resource

This project is consistent with Clark Fork Settlement Agreement, Appendix F5 Gas Saturation Control, Mitigation, and Monitoring Program measures: “The purpose of this measure is to

provide for the study, control, mitigation, and monitoring of gas supersaturation and the associated impacts to biological resources in the lower Clark Fork-Lake Pend Oreille (LCFR-LPO) system related to spill at the Clark Fork Projects." Furthermore, it aligns with other mitigation projects currently funded through the Appendix F5 Program (e.g., Lake Pend Oreille Lake Trout trap netting, gill netting, and angler incentive projects). The project is also consistent with Appendix C "to achieve the goal of increasing the long-term population viability of native salmonids in the Lake Pend Oreille-lower Clark Fork River system". Component (3) of Appendix C addresses similar threats to native salmonids by implementing the "Non-Native Fish Suppression Project in the East Fork Bull River". Outside of the CFSA, this project is further supported by the 2009 Bonneville Power Administration (BPA) Fish and Wildlife Program basin-wide strategies for non-natives (see 2012 proposal for this project). The Intermountain Province Subbasin Plan also clearly supports this project (also see 2012 proposal). This project is also supported by downriver interests (Tribes, WA, OR, BC) and five BPA funded projects sponsored by the Kalispel Tribe.

This project provides direct benefits to recovery and conservation of BT, WCT, Mountain Whitefish, native minnows and suckers, and gamefish in BCR being managed by KNRD, WDFW, and Idaho Department of Fish and Game by reducing predation and competition by NP. Reducing the predatory impact of NP on BT will increase the probability that entrained fish are collected and transported upstream of Albeni Falls Dam to complete their life history and contribute genetic diversity to depressed upstream populations. Reducing the abundance of NP in BCR demonstrates risk management and abatement for future efforts to increase the relative abundance of native salmonids in the lower Pend Oreille through mainstem fish passage projects, tributary restoration, and conservation aquaculture.

Budget

Item	Estimated Carryover[1]	2022 Budget Request
Vehicle/Boat O&M	$1,600	$9,600
Gillnets, Field Supplies/Equipment, and Personal Protective Equipment X 50%	$4,840	$2,854
Personnel: 1 Biologist III (0.10 FTE), 1 Biologist II (0.25 FTE), 5 Technicians (0.17 FTE each) X 50%	$16,500	$40,086
Indirect Costs (23.00% of direct costs)	$2,900	$12,085
Total	$25,840	$64,625
Anticipated Expenditures		$90,465

[1] *Estimated carryover of unexpended, approved funds as of January 1.*

Implementation of this project will be cost shared by a minimum of $64,625 (50% of total) through a KNRD contract with BPA (Non-Native Fish Suppression). An additional BPA-funded KNRD project (Joint Stock Assessment), will contribute up to $30,000 in permitting, study design, and monitoring of the NP population through the SPIN survey. The WDFW also annually contributes $20,000–$30,000 in-kind toward the SPIN survey, outreach, management, technical support, and assistance with data analysis and reporting. It should be noted that the Tribes' portion of the permitting (i.e., USFWS, WDFW) and monitoring component (SPIN) will be 100% funded outside of this request.

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2022 PROJECT PLAN

Lake Pend Oreille Experimental Walleye Angler Incentive Program

Project Contact

Ken Bouwens, Idaho Department of Fish and Game (IDFG), (208) 769-1414, ken.bouwens@idfg.idaho.gov *and*
Andy Dux, IDFG, (208) 769-1414, andy.dux@idfg.idaho.gov

Project History

This is an ongoing project originally approved through consent mail on December 3, 2018. It was also approved by the Management Committee since 2019. The scope and budget for this project is reviewed by the Management Committee annually.

Background

Suppression of piscivorous fishes, including Lake Trout and Rainbow Trout, has been the focus of Lake Pend Oreille (LPO) fishery management since 2006. Previous suppression programs have included incentivized angler harvest of Rainbow Trout (ended in 2013) and Lake Trout (ongoing), as well as commercial trap net and gillnet operations targeting Lake Trout. Through previous research, the IDFG established that reduced kokanee production in LPO, in concert with an over-abundance of upper trophic level predators had created a predator pit that would have likely led to a complete collapse of kokanee in the system (Hansen et al. 2010). The Lake Trout suppression program has been a major success and the kokanee population has responded positively.

Walleye, which were illegally introduced into Noxon Reservoir approximately 30 years ago, have become well-established throughout Noxon and Cabinet Gorge reservoirs. These reservoirs have provided suitable spawning and rearing habitat for Walleye and it is believed that downstream drift has led to subsequent invasions into the Idaho portion of the Clark Fork River, LPO and the Pend Oreille River. These fish appeared to exist in LPO at low densities in localized habitats but the densities have nearly doubled every three years from 2011 to 2017 during fall Walleye index netting. Additionally, increasing numbers of Walleye are incidentally being caught in Lake Trout netting efforts throughout the northern and southern basins of the lake.

An expanding Walleye population has the potential to put several fish populations in LPO at risk through direct predation and competition. Walleye are prolific piscivores and their establishment in other western lentic systems has led to significant fishery management challenges, particularly where they overlap with salmonid fisheries (MFWP 2016). Lake Pend Oreille represents a critical stronghold for Bull Trout within their native range. Westslope Cutthroat Trout populations in LPO are depressed relative to historic abundances, but they appear to be reasonably ubiquitous, thus providing some diversity to the sport fishery as well as life history diversity and conservation value. Rainbow Trout in LPO provide a popular world-class trophy fishery that largely depends on abundant kokanee for forage. Kokanee themselves provide a popular yield fishery on the lake and represent a forage base for adfluvial Bull Trout. Like we are currently observing with Walleye, Lake Trout existed at low abundance in LPO for many years before they became a predation concern. Lake Trout suppression programs were instituted to

reduce predation risk when we began to observe rapid population increases, as we are now seeing with Walleye. Should Walleye abundance continue to increase and the scope of their niche expand to include ecologically significant predation on kokanee, Westslope Cutthroat Trout, and juvenile Bull and Rainbow trout, some of the conservation advancement made through previous suppression programs may be at risk.

A Walleye population assessment project is currently being funded through Appendix F5 and includes monitoring, telemetry, and experimental netting. One of the goals of the population assessment project is to evaluate the feasibility of Walleye suppression as a management tool. To supplement this work, this project incentivizes angler harvest of Walleye to determine if this is an effective suppression method. This experimental program is intended to serve several purposes. First, it promotes angler harvest of Walleye in the LPO system, thus reinforcing via management that Walleye are a threat to the existing fishery. Second, it increases the potential for angling to serve as a tool for managing the Walleye threat, which is a common request from anglers. Finally, it will provide an opportunity to evaluate the effect of incentivized harvest on angler exploitation rate. Exploitation will be estimated and compared to previous estimates to assess the influence of incentivized harvest. Ultimately, this information will be useful for evaluating the role that angler harvest can play in the management of Walleye in LPO, particularly with respect to suppression feasibility.

The program is designed to provide rewards for a subset of the heads turned in in contrast to a direct per-fish bounty. A number of Walleye are tagged in the head using coded wire tags that are not visible externally. Tags are uniquely numbered and each has a reward value of $1,000. Heads are collected throughout the year and scanned for coded wire tags. If a tag is present, the angler receives a $1,000 reward. Additionally, anglers have their name entered into a monthly drawing for each head turned in that is not tagged. Each month a random drawing is conducted and ten winners receive a $100 reward. If less than 10 heads are turned in during a given month, then the number of drawing payouts is limited to the number of heads turned in that month.

The Walleye Angler Incentive program began in March 2019. During its first year of implementation a total of 785 Walleye were removed by 178 unique anglers. No tagged Walleye were turned in during 2019. In 2020, a total of 860 heads were turned in by 182 anglers. In addition, a total of 10 tagged Walleye (1.2% of the number of heads turned in) were submitted for the $1,000 payment. During 2021, 113 different anglers submitted 757 heads, with five of these being tagged for $1,000 payments (0.7%; Table 1).

Table 1. Number of Walleye removed and unique anglers participating in the LPO Walleye Angler Incentive Program, by month, 2019–2021.

	2019		2020		2021	
	Heads	Anglers	Heads	Anglers	Heads	Anglers
January			12	4	10	4
February			17	5	1	1
March	26	14	60	12	85	12
April	89	31	53	15	9	3
May	79	28	71	23	54	19
June	154	43	121	39	86	28
July	156	53	137	47	215	39
August	171	42	206	43	184	28
September	76	17	130	40	76	15
October	18	5	25	12	14	7
November	9	4	14	5	13	6
December	7	1	14	4	10	2

Goal

To implement an experimental angler incentive program targeting Walleye in LPO, thereby reducing the threat they pose to native and recreationally important species.

Objectives

1. Promote angler harvest of Walleye and increase the potential for angling to serve as a tool for regulating Walleye abundance.

2. Evaluate the utility of angler harvest for regulating Walleye population abundance in the LPO system.

Tasks

1. Conduct public outreach to make anglers aware of this new experimental program. (Objective 1)

2. Fish head freezer drop off locations around the lake will continue to be emptied, at least weekly, and maintained. Submitted fish heads will be processed. (Objective 1)

3. Tag additional Walleye in 2022 to maintain a similar tag return rate to 2021 based on estimates of annual mortality and angler exploitation rates. (Objective 1)

4. Pay anglers $1,000 for each coded wire-tagged Walleye caught in the LPO system. (Objective 1)

5. Conduct random monthly drawings and award ten $100 rewards per month to program participants. (Objective 1)

6. Summarized catch data will be submitted to a contractor for disbursement of reward tag payouts and facilitation of monthly random drawings and associated payouts. (Objective 2)

Work Products

- Annual Project Update – 2021; final due November 1, 2022
- Annual Work Summary; due December 1, 2022
- Annual Project Update – 2022; final due November 1, 2023

Permitting Requirements

Not applicable for the tasks proposed in this project plan.

Endangered Species Act consultation for this project plan is associated with the 2019 Biological Opinion on the effects of continued operation of the Clark Fork Hydroelectric Project on Bull Trout and designated Bull Trout critical habitat (BiOp), and the U.S. Fish and Wildlife Service (USFWS)-IDFG Cooperative Agreement pursuant to Section 6 of the Act. This project plan is consistent with the analysis and conclusions contained in the 2019 BiOp and the USFWS-IDFG Cooperative Agreement, and will adhere to all appropriate Terms and Conditions designed to reduce the extent and effects of incidental take on Bull Trout. Incidental take reporting for this project plan will be included in the annual Biological Opinion report as required by Term and Conditions 15–18 of the 2019 Incidental Take Statement, as well as IDFG's annual Section 6 report to the USFWS.

Cultural/Historic Resource Review

Not applicable for the tasks proposed in this project plan, there are no ground and/or vegetation disturbing activities, or proposed impacts to cultural/historic resources.

Benefit to the Resource

Bull Trout, Westslope Cutthroat Trout, kokanee, and Rainbow Trout are all target species that are potentially negatively impacted by operations at Cabinet Gorge Dam that lead to gas supersaturation. The Appendix F5 TDG Alternative Mitigation Program is "focused on the protection and enhancement of the fishery resources that might be affected by the future occurrence of elevated TDG levels downstream of the Cabinet Gorge HED" (Avista 2004). The goal of this project is to evaluate the feasibility of suppression of the burgeoning Walleye population downstream of Cabinet Gorge Dam as alternative mitigation to potential adverse effects of TDG supersaturation. Further, Walleye have the potential to offset some of the gains in predation management that have been made in the *LPO Lake Trout Netting Program*, which has been the major focus of the CFSA Appendix F5 Alternative Mitigation Program.

This approach is consistent with the Avista Native Salmonid Recovery Plan (NSRP, Appendix C of the CFSA) to restore and enhance migratory forms of native salmonids, and also with the USFWS Bull Trout recovery plan (USFWS 2015). This approach is also consistent with the management objectives outlined for the Clark Fork River and LPO in the Idaho Department of Fish and Game Fisheries Management Plan 2019-2024 (IDFG 2019).

Budget

Item	Estimated Carryover[1]	2022 Budget Request
Signage, flyers, and misc. outreach materials	$0	$250
Coded wire tag rewards	$2,000	$50,000
Monthly drawing rewards (10 @ $100 each)	$3,000	$12,000
Avista labor (0.5 FTE)	$2,000	$50,000
Vehicle operating costs	$500	$2,500
Supplies (freezers, freezer parts, bags, etc.)	$500	$2,000
Contractor cost to administer payments	$1,000	$2,000
Total	$9,000	$118,750
Anticipated Expenditures		$127,750

[1] *Estimated carryover of unexpended, approved funds as of January 1.*

NOTE: Although $50,000 was requested for coded wire tag rewards, our best estimate of angler exploitation and natural mortality suggests ≤10 of the tagged fish will be caught and submitted for the $1,000 payment. Thus, the actual angler payout will likely be approximately ≤$10,000 for tagged fish, making the actual cost to implement the program for one year closer to $52,000.

A match of approximately $5,000 of IDFG funds will be allocated towards this project for general administration, public outreach, data analysis, etc.

Literature Cited

Avista. 2004. Final Gas Supersaturation Control Program for the Clark for Project. Avista Corporation: Spokane, Washington. 90 pages + appendices.

Hansen, M. J., D. Schill, J. Fredericks, and A. Dux. 2010. Salmonid predator-prey dynamics in Lake Pend Oreille, Idaho, USA. Hydrobiologia 650:85-100.

IDFG (Idaho Department of Fish and Game). 2019. Fisheries Management Plan 2019-2024. Boise, ID.

MFWP (Montana Fish, Wildlife, and Parks). 2016. Ecology and Management of Montana Walleye Fisheries. Avista document identification number 2016-0449. Montana Cooperative Fishery Research Unit, Montana State University, Bozeman, Montana, and Montana Fish, Wildlife and Parks, Helena, Montana.

USFWS (U.S. Fish and Wildlife Service). 2015. Recovery plan for the coterminous United States population of bull trout (Salvelinus confluentus). Portland, Oregon. xii + 179 pages.

2022 PROJECT PLAN

Lake Pend Oreille/Clark Fork River Walleye Population Assessment

Project Contact

Ryan Hardy, Idaho Department of Fish and Game (IDFG), (208) 769-1414, Ryan.Hardy@idfg.idaho.gov *and*
Ken Bouwens, IDFG, (208) 769-1414, ken.bouwens@idfg.idaho.gov

Project History

This is a continuing project first approved in 2018. The scope and budget for this project are reviewed by the Management Committee annually.

Background

Suppression of piscivorous fishes, including Lake Trout and Rainbow Trout, has been the focus of the Lake Pend Oreille (LPO) fishery recovery since 2006. Previous suppression programs have included incentivized sport harvest of Rainbow Trout (ended in 2013) and Lake Trout (ongoing) as well as commercial trap net and gillnet operations targeting Lake Trout. Through previous research, we had established that reduced kokanee productivity in LPO, in concert with an over-abundance of upper trophic level predators had created a predator pit that would have likely led to a complete collapse of kokanee in the system (Hansen et al. 2010). The predator suppression program has been a major success and the kokanee population has responded positively.

Walleye, which were illegally introduced into Noxon Reservoir approximately 30 years ago, have become well established throughout Noxon and Cabinet Gorge reservoirs. These reservoirs have provided suitable spawning and rearing habitat for Walleye and downstream drift has led to subsequent invasions into the Idaho portion of the Clark Fork River, LPO and the Pend Oreille River. These fish appeared to exist in LPO at low densities in localized habitats but the densities have nearly doubled every three years from 2011 to 2017 during fall Walleye index netting. Walleye catch rates during targeted Lake Trout netting have generally remained low since 2006, but Walleye catch rates are increasing during Lake Trout netting efforts throughout the northern and southern basins of the lake.

An expanding Walleye population has the potential to put several fish populations in LPO at risk through direct predation and competition. Walleye are prolific piscivores and their establishment in other western lentic systems has led to significant fishery management challenges, particularly where they overlap with salmonid fisheries (MFWP 2016). Lake Pend Oreille represents a critical stronghold for Bull Trout within their native range. Westslope Cutthroat Trout populations in LPO are depressed relative to historic abundances, but they appear to be reasonably ubiquitous, thus providing some diversity to the sport fishery as well as life history diversity and conservation value. Rainbow Trout in LPO provide a popular world-class trophy fishery that largely depends on abundant kokanee for forage. Kokanee themselves often provide a popular yield fishery on the lake and represent a forage base for adfluvial Bull Trout. Like we are currently observing with Walleye, Lake Trout existed at low abundances in LPO for many years before they became a predation concern. Lake Trout suppression programs were instituted

to reduce predation risk when we began to observe rapid population increases, as we are now seeing with Walleye. Should Walleye abundances continue to increase and the scope of their niche expand to include ecologically significant predation on kokanee, Westslope Cutthroat Trout, and juvenile Bull and Rainbow trout, some of the conservation advancements made through previous suppression programs may be at risk.

This project proposes to gather fundamental information to help us assess the current status of the Walleye population, to evaluate the opportunities for management (suppression), and estimate the likely scope of their influence on the current fish community in LPO. We will accomplish this by implementing a test fishery approach that increases the scope and resolution of current management tools. We will implement a strategic acoustic telemetry program that will allow us to evaluate the number, location, and spatial extent of spawning aggregations, and we will then attempt to target one or several aggregations using various gear types to collect biological data and assess our fishing power. Finally, we will continue to evaluate Walleye diet and trophic status in order to determine the scope of their predator interactions. There will be synergy among these approaches that will improve their success. For example, identification of spawning aggregations will not only help clarify opportunities for suppression, but will facilitate our understanding of current distribution and life history of Walleye in Lake Pend Oreille.

The Fall Walleye Index Netting Project (FWIN) is completed on a three year rotation. It is a robust tool that is used to monitor the relative size of the Walleye population in LPO using a randomized netting design to assess and track the relative size of the Walleye population via catch per unit effort estimates (Morgan 2002). Results from the 2020 FWIN broadly suggest that Walleye catch rates in Lake Pend Oreille have decreased since 2017 (Figure 1). Lake Pend Oreille was divided into four zones to compare changes in Walleye catch rates over time among the different regions in the Lake Pend Oreille system that met the FWIN sampling criteria (Morgan 2002, Ryan et al. 2021). Three of the four zones showed relatively consistent catch rates compared to 2017, but the Pend Oreille river zone has continued to show increases in catch rate since 2011 (Ryan et al. 2021). Suppression netting conducted since 2018 coupled with the Walleye AIP program (beginning in 2019) may be partially responsible for the decreased catch rates overall, but suppression netting has focused in the north basin of the lake and most of the Walleye (heads) returned during the AIP suggest angling has focused on the north basin of the lake as well. To continue reducing Walleye densities in general and in the Pend Oreille River specifically, we plan to refine our telemetry methods in the Pend Oreille River to better evaluate residency, movements, and areas where Walleye concentrate for potential suppression and to help increase angler exploitation in the river. This may include the addition of more telemetry receivers and equipment to improve the timeliness and efficiency of the data flow from the field to the anglers or netters.

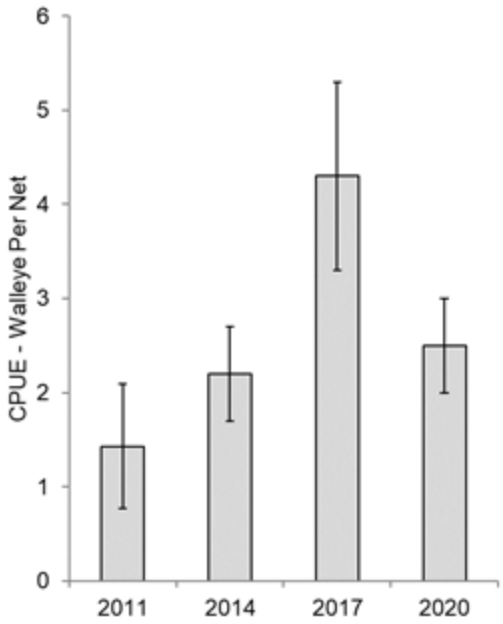

Figure 1. FWIN catch rates, 2011–2020.

Ultimately, this information will be used to establish tolerable management thresholds for Walleye densities and help identify a range of potential management options. Given burgeoning Walleye populations have a track record of negative fishery consequences in western waters, we will be focusing this project on the efficacy of suppression tools, including physical removal and use of emerging suppression technologies including Trojan Y-chromosome hatchery fish (e.g., Schill et al. 2016).

Goal

Assess and evaluate opportunities for Walleye population management in the LPO watershed.

Objectives

1. Locate Walleye concentrations and determine their general movement patterns to focus netting and angler effort on areas with high Walleye density to maximize catch rates and exploitation.

2. Evaluate our ability to capture Walleye in various locations during different times using different gear types.

3. Collect biological data from captured Walleye to learn about their growth, diet, origin, and other population parameters.

4. Evaluate our ability to regulate the abundance of the LPO Walleye population.

Tasks

1. Implant acoustic tags in 30 additional Walleye to add to the 52 fish that are already tagged. (Objective 1)

2. Deploy, maintain, and download 51 fixed acoustic receivers throughout LPO, the Clark Fork River, and the Pend Oreille River to determine seasonal movement patterns. (Objective 1)

3. Weekly, actively track tagged Walleye to provide real-time data to inform both targeted netting and angler effort. (Objective 1)

4. Provide timely updates on Walleye locations to the public to increase angler exploitation. (Objective 1)

5. Contract with Hickey Brothers Research, LLC in the spring to use commercial gill netting techniques to target Walleye spawning concentrations. (Objective 2)

6. Experiment with various gear types (gill nets, trap nets, e-fishing) to target Walleye in areas and during times where commercial scale netting is not feasible. (Objective 2)

7. Collect necessary biosamples to facilitate trophic and diet studies, as well as otolith microchemistry to determine sources of recruitment above or below Cabinet Gorge Dam. Because trophic and microchemistry studies are outside the scope of this project, samples will be archived for later processing. (Objectives 2 and 3)

8. Compile and evaluate tracking, catch, and biological data to elucidate trends and direct future efforts. (Objective 4)

9. Continue to survey and process bathymetry data to create detailed bathymetric maps of the Clark Fork River, the Clark Fork Delta, and other areas where Walleye are known to concentrate. (Objective 1 and 2)

10. Use the bathymetric maps to facilitate targeted removal. (Objective 2)

Work Products

- Annual Project Update – 2021; final due November 1, 2022
- Annual Work Summary; due December 1, 2022
- Annual Project Update – 2022; final due November 1, 2023

Permitting Requirements

Not applicable for the tasks proposed in this project plan. Any necessary Endangered Species Act consultation or take reporting will be conducted under Idaho Department of Fish and Game's (IDFG) Section 6 Agreement. Endangered Species Act consultation for this project plan is associated with the 2019 Biological Opinion on the effects of continued operation of the Clark Fork Hydroelectric Project on Bull Trout and designated Bull Trout critical habitat (BiOp), and the U.S. Fish and Wildlife Service (USFWS)-IDFG Cooperative Agreement pursuant to Section 6 of the Act. This project plan is consistent with the analysis and conclusions contained in the 2019 BiOp and the USFWS-IDFG Cooperative Agreement, and will adhere to all appropriate Terms and Conditions designed to reduce the extent and effects of incidental take on Bull Trout. Incidental take reporting for this project plan will be included in the annual Biological Opinion

report as required by Term and Conditions 15–18 of the 2019 Incidental Take Statement, as well as IDFG's annual Section 6 report to the USFWS.

Cultural/Historic Resource Review
Not applicable for the tasks proposed in this project plan, there are no ground and/or vegetation disturbing activities, or proposed impacts to cultural/historic resources.

Benefit to the Resource
Bull Trout, Westslope Cutthroat Trout, kokanee, and Rainbow Trout are all target species that are negatively impacted by operations at Cabinet Gorge Dam that lead to gas supersaturation. The Appendix F5 total dissolved gas (TDG) Alternative Mitigation program is "focused on the protection and enhancement of the fishery resources that might be affected by the future occurrence of elevated TDG levels downstream of the Cabinet Gorge HED [Hydroelectric Development]" (Avista 2004). The goal of this project is to evaluate the potential risk and feasibility of suppression of the burgeoning Walleye population downstream of Cabinet Gorge Dam as alternative mitigation to potential adverse effects of TDG supersaturation. Further, Walleye have the potential to offset some of the gains in predation management that have been made in the *LPO Lake Trout Netting Program* (also funded through Appendix F5 of the CFSA).

Our approach is consistent with the Avista Native Salmonid Restoration Plan (Appendix C of the CFSA) to restore and enhance migratory forms of native salmonids, and also with the USFWS Bull Trout recovery plan (USFWS 2015). This approach is also consistent with the management objectives outlined for the Clark Fork River and Lake Pend Oreille in the Idaho Department of Fish and Game Fisheries Management Plan 2019-2024 (IDFG 2019).

Budget

Item	Estimated Carryover[1]	2022 Budget Request
Contract with Hickey Bros. LLC for up to three weeks of targeted Walleye netting	$0	$55,000
Full Time Benefitted IDFG Technician including overhead (0.67 FTE)	$0	$30,000
Temporary Non-benefitted IDFG Technician including overhead (0.67 FTE)	$0	$20,000
Avista staff time (0.25 FTE)	$2,000	$25,000
Total	$2,000	$130,000
Anticipated Expenditures		$132,000

[1] *Estimated carryover of unexpended, approved funds as of January 1.*

Idaho Department of Fish and Game, using Bonneville Power Administration (BPA) funds, recently purchased acoustic tags and receivers (~$60,000 in 2021) for this project. This project will be administered and implemented by IDFG fisheries research staff payed with BPA funds, including Pete Rust (6 mos, ~$48,000) and Ryan Hardy (2 mo, ~$16,000). All additional operating costs (boat, fleet rentals, fuel, etc.) will be covered by IDFG using BPA funds.

Literature Cited

Avista. 2004. Final Gas Supersaturation Control Program for the Clark for Project. Avista Corporation: Spokane, Washington. 90 pages + appendices.

Hansen, M. J., D. Schill, J. Fredericks, and A. Dux. 2010. Salmonid predator-prey dynamics in Lake Pend Oreille, Idaho, USA. Hydrobiologia 650:85–100.

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Ryan, R., M. Corsi, and P. Rust. 2021. Characteristics of an Introduced Walleye Population with implications for Suppression. North American Journal of Fisheries Management.

Schill, D. J., J. A. Heindel, M. R. Campbell, K. A. Meyer, and E. R. J. M. Mamer. 2016. Production of a YY male Brook Trout broodstock for potential eradication of undesired brook trout populations. North American Journal of Aquaculture 78:72–83.

USFWS (U.S. Fish and Wildlife Service). 2015. Recovery plan for the coterminous United States population of bull trout (*Salvelinus confluentus*). Portland, Oregon. xii + 179 pages.

2022 PROJECT PLAN

Lake Pend Oreille Lake Trout Angler Incentive Program

Project Contact
Ken Bouwens, Idaho Department of Fish and Game (IDFG), (208) 769-1414,
ken.bouwens@idfg.idaho.gov

Project History
This is a continuing project that was originally approved by the Management Committee (MC) in 2007. The scope and budget for this project are reviewed by the MC annually.

Background
The kokanee population of Lake Pend Oreille (LPO) declined dramatically from historic levels due to a variety of habitat and ecological impacts. Historically, the adult population of around five million kokanee supported a sport and commercial fishery averaging one million fish per year. Predation was the primary factor limiting kokanee population recovery. Lake level management, restricted fish passage, and floods have also contributed to the decline of kokanee.

In 2000, the kokanee fishery was closed to increase spawning escapement and limits on Rainbow and Lake trout were liberalized to encourage harvest of Lake Trout and reduce predation on young kokanee. Despite liberalized harvest opportunity, angler exploitation was not keeping up with an expanding Lake Trout population. Non-native Lake Trout were not only recognized as a threat to the kokanee population and the trophy Rainbow Trout fishery, but case studies throughout the intermountain west have clearly demonstrated that Lake Trout also threaten the persistence of Bull Trout.

To address kokanee predation issues in LPO, predator removal using a large-scale netting program and an Angler Incentive Program (AIP) was implemented beginning in 2006. The goal of both the netting and angler harvest programs is to suppress Lake Trout and subsequently increase kokanee survival. The AIP additionally had the goal of reducing Rainbow Trout abundance; however, this component of the program was discontinued in 2013 because of limited success and increased resiliency of the kokanee population.

The responses observed to date suggest that suppression of Lake Trout can be achieved and provide benefits for both kokanee and Bull Trout. A positive response by kokanee has been observed corresponding to a reduction in the Lake Trout population, and kokanee abundance estimates have continued along an increasing trajectory. However, high exploitation of Lake Trout needs to be sustained.

The combined predator removal programs in LPO continue to demonstrate progress (Figure 1). Idaho Department of Fish and Game returned to trophy management of the Rainbow Trout fishery in 2013 and discontinued Rainbow Trout reward payments as part of the AIP. Idaho Department of Fish and Game (IDFG) opened a kokanee harvest fishery in 2013, and in 2014 daily kokanee limits were raised from six to 15 fish. Despite these signs of success, continued pressure on Lake Trout is necessary to insure long-term suppression of the population.

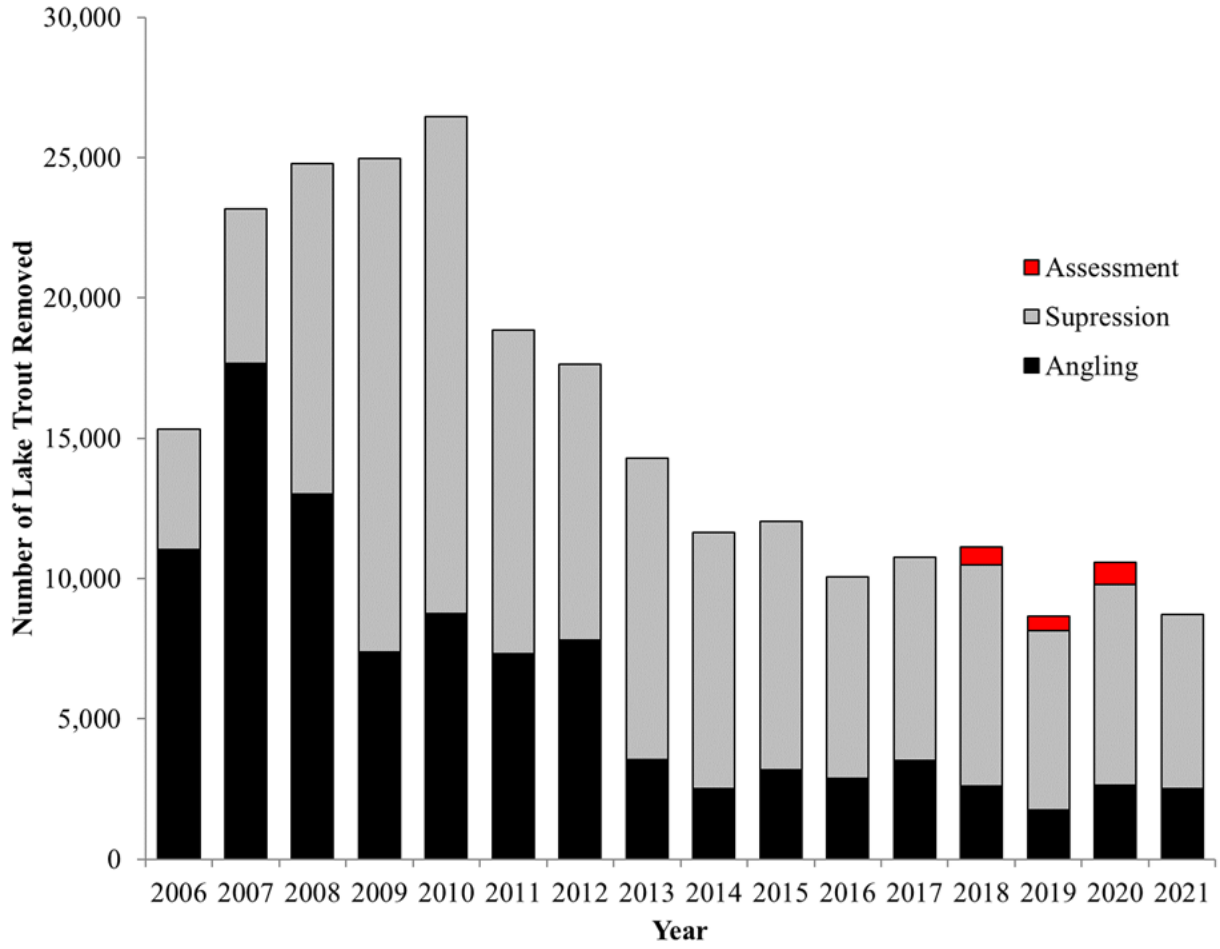

FIGURE 1. Lake Trout harvested and removed from Lake Pend Oreille, Idaho by year and collection method.

Anglers continue to play a necessary role in maintaining high exploitation rates. The efficiency of predator removal has remained at high levels under the combined effort of both netting and angling. Anglers continue to catch intermediate sized Lake Trout that are less vulnerable to netting gear during much of the sampling period as well as significant numbers of other size classes.

Goal

Improve and maintain favorable forage base for Gerrard Rainbow Trout and Bull Trout in Lake Pend Oreille by reducing Lake Trout abundance to increase kokanee survival.

Objective

1. Maintain high angling mortality on Lake Trout.

Tasks

1. Continue paying a $15/fish bounty on angler caught Lake Trout from LPO. (Objective 1)

2. Fish head freezer drop off locations around the lake will continue to be emptied, at least weekly, and maintained. Submitted fish heads will be processed at the IDFG Field Station. (Objective 1)

3. Summarized catch data will be submitted to a contractor for payment. (Objective 1)

4. All illegally harvested Bull Trout turned in through the program incidentally will be genetically assessed for stream of origin. (Objective 1)

5. Make available up to $16,000 dollars ($2,000 per derby maximum) to be used to sponsor LPO angling derbies. (Objective 1)

Work Products

- Annual Project Update – 2021; final due November 1, 2022
- Annual Work Summary; due December 1, 2022
- Annual Project Update – 2022; final due November 1, 2023

Permitting Requirements

Not applicable for the tasks proposed in this project plan.

Endangered Species Act consultation for this project plan is associated with the 2019 Biological Opinion on the effects of continued operation of the Clark Fork Hydroelectric Project on Bull Trout and designated Bull Trout critical habitat (BiOp), and the U.S. Fish and Wildlife Service (USFWS)-IDFG Cooperative Agreement pursuant to Section 6 of the Act. This project plan is consistent with the analysis and conclusions contained in the 2019 BiOp and the USFWS-IDFG Cooperative Agreement, and will adhere to all appropriate Terms and Conditions designed to reduce the extent and effects of incidental take on Bull Trout. Incidental take reporting for this project plan will be included in the annual Biological Opinion report as required by Term and Conditions 15–18 of the 2019 Incidental Take Statement, as well as IDFG's annual Section 6 report to the USFWS.

Cultural/Historic Resource Review

Not applicable for the tasks proposed in this project plan, there are no ground and/or vegetation disturbing activities, or proposed impacts to cultural/historic resources.

Benefit to the Resource

This project is consistent with the IDFG 2019-2024 Fish Management Plan (IDFG 2019). This project will meet the objectives of the Clark Fork Settlement Agreement Appendices A and F5 mitigation programs by directly reducing predation on kokanee and competition with Bull Trout. The project will also likely result in reduction of predation on Bull Trout and Westslope Cutthroat Trout in LPO to further benefit these species. Our approach is also consistent with the Avista Native Salmonid Restoration Plan (Appendix C) to restore and enhance migratory forms of native salmonids, and also with the USFWS Bull Trout Recovery Plan (USFWS 2015). This project is also consistent with Appendix N1 (Bald Eagle Monitoring and Protection) through enhancement of kokanee, an important food source for wintering eagles. This project provides direct, on-the-ground benefits to resources potentially adversely impacted by elevated TDG

levels in the Clark Fork River and LPO, as well as those impacted by degraded tributary habitat, by reducing competition and predation on kokanee, Bull Trout and Westslope Cutthroat Trout in LPO.

Budget

Item	Estimated Carryover[1]	2022 Budget Request
Angler incentive award (4,000 fish @ $15 each)	$5,000	$60,000
Avista labor (0.5 FTE)	$4,000	$50,000
Vehicle operating costs	$0	$10,000
Supplies (freezers, freezer parts, bags, etc.)	$0	$2,000
Contractor costs to administer payments	$1,000	$6,000
Genetic analysis (10 fish)	$0	$4,000
Derby sponsorship	$0	$16,000
Total	$10,000	$148,000
Anticipated Expenditures		$158,000

[1] *Estimated carryover of unexpended, approved funds as of January 1.*

Idaho Department of Fish and Game contributes in-kind cost share to this project for logistics and planning at an estimated cost of approximately $10,000 annually.

Literature Cited

IDFG (Idaho Department of Fish and Game). 2019. Fisheries Management Plan 2019-2024. Boise, ID.

USFWS (U.S. Fish and Wildlife Service). 2015. Recovery plan for the coterminous United States population of bull trout (Salvelinus confluentus). Portland, Oregon. xii + 179 pages.

2022 PROJECT PLAN

Lake Pend Oreille Lake Trout Netting Program

Project Contact

Ryan Hardy, Idaho Department of Fish and Game (IDFG), (208) 769-1414, ryan.hardy@idfg.idaho.gov *and*
Ken Bouwens, IDFG, (208) 769-1414, ken.bouwens@idfg.idaho.gov

Project History

This is a continuing project originally approved by the Management Committee (MC) in 2007. The scope and budget for this project are reviewed by the MC annually (budgets for the subsequent two years are reviewed annually).

Background

The kokanee population of Lake Pend Oreille (LPO) declined dramatically from historic levels due to a variety of habitat and ecological impacts. Historically, the adult population of around five million kokanee supported a sport and commercial fishery averaging one million fish per year. Predation was the primary factor limiting kokanee population recovery. Lake level management, restricted fish passage, and floods have also contributed to the decline of kokanee.

In 2000, the kokanee fishery was closed to increase spawning escapement and limits on Rainbow and Lake trout were liberalized to encourage harvest on Lake Trout and reduce predation on young kokanee. Despite liberalized harvest opportunity, angler exploitation was not keeping up with an expanding Lake Trout population. Non-native Lake Trout were not only recognized as a threat to the kokanee population and the trophy Rainbow Trout fishery, but case studies throughout the intermountain west have clearly demonstrated that Lake Trout also threaten the persistence of Bull Trout.

To address kokanee predation issues in LPO, predator removal using a large-scale netting program and an Angler Incentive Program (AIP) was implemented beginning in 2006. The goal of both the netting and angler harvest programs is to suppress Lake Trout and subsequently increase kokanee survival. The AIP additionally had the goal of reducing Rainbow Trout abundance; however, this component of the program was discontinued in 2013 because of limited success and increased resiliency of the kokanee population.

The responses observed to date suggest that suppression of Lake Trout can be achieved and provide benefits for both kokanee and Bull Trout. A positive response by kokanee has been observed corresponding to a reduction in the Lake Trout population, and kokanee abundance estimates have continued along an increasing trajectory. However, recent analyses suggest high exploitation of Lake Trout needs to be sustained for several more years to achieve Lake Trout suppression to late 1990’s abundances.

The combined predator removal programs in LPO continue to demonstrate progress. The Idaho Department of Fish and Game (IDFG) returned to trophy management of the Rainbow Trout fishery in 2013 and discontinued Rainbow Trout reward payments as part of the AIP. Idaho

Department of Fish and Game opened a kokanee harvest fishery in 2013, and in 2014 daily kokanee limits were raised from six to 15 fish. Despite these signs of success, continued pressure on Lake Trout is necessary to insure long-term suppression of the population.

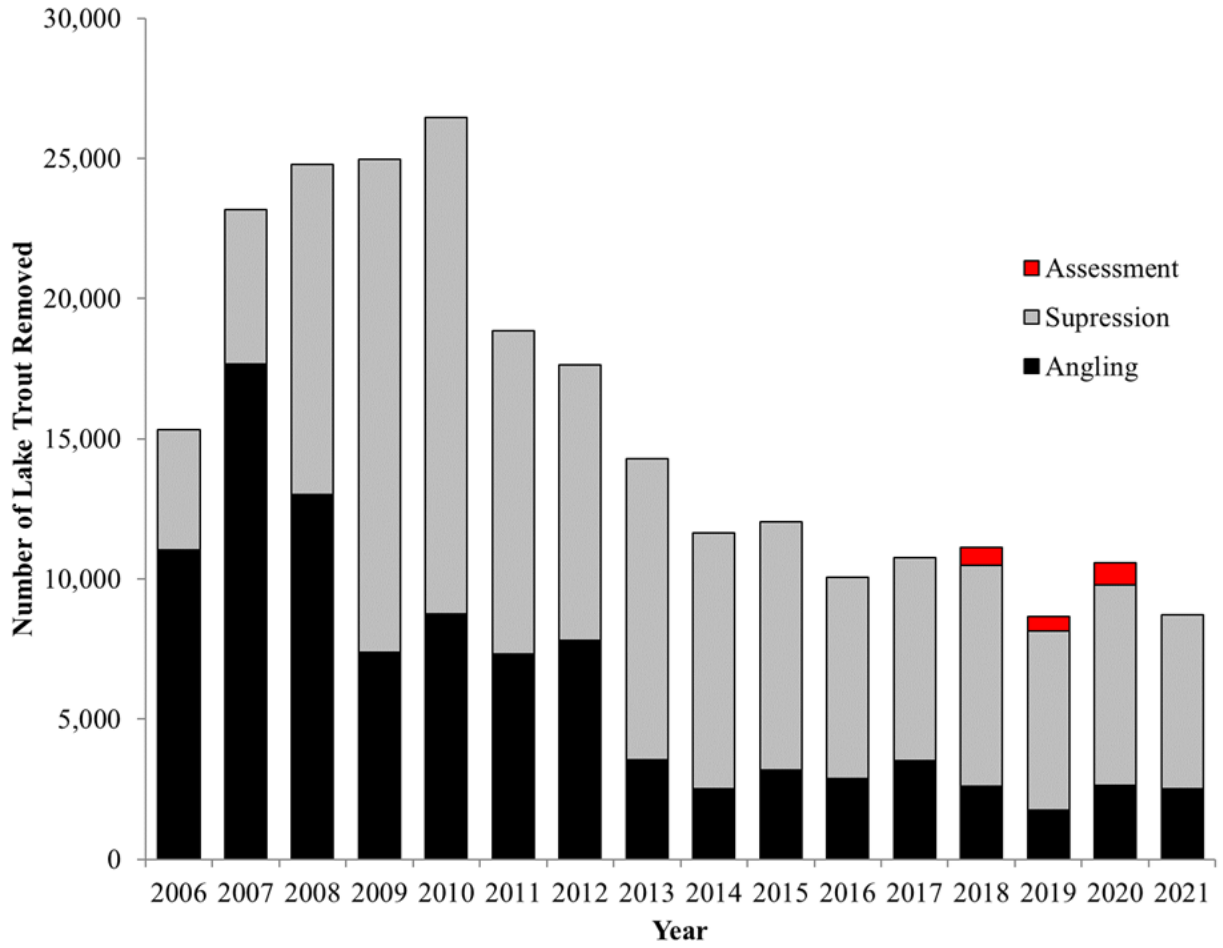

FIGURE 1. Lake Trout harvested and removed from Lake Pend Oreille, Idaho by year and collection method.

Fishing effort will remain high as efforts continue to target juvenile and spawning adult Lake Trout. However, we will continue to modify netting strategies in an attempt to improve catch efficiency and reduce bycatch mortality. We discontinued trap nets for spring fishing in 2010 following a continued decline in trap net efficiency, presumably due to declining adult Lake Trout abundance. We had maintained standardized trap net effort in the fall as a tool for monitoring relative adult Lake Trout and Bull Trout abundance, but we discontinued this effort in 2018 as we have developed improved Lake Trout monitoring tools using gillnets. We intend to continue gill netting efforts that target mature Lake Trout during the fall at spawning sites. Also, we will target juvenile Lake Trout during winter and early spring to capitalize on expected high catch rates. This also acts to focus netting when Bull Trout bycatch and mortality has been low relative to other time periods.

The long-term goal of the Lake Trout suppression program is to reduce fishing effort and transition into a maintenance suppression program that will keep Lake Trout at low density once

target densities are achieved. Benefits will include an easier program to implement and reduced costs. Results from Lake Trout population models (Hansen et al. 2019) developed by Dr. Michael Hansen (USGS, Hammond Bay Biological Station) and IDFG personnel suggest approximately 10 more years of high effort netting will be required to achieve late 1990's abundances. Once management targets are achieved, these models indicate a greatly reduced gillnet effort (~40% of peak gillnet effort) will maintain abundances at or below targets and eventually drive the Lake Trout population to extinction.

Lake Trout netting methods will closely follow those described in Rust et al. (2020). Hickey Brothers Research, LLC will be contracted to remove Lake Trout from Lake Pend Oreille using gill nets during 14 weeks in the winter/spring netting season and 14 weeks in the fall netting season. We will be conducting standardized assessment during the first three weeks of netting in January. In prior years, trap net catch rates were utilized as an index of Lake Trout and Bull Trout abundance. Trap netting was discontinued in 2018 and replaced with the random assessment netting protocol based upon an analysis by Hansen et al. (2019). Data from this program will be utilized to conduct a cohort analysis for Lake Trout, which will provide an annual age-specific abundance estimate.

Bottom-set gill nets with stretch mesh sizes ranging from 3.8 to 14 cm will be used. Each net is 274 m long and several will be tied together to form a gang that is generally set in a serpentine pattern parallel to shore. Gill nets will be set around dawn and retrieved in the late-morning (typically 4–6 hour sets). See Rust et al. (2020) for a more detailed explanation of netting methods.

With the exception of Lake Whitefish *Coregonus clupeaformis* all game fish captured in gill nets will be enumerated. Because of high catch rates, Lake Whitefish will be enumerated from a stratified random subset of standardized assessment netting locations. Catch rates will be calculated as the number of fish of a particular species captured per 274 m net (box). A time component is not included in these catch rates because Lake Trout catch has typically not increased with the duration of net sets (IDFG, unpublished data).

All captured individuals of target species (e.g., Lake Trout, Northern Pike *Esox lucius*, and Walleye) will be measured for total length and, with few exceptions (i.e., those tagged for research purposes), removed from the population and donated to local food banks or raptor rehabilitation facilities. Sex and maturity will be determined for most of the Lake Trout captured throughout the spawning period (September–November). Otoliths will be removed from a subset of Lake Trout during the fall (late September–December) for ageing purposes. All Bull Trout will be measured for total length, a genetic sample will be taken, and scanned for PIT tags. Previously unmarked Bull Trout will be implanted with a 12-mm full duplex PIT tag, revived in an oxygenated tank if necessary, assigned a condition score, and released. Head length and body depth will be measured, sex and maturity level determined, otoliths, scales, and fin rays will be collected, and stomach contents will be described from all Bull Trout mortalities. Pathogen samples will be taken from a subset of incidental Bull Trout mortalities.

At the spring 2021 MC meeting, approval was granted for funding of the 2022 LPO Lake Trout Netting Program. We request funding one year in advance because it provides some level of certainty in the contracting which allows for continued capital investment by Hickey Brothers

Research, LLC to improve the efficiency and effectiveness of the project. Like in past years, Bonneville Power Administration (BPA) will cover a portion of the costs for 2022. To date, approval for 2023 BPA funds has not been secured; therefore, we are maintaining our request for full Avista funding for 2023. The likelihood of approval on cost sharing in 2023 is high.

Goal
Improve and maintain favorable forage base for Gerrard Rainbow Trout and Bull Trout in Lake Pend Oreille by reducing Lake Trout abundance to increase kokanee survival.

Objective
1. Maintain high netting mortality on LPO lake Trout.

2. Collect information from incidentally-caught Bull Trout.

Tasks
1. Contract Hickey Brothers Research LLC to provide 28 weeks of netting. (Objective 1)

2. PIT-tag and collect genetics samples from all incidentally-caught Bull Trout. (Objective 2)

3. Collect biological samples from incidentally-caught Bull Trout mortalities. (Objective 2)

4. Provide Avista Technician support to assist with the collection of Bull Trout Pathology samples and to collect biological data from all incidentally-caught Bull Trout mortalities. (Objective 2)

Work Products
- Annual Project Update – 2021; final due November 1, 2022
- Annual Work Summary; due December 1, 2022
- Annual Project Update – 2022; final due November 1, 2023

Permitting Requirements
Not applicable for the tasks proposed in this project plan.

Endangered Species Act consultation for this project plan is associated with the 2019 Biological Opinion on the effects of continued operation of the Clark Fork Hydroelectric Project on Bull Trout and designated Bull Trout critical habitat (BiOp), and the U.S. Fish and Wildlife Service (USFWS)-IDFG Cooperative Agreement pursuant to Section 6 of the Act. This project plan is consistent with the analysis and conclusions contained in the 2019 BiOp and the USFWS-IDFG Cooperative Agreement, and will adhere to all appropriate Terms and Conditions designed to reduce the extent and effects of incidental take on Bull Trout. Incidental take reporting for this project plan will be included in the annual Biological Opinion report as required by Term and Conditions 15–18 of the 2019 Incidental Take Statement, as well as IDFG's annual Section 6 report to the USFWS.

Cultural/Historic Resource Review
Not applicable for the tasks proposed in this project plan, there are no ground and/or vegetation disturbing activities, or proposed impacts to cultural/historic resources.

Benefit to the Resource
This project is consistent with the IDFG 2019–2024 Fish Management Plan (IDFG 2019). This project will meet the objectives of the Clark Fork Settlement Agreement Appendices A and F5 mitigation programs by directly reducing predation on kokanee and competition with Bull Trout. The project will also likely result in reduction of predation on Bull Trout and Westslope Cutthroat Trout in LPO to further benefit these species. Our approach is also consistent with the Avista Native Salmonid Restoration Plan (Appendix C of the Clark Fork Settlement Agreement) to restore and enhance migratory forms of native salmonids, and also with the USFWS Bull Trout Recovery Plan (USFWS 2015). This project is also consistent with Appendix N1 (Bald Eagle Monitoring and Protection) through enhancement of kokanee, an important food source for wintering eagles. This project provides direct, on-the-ground benefits to resources potentially adversely impacted by elevated TDG levels in the Clark Fork River and LPO, as well as those impacted by degraded tributary habitat, by reducing competition and predation on kokanee, Bull Trout and Westslope Cutthroat Trout in LPO.

2022 Budget

Item	Estimated Carryover[1]	2022 Budget Request
Hickey Bros. contract Avista cost share	$0	$350,626
Avista labor (0.25 FTE)	$0	$25,000
PIT tags	$0	$4,000
Genetic analysis	$0	$75,000
Total	$0	$454,626
Anticipated Expenditures		$454,626

[1] *Estimated carryover of unexpended, approved funds as of January 1.*

In 2022, total project cost is expected to be $623,446. We will again be cost sharing the *LPO Lake Trout Netting Program* with BPA funds administered through the IDFG LPO Resident Fish Mitigation Program. IDFG will provide $168,820. Therefore, we do not intend to use the full amount approved in 2021 ($585,000).

2023 Budget

Item	Estimated Carryover[1]	2023 Budget Request
Hickey Bros. contract	$0	$520,000
Avista labor (0.25 FTE)	$0	$25,000
PIT tags	$0	$4,000
Genetic analysis	$0	$75,000
Total	$0	$624,000
Anticipated Expenditures		$624,000

[1] *Estimated carryover of unexpended, approved funds as of January 1.*

Literature Cited

Hansen, M. J., Corsi, M. P., and A. M. Dux. 2019. Long-term suppression of the Lake Trout (*Salvelinus namaycush*) population in Lake Pend Oreille, Idaho. Hydrobiologia 840:335–349.

IDFG (Idaho Department of Fish and Game). 2019. Fisheries Management Plan 2019-2024. Boise, ID.

Rust, P., N. Mucciarone, S. M. Wilson, M. P. Corsi, and W. H. Harryman. 2020. Lake Pend Oreille Research, 2017 and 2018. Lake Pend Oreille Fishery Recovery Project Annual Progress Report, January 1, 2017–December 31, 2018. IDFG Report Number 20-01. Boise, ID.

USFWS (U.S. Fish and Wildlife Service). 2015. Recovery plan for the coterminous United States population of bull trout (Salvelinus confluentus). Portland, Oregon. xii + 179 pages.

2022 PROJECT PLAN

Demography of Adfluvial Bull Trout in Lake Pend Oreille

Project Contact

Matthew Corsi, Idaho Department of Fish and Game (IDFG), (208) 769-1414, matthew.corsi@idfg.idaho.gov ,
Ryan Hardy, IDFG, (208) 769-1414, ryan.hardy@idfg.idaho.gov, *and*
Ken Bouwens, IDFG, (208) 769-1414, ken.bouwens@idfg.idaho.gov

Project History

This is a continuing project that was approved by the Management Committee (MC) in 2017. It was ranked by the Water Resources Technical Advisory Committee in January, 2017. No changes to the budget are being requested. We are asking for minor changes to extend the reporting deadlines.

Background

Lake Trout suppression has been a fundamental component of the Lake Pend Oreille (LPO) fishery recovery effort since 2006. Suppression efforts have included incentivized angler harvest in addition to commercial gillnet and trap net operations. Bull Trout, which are listed as Threatened under the Endangered Species Act, are frequently encountered during netting operations and bycatch mortality is an important concern for the success of the suppression program. This is especially the case because the Bull Trout population is intended to be a primary beneficiary of the *Lake Pend Oreille Lake Trout Netting Program*. Total abundance estimates for Bull Trout in LPO were completed in 1998 (Vidergar 2000) and 2008 (McCubbins et al. 2016). The abundance estimate completed in 1998 was 12,134 total Bull Trout, and the 2008 estimate was 12,513 Bull Trout larger than 400mm, demonstrating stability in the LPO Bull Trout population during that time. There had been two years of Lake Trout suppression when the 2008 estimate was made, but there has been well over a decade of active suppression since then. However, extensive standardized trap net and redd count data have suggested that Bull Trout have remained stable throughout the netting program. In spite of bycatch, the suppression program has been beneficial to the Bull Trout population. Population metrics have suggested stability, and the reduction of Lake Trout to approximately 25% of their 2006 abundance has led to a resurgence of kokanee, a primary forage species for Bull Trout in the system. Improved understanding of Bull Trout population dynamics would provide timely information to further evaluate the direct benefits of suppression programs on the LPO Bull Trout population as we transition that program into maintenance mode.

Most Bull Trout caught incidentally during netting operations are released alive. Bull Trout bycatch in the netting program provides an opportunity to apply passive integrated transponder (PIT) tags to fish released alive. The tags can then be interrogated when that fish is encountered again, whether in the netting program, during fishery surveys, or at tributary PIT tag arrays. The Idaho Department of Fish and Game (IDFG), with funding from the Clark Fork Settlement Agreement (CFSA) and other sources, has been collecting PIT tag interrogation data on Bull Trout in LPO and tributaries since 2011, resulting in a substantial dataset of capture, mark, and recapture (CMR) data. While these data are currently available for analyses to address questions

about abundance and population dynamics, the approaches required are quantitatively intensive. In addition, access to multiple corroborative datasets (e.g., redd counts, trap net data) provide an opportunity to build integrated population demographic models (IPMs, see Schaub and Abadi 2011 for a review) that yield improved estimates of vital rates (such as survival) and population growth rates. Improved understanding of population dynamics using these tools would allow us to not only better evaluate the success of the netting program, but also to develop the quantitative basis to evaluate the feasibility of limited Bull Trout harvest opportunity to anglers, a topic of longstanding interest to many Idaho anglers and IDFG.

Due to the technical complexity of this type of analysis, we are developing a team of IDFG staff to include a project biologist, IDFG's recently hired biometrician and other IDFG expertise from IDFG Wildlife Bureau Research staff that have extensive experience with IPMs. Once these tools are developed, they may be employed on a more regular or possibly annual basis. The intent of this program is to fully leverage all relevant Bull Trout datasets and appropriately incorporate uncertainty in estimates of abundance and population trajectory. In addition, this study will help IDFG, Avista, and other agencies evaluate and, if necessary, modify and improve current predator suppression and Bull Trout monitoring programs in LPO through the CFSA process.

Goal
To develop a Bull Trout population model to evaluate netting and management strategies in Lake Pend Oreille.

Objectives
1. Quantify the effects of netting bycatch on Bull Trout survival and growth.

2. Estimate abundance of Bull Trout in Lake Pend Oreille.

3. Develop optimal sampling and statistical methodologies, as well as an IPM to be used for future Bull Trout monitoring. This IPM will likely incorporate redd count data along with information from the CMR modeling. Identify and rectify any data gaps associated with full development of the IPM.

Tasks
1. Convene IDFG team to develop model type and structure, evaluate current datasets, identify potential data gaps/solutions and establish individual roles and timelines. Team will consist of Matthew Corsi (project coordinator), TBD Pacific States Marine Fisheries Commission Biologist (PSMFC, project technical lead), Josh McCormick (statistical/programming oversight), and Mark Hurley (statistical/programming oversight). Timeline: June 2017 – September 2017. (Objectives 1–3; ***Completed in 2017***)

2. Team will parameterize model(s) and use it to evaluate current demographic characteristics of LPO Bull Trout, evaluate influence of netting programs on survival and abundance, and critically evaluate current Bull Trout monitoring programs to determine if and how to shift monitoring resources. Develop and run fishery scenarios under various netting regimes. Timeline: September 2017 – May 2019. (Objectives 1–3; ***Completed in***

2019)

3. Project coordinator and technical lead will work with IDFG biometrician to streamline programming and develop sufficient metadata to ensure IPM can be used and modified by IDFG staff indefinitely for continued monitoring of Bull Trout status and trends in LPO. Timeline: Product delivered by December 2019. (Objectives 1–3; ***Completed 2019***)

Work Products

- Project Completion Report outlining the findings for Objectives 1–3; final due August 1, 2022
- Publication of model and results in peer reviewed literature; submission due December 1, 2022
- Annual Work Summary; due December 1, 2022

Permitting Requirements

Not applicable for the tasks proposed in this project plan.

Endangered Species Act consultation for this project plan is associated with the 2019 Biological Opinion on the effects of continued operation of the Clark Fork Hydroelectric Project on Bull Trout and designated Bull Trout critical habitat (BiOp), and the U.S. Fish and Wildlife Service (USFWS)-IDFG Cooperative Agreement pursuant to Section 6 of the Act. This project plan is consistent with the analysis and conclusions contained in the 2019 BiOp and the USFWS-IDFG Cooperative Agreement, and will adhere to all appropriate Terms and Conditions designed to reduce the extent and effects of incidental take on Bull Trout. Incidental take is not expected for this project; however, if it does occur it will be included in the annual Biological Opinion report as required by Term and Conditions 15–18 of the 2019 Incidental Take Statement, as well as IDFG's annual Section 6 report to the USFWS.

Cultural/Historic Resource Review

Not applicable for the tasks proposed in this project plan, there are no ground and/or vegetation disturbing activities, or proposed impacts to cultural/historic resources.

Benefit to the Resource

This project provides a means to explicitly evaluate the role of the *Lake Pend Oreille Lake Trout Netting Program* on Bull Trout demography. This program contributes to the completion of objectives of the CFSA Appendices A and F5 mitigation programs by explicitly evaluating the population responses of Bull Trout to the Lake Trout Trap and Gill Net Program. This important program has resulted in measured responses from kokanee populations, but evaluation of Lake Trout suppression on Bull Trout will be enhanced by development of these CMR tools. Our approach is also consistent with the Avista Native Salmonid Restoration Plan (NSRP, Appendix C of the CFSA) to restore and enhance migratory forms of native salmonids, and also with the USFWS Bull Trout recovery plan. It provides IDFG and Avista with the means to appropriately assess current mitigation programs, as well as fully exploit the datasets already being collected by these programs. Results from this program will used by IDFG to monitor current and future status of Bull Trout in Lake Pend Oreille. Bull Trout conservation is one of the primary goals of the Lake Pend Oreille Trap and Gill Net Program. It will provide an improved understanding of

Bull Trout abundance and will assist IDFG in managing a complex fishery with three apex predators (including Lake Trout and Rainbow Trout). The development of integrated population model for Bull Trout will allow IDFG to evaluate scenarios involving recreational fisheries harvest, varying levels of Lake Trout suppression, and techniques to modify Bull Trout bycatch as netting efforts evolve.

Budget

Item	Estimated Carryover[1]	2022 Budget Request
Avista cost share for this project	$0	$0
Total	$0	$0
Anticipated Expenditures		$0

[1] *Estimated carryover of unexpended, approved funds as of January 1.*

Literature Cited

McCubbins, J.L., Hansen, M.J., DosSantos, J.M. and Dux, A.M., 2016. Demographic characteristics of an adfluvial bull trout population in Lake Pend Oreille, Idaho. North American Journal of Fisheries Management 36(6):1269-1277.

Schaub, M., and F. Abadi. 2011. Integrated population models: a novel analysis framework for deeper insights into population dynamics. Journal of Ornithology 152: S227-S237.

Vidergar, D. T. 2000. Population estimates, food habits and estimates of consumption of selected predatory fishes in Lake Pend Oreille, Idaho. Master's thesis. University of Idaho, Moscow, ID.

2022 PROJECT PLAN

Lake Pend Oreille Bull Trout Population Monitoring and Evaluation

Project Contact

Ken Bouwens, Idaho Department of Fish and Game (IDFG), (208) 769-1414, ken.bouwens@idfg.idaho.gov *and*
Ryan Hardy, IDFG, (208) 769-1414, Ryan.Hardy@idfg.idaho.gov

Project History

This is an ongoing project for 2022. The scope and budget for this project will be reviewed annually by the Management Committee. This project was ranked by the WRTAC on January 20, 2021. Rather than produce annual project updates for the project plan (as was proposed in 2021), a comprehensive report will be produced every three years.

Background

This project will provide a mechanism to combine the unique and valuable data that has been collected through the Clark Fork Settlement Agreement (CFSA) over the last 20 years through separate projects into one integrated monitoring program. Many of these data have been collected through previous CFSA-supported projects but also include data collected via other funding mechanisms. Specifically, Bull Trout-specific data collected from the Lake Pend Oreille (LPO) netting programs (Lake Trout and Walleye), angler incentive programs, tributary monitoring, and redd counts will be evaluated together in this project. These data will be utilized together to evaluate the LPO Bull Trout metapopulation, primarily using the model developed through the *Demography of Adfluvial Bull Trout in Lake Pend Oreille* project plan.

Two predator suppression programs (Lake Trout and Walleye) have been implemented on LPO in an effort to reverse the impacts of an unbalanced predator population on both kokanee and native fish assemblages. However, an average of about 300 (range: ~100–550) Bull Trout have been removed annually as incidental bycatch as part of these efforts since 2006. Every effort was made to collect as much data as possible from these fish. Data collected include total length, head length, body depth, stomach content descriptions, as well as sex, maturity level, and fecundity. Otoliths, scales, fin rays, genetic and pathogen samples were also taken. The majority of these data and samples have been archived with limited analysis to date. In addition, an average of approximately 1,100 (range: ~550–1,500) Bull Trout were released alive annually, with length data collected from and PIT tags implanted in a majority of these fish. The netting programs and tributary-based PIT arrays serve as interrogation points for these PIT-marked fish. Over the years, marked fish have been re-located almost 2,000 times. These mark-recapture data, in conjunction with annual redd count data, were used to develop an Integrated Population Model (IPM) that will be utilized, updated, and improved to track the overall population trajectory within LPO. This is important to evaluate the overall health of the LPO metapopulation, evaluate the impact of ongoing predator management, and inform future management decisions including a possible harvest fishery. A more complete analysis of these data can be used further inform the IPM by updating our understanding of LPO-specific Bull Trout life history, age and growth, mortality, and recruitment.

These collective data comprise a large and complicated dataset. Idaho Department of Fish and Game (IDFG) has developed a comprehensive database to handle all Lake Pend Oreille monitoring and evaluation data, including those data described above. It is important for these datasets to be comprehensive and coordinated, in part, because there are numerous opportunities for Bull Trout recaptures across IDFG regional and research programs. One of the IDFG requirements for the development of this database was that it be compatible with, and able to be queried by, IDFG's statewide Lakes and Streams database. The development of this database is nearing completion, but the nearly year-round nature of data entry and collection requires regular database support and management. As this database matures, it will likely represent the most robust Bull Trout life history dataset in the world. Further, these data support management of other CFSA programs, especially Lake Trout suppression, Walleye suppression, Angler Incentive Program, and Fall Walleye Index Netting.

Goal
Monitor and evaluate the LPO Bull Trout metapopulation.

Objectives
1. Compile and organize existing LPO Bull Trout data.

2. Evaluate Bull Trout population life history, age and growth, mortality, and recruitment parameters.

Tasks
1. Enter and organize existing data in a relational LPO-wide database. (Objective 1)

2. Provide database consultant support as necessary. (Objective 1)

3. Age archived Bull Trout structures. (Objective 2)

4. Evaluate and summarize archived biodata (length, weight, fecundity, diet, etc.). (Objectives 1 and 2)

5. Collect and summarize PIT recapture data from both the suppression netting projects and tributary arrays. (Objectives 1 and 2)

6. Combine available biological, genetic, and PIT data to investigate Bull Trout tributary stray rates, growth, mortality, recruitment, state-based survival, migration timing, and spawning frequency. (Objectives 1 and 2)

Work Products
- Annual Work Summary; due December 1, 2022
- Comprehensive Project Report; final due November 1, 2024

Permitting Requirements
Not applicable for the tasks proposed in this project plan.

Endangered Species Act consultation for this project plan is associated with the 2019 Biological Opinion on the effects of continued operation of the Clark Fork Hydroelectric Project on Bull Trout and designated Bull Trout critical habitat (BiOp), and the U.S. Fish and Wildlife Service (USFWS)-IDFG Cooperative Agreement pursuant to Section 6 of the Act. This project plan is consistent with the analysis and conclusions contained in the 2019 BiOp and the USFWS-IDFG Cooperative Agreement, and will adhere to all appropriate Terms and Conditions designed to reduce the extent and effects of incidental take on Bull Trout. Incidental take reporting for this project plan will be included in the annual Biological Opinion report as required by Term and Conditions 15–18 of the 2019 Incidental Take Statement, as well as IDFG's annual Section 6 report to the USFWS.

Cultural/Historic Resource Review
Not applicable for the tasks proposed in this project plan, there are no ground and/or vegetation disturbing activities, or proposed impacts to cultural/historic resources.

Benefit to the Resource
The proposed project is entirely consistent with the Dissolved Gas Supersaturation Control, Mitigation, and Monitoring Program (Appendix F5, CFSA), through the monitoring of ongoing dissolved gas mitigation efforts funded under this appendix. As such, it is also consistent with goals of the Fish Passage/Native Salmonid Restoration Plan (Appendix C). The project also relates to Appendix A by complimenting ongoing tributary monitoring efforts in Lake Pend Oreille tributaries. It is also entirely consistent with the IDFG Fisheries Management Plan (IDFG 2019) as it supports the restoration of Bull Trout and suppression of kokanee predators in the LPO system. This project proposal is also consistent with the Lake Pend Oreille Bull Trout Conservation Plan (Resource Planning Unlimited 1999) that provides similar direction for the conservation of Bull Trout in the system.

Budget

Item	Estimated Carryover[1]	2022 Budget Request
Avista labor (1.0 FTE)	$20,000	$100,000
Contract database consultant	$20,000	$0
Total	$40,000	$100,000
Anticipated Expenditures		$140,000

[1] *Estimated carryover of unexpended, approved funds as of January 1.*

This project will be a combined effort between IDFG/Bonneville Power Administration-funded research staff and Avista staff. Thus, we expect an approximately 50% cost share for this project.

Literature Cited
IDFG (Idaho Department of Fish and Game). 2019. Fisheries Management Plan 2019-2024. Boise, ID.

Resource Planning Unlimited. 1999. Lake Pend Oreille Bull Trout Conservation Plan. State of Idaho. Boise, Idaho.

2022 PROJECT PLAN

Lake Pend Oreille Nearshore Index Netting

Project Contact

Ken Bouwens, Idaho Department of Fish and Game (IDFG), (208) 769-1414,
ken.bouwens@idfg.idaho.gov

Project History

This is a continuing project first approved by the Management Committee (MC) in 2015, and again approved in 2018. This proposal is for the third round of sampling in 2022.

Background

Native trout population abundance and growth parameters are being monitored long-term on Lake Pend Oreille (LPO) tributaries (Bouwens et al. 2021). Fish assemblage and abundance index data are also periodically being collected targeting Walleye and other demersal species in LPO (Ryan and Fredericks 2012; Watkins et al. 2015 Ryan et al. 2021) However, prior to this project, little data describing Westslope Cutthroat Trout (WCT) population levels or growth characteristics in LPO have been collected. Experimental passage of WCT over Cabinet Gorge Dam has occurred since 2015, and it is hoped that passage of WCT to historic upstream spawning grounds will bolster adfluvial populations both in the spawning reaches and in LPO. In addition, case studies throughout the intermountain west have clearly demonstrated that introduced Lake Trout have threatened the persistence of native fish assemblages including Bull Trout and WCT (Donald and Alger 1993; Fredenberg 2002; Martinez et al. 2009). The *LPO Lake Trout Netting Program* and the *LPO Angler Incentive Program* have worked jointly to remove non-native predatory fish from LPO since 2006, greatly changing the conditions in LPO in a relatively short period of time. The effects of predator management on WCT in LPO are unknown. A program to monitor the success of these projects with respect to WCT in LPO is needed.

This project is a tool to monitor WCT abundance and growth conditions within LPO. Repeated (every 3 years) sampling using standardized floating gillnet gear targeting WCT is planned. Resultant catch rates will provide an index of relative abundance. Age, weight, and length data can provide useful information regarding growing conditions. Data from this sampling event will be compared to data collected in 2015 and 2019 (Bouwens and Jakubowski 2017; Ransom et al., 2021a). This project will provide baseline and ongoing monitoring of relative WCT abundance and growth conditions with respect to transport over Cabinet Gorge Dam and LPO predator management.

In 2015 the survey was performed in the spring. It was proposed that the timing of the netting effort be changed from the spring to the fall in 2019 and beyond. It was recognized that there may be some loss in data comparability between the 2015 event and subsequent events, but migration timing data in Trestle and Granite creeks (Bouwens and Jakubowski 2017; Ransom et al. 2021b) suggested that some WCT may still be in tributaries in early June when the spring sampling was implemented and that fall sampling of spring spawning fish would be more appropriate. Fall sampling in 2019 provided similar WCT catch rates as spring sampling in 2015,

but catch rates on other species such as Northern Pikeminnow *Ptychocheilus oregonensis* and Peamouth Chub *Mylocheilus caurinus* were much reduced, presumably because they were not utilizing nearshore habitat in the fall for spawning (Ransom et al. 2021a). As it is desirable to gather population trend data on these forage fish species, in 2022 we plan to conduct the survey in both the spring and fall of the same year to definitively assess WCT catch rates between seasons. If WCT catches are similar, but we gain more information on other species in our spring sampling, then we propose sampling in the spring in future years.

Goal
Maintain an ongoing monitoring program assessing the LPO WCT population.

Objective
1. Monitor LPO surface-oriented nearshore fish assemblage, particularly WCT, relative abundance, growth, and origin.

Tasks
1. Generally following methods outlined in Ransom et al. (2021a), deploy 60 net/nights of standardized gillnet gear in LPO at randomly chosen near-shore locations.

2. Identify, count, and collect age/weight/length data from all salmonids captured.

3. Collect otoliths for age analysis and future microchemistry processing from all WCT.

4. Analyze and summarize data in a report.

Work Products
- Annual Work Summary; due December 1, 2022
- Project Completion Report; final due December 1, 2023

Permitting Requirements
Not applicable for the tasks proposed in this project plan.

Endangered Species Act consultation for this project plan is associated with the 2019 Biological Opinion on the effects of continued operation of the Clark Fork Hydroelectric Project on Bull Trout and designated Bull Trout critical habitat (BiOp), and the U.S. Fish and Wildlife Service (USFWS)-Idaho Department of Fish and Game (IDFG) Cooperative Agreement pursuant to Section 6 of the Act. This project plan is consistent with the analysis and conclusions contained in the 2019 BiOp and the USFWS-IDFG Cooperative Agreement, and will adhere to all appropriate Terms and Conditions designed to reduce the extent and effects of incidental take on Bull Trout. Incidental take reporting for this project plan will be included in the annual Biological Opinion report as required by Term and Conditions 15–18 of the 2019 Incidental Take Statement, as well as IDFG's annual Section 6 report to the USFWS.

Cultural/Historic Resource Review
Not applicable for the tasks proposed in this project plan, there are no ground and/or vegetation disturbing activities, or proposed impacts to cultural/historic resources.

Benefit to the Resource

The proposed project is entirely consistent with the Dissolved Gas Mitigation and Monitoring Program (Appendix F5, CFSA), through the monitoring of ongoing dissolved gas mitigation efforts funded under this appendix. As such, it is also consistent with goals of the Fish Passage/Native Salmonid Restoration Plan (Appendix C). The project also relates to Appendix A by complimenting ongoing tributary monitoring efforts related to maintenance of habitat for native fish in Lake Pend Oreille tributaries. This proposed project is entirely consistent with the Idaho Department of Fish and Game Fisheries Management Plan (IDFG 2019) as it supports the restoration of WCT and suppression of kokanee predators in the LPO system. This project proposal is also consistent with Native Salmonid Restoration Plan (NSRP) (Kleinshmidt and Pratt 1998). This project would provide a mechanism for evaluation of ongoing efforts in Appendices A, C, and F5 that benefit WCT in LPO and associated tributary streams. This project would also provide additional insight into the role the lake environment plays in regulating WCT abundance throughout the LPO system.

Budget

Item	Estimated Carryover[1]	2022 Budget Request
Supplies (nets, etc.)	$0	$2,500
Technician labor (Project admin, report writing, aging, fieldwork, etc.; 0.75 FTE)	$0	$75,000
Boat expenses	$0	2,000
Total	$0	$79,500
Anticipated Expenditures		$79,500

[1] *Estimated carryover of unexpended, approved funds as of January 1.*

Literature Cited

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2022 PROJECT PLAN

Idaho Protection and Education Officer Support

Project Contacts

Dustin Masin, Idaho Department of Fish and Game (IDFG), (208) 608-8651, Dustin.Masin@idfg.idaho.gov *and*
Ken Bouwens IDFG, (208) 769-1414, ken.bouwens@idfg.idaho.gov

Project History

This is a continuing project for 2022. The Water Resources Technical Advisory Committee ranked this project on January 21, 2020. The project was first approved by the Management Committee (MC) in 2020. The scope and budget will be reviewed annually by the MC. This project plan represents the Clark Fork Settlement Agreement (CFSA) Appendix F5 component of a cost share arrangement with Appendix D to fund this position. This cost share reflects the changing nature of this position, in which a significant proportion of the officer's time is spent patrolling and contacting anglers pursuing other recreationally important and/or native species in the lower Clark Fork River – Lake Pend Oreille area.

Background

The Idaho CFSA Protection and Education Officer position was created in 1999 to address illegal Bull Trout harvest through direct law enforcement action taken on Lake Pend Oreille (LPO) and its tributaries. The CFSA recognized that illegal harvest of Bull Trout was a significant threat; specifically, poaching of spawning fish could greatly impact the spawning population of a stream. It was determined that in addition to traditional enforcement action, public education would be an effective approach to reduce illegal and inadvertent harvest of Bull Trout (Avista 1999).

The focus of Appendix D of the CFSA is Bull Trout conservation. The CFSA, specifically through Appendix F5, has invested millions of dollars into projects intended to directly benefit the suite of fishery resources of LPO beyond Bull Trout. It was recognized that the introduced Lake Trout and Walleye populations in LPO directly threaten both native salmonids and desirable non-native species such as kokanee and Gerrard Rainbow Trout, and intensive predator suppression projects have been implemented through the CFSA to address these threats. In addition, Westslope Cutthroat Trout conservation in Idaho is a priority of the CFSA and the IDFG, but is not a species addressed directly under Appendix D.

Giving the Idaho Protection and Education (P&E) Officer the ability to patrol and educate the public on the CFSA's broader objectives will provide both conservation benefits and promote a greater public understanding of the issues surrounding LPO management. For example, much like with Bull Trout, harvest of Westslope Cutthroat Trout is not allowed in the LPO watershed in Idaho and there is a need to educate the public on Westslope Cutthroat Trout identification. Incidental native salmonid harvest, especially of Bull Trout and Westslope Cutthroat Trout, has been associated with the expanding fishery targeting bass and Walleye. This fishery primarily takes place on the northwestern end of LPO near Sandpoint, an area not frequently patrolled by the P&E Officer in the past. In addition, the springtime fishery in the Clark Fork River targeting

Gerrard Rainbow Trout is expanding in response to successful LPO predator management and providing the P&E Officer the ability to interact with this fishery is important.

In 2022, we are also requesting the purchase of an unmanned aerial vehicle (UAV), or drone. The number of applicable uses would vary year to year, but estimated deployments for enforcement would likely be approximately 1–2 times per month on average with educational and resource needs bringing the use cases upwards of 4 or more times per month. The UAV would also be available for use in other CFSA projects.

In terms of law enforcement applicability, Idaho has restrictions on uses of drones defined under Idaho Code 21-213. No UAV can be used to photograph or view private property or specifically target an individual without a warrant. However, the code does not prohibit the use of these vehicles for flying over public property or to check an area for use or activity as long as that footage is not used for public dissemination. From a resource perspective, the UAV could be used to view areas along river corridors affected by high water or woody debris. There is potential to use UAVs to help monitor spawning locations or quickly determine presence or absence of a species at a given time of year. During habitat management projects, implementers would benefit from a wider view of the project area and more quickly identify hazards or obstacles to those projects without subcontracting a third party. While Idaho state law still applies to operating a drone for these purposes, most projects occur on public ground or property where IDFG or Avista could easily obtain written permission. Nearly every project or property acquisition could benefit by the availability of remotely operated aerial vehicle.

Finally, a UAV would be beneficial to the production of educational materials. People in general are visually stimulated. Perspectives of these large drainages and expansive ecosystems are far better conveyed with the use of expansive footage of these locations rather than verbal descriptions.

Goal
The goal of this project is to expand the scope of the Idaho P&E Officer to provide enforcement and education services with respect to all native and desirable non-native species conservation.

Objectives
1. Patrol LPO tributaries known to support Westslope Cutthroat Trout, kokanee, and Rainbow Trout.

2. Patrol the LPO, Clark Fork River, and Pend Oreille River fisheries.

3. Educate anglers regarding LPO specific fishing regulations.

4. Educate public on the basic ecology of LPO, including predator management objectives, distinguishing characteristics of LPO species including Westslope Cutthroat Trout, and proper catch and release techniques.

5. Develop educational materials, both physical and electronic, to educate the public on fishery management practices and fish identification.

Tasks

1. Conduct enforcement efforts, possibly including undercover and/or plain clothes surveillance patrols, on tributaries of LPO to monitor regulation compliance, catch rates, and incidental harvest. (Objective 1)

2. Utilize remote cameras to monitor popular fishing locations and drainages to note heavy use times to better focus patrol efforts. (Objective 1)

3. Conduct boat patrols, possibly including undercover and/or plain clothes surveillance patrols, on the lake to monitor regulation compliance, catch rates, and incidental harvest. (Objective 2)

4. Direct more enforcement and boating attention to shallower portions of LPO and the Pend Oreille River, especially in the spring when water temperatures are colder and native salmonids are more likely to be found among warmwater fishes. (Objective 2)

5. Monitor streams and riparian habitat for unlawful development or alterations. (Objectives 1 and 2)

6. As allowed by CDC guidelines, continue student-focused educational programs, the Pend Oreille and Coeur d'Alene Water Festivals, the WDC, and the Trestle Creek Interpretive Site. Include messages regarding fish identification and life history requirements, and catch-and-release methods at these events. (Objective 3 and 4)

7. As allowed by CDC guidelines, attend research efforts, events, or trainings to better understand dynamics of the Pend Oreille fishery to be more informed when educating the public. (Objectives 1–4)

8. Develop electronic and physical media elements for interpretive panels, trailer materials, handouts, swag, online videos, and teacher resources to be made available for area schools districts, homeschooled students, and recreators. (Objectives 3–5)

Work Products

- Mid-year report; due to Avista; August 1, 2022
- Annual Work Summary; due to Ken Bouwens, IDFG; November 1, 2022

Permitting Requirements

Endangered Species Act consultation for this project plan is associated with the 2019 Biological Opinion on the effects of continued operation of the Clark Fork Hydroelectric Project on Bull Trout and designated Bull Trout critical habitat (BiOp), and the U.S. Fish and Wildlife Service (USFWS)-IDFG Cooperative Agreement pursuant to Section 6 of the Act. This project plan is consistent with the analysis and conclusions contained in the 2019 BiOp and the USFWS-IDFG Cooperative Agreement, and will adhere to all appropriate Terms and Conditions designed to reduce the extent and effects of incidental take on Bull Trout. Incidental take reporting for this project plan will be included in the annual Biological Opinion report as required by Term and

Conditions 15–18 of the 2019 Incidental Take Statement, as well as IDFG's annual Section 6 report to the USFWS.

Cultural/Historic Resource Review
Not applicable for the tasks proposed in this project plan.

Benefit to the Resource
This project will provide conservation benefits to native salmonids (Bull Trout and Westslope Cutthroat Trout) and other fish. Appendix F5 of the CFSA is designed to mitigate for the potential impacts of high levels of total dissolved gas (TDG) associated with spill at Noxon Rapids and Cabinet Gorge dams. High TDG can impact all fish species. It is recognized that it is difficult to mitigate directly for TDG impacts, and alternative mitigation is an appropriate use of Appendix F5 funds.

This proposed project is entirely consistent with the IDFG Fisheries Management Plan (IDFG 2019) the Management Plan for the Conservation of Westslope Cutthroat Trout in Idaho (IDFG 2013), Columbia Headwaters Recovery Unit Implementation Plan for Bull Trout (*Salvelinus confluentus*) (USFWS 2015), and the Native Salmonid Restoration Plan (Kleinschmidt and Pratt 1998), as it supports the enforcement and management of the LPO fishery, especially with respect to Bull Trout and Westslope Cutthroat Trout conservation.

Budget

Item	Estimated Carryover[1]	2022 Budget Request
Payroll (0.25 FTE)	$10,408	$15,020
IDFG (benefits)	$1,517	$6,930
Overhead (34.65% of personnel costs)	$0	$7,606
Communication Services	$0	$363
Training	$0	$188
Travel (Hotels, Per Diem, Etc.)	$0	$300
Specific use supplies (gear, education materials, etc.)	$0	$1,250
Renting Operating leases and Maintenance (Boat and vehicle)	$0	$2,500
UAV	$0	$3,000
Educational Materials	$0	$2,000
Avista support (0.05 FTE)	$0	$375
Total	$11,925	$39,532
Anticipated Expenditures		$51,475

[1] *Estimated carryover of unexpended, approved funds as of January 1.*

As proposed, it is anticipated that approximately 75% of the Idaho P&E Officer's time will be dedicated to Bull Trout-specific activities (Appendix D) and 25% of their time will be dedicated to broader LPO issues, focusing on those species that are expected to directly benefit from other CFSA-sponsored projects (Appendix F5).

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2022 PROJECT PLAN

Lake Pend Oreille Tributary PIT-Monitoring Station Installation

Project Contact
Ken Bouwens, Idaho Department of Fish and Game (IDFG), (208) 769-1414,
ken.bouwens@idfg.idaho.gov

Project History
This is a continuing project for 2022, with changes in both scope and budget. The Water Resources Technical Advisory Committee ranked this project on January 20, 2021. The project was first approved by the Management Committee (MC) in 2021.

Background
Passive Integrated Transponder (PIT) monitoring stations have been installed and operated at a number of locations in Idaho under various Clark Fork Settlement Agreement (CFSA) programs. The arrays in Trestle and Granite creeks were originally installed with the intent of estimating in-lake survival of Bull and Westslope Cutthroat trout using Lake Pend Oreille (LPO). This project has come to completion (Ransom et al. 2021). Concurrent with this project, the LPO Lake Trout Netting Program has become an additional tagging interrogation point for PIT tag recovery, and data from these arrays become integral to the LPO Bull Trout Demography model, which we intend to use to annually to evaluate the LPO Bull Trout metapopulation. Expanding our arrays will provide increased precision in our model while simultaneously allowing us to evaluate stream-specific questions like juvenile survival and straying rates. New arrays were installed in Trestle and Granite creeks in 2021; however, the Gold Creek array was not installed due to logistical delays and will be installed in 2022. In addition, three additional arrays are planned to be installed in the Pack River watershed in 2022.

Goal
Monitor movements of PIT-tagged fish in key tributaries to LPO.

Objectives
1. Replace existing outdated PIT arrays in Trestle and Granite creeks.(**Completed 2021**)
2. Install a new PIT array on South Gold Creek.
3. Install a PIT array in the Pack River just downstream of the mouth of Caribou Creek.
4. Install a PIT array in the Pack River near its mouth.
5. Install a PIT array in lower Grouse Creek.

Tasks
1. Determine location for arrays in South Gold Creek and in the Pack River watershed. (Objectives 2–5)

2. Gain landowner permission for new array locations. (Objective 2–5)

3. Determine appropriate power/telecom sources for all arrays. (Objective 2–5)

4. Acquire appropriate permits, as necessary. (Objective 2–5)

5. Install new arrays. (Objective 2–5)

Work Products

- Annual Work Summary; due December 1, 2022

Permitting Requirements

Avista and Idaho Department of Fish and Game (IDFG) personnel will determine and acquire any permits are required for the proposed work.

Endangered Species Act consultation for this project plan is associated with the 2019 Biological Opinion on the effects of continued operation of the Clark Fork Hydroelectric Project on Bull Trout and designated Bull Trout critical habitat (BiOp), and the U.S. Fish and Wildlife Service (USFWS)-IDFG Cooperative Agreement pursuant to Section 6 of the Act. This project plan is consistent with the analysis and conclusions contained in the 2019 BiOp and the USFWS-IDFG Cooperative Agreement, and will adhere to all appropriate Terms and Conditions designed to reduce the extent and effects of incidental take on Bull Trout. Incidental take is not expected for this project; however, if it does occur it will be included in the annual Biological Opinion report as required by Term and Conditions 15–18 of the 2019 Incidental Take Statement, as well as IDFG's annual Section 6 report to the USFWS.

Cultural/Historic Resource Review

Avista cultural staff will coordinate a cultural/historic resource review for the project. The work product for this review will be confidential due to the sensitive nature of the content.

Benefit to the Resource

Restoration and enhancement of Bull Trout and Westslope Cutthroat Trout populations as well as other species potentially impacted by dissolved gas supersaturation is an important component of appendices A and F5 of the CFSA. The use of PIT arrays is a valuable tool that allows passive monitoring of movements of fish in the project area. Fish that are tagged and detected at arrays provide information that that can be used to evaluate and improve programs that are currently being implemented under the CFSA. This leads to more effective implementation and more efficient use of funds available for these programs.

Budget

Item	Estimated Carryover[1]	2022 Budget Request
Avista labor (0.25 FTE)	$0	$25,000
Equipment (3 @ $70K each; 1 @ $50K in carryover)	$51,000	$210,000
Biomark Installation Labor (3 @ $27K each; 1 @ $20K in carryover)	$20,000	$81,000
Other expenses (Power, telecom, cultural/historic resource review, etc.)	$60,000	$50,000
Total	$131,000	$366,000
Anticipated Expenditures		$497,000

[1] *Estimated carryover of unexpended, approved funds as of January 1.*

Literature Cited

Ransom, A.L, S, Frawley, R. Jakubowski, and K.A. Bouwens. 2021. 2011-2019 Lake Pend Oreille Bull Trout Survival Study Project Completion Report. Report to Avista Corporation and the Idaho Dept. of Fish and Game. Noxon, Montana. Avista Doc. No. 2021-0161.

2022 PROJECT PLAN

Lake Pend Oreille Tributary PIT-Monitoring Station Operation and Maintenance

Project Contact
Ken Bouwens, Idaho Department of Fish and Game (IDFG), (208) 769-1414,
ken.bouwens@idfg.idaho.gov

Project History
This is an ongoing project for 2022. This project was ranked by the WRTAC on January 20, 2021. The scope and budget are reviewed by the Management Committee annually.

Background
Passive Integrated Transponder (PIT) monitoring stations have been installed and operated at a number of locations in Idaho under various Clark Fork Settlement Agreement (CFSA) programs. The current arrays located in Trestle and Granite creeks will be replaced with Biomark arrays this summer, as well as a new array that will be installed in South Gold Creek. These stations are installed for various reasons; although, the primary reason is to passively monitor movements of tagged fish in tributaries. These movements help delineate migration timing for fish and can also be used to evaluate survival and trap efficiency. The operation and maintenance of PIT-monitoring stations includes costs associated with power, fiber, communications, permitting, and operation and maintenance costs. This project plan was developed to compile all costs associated with operation and maintenance of monitoring stations into one project plan. This will eliminate the need to break out charges on invoices to multiple projects and allow for the tracking of costs associated with the use of this technology.

Goal
Monitor movements of PIT-tagged fish in key tributaries to Lake Pend Oreille.

Objectives
1. Operate PIT-monitoring stations in tributaries to Lake Pend Oreille

2. Perform maintenance as needed to PIT-monitoring stations in tributaries to Lake Pend Oreille.

Tasks
1. Pay all invoices associated with operation of five PIT-monitoring stations (Trestle Creek, Granite Creek, South Gold Creek, Upper Pack River, Lower Pack River, and Grouse Creek) in Idaho (i.e., electric use, internet fees, Biomark data service fees, cellular internet fees, permit fees, etc.). (Objective 1)

2. A temperature data logger will be deployed at each array in 2022 (Table 1). (Objective 1)

3. Repair damage to PIT-monitoring stations, if necessary. (Objective 2)

4. Purchase additional antennas or hardware as needed. (Objectives 1 and 2)

Table 1. Location of temperature data loggers at PIT antennas on Trestle, Granite, South Gold, and Grouse creeks, and the Pack River.

Stream	Site name	River Km	Latitude	Longitude
Trestle Creek	PIT array	0.9	48.285057	-116.341734
Granite Creek	PIT array	0.5	48.084050	-116.422041
South Gold Creek*	PIT array	0.2	47.970490	-116.452493
Upper Pack River*	PIT array	42.0	48.45275	-116.54258
Lower Pack River*	PIT array	5.9	48.34417	-116.38913
Grouse Creek*	PIT array	10.9	48.43840	-116.39370

* River Km, Latitude, and Longitude are estimated until the array is installed

Work Products

- Temperature monitoring data for the six sites; due December 1, 2022
- Annual Work Summary; due December 1, 2022

Permitting Requirements

If maintenance or repair of a PIT array is required, Avista and Idaho Department of Fish and Game (IDFG) personnel will determine and acquire which, if any, permits are required for the proposed work.

Endangered Species Act consultation for this project plan is associated with the 2019 Biological Opinion on the effects of continued operation of the Clark Fork Hydroelectric Project on Bull Trout and designated Bull Trout critical habitat (BiOp), and the U.S. Fish and Wildlife Service (USFWS)-IDFG Cooperative Agreement pursuant to Section 6 of the Act. This project plan is consistent with the analysis and conclusions contained in the 2019 BiOp and the USFWS-IDFG Cooperative Agreement, and will adhere to all appropriate Terms and Conditions designed to reduce the extent and effects of incidental take on Bull Trout. Incidental take is not expected for this project; however, if it does occur it will be included in the annual Biological Opinion report as required by Term and Conditions 15–18 of the 2019 Incidental Take Statement, as well as IDFG's annual Section 6 report to the USFWS.

Cultural/Historic Resource Review

If maintenance and/or repair of a PIT array will cause ground or vegetation disturbance, Avista cultural staff will coordinate a cultural/historic resource review for the project. The work product for this review will be confidential due to the sensitive nature of the content.

Benefit to the Resource

Restoration and enhancement of Bull Trout and Westslope Cutthroat Trout populations as well as other species potentially impacted by dissolved gas supersaturation is an important component of Appendix A and F5 of the CFSA. The use of PIT arrays is a valuable tool that allows passive monitoring of movements of fish in the project area. Fish that are tagged and detected at arrays provide information that that can be used to evaluate and improve programs that are currently being implemented under the CFSA. This leads to more effective implementation and more efficient use of funds available for these programs.

Budget

Item	Estimated Carryover[1]	2022 Budget Request
PIT-monitoring station maintenance	$0	$20,000
Avista labor (0.1 FTE)	$0	$10,000
Biomark BioLogic plus cell (6 @ $1,716 each; 12 months)	$10,296	$10,296
Electric use (6 @ $1,200 each; 12 mo.)	$7,200	$7,200
Other expenses (e.g., temperature data loggers)	$0	$2,000
Total	$17,496	$49,496
Anticipated Expenditures		$66,992

[1] *Estimated carryover of unexpended, approved funds as of January 1.*

2022 PROJECT PLAN

Clark Fork River Population Monitoring

Project Contact

Ken Bouwens, Idaho Department of Fish and Game (IDFG), (208) 769-1414
ken.bouwens@idfg.idaho.gov

Project History

This is an ongoing project from 2021 with changes to both scope and budget. The Water Resources Technical Advisory Committee ranked this project on January 20, 2021. A portion of this work has been approved for funding from Appendix A by the Management Committee intermittently since 1999. In 2021 it was funded through Appendix F5 with changes to the scope and budget. The scope and budget are reviewed by the Management Committee annually.

Background

Continued periodic monitoring of fish abundance in the Clark Fork River in Idaho (CFR) was recommended following a 10-year study (1999–2008) describing the abundance of Brown Trout, Mountain Whitefish, Rainbow Trout, and Westslope Cutthroat Trout in the lower Clark Fork River, resulting from a change in minimum flow requirements from 3,000 cfs to 5,000 cfs at Cabinet Gorge Dam. No significant changes or trends in relative abundance were detected during this monitoring period (Ryan and Jakubowski 2012). However, follow-up surveys were conducted in 2014, 2015, and again in 2017 and results suggested increases in trout abundance over past estimates (Bouwens and Jakubowski 2017, Baker et al. 2018). Regardless, an agreement was made to return to the prior minimum flow requirement of 3,000 cfs beginning in 2018 (i.e., Amendment No. 1 of the CFSA).

A comprehensive review of the last 22 year's data (including 2018 and 2021 data that has yet to be analyzed) is planned for 2022. This work product was previously associated with the Appendix A project plan titled "Fish Resource Monitoring, Enhancement, and Management Plan." In addition to changes in abundance over time, we intend to also review other population dynamics metrics including growth, recruitment, and mortality and relate them to environmental variable including absolute minimum flow, ramping rates, hydrograph variation, total dissolved gas (TDG) production, and other variables. One analysis will be calculating incremental growth on Mountain Whitefish and relating it to environmental factors after Watkins et al. (2017).

We plan to continue periodic sampling on a three-year rotational basis, with the next estimates scheduled for 2024. However, prior to implementation we will review our existing methods and evaluate if any changes to our methods are required and if any additional data collection is warranted.

To date we have not been collecting any information on non-salmonids in the CFR. Beginning in 2021, we performed some preliminary sampling to determine if it was feasible to conduct a low-effort catch-per-unit-effort (CPUE) electrofishing survey in the CFR to both assess salmonid populations but also to describe the entire fish assemblage in the area. A single pass was made on each bank in mid- September at pre-determined sampling reaches and all fish species of all sizes

were collected. We intend to continue this sampling in 2022 and beyond to describe species composition, and relative abundance.

In addition, we intend to develop a two-dimensional hydraulic model of the CFR. Habitat quantification will be based on hydraulic model output with mapped locations of areas with lower velocities at multiple flows, including substrate and vegetation mapping. Inclusion of vegetation mapping will improve the accuracy of available habitat maps. The resulting maps will provide quantifiable areas to allow comparison at various flows and allows the development of a water quality model or empirically based relationship between habitat and total dissolved gas (TDG).

Goal
Perform necessary fish resource population monitoring in the CFR downstream of Cabinet Gorge Dam to assess potential changes with respect to minimum flow, TDG, and other environmental variables.

Objectives
1. Perform a comprehensive analysis of 2014–2021 CFR salmonid monitoring data and summarize long-term trends in species-specific abundance, distribution, size, growth, as well as relative species composition.

2. Every three years, estimate the estimates of Mountain Whitefish, Brown Trout, Westslope Cutthroat Trout, and Rainbow Trout in the CFR. Next event: 2024.

3. Annually, assess species composition and relative abundance of fish populations in the CFR.

4. Describe flows in the CFR with respect to fish habitat availability, TDG, and other parameters.

5. Review and implement a long-term monitoring plan in the CFR downstream of Cabinet Gorge Dam.

Tasks
1. Catalog and organize existing data and samples. (Objectives 1–3)

2. Age sufficient structures from Brown Trout, Mountain Whitefish, Rainbow Trout, and Westslope Cutthroat Trout to perform a length at age analysis, develop von Bertalanffy growth curves, as well as develop catch curves to estimate mortality for all years that sufficient samples exist for these species. (Objective 1)

3. Measure and back calculate incremental growth on Mountain Whitefish scales as a proxy for growth conditions in the CFR since 1999. (Objective 1)

4. Summarize pre-2020 data in a comprehensive report. (Objective 1)

5. Conduct mark-recapture experiments every three years on target salmonid species. (Objective 2)

6. Conduct CPUE surveys annually on all fish species. (Objective 3)

7. Collect temperature data at strategic locations within the lower Clark Fork River. (Objective 4)

8. Work with the Aquatic Implementation Team to establish analysis methods and interpret the results of the comprehensive review of the last 20 year's data. (Objective 5)

Table 1. Temperature data logger locations in the lower Clark Fork River.

Stream	Site name	River Km	Latitude	Longitude
Clark Fork River	Temperature Station 1/Clark Fork River USGS gage	13.0	48.087351	-116.073078
Clark Fork River	Spawning Shelf[1]	12.5	48.086621	-116.079265
Clark Fork River	Temperature Station 2	4.5	48.126804	-116.159274

[1] This is at the same location as the "Downstream Cabinet Gorge" site in the *Total Dissolved Gas Monitoring* Project Plan.

Work Products

- Annual Project Update; 2018 and 2021 Lower Clark Fork River Population Monitoring; final due November 1, 2022
- Annual Project Update; 2022 Lower Clark Fork River Population Monitoring; final due November 1, 2023
- Comprehensive Project Report; Lower Clark Fork River Population Monitoring (through 2021); final due November 1, 2022
- Annual Work Summary; due December 1, 2022

Permitting Requirements

Not applicable for the tasks proposed in this project plan.

Endangered Species Act consultation for this project plan is associated with the 2019 Biological Opinion on the effects of continued operation of the Clark Fork Hydroelectric Project on Bull Trout and designated Bull Trout critical habitat (BiOp), and the U.S. Fish and Wildlife Service (USFWS)-Idaho Department of Fish and Game (IDFG) Cooperative Agreement pursuant to Section 6 of the Act. This project plan is consistent with the analysis and conclusions contained in the 2019 BiOp and the USFWS-IDFG Cooperative Agreement, and will adhere to all appropriate Terms and Conditions designed to reduce the extent and effects of incidental take on Bull Trout. Incidental take reporting for this project plan will be included in the annual Biological Opinion report as required by Term and Conditions 15–18 of the 2019 Incidental Take Statement, as well as IDFG's annual Section 6 report to the USFWS.

Cultural/Historic Resource Review

Not applicable for the tasks proposed in this project plan, there are no ground and/or vegetation disturbing activities, or proposed impacts to cultural/historic resources.

Benefit to the Resource

The proposed activities are consistent with the Dissolved Gas Supersaturation Control, Mitigation, and Monitoring Program (Appendix F5) as they are focused on fish species that are exposed to elevated total dissolved gas levels when spill occurs at Cabinet Gorge Dam. They are also consistent with goals of the Fish Passage/Native Salmonid Restoration Plan (Appendix C), and the Idaho Tributary Habitat Acquisition and Fishery Enhancement Program (Appendix A), through assessment of native salmonid populations, including Bull Trout and Westslope Cutthroat Trout. Tasks conducted under this fund are also consistent with other established plans including the Lake Pend Oreille Bull Trout Conservation Plan (Resource Planning Unlimited 1999) and the IDFG Fisheries Management Plan (IDFG 2019).

Budget

Item	Estimated Carryover[1]	2022 Budget Request
Avista labor (1.5 FTE)	$21,256	$150,000
Field gear (waders, raingear, gloves, etc.)	$0	$1,000
Biological collection supplies (PIT tags, vials, dip nets, etc.)	$1,000	$1,000
Lab/Aging supplies	$2,500	$2,500
Avista administration	$0	$1,000
Total	$24,756	$155,500
Anticipated Expenditures		$180,256

[1] *Estimated carryover of unexpended, approved funds as of January 1.*

Literature Cited

Baker, W. D., Bouwens, K. A., and R. Jakubowski. 2018. 2017 Lower Clark Fork River Salmonid Abundance Monitoring Project Update. Report to Avista, Noxon, Montana and the Idaho Department of Fish and Game, Boise, Idaho.

Bouwens, K.A. and R. Jakubowski. 2017. 2014-2015 Lower Clark Fork River Fishery Assessment Project Update. Report to Avista Corporation, Noxon, Montana and the Idaho Department of Fish and Game, Boise, Idaho.

IDFG (Idaho Department of Fish and Game). 2019. Fisheries Management Plan 2019-2024. Boise, Idaho.

Resource Planning Unlimited. 1999. Lake Pend Oreille Bull Trout Conservation Plan. State of Idaho. Boise, Idaho.

Ryan, R., and R. Jakubowski. 2012. Lower Clark Fork River Fishery Assessment Project Completion Report. Report to Avista Corporation. Noxon, Montana.

Watkins, C.J., T.J. Ross, M.C. Quist, and R. S. Hardy. 2017. Response of Fish Population Dynamics to Mitigation Activities in a Large Regulated River. Transactions of the American Fisheries Society 146:703-715.

2022 PROJECT PLAN

Lightning Creek Delta Connectivity Project

Project Contact

Ken Bouwens, Idaho Department of Fish and Game (IDFG), (208) 769-1414,
ken.bouwens@idfg.idaho.gov

Project History

This is a continuing project with changes in scope and budget for 2022. This project was ranked by the WRTAC on January 20, 2021. The purpose of this project was to determine if there is a feasible construction project that could facilitate flow thorough the eastern channel maintaining connectivity and facilitating fish passage during the times when fish are actively migrating into Lightning Creek. A design has been developed and modeled, and this proposal has been modified to incorporate construction in 2022.

Background

Lightning Creek is an extremely flashy river located in Idaho's wettest mountain range. It receives an average of 90 inches of precipitation a year and experiences frequent flood events, with a Q-100 of 8,400 cfs ─ often associated with rain on snow events (PWA 2004). In contrast, at lower discharge periods (typical of summertime) the downstream reaches of Lightning Creek frequently goes subsurface with disconnected channel threads, typically when flows drop below about 100 CFS (as measured at the USGS gauge directly upstream of the Highway 200 bridge).

Lightning Creek enters the Clark Fork River and Lake Pend Oreille (LPO) through a dynamic cobble/sand alluvial fan. It has an extremely high sediment transport rate during large flow events. As the river becomes less confined with less gradient at its mouth, the mobile bedload settles into wide depositional zones. The surface flow at the mouth typically has split into two primary channels: an eastern channel that empties directly into the Clark Fork River, and a western branch that bypasses the mainstem Clark Fork River and empties more directly into LPO (PWA 2004). In 2006, a major flood threatened both the railroad and Highway 200 bridge, spurring an emergency wood removal project in 2007 in the lower reaches of Lightning Creek and ongoing dredging at the railroad bridge. Since then, flows have shifted to the western branch. Flows through the eastern branch have diminished to the point that it is only wetted during the highest flows (Figure 1).

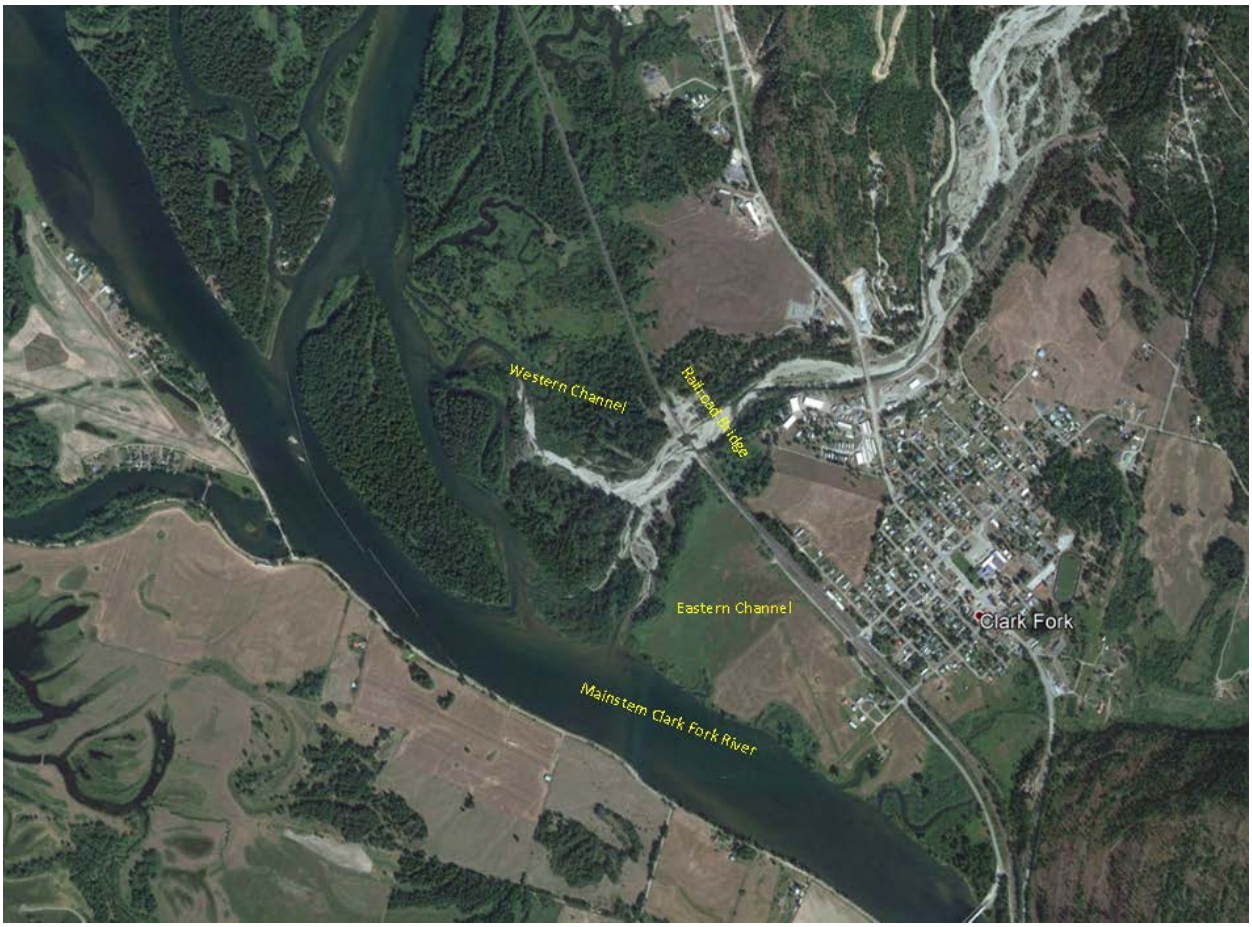

Figure 1. Aerial photo of the mouth of Lightning Creek in 2019.

Lightning Creek supports a springtime spawning migration of adfluvial Rainbow Trout and Westslope Cutthroat Trout. Although fish likely ascend Lightning Creek through both channels, a targeted fishery takes place in the mainstem Clark Fork River (Bouwens and Jakubowski 2020) and fish appear to attract to the mouth of the eastern channel even if no surface flows are available. In addition to fish passage through the eastern channel being completely blocked at times, certain power peaking flow scenarios from Cabinet Gorge Dam likely exacerbates incidents of fish stranding in the extreme lower end of the eastern channel as the flow rapidly recedes into the alluvium. Bull Trout also ascend Lightning Creek to spawn. Although they are fall spawners, in most years they must pass upstream of the lower reaches of Lightning Creek before surface flows diminish mid-summer. It is unknown if limited surface flows in the eastern channel impedes the spawning migration for these fish.

An initial site visit was made with an engineer during 2020 (RIVHAB 2020). It was noted that Lightning Creek is confined underneath the highway bridge and through the railroad bridge. The eastern and western channels begin to form directly downstream of the confinement at the railroad bridge. Light gravel mining/dredging occurs near the railroad bridge from the western bank that has significantly altered the natural elevation and is influencing the flow direction towards scouring a larger western channel. A digital elevation terrain model (DEM) was developed using existing (USACE 2010) LIDAR data (Figure 2).

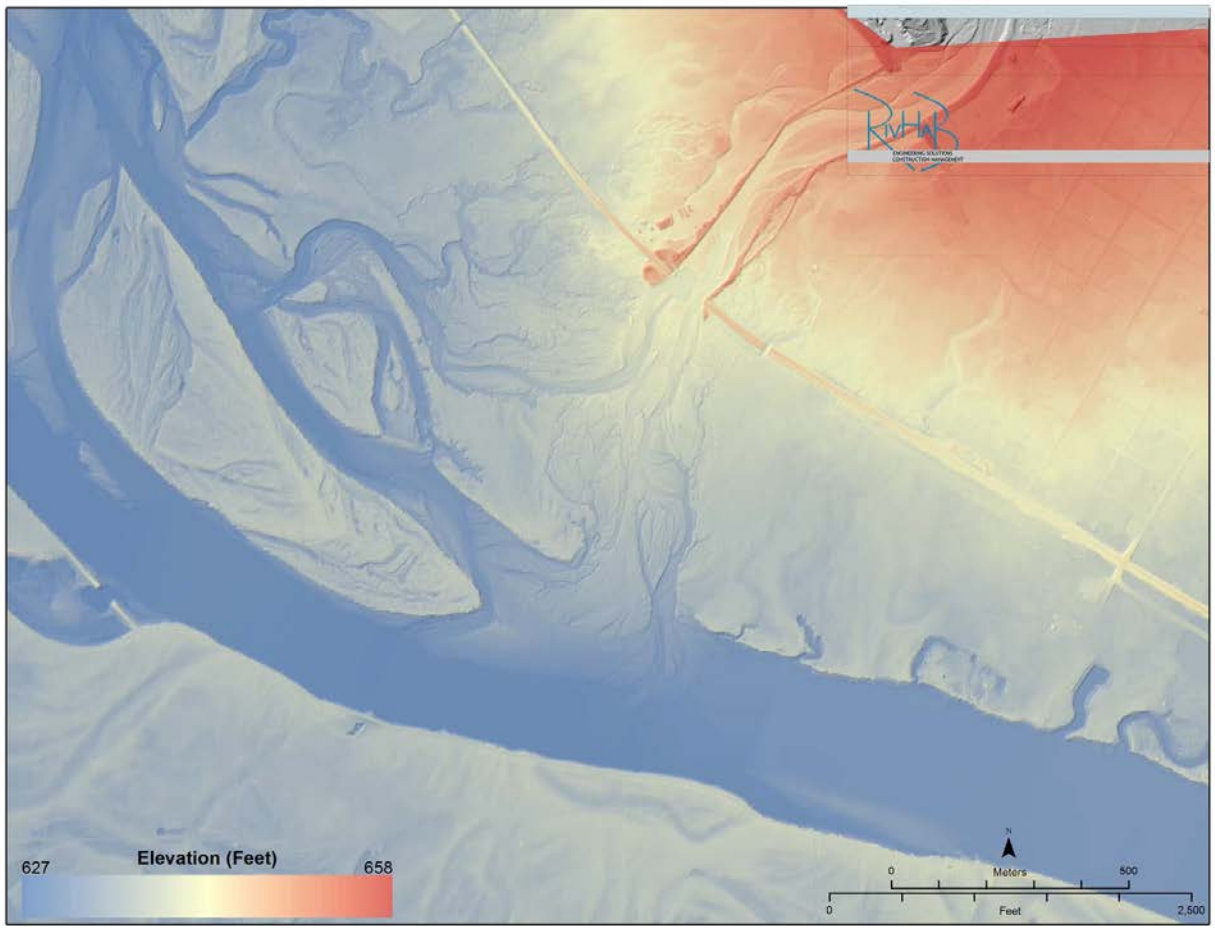

Figure 2. DEM of the project area based on 2010 LIDAR elevations.

The purpose of this project was to determine if there is a feasible construction project that could facilitate flow thorough the eastern channel maintaining connectivity and facilitating fish passage during the times when fish are actively migrating into Lightning Creek. A design has been developed and modeled, and this proposal has been modified to incorporate construction in 2022 (Figure 3).

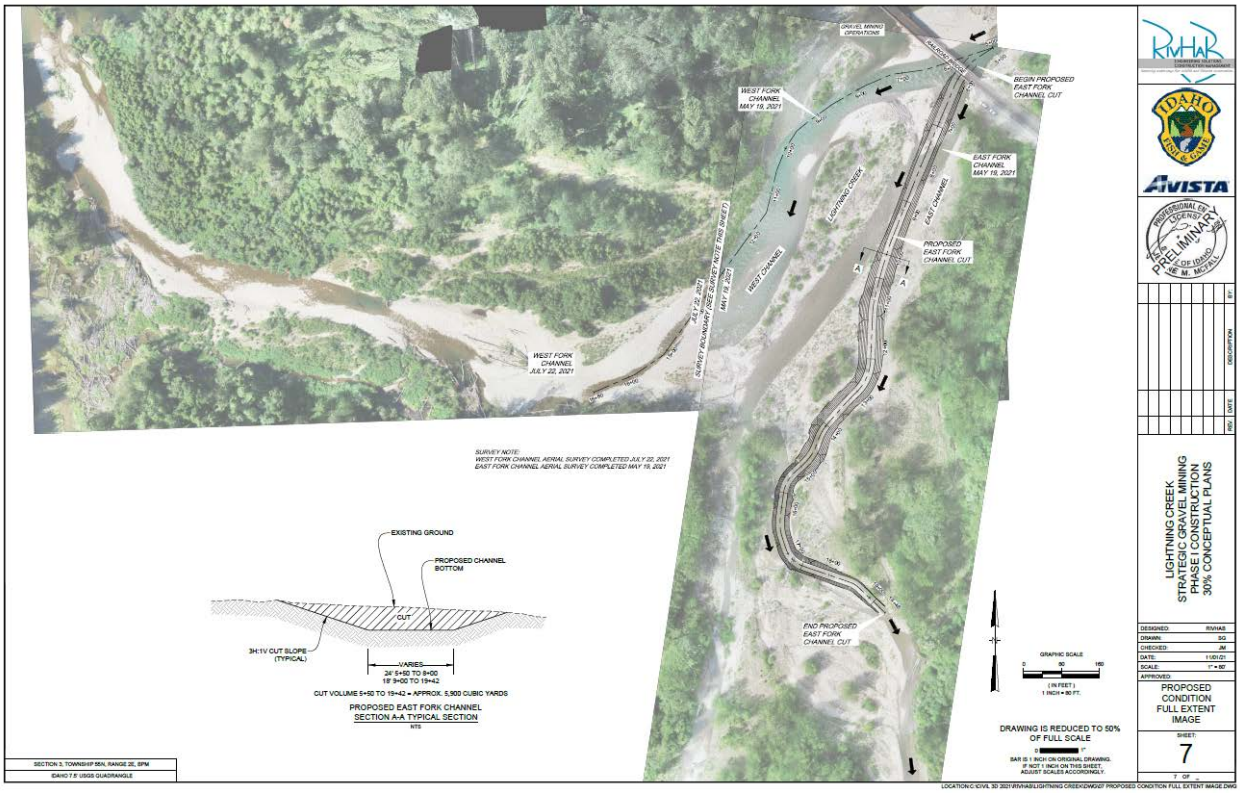

Figure 3. Preliminary design.

Goal
Provide connectivity and fish passage between the mainstem Clark Fork River and Lightning Creek during periods when lower Lightning Creek is actively flowing on the surface.

Objectives
1. Determine appropriate channel dimensions necessary to maintain flow through the eastern channel during the springtime fish migration period.

2. Determine the amount of material that would need to be removed to provide the necessary channel dimensions to maintain surface flow in the eastern channel at the design flows.

3. Develop a construction plan to remove the necessary amount of material.

4. Develop a long-term strategic gravel mining plan to maintain flows in both channels.

5. Acquire all necessary permits and construct project.

Tasks
1. Update existing terrain model with current stream channel bathymetry survey data following 2021 spring peak runoff. (Objective 1) ***Completed in 2021***

2. Determine realistic design flow based on historic flow conditions using the updated

model. (Objective 1) ***Completed in 2021***

3. Design channel plan and profile dimensions. Design submittals shall be reviewed at the 30%, 60%, and 90% stages to ensure Avista collaboration and landowner/stakeholder discussions. (Objective 1)

4. Calculate the amount of material for initial removal (2022) required to construct the channel. (Objective 2) ***Completed in 2021***

5. Develop a strategic gravel mining plan to be implemented annually to sustain passage within the eastern channel. (Objective 3)

6. Determine who will implement the plan. (Objective 4)

7. Assist with permitting for the mining plan. (Objective 4)

8. Hire a contractor and construct the project (Objective 5)

Work Products

- Technical memoranda describing project progress at appropriate intervals
- Design submittals at 30%, 60%, and 90% review. The 60% submittal will include hydraulic model results and will be used to initiate the permitting process; due date to be determined
- Final stamped design drawings for channel construction to occur in 2022; due date to be determined
- Final gravel mining plan; due date to be determined
- Annual Work Summary; due December 1, 2022

Permitting Requirements

All necessary state, federal and local permits required for construction will be procured by Idaho Department of Fish and Game (IDFG) and the project implementer. Permission from private landowners in the project area may be necessary for a thorough review of the watershed. If permission is necessary, it will be procured by IDFG and the contractor.

Endangered Species Act consultation for this project plan is associated with the 2019 Biological Opinion on the effects of continued operation of the Clark Fork Hydroelectric Project on Bull Trout and designated Bull Trout critical habitat (BiOp), and the U.S. Fish and Wildlife Service (USFWS)-IDFG Cooperative Agreement pursuant to Section 6 of the Act. This project plan is consistent with the analysis and conclusions contained in the 2019 BiOp and the USFWS-IDFG Cooperative Agreement, and will adhere to all appropriate Terms and Conditions designed to reduce the extent and effects of incidental take on Bull Trout. No Bull Trout take is expected to implement this project plan.

Cultural/Historic Resource Review

Avista cultural staff will coordinate a cultural/historic resource review for the project. The work product for this review will be confidential due to the sensitive nature of the content.

Benefit to the Resource

The project is consistent with the Dissolved Gas Supersaturation Control, Mitigation, and Monitoring Program (Appendix F5) as it identifies options for improving stream connectivity for Westslope Cutthroat Trout, Rainbow Trout, and Bull Trout, all species identified as the focus of the Appendix F5 mitigation program. It is also consistent with the goals of the Idaho Tributary Habitat Acquisition and Fishery Enhancement Program (Appendix A of the Settlement Agreement), through enhancement of tributary habitat conditions for native salmonids including Bull Trout and Westslope Cutthroat Trout. The project is consistent with other established plans including the Lake Pend Oreille Bull Trout Conservation Plan (habitat enhancement; Resource Planning Unlimited 1999) and the IDFG Fisheries Management Plan (IDFG 2019).

Budget

Item	Estimated Carryover[1]	2022 Budget Request
Engineering assistance with permitting, contracting and construction contract costs	$17,621	$5,000
Construction Contract Costs	$0	$85,824
Cultural/Historic Review	$0	5,000
Avista Labor (0.02 FTE)	$0	$2,000
Total	$17,621	$97,824
Anticipated Expenditures		$115,445

[1] *Estimated carryover of unexpended, approved funds as of January 1.*

Literature Cited

Bouwens, K.A. and R. Jakubowski. 2020. 2018 Lake Pend Oreille Tributary Creek Survey. Report to Avista and Idaho Dept. of Fish and Game. Noxon, MT and Boise, ID.

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RIVHAB. 2020. Site Visit Summary, Lightning Creek on July 24, 2020. Technical Memorandum. Boise, ID.

USACE (US Army Corps of Engineers). 2010. LiDAR – Columbia River Treaty 2014/2024 Project. Date delivered: 2010.

2022 PROJECT PLAN

Lower Clark Fork River Flow Model

Project Contact

Ken Bouwens, Idaho Department of Fish and Game (IDFG), (208) 769-1414
ken.bouwens@idfg.idaho.gov
and
Paul Kusnierz, Avista, (406) 847-1274, paul.kusnierz@avistacorp.com

Project History

This is a new project for 2022. This project was scored by the WRTAC on 1/19/2022 and the Evaluation and Ranking Criteria scores are included as the last page of this project plan.

Background

The lower Clark Fork River extends about 10 miles from Cabinet Gorge Dam downstream to Lake Pend Oreille (Figure 1). This section of river experiences flows ranging from 3,000 cfs during the summer to more than 110,000 cfs during spring runoff. Daily fluctuations of greater than 20,000 cfs due to power peaking are common. In addition, the level of Lake Pend Oreille changes seasonally and the portion of the lower Clark Fork River downstream of Foster Side Channel is riverine during the winter but more lake-like during the summer with transitional periods in the spring and fall. These seasonal and daily fluctuations in flow and stage create a dynamic system for fishes to inhabit.

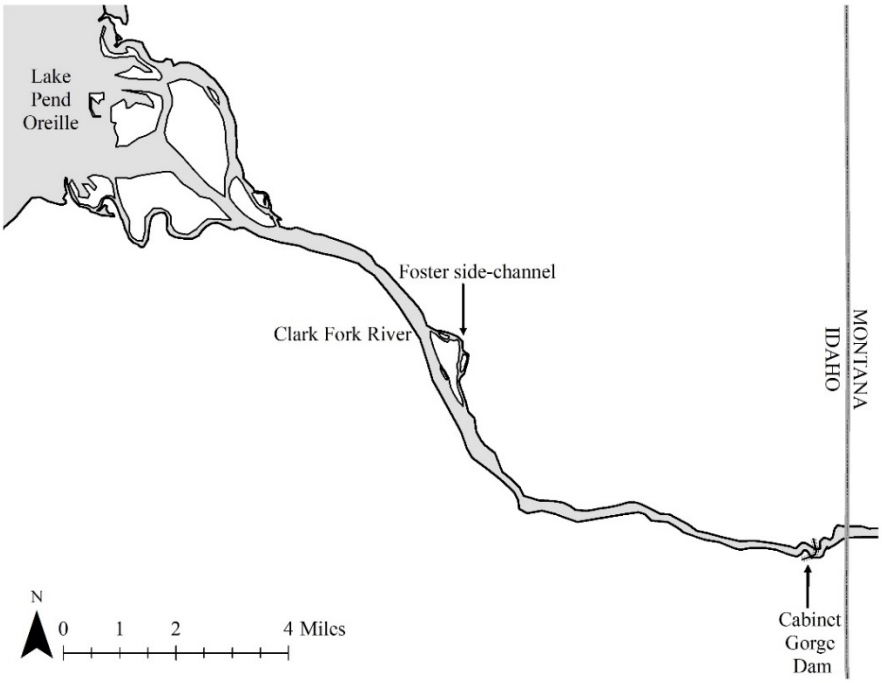

Figure 1. The lower Clark Fork River from Cabinet Gorge Dam downstream to Lake Pend Oreille.

The lower Clark Fork River has been periodically monitored for fish abundance since 1999 (Ryan and Jakubowski 2012; Bouwens and Jakubowski 2017; Baker et al. 2018). In addition, fish have been monitored for gas bubble disease in this portion of the river during times of spill at Cabinet Gorge Dam periodically since 1997 (Kusnierz 2020). The lower Clark Fork River and delta are suspected spawning areas for non-native Walleye. However, despite substantial effort to assess the effectiveness of suppression netting for Walleye in Lake Pend Oreille and the Pend Oreille River, little has been done to directly suppress Walleye in the lower Clark Fork River.

A high-quality flow model of the lower Clark Fork River would allow fisheries managers to better understand suitable fish habitat at a variety of flow levels. Specifically, it would aid in identification and quantification of suitable velocity and where fish could compensate for the effects of high total dissolved gas. In addition, it may facilitate finding areas suitable to target Walleye suppression.

The intent of this project is to develop a two-dimensional hydraulic model of the lower Clark Fork River. This model will be based on bathymetric and substrate data previously collected from the lower Clark Fork River (Figures 2 and 3). Additional data will be collected to fill in areas where data are unavailable and when necessary to develop more robust datasets. Habitat quantification will be based on hydraulic model output with mapped locations of areas with lower velocities at multiple flows, including substrate and vegetation mapping. Inclusion of vegetation mapping will improve the accuracy of available habitat maps. The resulting maps will provide quantifiable areas to allow comparison at various flows. This modeling exercise will provide managers with estimates of where and when habitat conditions are suitable for fish in the lower Clark Fork River and identify potential habitat limitations.

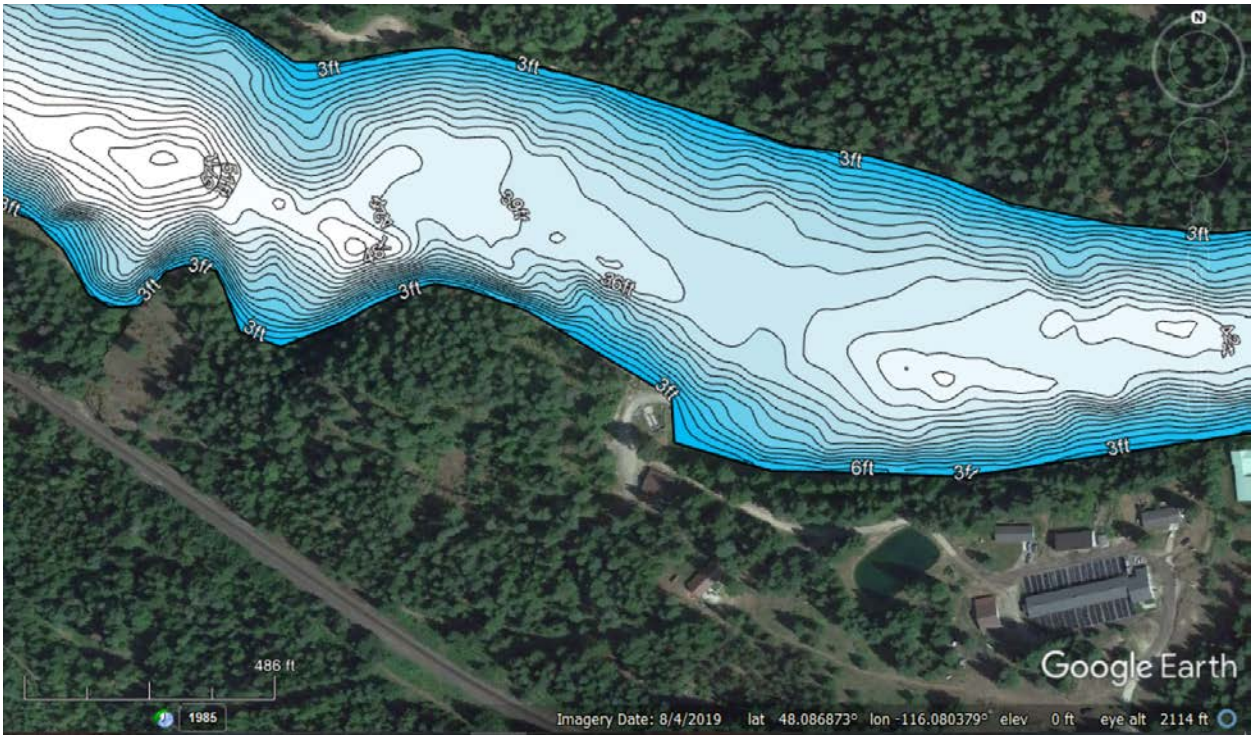

Figure 2. Bathymetry of the lower Clark Fork River near the Clark Fork Hatchery.

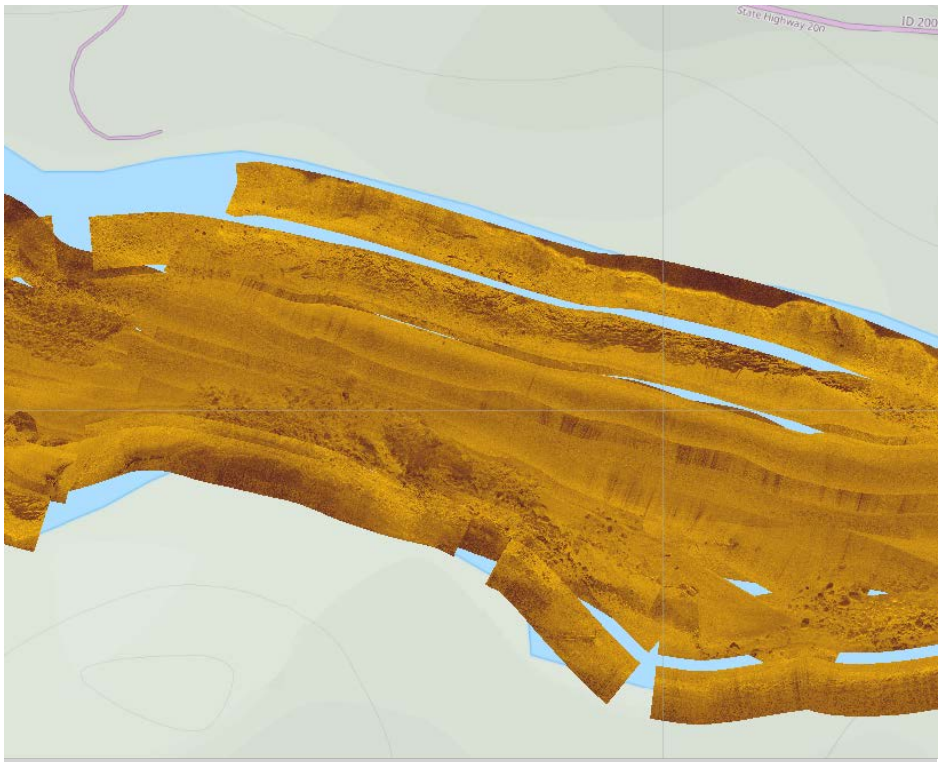

Figure 3. Substrate scans of the lower Clark Fork River near the Clark Fork Hatchery.

Goal

Develop a high quality, precise flow model extending from Cabinet Gorge Dam downstream to the submerged portion of the Clark Fork River delta.

Objectives

1. Establish the data resolution necessary to develop a robust model and identify whether HEC-RAS is the appropriate model.

2. Use high quality bathymetric, substrate, and landform data to construct the model.

3. Validate the final model and ensure it is appropriately used.

4. Describe flows in the lower Clark Fork River with respect to fish habitat availability, TDG, and other parameters.

Tasks

1. Meet with consultant to understand whether the objectives can be met with the existing data and using HEC-RAS, and to discuss alternative models. (Objective 1)

2. Review and georeference existing bathymetric data. Collect any new bathymetric data necessary to construct and validate the model. (Objectives 2 and 3)

3. Work with Avista legal to ensure that if requested, the model and input data are not released to the public without Avista oversite. (Objective 3)

4. Validate the final model. (Objective 3)

5. Identify and calculate the amount of area at certain velocities and depths at different discharge levels. (Objective 4)

6. Produce a report that describes model input data, the validation process and results, and fish habitat availability based on velocity and depth. (Objectives 3 and 4).

Work Products

- Annual Work Summary; due December 1, 2022
- Model files including GIS input data and R code; due November 1, 2023
- Comprehensive Project Report; Flow analysis and modeling in the Clark Fork River; final due November 1, 2023

Permitting Requirements

Not applicable for the tasks proposed in this project plan.

Endangered Species Act consultation for this project plan is associated with the 2019 Biological Opinion on the effects of continued operation of the Clark Fork Hydroelectric Project on Bull Trout and designated Bull Trout critical habitat (BiOp), and the U.S. Fish and Wildlife Service (USFWS)-Idaho Department of Fish and Game (IDFG) Cooperative Agreement pursuant to Section 6 of the Act. This project plan is consistent with the analysis and conclusions contained in the 2019 BiOp and the USFWS-IDFG Cooperative Agreement, and will adhere to all appropriate Terms and Conditions designed to reduce the extent and effects of incidental take on Bull Trout. Incidental take reporting for this project plan will be included in the annual Biological Opinion report as required by Term and Conditions 15–18 of the 2019 Incidental Take Statement, as well as IDFG's annual Section 6 report to the USFWS.

Cultural/Historic Resource Review

Not applicable for the tasks proposed in this project plan, there are no ground and/or vegetation disturbing activities, or proposed impacts to cultural/historic resources.

Benefit to the Resource

This project will facilitate the identification and quantification of areas in the lower Clark Fork River with velocity favorable to fish and where fish can compensate for the effects of high total dissolved gas. As such, this information will be useful for fishery management in the lower Clark Fork River. The proposed activities are consistent with the Dissolved Gas Supersaturation Control, Mitigation, and Monitoring Program (Appendix F5) as they are focused on fish species that are exposed to elevated total dissolved gas levels when spill occurs at Cabinet Gorge Dam. They are also consistent with goals of the Fish Passage/Native Salmonid Restoration Plan (Appendix C), and the Idaho Tributary Habitat Acquisition and Fishery Enhancement Program (Appendix A), through assessment of native salmonid populations, including Bull Trout and Westslope Cutthroat Trout. Tasks conducted under this fund are also consistent with other

established plans including the Lake Pend Oreille Bull Trout Conservation Plan (Resource Planning Unlimited 1999) and the IDFG Fisheries Management Plan (IDFG 2019).

Budget

Item	Estimated Carryover[1]	2022 Budget Request
Avista labor (0.2 FTE)	$0	$15,000
Flow Modeling	$0	$48,000
Total	$0	$63,000
Anticipated Expenditures		$63,000

[1] *Estimated carryover of unexpended, approved funds as of January 1.*

Literature Cited

Baker, W. D., Bouwens, K. A., and R. Jakubowski. 2018. 2017 Lower Clark Fork River Salmonid Abundance Monitoring Project Update. Report to Avista, Noxon, Montana and the Idaho Department of Fish and Game, Boise, Idaho.

Bouwens, K.A. and R. Jakubowski. 2017. 2014-2015 Lower Clark Fork River Fishery Assessment Project Update. Report to Avista Corporation, Noxon, Montana and the Idaho Department of Fish and Game, Boise, Idaho.

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Resource Planning Unlimited. 1999. Lake Pend Oreille Bull Trout Conservation Plan. State of Idaho. Boise, Idaho.

Ryan, R., and R. Jakubowski. 2012. Lower Clark Fork River Fishery Assessment Project Completion Report. Report to Avista Corporation. Noxon, Montana.

Appendix F5 Mitigation Fund
Project Evaluation and Ranking Criteria score sheet

As scored by the WRTAC on 1/19/2022

Project Title: Lower Clark Fork River Flow Model

Criteria	Score			
	3	**2**	**1**	**0**
A. Population exposure	**Routinely in LPO or LCFR**	Routinely from Dover to Box Canyon	Intermittently or occasionally	Population not exposed
B. Species to benefit	**Bull Trout and Westslope Cutthroat Trout**	Bull Trout or Westslope Cutthroat Trout	Target species but not Bull Trout or Westslope Cutthroat Trout	None
C. Mitigate or evaluate	Mitigates	**Evaluates**	NA	Not applied to resources affected by TDG
D. Project effectiveness	Solves primary problem	Partially solves or provides all information	**Provides some information**	Does not address primary problem
E. Cost/benefit	Benefit exceptional relative to cost	Benefit high relative to cost	**Benefit consistent with cost**	Cost exceeds benefit
F. Outside funding	≥ 50%	25–49%	≤ 24%	**Entirely CFSA funded**

Scoring Instructions:

- When ranking proposals that do not involve on-the-ground implementation but are necessary to the scope of physical projects (e.g., applied research, watershed assessments, NEPA analyses), score them with regard to the "expected" or "average" resultant physical project.
- **A score of "0" in any of the criteria does not necessarily mean the project is ineligible for CFSA funding.** Rather, a score of "0" should be considered an indication that this aspect of the project needs to be thoroughly discussed and considered.
- Although total scores for each proposed project can be summed to get a general idea of the relative strength of each project, **the scoring system should be viewed as an ordinal rather than absolute ranking system**. In light of this and in the interest of maintaining a simple and objective scoring system, only whole numbers will be utilized (e.g., no half points).

2022 PROJECT PLAN

Lake Pend Oreille and Pend Oreille River Creel Survey

Project Contact

Ryan Hardy, Idaho Department of Fish and Game (IDFG), (208) 769-1414, Ryan.Hardy@idfg.idaho.gov *and*
Ken Bouwens, IDFG, (208) 769-1414, ken.bouwens@idfg.idaho.gov

Project History

This is a new project for 2022. It is a follow-up to a Lake Pend Oreille (LPO) creel survey funded by the Clark Fork Settlement Agreement (CFSA) in 2013 and conducted in 2014–2015. This project was scored by the WRTAC on 1/19/2022 and the Evaluation and Ranking Criteria scores are included as the last page of this project plan. This project was approved through the consent mail process on 2/10/2022.

Background

Lake Pend Oreille (LPO) is Idaho's largest (36,000 ha surface) and deepest (360 m) natural lake. The native salmonid species assemblage consists of Bull Trout *Salvelinus confluentus*, Westslope Cutthroat Trout *Oncorhynchus clarkii lewisi*, Mountain Whitefish *Prosopium williamsoni*, and Pygmy Whitefish *P. coulteri*. Lake Pend Oreille supports one of the strongest remaining adfluvial Bull Trout populations in the United States. Lake Pend Oreille also has a substantial non-native sport fish component including Rainbow Trout *O. mykiss*, Lake Trout *S. namaycush*, kokanee *O. nerka*, Smallmouth Bass *Micropterus dolomieu*, Largemouth Bass *M. salmoides*, Yellow Perch *Perca flavescens*, Black Crappie *Pomoxis nigromaculatus*, Lake Whitefish *P. clupeiformis*, Walleye *Sander vitreus*, and two sunfishes *Lepomis spp*. The lake is known for its premier sport fishery for trophy Rainbow Trout, but also supports notable kokanee, Bull Trout and Westslope Cutthroat Trout fisheries, as well as increasingly popular warmwater fisheries.

Kokanee have been the primary driver of the LPO fishery since they were introduced in the 1930s. They serve a dual role by providing both a high-yield sport fishery and the primary prey source for pelagic predators (e.g., Rainbow Trout, Bull Trout) that support trophy fisheries. From the 1950s (when creel surveys began) through the mid-1970s, LPO anglers targeted mainly kokanee, with commensurately high kokanee harvests, and there was an active commercial fishery (Bowles et al. 1986). A world-renowned trophy fishery for Rainbow Trout and Bull Trout also existed during that era. However, kokanee abundance began declining in the mid-1960s and reached a depressed state by the 1970s. The commercial fishery was closed in 1973. Lake Trout, introduced initially in the early part of the 20th century, became increasingly abundant by the early 2000s, and increased predation threatened to collapse the already diminished kokanee population (Wahl et al. 2015). This prompted the implementation of fishing regulation changes intended to balance high predator abundance, specifically Lake Trout and Rainbow Trout, with the declining kokanee prey base. In 2000, the kokanee fishery was closed, Rainbow Trout limits were liberalized, and the limit on Lake Trout was removed. Despite these efforts, the Lake Trout population continued to expand, and the kokanee fishery did not show signs of recovery. Restricted fish passage, zooplankton dynamics, and floods may have also contributed to the

decline of kokanee (Corsi et al. 2019).

More intensive predator management became a necessary focus for kokanee recovery in LPO. Research determined that reduced kokanee productivity in LPO, in concert with an over-abundance of upper trophic level predators, had created a predator pit that would have likely led to a complete collapse of kokanee in the system (Hansen et al. 2010). Beginning in 2006, with support from Avista and the Bonneville Power Administration, predator suppression programs were implemented with the goal of reducing predator abundance in LPO. An Angler Incentive Program (AIP) was introduced to incentivize sport harvest of Rainbow Trout and Lake Trout. In addition, commercial trap net and gill net operations targeting Lake Trout were implemented to further reduce the predator population and increase kokanee survival. The AIP was also intended to reduce Rainbow Trout abundance, but this component of the program was discontinued in 2013 because of limited success and increased resiliency of the kokanee population by that time. The predator suppression program has been a major success and the kokanee population has responded positively (Dux et al. 2019; Rust et al. 2020; Bouwens et al. 2021).

Much like with Lake Trout, an expanding Walleye population has the potential to put several fish populations in LPO at risk through direct predation and competition. Walleye are prolific piscivores and their establishment in other western lentic systems has led to significant fishery management challenges, particularly where they overlap with salmonid fisheries (McMahon and Bennett 1996; MFWP 2016). Lake Trout existed at low abundances in LPO for many years before they became a predation concern, and it is likely a similar situation exists with Walleye. Lake Trout suppression programs were instituted to reduce predation risk when we began to observe rapid population increases, as we are now seeing with Walleye. These similar patterns led to the establishment of an experimental Walleye netting program in 2018 and a Walleye AIP in 2019. Unlike the bounty system established for Lake Trout, the Walleye AIP instead focuses on a small number of tagged fish for a high reward ($1,000 per fish).

Given the active management of LPO fish populations in recent years, it is important to understand how the fishery has responded to these actions. Additionally, introduced warmwater fish populations have continued to expand within the lake and their influence on the fishery warrants monitoring. The last LPO-wide creel survey was conducted in 2014–2015 (Bouwens and Jakubowski 2016), and the Clark Fork River and major tributaries to LPO were surveyed in 2018 (Bouwens and Jakubowski 2020). However, neither of these surveys captured information on the fishery in the Pend Oreille River (POR) downstream of LPO.

Goal
Understand the fishery in LPO and the POR.

Objectives

1. Evaluate the LPO fishery by estimating angling effort, catch rate, and catch.

2. Evaluate the POR fishery by estimating angling effort, catch rates, and catch.

3. Evaluate trends in the LPO fishery by comparing recent data to historic information.

Methods

Angling effort, catch rate, and catch will be estimated where both effort and catch rate will be estimated using roving methods (Pollock et al. 1994). The fishery will be stratified into multiple sections. Three creel clerks will be dedicated to this project, although some additional funding will be available for assistance by existing staff to assist as necessary. Lake and river fisheries will be monitored exclusively through vehicular access, with aerial flights utilized for count data.

Days and shifts will be selected using a two-stage design, where days will be stratified by week days and weekend days. Generally, four to five days per week will be sampled, including both weekend days. Once the days are selected, shifts will be selected and will be non-overlapping. When daylight hours are short (i.e., less than 12 hours), the shift may encompass the entire day.

Total angling effort in angler hours on day d ($\widehat{E}_d$) will be estimated as:

$$\widehat{E}_d = T_d \bar{I}_d, \tag{1}$$

where T_d is the total number of hours in the fishing day and $\bar{I}_d$ is the mean of the angler counts conducted on day d. Angling effort ($\widehat{E}_k$) for the kth stratum will be estimated as:

$$\widehat{E}_k = N_k \frac{\sum_{d=1}^{n_k} \widehat{E}_d}{n_k}, \tag{2}$$

where N_k is the number of days in the stratum and n_k is the number of days surveyed in the stratum. Estimates of effort among strata will be summed to estimate effort ($\widehat{E}$) over the duration of the fishing season or time period of interest. The variance estimator for equation (2) depends on the estimate of within-day variance, which cannot be calculated when only one count is made or one shift is sampled. However, the within-stratum variance ($\widehat{V}(\widehat{E}_k)$) can be approximated (Pollock et al. 1994; Scheaffer et al. 2006; Su and Clapp 2013) as:

$$\widehat{V}(\widehat{E}_k) = {N_k}^2 \left(\frac{s^2_{\widehat{E}_k}}{n_k} \right), \tag{3}$$

where $s^2_{\widehat{E}_k}$ is the sample variance which is calculated as:

$$s^2_{\widehat{E}_k} = \frac{\sum_{d=1}^{n_k} (\widehat{E}_d - \overline{E}_k)}{n_k - 1}, \tag{4}$$

where $\overline{E}_k$ is the average daily effort estimate over the stratum. Similar to the point estimate, the overall season variance ($\widehat{V}(\widehat{E})$) is calculated as the sum of the estimated strata variances. A CI for estimated angling effort over the sampling period ($CI_{\widehat{E}}$) is estimated as:

$$CI_{\widehat{E}} = \widehat{E} \pm Z_{\alpha/2} \sqrt{\widehat{V}(\widehat{E})}, \tag{5}$$

where $Z_{\alpha/2}$ is the desired critical value for the CI (e.g., 1.96 for a 95% CI).
Mean angler catch rate using the daily estimator in fish per angler-hour on day d ($\widehat{R}_d$) will be estimated as:

$$\widehat{R}_d = \frac{\sum_{i=1}^{j_d} c_{d,i}}{\sum_{i=1}^{j_d} h_{d,i}}, \quad (6)$$

where $j_d$is the total number of anglers interviewed on day d, $c_{d,i}$ is the number of fish caught by the ith angler on day d, and $h_{d,i}$ is the total number of hours fished by the ith angler on day d. Variance of catch rate will be estimated using bootstrapping methods.

Catch on day d ($\widehat{C}_d$) will be estimated as:

$$\widehat{C}_d = \widehat{R}_d \widehat{E}_d. \quad (7)$$

Catch for the stratum ($\widehat{C}_k$) will be estimated as:

$$\widehat{C}_k = N_k \frac{\sum_{d=1}^{n} \widehat{C}_d}{n_k}. \quad (8)$$

Estimated catch among strata will be added to estimate season catch. Similar to effort, approximate variance for the stratum can be estimated using equation (3) with catch sample variance substituted for effort variance (estimated using equation [4]). Stratum variance is then summed to estimate season catch variance and CIs.

Work Products

- Annual Work Summary; due December 1, 2022
- Comprehensive Project Report; final due November 1, 2023

Permitting Requirements

Not applicable for the tasks proposed in this project plan.

Endangered Species Act consultation for this project plan is associated with the 2019 Biological Opinion on the effects of continued operation of the Clark Fork Hydroelectric Project on Bull Trout and designated Bull Trout critical habitat (BiOp), and the U.S. Fish and Wildlife Service (USFWS)-IDFG Cooperative Agreement pursuant to Section 6 of the Act. This project plan is consistent with the analysis and conclusions contained in the 2019 BiOp and the USFWS-IDFG Cooperative Agreement, and will adhere to all appropriate Terms and Conditions designed to reduce the extent and effects of incidental take on Bull Trout. Incidental take is not expected for this project; however, if it does occur it will be included in the annual Biological Opinion report as required by Term and Conditions 15–18 of the 2019 Incidental Take Statement, as well as IDFG's annual Section 6 report to the USFWS.

Cultural/Historic Resource Review
Not applicable for the tasks proposed in this project plan.

Benefit to the Resource
The ultimate measure of ongoing mitigation efforts is their realization in the associated fisheries. The fisheries that we are proposing to assess have been entirely influenced by the operation of Noxon Rapids and Cabinet Gorge dams and subsequent CFSA mitigation activities. For instance, the Rainbow Trout and Bull Trout fisheries have been and will continue to be influenced directly by ongoing predator management activities in LPO and tributary enhancement projects. Minus periodic spawning forays, adults of these species spend the vast majority of their lives in LPO, which is the primary target area of the Appendix F5 Dissolved Gas Supersaturation Control, Mitigation, and Monitoring Program. The goal of the CFSA-supported predator management activities has been to bolster the forage base (kokanee) for these species and it is logical to assess the realization of these efforts on the fishery. An understanding of how these fisheries may contribute to overall estimates of mortality will allow further refinement of population management, especially since these fisheries were virtually non-existent prior to CFSA-related management actions.

Fishing effort and associated success in the proposed project streams has anecdotally been increasing. A more complete understanding of the LPO and POR fishery will allow for enhancement of these resources through more precise management that would otherwise not be possible. Data from this project will be utilized in the management planning and rulemaking processes to determine the level of regulation necessary to allow for reasonable fishing opportunity while also protecting the resource.

Budget

Item	Estimated Carryover[1]	2022 Budget Request
Aerial flights utilized to collect angler count data	$0	$95,000
Avista support (0.05 FTE)	$0	$5,000
Total	$0	$100,000
Anticipated Expenditures		$100,000

[1] *Estimated carryover of unexpended, approved funds as of January 1.*

This project will be a cost share with IDFG and all CFSA-related costs are listed above. The total IDFG contribution is expected to be approximately $137,000 and will cover three IDFG technicians for three months, three non-benefited creel clerks, and fleet rental trucks. The estimated total budget for this project is $237,000.

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Boise, Idaho.

Appendix F5 Mitigation Fund
Project Evaluation and Ranking Criteria score sheet

As scored by the WRTAC on 1/19/2022

Project Title: Lake Pend Oreille and Pend Oreille River Creel Survey

Criteria	Score			
	3	**2**	**1**	**0**
A. Population exposure	**Routinely in LPO or LCFR**	Routinely from Dover to Box Canyon	Intermittently or occasionally	Population not exposed
B. Species to benefit	**Bull Trout and Westslope Cutthroat Trout**	Bull Trout or Westslope Cutthroat Trout	Target species but not Bull Trout or Westslope Cutthroat Trout	None
C. Mitigate or evaluate	Mitigates	**Evaluates**	NA	Not applied to resources affected by TDG
D. Project effectiveness	Solves primary problem	Partially solves or provides all information	**Provides some information**	Does not address primary problem
E. Cost/benefit	Benefit exceptional relative to cost	Benefit high relative to cost	**Benefit consistent with cost**	Cost exceeds benefit
F. Outside funding	**≥ 50%**	25–49%	≤ 24%	Entirely CFSA funded

Scoring Instructions:

- When ranking proposals that do not involve on-the-ground implementation but are necessary to the scope of physical projects (e.g., applied research, watershed assessments, NEPA analyses), score them with regard to the "expected" or "average" resultant physical project.
- **A score of "0" in any of the criteria does not necessarily mean the project is ineligible for CFSA funding.** Rather, a score of "0" should be considered an indication that this aspect of the project needs to be thoroughly discussed and considered.
- Although total scores for each proposed project can be summed to get a general idea of the relative strength of each project, **the scoring system should be viewed as an ordinal rather than absolute ranking system**. In light of this and in the interest of maintaining a simple and objective scoring system, only whole numbers will be utilized (e.g., no half points).

2022 PROJECT PLAN

Gas Supersaturation Control Program Total Dissolved Gas Abatement

Project Contact
Paul Kusnierz, Avista, (406) 847-1274, paul.kusnierz@avistacorp.com

Project History
Total dissolved gas (TDG) abatement in the lower Clark Fork River during the spring runoff season is a required activity under FERC License No. 2058. The original Gas Supersaturation Control Program (GSCP) was approved by all pertinent stakeholders in 2004 (Avista 2004) and FERC issued an order approving the GSCP on January 1, 2005. An addendum to the 2004 GSCP was approved by the Management Committee (MC) in 2009 (Avista 2009). The GSCP Addendum specifies that up to $5,000,000 may be spent on engineering and evaluation and up to $25,000,000 may be spent on construction and implementation of TDG reduction measures. Unspent funds for these actions may be applied to annual mitigation when implementation of TDG reduction measures is complete. However, this is dependent on the flows at which the interim target of 120% saturation are met. This project is a continuation of work that has occurred at Cabinet Gorge Dam since 2004.

Background
During the spring runoff season, flow in the lower Clark Fork River can exceed the hydraulic capacity of Cabinet Gorge powerhouse facility. When this occurs, it is necessary to spill water over the dam's spillway. The physical characteristics of the Cabinet Gorge Dam spillway, in particular the deep (about 70 ft) plunge pool and the way in which spill aerates water released through the powerhouse, can lead to TDG supersaturation. Implementation of the TDG abatement program involves construction of spillway modifications for TDG reduction. The MC was directed by the 2009 Addendum to only approve TDG reduction measures "for which performance evaluations predict passage of a specified capacity of excess flows past Cabinet Gorge Dam which meet the interim TDG Target" (Avista 2009). The TDG reduction measures ultimately approved by the MC consist of adding roughness elements to the spillways (Avista 2012; 2013a; 2013b; 2014). To date, five spillway bays have been modified and TDG monitoring has shown that the modifications of the spillway bays have resulted in reduction of TDG released downstream of the dam.

Goal
The goal of this project is the implementation of TDG reduction measures as described in the GSCP Addendum in the areas of "Engineering & Evaluation" and "Construction & Implementation."

Objectives
1. Meet with the Gas Supersaturation Subcommittee (GSSC), to transition into Phase III of the GSCP Addendum and consider other options to further reduce TDG released downstream of the dam during spring runoff.

2. Conduct ongoing evaluation to address impacts of the use of the modified spillway crests

on the powerhouse and on employee safety.

Tasks

1. Convene the GSSC to transition into Phase III of the GSCP Addendum and evaluate any potential TDG reduction measures. (Objective 1)

2. Identify and evaluate the issues resulting from spray created by the use of the modified spillway crests on the powerhouse and on employee safety (e.g., residue buildup on transformers, ice formation on the deck), and propose fixes. (Objective 2)

3. Select and implement fixes to the identified issues. (Objective 2)

Work Products

- Annual Work Summary; due December 1, 2022

Permitting Requirements

Not applicable for the tasks proposed in this project plan.

Endangered Species Act consultation for this project plan is associated with the 2019 Biological Opinion on the effects of continued operation of the Clark Fork Hydroelectric Project on Bull Trout and designated Bull Trout critical habitat (BiOp). This project plan is consistent with the analyses and conclusions contained in the 2019 BiOp and will adhere to all appropriate Terms and Conditions designed to reduce the extent and effects of incidental take on Bull Trout. No incidental take of Bull Trout is anticipated as a result of this project plan; therefore, no take reporting is required.

Cultural/Historic Resource Review

Avista will coordinate cultural/historic resource review for this project prior to implementing the fixes for this project plan. The work product for this review will be confidential due to the sensitive nature of the content.

Benefit to the Resource

This project is the direct implementation of a portion of Appendix F5 under the CFSA (Avista 1999).

Idaho water quality standards are based upon support of beneficial uses, and in particular “Cold Water Aquatic Life.” Continued TDG abatement is critical to maintaining the health of all native fisheries in the lower Clark Fork River and Lake Pend Oreille.

Budget

Item	Estimated Carryover	2022 Budget Request
Biologist labor (0.06 FTE)	$0	$10,000
Consultant	$0	$10,000
Contractor	$0	$25,000
Cultural/Historic Resource Review	$0	$5,000
Total	$0	$50,000
Anticipated Expenditures		$50,000

[1] *Estimated carryover of unexpended, approved funds as of January 1.*

Literature Cited

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2022 ANNUAL IMPLEMENTATION PLAN SUMMARY – APPENDIX G

Clark Fork Project, FERC No. 2058
Cabinet Gorge and Noxon Rapids Hydroelectric Developments

Title
Implementation of Land Use Management Plan (LUMP)

Implementation Staff Lead
Arthur D. Potts, Avista, (406) 847-1283, arthur.potts@avistacorp.com

Background
The purpose of this measure is to provide for the long-term protection and maintenance of sensitive and important resources on Avista owned project lands, including the existing rural and semi-remote character of the shoreline, through implementation of the Land Use Management Plan (LUMP). Avista project lands will be managed to protect these qualities while still allowing for reasonable public access and other compatible uses.

Year 2022 work efforts are a continuation of past efforts and remain focused on implementing the three distinct components of the LUMP:

2022 Project Plans
1. Administration of the Land Use Management Plan (LUMP)
2. Monitoring Associated with the Land Use Management Plan (LUMP)
3. Enforcement Associated with the Land Use Management Plan (LUMP**)**

Work Products
Administration of the Land Use Management Plan (LUMP)
- Unless a specific document is created for a task, all work associated with this Project Plan will be documented in the 2022 Terrestrial Resources Annual Work Summary. Due Date: December 1, 2022.
- Develop annual pesticide and herbicide report to be included in the 2022 Annual Work Summary. Due Date: December 1, 2022.
- Managing Aquatic Invasive Plants on Noxon and Cabinet Gorge Reservoirs Due Date: Mid-year report; due to the Terrestrial Program Leader August 1, 2022 and Annual Work Summary; due to the Terrestrial Program Leader November 15, 2022

Monitoring Associated with the Land Use Management Plan (LUMP)
- All work associated with this Project Plan will be documented in the 2022 Annual Work Summary. Due Date: December 1, 2022.

Enforcement Associated with the Land Use Management Plan (LUMP)
- All work associated with this Project Plan will be documented in the 2022 Annual Work Summary. Due Date: December 1, 2022.
- Annual reports from Idaho Fish and Game will be provided per the MOU agreement. Due Dates: December 1, 2022.

2022 Appendix G Land Use Management Plan Budget

Budget Summary	
Unexpended funds with interest	$0
2022 contribution (estimate)[1]	$167,500
Total available	**$167,500**
2022 MC-approved budget	$167,500
Unobligated funds	**$0**

[1] Estimated costs are projections made now; however, Avista will pay the actual costs as approved by the Management Committee. The amount needed to implement this PM&E may vary greatly by year depending upon legal/survey needs to address issues related to the management of Avista owned Project lands.

2022 Project	Carryover[1]	2022 Budget
Administration of the Land Use Management Plan (LUMP)	$0	$112,500
Monitoring Associated with the Land Use Management Plan (LUMP)	$0	$10,000
Enforcement Associated with the Land Use Management Plan (LUMP)	$0	$45,000
Total	**$0**	**$167,500**
MC-approved budget		**$167,500**

[1] Estimated carryover of unexpended, approved funds as of January 1.

As approved by the Management Committee on 3/15/2022

2022 PROJECT PLAN

Administration of the Land Use Management Plan (LUMP)

Project Contact
Arthur D. Potts, Avista, (406) 847-1283, arthur.potts@avistacorp.com

Project History
This is a continuing project that has been approved annually by the Management Committee (MC).

Background
The Land Use Management Plan (LUMP) establishes appropriated land use classifications and management guidelines to protect identified natural, aesthetic, and cultural resources that occur on Avista owned project lands. It also provides opportunity for public and some private access to project lands and waters where appropriate. The Administration component of this PM&E is in place to ensure that staff and budget are in place to coordinate and implement the following objective. This project is part of the direct implementation of Clark Fork Settlement Agreement Appendix G.

Goal
The Administration component of this PM&E is in place to ensure that staff and budget are in place to coordinate and implement the following objective.

Objective
1. The overall goal of the LUMP is to protect sensitive and important resources on Avista owned project lands, including the existing character or the shoreline.

Tasks
1. Continue to implement the Private Recreation Permit Program
2. Continue to address property ownership/trespass issues as they arise.
3. Continue to process requests for leases/easements of Avista Project property.
4. If a request is received, review and process Rock Creek Mine request to place discharge pipe across Project lands.
5. Ongoing coordination of land use management program among Terrestrial Resource Technical Advisory Committee, Sanders County, and Green Mountain Conservation District, and the cultural resources, wildlife, recreation, aesthetics, and erosion programs.
6. Continue implementation of the Pesticide and Herbicide Use Plan in consultation with the MC. See the attached document outlining 2022 planned pesticide and herbicide use on Avista project property.
7. The Land Use Subgroup will continue working to identify potential changes to the LUMP in preparation for the 5-year review to be completed in 2023.
8. The Special Uses Subgroup and other interested parties will evaluate new requests for special use permits by private, and for-profit rental companies to use Avista owned and managed recreation areas as needed.
9. Replace identification for recreation permit sites throughout Project.

10. Managing Aquatic Invasive Plants on Noxon and Cabinet Gorge Reservoirs by the continued participation with and support of the Sanders County AIPTF to implement an Integrated Eurasian watermilfoil (EWM) Management Plan.
    a. Fund an individual to serve as a coordinator for the AIPTF. This effort helps ensure effective communication among the members, maintaining timelines for deliverables, and improving overall coordination.
    b. Fund educational efforts of the AIPTF that include maintaining informational signage and/or having a person interviewing recreational boaters at the various recreation sites during the peak recreational season.
    c. Funding available for special meeting/coordination with agency or other personnel related to EWM control efforts on Noxon and Cabinet reservoirs.

Work Products

- Unless a specific document is created for a task, all work associated with this Project Plan will be documented in the 2022 Terrestrial Resources Annual Work Summary. Due Date: December 1, 2022.
- Develop annual pesticide and herbicide report to be included in the 2022 Annual Work Summary. Due Date: December 1, 2022.
- Managing Aquatic Invasive Plants on Noxon and Cabinet Gorge Reservoirs Due Date: Mid-year report; due to the Terrestrial Program Leader August 1, 2022 and Annual Work Summary; due to the Terrestrial Program Leader November 15, 2022

Cultural/Historic Resource Review

Work proposed under this Project Plan will either: 1) not involve any ground disturbing activities or impact historic resources, or 2) will be performed under the cultural assessment associated with the specific proposed project.

Benefit to the Resource

Provide protection for sensitive and important resources on Avista owned project lands, including the existing character or the shoreline, while providing opportunity for public and some private access to project lands and waters where appropriate.

Budget

Item	Estimated Carryover	2022 Budget Request
Tasks 1-9: Labor and materials	$0	$85,000
Task 10 a: Labor for Sanders County AIPTF Coordinator	$0	$19,500
Task 10 b: EWM Education efforts – Labor and materials	$0	$3,000
Task 10 c: Funding for special meetings/coordination	$0	$5,000
Total	$0	$112,500
Anticipated Expenditures		$112,500

2022 Pesticide and Herbicide Application Plan

This plan provides a list of known sites that may be treated in any given year depending on infestation rates and overall weather conditions. Additional sites may be treated when a "new" invasive noxious plant species is discovered, and treatment is needed.

Pesticide Use on Project Property
Pesticides as defined for the purpose of this document are insecticides, fungicides, and rodenticides.

The only application currently occurring under this category is the annual fall application of fungicide (PHNB) on the greens and tee boxes of Thompson Falls Golf Course. The greens keeper employed by the golf course conducts this application.

Herbicide Use on Project Property

- *Earthen portion of Noxon Rapids Dam:*
  This area is spot treated on an annual basis utilizing an Avista employee who is a licensed applicator. The primary focus of this effort is to treat rush skeleton weed, Dalmatian toadflax, Saint John's wort, and knapweed. Spot treatment will continue as long as needed to prevent any further establishment or spread of these noxious weeds.

- *Road Right-of-Ways:*
  Road rights-of-way leading into both dams and associated facilities are treated annually utilizing an Avista employee who is a licensed applicator. This is done to help prevent the spread of Dalmatian toadflax, knapweed, and Saint John's wort from these traffic areas.

- *Switchyards:*
  Switchyards associated with both Noxon Rapids and Cabinet Gorge dams are treated with a soil sterilant on an annual basis, utilizing an Avista employee. Switchyards must be kept free of all vegetation in order to operate in a safe and reliable manner.

- *Treatment of Leafy Spurge:*
  Avista has treated leafy spurge on the upper end of the Clark Fork Project for over ten years. The goal of this treatment is to limit the spread of leafy spurge to downstream sites. These areas are spot sprayed one to two times a year by a licensed applicator. Primary sites of treatment are at Sandy Beaches Estates, Thompson Falls State Park and Trail, State Trust Lands adjacent to Thompson Falls State Park, Thompson Falls Golf Course and limited spot spraying downstream to Finley Flats as needed.

- *Treatment of Japanese Knotweed:*
  Follow-up monitoring and treatment, if needed, of two infestations of Japanese knotweed growing along Cabinet Gorge Reservoir near Noxon, Montana and a smaller patch near Trestle Creek (Idaho).

- *Thompson Falls Golf Course:*
  The fairways on Thompson Falls Golf Course are treated one to two times a year. No application of pesticide is allowed within 30 yards of the river. The golf course greens keeper will apply these treatments.

- *Pilgrim Creek Park:*
  Avista will continue to take measures to control noxious weeds on the 5-acre grass point. These measures include spraying, mowing, and irrigating the point to decrease the abundance of noxious weeds. A licensed applicator will be utilized to treat these areas as well as the dirt infields of the two baseball fields and the stone dust American Disability Act (ADA) paths to prevent vegetation from growing in these areas. Approval from the CRMG has been obtained for this work (2002).

- *Avista Property Associated with Island Park Subdivision Private Recreation Lease:*
  Activity will include survey of the ten-acre parcel and treatment of any infested areas as needed.

- *Clark Fork Access Site:*
  This recreation site is along the lower Clark Fork River two miles downstream of the Montana – Idaho border. A licensed applicator will be utilized to treat the stone dust ADA paths to prevent vegetation from growing in the trails. There may also be spot treatments for tansy, knapweed, and poison ivy at this site as needed.

- *Heron Boat Ramp:*
  A licensed applicator will treat the site (approximately 2.5 acres) for knapweed as needed.

- *Weed Species of Special Concern to Sanders County, Montana:*
  The Sanders County Weed District is currently attempting to detect and eradicate all rush skeleton weed in the county. Rush skeleton weed has been found on Avista Project Property located on the face of the earthen portion of Noxon Rapids Dam, Pilgrim Creek Park (2015), and the parking area associated with the boat ramp in the town of Noxon. These sites are treated and monitored annually by Avista and Sanders County weed specialist.

  Avista will continue control efforts of scotch broom on Avista property. Scotch broom has been detected on Avista property near the Big Eddy and Frog Pond recreation sites, where the plant has invaded from adjacent landowners.

  Based on direction from Sanders County Weed District and others, Avista may treat specific populations of yellow flag iris along the reservoirs.

- *Treatment of USFS lands by the USFS:*
  The USFS currently applies herbicides on a limited basis at the USFS-owned and operated recreations sites within the Project Boundary. As part of this Plan, the USFS will provide Avista a summary of herbicides used at these sites to be included in the Clark Fork Project Annual Report. An Avista licensed applicator or a contracted licensed applicator will also treat as needed.

- *Treatment of MFWP sites by MFWP:*
  Montana Fish, Wildlife and Parks currently applies herbicides on a limited basis at Thompson Falls State Park and Flat Iron Fishing Access Site as part of ongoing operations and maintenance. As part of this Plan, MFWP will provide Avista a summary of herbicides used at these sites to be included in the Clark Fork Annual Report. An Avista licensed applicator or a contracted licensed applicator will also treat as needed.

- *Treatment on Bull River Properties:*
  These properties include the Bull River Wildlife Management Area and Wood Duck properties. Although these properties are not Project lands, the acquisition and management are associated with the CFSA. These areas will be treated as needed by MFWP, Avista or contracted licensed applicator.

- *Treatment of Cultural Sites:*
  There may be a need to treat sites that contain culturally significant plants to protect these areas from invasive noxious weeds. The treatment of these sites will be at the direction of the CRMG, and specific locations will not be disclosed to protect them from vandalism or other damage.

- *Treatment of Dispersed Recreation Sites and Private Recreation Permit Sites:*
  A licensed applicator will treat many of the dispersed recreation sites as time and conditions allow.

  Knapweed control may also be needed at some Private Recreation Permit sites. Avista will work with adjoining landowners to control knapweed as appropriate.

- *Treatment of EWM:*
  The AIPTF may continue implementation of limited treatment of EWM on Noxon and Cabinet Gorge reservoirs along public access sites and shoreline dock areas. Herbicide use will only be implemented after the AIPTF has received all necessary permits and satisfied other applicable requirements (public notification, MEPA, etc.), with locations based on pretreatment monitoring of both reservoirs. This is only one facet of an Integrated Management Plan, which may also utilize bottom barriers, hand removal and education components.

2022 PROJECT PLAN

Managing Aquatic Invasive Plants on Noxon and Cabinet Gorge Reservoirs

Project Contacts

Larry Lack, Chair, Sanders County Aquatic Invasive Plants Task Force
Email: grizzlyadams_mt@yahoo.com

Kim Bergstrom, Sanders County Aquatic Invasive Plants Task Force Facilitator
Phone: (406) 546-2447
Email: pinnacle@blackfoot.net

Project History

This is a continuing project, directed and managed by the Sanders County Aquatic Invasive Plants Task Force (Task Force) to monitor and address the infestation of Eurasian watermilfoil (EWM) in Noxon and Cabinet Gorge reservoirs, and to educate the public about aquatic invasive species. The Management Committee originally began funding this program in 2008 with funding from Appendix G and H. In 2008, the Management Committee approved a small amount of funding from Appendix B for reservoir mapping of EWM. The Management Committee first approved funds for treatment of EWM (from Appendix B) in 2014. Funding for the EWM management and treatment is reviewed and approved annually by the Management Committee.

Background

Eurasian watermilfoil and curlyleaf pondweed (CLP) were confirmed in Noxon and Cabinet Gorge reservoirs in 2007; this was the first identified infestation of EWM in Montana. Initial studies indicated that EWM covered 247 acres in Noxon and 117 acres in Cabinet and spread at a rate of about 9.8% annually in the reservoirs.

Eurasian watermilfoil is an aggressive, non-native aquatic weed that poses a serious threat to Montana's rivers and lakes. When introduced into a waterbody, EWM spreads quickly and forms thick beds with dense canopies that crowd out native aquatic plants and threaten fisheries, water quality, drinking and irrigation water supplies and recreational uses. Once established, dense EWM beds can deplete oxygen needed by fish and other aquatic organisms (Madsen 2014). With the exception of bottom barriers, control measures selectively target EWM, thereby maintaining populations of native coontail, elodea, pondweeds and whitewater buttercup.

The Sanders County Commissioners established the Task Force in 2008 to develop and implement an integrated weed management approach to contain and manage infestations of EWM. The annual program has included the following components:

- Controlling priority areas of invasive milfoil stands through a combination of aquatic herbicide treatments, diver dredging (hand removal) in small, narrow plots where herbicides have proven to be less effective or adequate application is problematic, and the use of bottom barriers at high-use docks/ramps (public and private) to reduce the risk of boats transporting weed fragments.

- Conducting annual pre- and post-treatment monitoring to verify treatment effectiveness on targeted invasive species and re-colonization of native aquatic plant species at treated sites. Monitoring services were provided by Montana Fish Wildlife and Parks in 2019 at no cost to Sanders County.
- Monitoring littoral zones of Noxon and Cabinet Gorge reservoirs to determine if and how the composition and density of submersed vegetation and the location of invasive plant stands is changing over time.
- Implementing an education program to raise awareness about aquatic invasive plants and the importance of preventing the spread of aquatic invasive species. The Task Force is currently exploring new ways to conduct outreach after saturating the recreating public with direct outreach at boat launches for nearly ten consecutive years.
- Coordinating with Montana Fish, Wildlife & Parks and Idaho Department of Agriculture on mandatory boat check stations to prevent invasive aquatic plants from being transported to non-infested areas.
- Meeting monthly to evaluate program results and guide adaptive management techniques. Technical expertise includes aquatic resource professionals and representatives of federal, state and local government agencies, nonprofits, tribes and others with knowledge in fisheries, aquatic plant ecology, water resources, water quality and aquatic plant management. A Scientific Review Panel was established in 2018 to further assist the Task Force with review of monitoring results and consideration of control options.

In 2016, the Task Force received funding from the Montana Department of Natural Resources and Conservation (DNRC) to conduct an alternatives analysis (Analysis of Treatment Alternatives 2017) to examine management methods for reducing infestations. The analysis determined that successful management of EWM in Sanders County would contain and control existing aquatic invasive species (AIS) populations and prevention new introductions of AIS within the Noxon and Cabinet Gorge reservoirs. Through this analysis process, the top priority for control was determined to be near public and private access sites, including public and private boating access sites and shoreline dock areas. The second priority for control is large, high density shallow access areas with significant boat traffic.

Goal

The goals of this project are to sustain recreational fisheries as well as native plants and species that rely on riparian and littoral areas and habitats; improve access to water-based recreational opportunities; maintain or improve aesthetic values; and protect hydropower infrastructure and investment.

Objectives

1. Manage aquatic invasive species according to the Sanders County Aquatic Invasive Plant Management Plan.
2. Educate the public and landowners about the need to control and contain aquatic invasive species and keep them informed of the management activities of Sanders County.
3. Ensure that Sanders County interests are represented in the overall statewide management of aquatic invasive species, including the prevention of zebra and quagga mussels through watercraft inspection stations.

4. Monitor the extent and spread of EWM in the Cabinet Gorge and Noxon reservoirs, as well as the effectiveness of control measures.

Tasks

Task 1. Control Measures

Shoreline landowners with docks will be permitted to rake milfoil to remove it. Exact acreages and locations of control measures will be based on information from pre-treatment surveys, with public access and recreation sites taking priority. (Objectives 1, 2, 4)

Task 2. Education and Outreach

The Task Force conducts public education and outreach programs that target boaters, anglers, recreationists, and the general public. The specific activities will be determined by the Task Force and may include creation and distribution of educational materials with information about ways to reduce the spread of aquatic invasive species. The Task Force also updates the public annually about aquatic invasive species management activities. (Objective 2)

Task 3: Program Management

With assistance from the Task Force Facilitator, the Task Force holds monthly meetings to manage all aspects of the annual program. The group works closely with the Scientific Advisory Panel to implement recommendations and advises Sanders County on the selection of any contractor(s), contract development and contractor oversight. Working with its technical advisors, the Task Force evaluates project results and reports those results to funders. Task Force participants include Montana State University Extension Office/Sanders County; Avista; Montana Fish, Wildlife & Parks; Noxon-Cabinet Shoreline Coalition (NCSC); Green Mountain Conservation District; Sanders County Weed District; U.S. Forest Service; Confederated Salish & Kootenai Tribes; NorthWestern Energy; Montana BASS Federation; private industry; and community members. Task Force members provide in-kind support valued at $40,000 annually to implement the project. (Objectives 1-4)

Work Products

- Mid-year report; due to the Terrestrial Program Leader August 1, 2022.
- Annual Work Summary; due to the Terrestrial Program Leader November 15, 2022

Permitting Requirements

A Montana 310 Permit is required for the placement of bottom barriers on the bed of the reservoir, and the Noxon Cabinet Shoreline Coalition has the 310 Permit for this purpose.

A Montana Pesticide Discharge Permit is required for the use of herbicides to treat aquatic invasive species. Sanders County has a current permit, which is in effect through Oct. 31, 2022.

Cultural/Historic Resource Review

None. When the Environmental Assessment was scoped for EWM herbicide treatments, it was determined that treatments would not involve any new disturbance, therefore no cultural resource surveys were required.

Benefit to the Resource

Key objectives of this project focus on sustaining the reservoirs' recreational fisheries, improving access to water-based recreational opportunities, maintaining or improving aesthetic values, and protecting sensitive and important resources of Noxon and Cabinet reservoirs. As such, this project supports the CFSA Appendix B Recreational Fishery Enhancement Program (recreational fishery management); CFSA Appendix G Implementation of the Land Use Management Plan (protection and maintenance of sensitive resources, including shorelines); and CFSA Appendix H Implementation of the Recreation Resource Management Plan (management and preservation of recreation resources and public access).

With a focus on control, prevention and education, project activities dovetail with aquatic invasive species efforts on-going across Montana, Idaho and regionally. The program is consistent with the Montana Aquatic Nuisance Management Plan, which seeks to minimize the harmful ecological, economic, and social impacts of aquatic nuisance species through prevention and management, population growth, and dispersal into, within, and from Montana (Montana ANS Technical Committee 2002). The program is also consistent with the state's Wildlife Action Plan, which seeks to avoid spread of aquatic invasive species (Montana Fish, Wildlife & Parks 2015), and the state Aquatic Invasive Species Program, which "seeks to minimize the harmful ecological, economic, and social impact of AIS through prevention and management of introduction, population growth and dispersal of AIS…" (Analysis of Treatment Alternatives 2017).

Budget

Item	Estimated Carryover	2022 Budget Request
Education & Outreach	$0	$3,000
Task Force Facilitation	$0	$19,500
Miscellaneous (conferences, training, mileage, permits, meeting expenses)	$0	$5,000
Total	$0	$27,500
Anticipated Expenditures		$27,500

The Noxon-Cabinet Shoreline Coalition provides an annual $2,600 in-kind support from its members for the bottom barrier program. As described above, the county's Task Force members provide in-kind support valued at $40,000 annually to direct and implement all aspects of the EWM management project. In addition, the Task Force is considering applying to the Montana DNRC under a new AIS funding program for $25,000 to use for EWM control measures. Of that, $2,500 may be eligible to cover administrative costs, which could offset the Task Force Facilitation, reducing Avista's contribution to $17,000 in that line item. Grant awards are expected in the spring of 2022.

Literature Cited

DeBruyckere, L.A., T. Pennington. 2017. Analysis of Treatment Alternatives for Invasive Watermilfoil in Noxon Rapids and Cabinet Gorge Reservoirs, Sanders County, Montana.

Madsen, J.D. 2014. Eurasian Watermilfoil. In Biology and Control of Aquatic Plants, A Best Management Practices Handbook. L.A. Gettys, W.T. Haller, and D.G. Petty, editors. Aquatic Ecosystem Restoration Foundation.

Montana Aquatic Nuisance Species Technical Committee. 2002. Montana Aquatic Nuisance Species (ANS) Management Plan. 142pp.

Montana Fish, Wildlife & Parks. 2015. Montana's State Wildlife Action Plan. Helena, MT. 441pp.

As approved by the Management Committee on 3/15/2022

2022 PROJECT PLAN

Monitoring Associated with the Land Use Management Plan (LUMP)

Project Contact
Arthur D. Potts, Avista, (406) 847-1283, arthur.potts@avistacorp.com

Project History
This is a continuing project that has been approved annually by the Management Committee since 1999.

Background
The Land Use Management Plan (LUMP) establishes appropriated land use classifications and management guidelines to protect identified natural, aesthetic, and cultural resources that occur on Avista owned project lands. It also provides opportunity for public and some private access to project lands and waters where appropriate.

Goal
The Monitoring component of this PM&E is in place to ensure that staff and budget are in place to coordinate and implement the following objective. This project is part of the direct implementation of Clark Fork Settlement Agreement Appendix G.

Objective
1. The overall goal of the LUMP is to protect sensitive and important resources on Avista owned project lands, including the existing character or the shoreline.

Task
1. Continue annual inspections of Avista project lands to assure compliance with permit and lease conditions and assure compliance with acceptable land uses and restrictions as defined by Land Use Classifications.

Work Product
- All work associated with this Project Plan will be documented in the 2022 Annual Work Summary. Due Date: December 1, 2022.

Cultural/Historic Resource Review
May be needed on a case by case basis and will coordinate with Avista Cultural Resource Specialist.

Benefit to the Resource
Provide protection for sensitive and important resources on Avista owned project lands, including the existing character or the shoreline, while providing opportunity for public and some private access to project lands and waters where appropriate.

Budget

Item	Estimated Carryover	2022 Budget Request
Labor and equipment	$0	$10,000
Total	$0	$10,000
Anticipated Expenditures		$10,000

As approved by the Management Committee on 3/15/2022

2022 PROJECT PLAN

Enforcement Associated with the Land Use Management Plan (LUMP)

Project Contact
Arthur D. Potts, Avista, (406) 847-1283, arthur.potts@avistacorp.com

Project History
This is a continuing project that has been approved annually by the Management Committee.

Background
The Land Use Management Plan (LUMP) establishes appropriated land use classifications and management guidelines to protect identified natural, aesthetic, and cultural resources that occur on Avista owned project lands. It also provides opportunity for public and some private access to project lands and waters where appropriate.

Goal
The Enforcement component of this PM&E is in place to ensure that staff and budget are in place to coordinate and implement the following objective. This project is part of the direct implementation of Clark Fork Settlement Agreement Appendix G.

Objective
1. Continue enforcement to prevent and when appropriate prosecute violations of the law, permit and lease conditions, and other unauthorized uses of project lands and waters. These activities will be coordinated with Avista real-estate, legal, land survey personnel, Montana Fish, Wildlife and Parks (MFWP), Idaho Fish and Game (IDFG), United State Forest Service (USFS), or other law enforcement agencies.

Tasks
1. Continue to coordinate with Montana Fish, Wildlife and Parks enforcement personnel to assist in the prevention and when appropriate prosecute violations of the law, permit and lease conditions and other unauthorized uses of project lands and waters.
2. Continue to provide funding for Idaho Fish and Game enforcement personnel to assist in the prevention and when appropriate prosecute violations of the law, permit and lease conditions and other unauthorized uses of project lands and waters.
3. Continue to provide funding for Avista real-estate, legal, land survey, and cultural personnel to assist in the prevention and when appropriate prosecute violations of the law, permit and lease conditions and other unauthorized uses of project lands and waters.

Work Products
- All work associated with this Project Plan will be documented in the 2022 Annual Work Summary. Due Date: December 1, 2022.
- Annual reports from Idaho Fish and Game will be provided per the MOU agreement. Due Dates: December 1, 2022.

Cultural/Historic Resource Review
Work proposed under this fund will either: 1) not involve any ground disturbing activities or impact historic resources, or 2) will be performed under the cultural assessment associated with the original project.

Benefit to the Resource
Provide protection for sensitive and important resources on Avista owned project lands, including the existing character or the shoreline, while providing opportunity for public and some private access to project lands and waters where appropriate.

Budget

Item	Estimated Carryover	2022 Budget Request
Montana Enforcement MOU with Montana Fish, Wildlife and Parks	$0	$0
Idaho Enforcement MOU with Idaho Fish and Game	$0	$5,000
Avista and contract real-estate, legal, land survey, and cultural personnel	$0	$40,000
Total	$0	$45,000
Anticipated Expenditures		$45,000

2022 ANNUAL IMPLEMENTATION PLAN SUMMARY – APPENDIX H

Clark Fork Project, FERC No. 2058
Cabinet Gorge and Noxon Rapids Hydroelectric Developments

Title: Implementation of the Recreation Resource Management Plan (RRMP)

Implementation Staff Lead:
Arthur D. Potts, Avista, (406) 847-1283, arthur.potts@avistacorp.com

Background: The purpose of this measure is to provide for appropriate and adequate recreational opportunities and facilities associated with the Clark Fork Project through implementation of the Recreation Resource Management Plan (RRMP). Seven goals to be met through its implementation include:

1. Manage existing recreation resource needs.
2. Manage future recreation resource needs.
3. Provide adequate and safe public access.
4. Preserve recreation resources.
5. Coordinate recreation planning and needs.
6. Provide cost-effective and desirable recreation opportunities.
7. Provide compatible recreation opportunities.

Year 2022 work efforts are a continuation past efforts and remain focused on implementing the five distinct components of the RRMP:

2022 Project Plans

1. RRMP – Administration and Resource Integration
2. RRMP – Recreation Facility Development
3. RRMP – Monitoring
4. RRMP – Operation and Maintenance
5. RRMP – Interpretation and Education

Work Products

RRMP – Administration and Resource Integration

- Unless a specific document is created for a task, all work associated with this Project Plan will be documented in the 2022 Annual Work Summary. Due Date: December 1, 2022.

RRMP – Recreation Facility Development

- All work associated with this Project Plan will be documented in the 2022 Annual Work Summary. Due Date: December 1, 2022.

RRMP – Monitoring

- Unless a specific document is created for a task, all work associated with this Project Plan will be documented in the 2022 Annual Work Summary. Due Date: December 1, 2022.
- Report summarizing data from up to 23 automated traffic counters to measure use at various developed and dispersed recreation sites and trails. *January 2022*

- Summary maps showing dispersed recreation areas along the projects and permitted dock locations (showing dock densities per 0.5-mile segments of shoreline). *January 2022*

RRMP – Operation and Maintenance

- All work associated with this Project Plan will be documented in the 2022 Annual Work Summary. Due Date: December 1, 2022.

RRMP – Interpretation and Education

- All work associated with this Project Plan will be documented in the 2022 Annual Work Summary. Due Date: December 1, 2022.

2022 Appendix H Recreation Resource Management Plan Budget

Budget Summary	
Unexpended funds with interest	$0
2022 contribution (estimate)[1]	$241,500
Total available	**$241,500**
2022 MC-approved budget	$241,500
Unobligated funds	**$0**

[1] Estimated costs are projections made now; however, Avista will pay the actual costs as approved by the Management Committee. The amount needed to implement this PM&E may vary greatly by year depending upon legal/survey needs to address issues related to the management of Avista owned Project lands.

2022 Project	Carryover[1]	2022 Budget
RRMP - Administration and Resource Integration	$0	$0
RRMP - Monitoring	$0	$20,000
RRMP - Operation and Maintenance	$0	$216,000
RRMP - Interpretation and Education	$0	$5,500
Total	**$0**	**$241,500**
MC-approved budget		**$241,500**

[1] Estimated carryover of unexpended, approved funds as of January 1.

2022 Appendix H Facilities Fund Budget

Budget Summary	
Unexpended funds with interest	$496,880
2022 contribution (including GDP inflation rate)	$235,282
Total available	**$732,162**
2022 MC-approved budget	$376,200
Unobligated funds	**$355,962**

2022 Project	Carryover[1]	2022 Budget
Recreation Resource Facility Development Plan[2]	$0	$376,200
Total	**$0**	**$376,200**
MC-approved budget		**$376,200**

[1] Estimated carryover of unexpended, approved funds as of January 1.

[2]More projects are listed than will be completed. This provides for flexibility as projects are delayed due to permitting or other constraints. Projects have also been ranked as primary and secondary in terms of priority. The Recreation Resource Subgroup will evaluate project status on an ongoing basis to adapt implementation as needed.

As approved by the Management Committee on 3/15/2022

2022 PROJECT PLAN

Recreation Resource Management Plan (RRMP) - Administration and Resource Integration

Project Contact
Arthur D. Potts, Avista, (406) 847-1283, arthur.potts@avistacorp.com

Project History
This is a continuing project that has been approved annually by the Management Committee since 1999.

Background
The purpose of the administration and resource integration of the Recreation Resource Management Plan (RRMP) is to ensure coordination of the activities of this program with those of other recreation provides, and will be integrated with Avista's Land Use Management Plan, Cultural Resources, Wildlife, Fisheries, Aesthetics, Erosion, and Americans with Disabilities Act Compliance. Avista will administer this project using a recreation specialist along with clerical, consultant, and technical support as needed.

Objective
Ensure the coordination of the implementation of the RRMP with other resource programs and recreation resource providers along the Clark Fork Project.

Tasks
1. Administer the RRMP with Recreational Specialist, clerical, consultant, and technical support.
2. Integrate RRMP programs and projects with land use, cultural resources, wildlife, fisheries, aesthetics, and erosion control programs.

Work Products
- Unless a specific document is created for a task, all work associated with this Project Plan will be documented in the 2022 Annual Work Summary. Due Date: December 1, 2022.

Cultural/Historic Resource Review
No ground disturbing activities or impact to historic resources will occur as part of implementing this part of the RRMP.

Benefit to the Resource
Ensures the coordination of the implementation of the RRMP with other resource programs and recreation resource providers along the Clark Fork Project.

Budget

Item	Estimated Carryover	2022 Budget Request
Costs associated with this project plan will be covered under the other components of this PM&E	$0	$0
Total	$0	$0
Anticipated Expenditures		$0

As approved by the Management Committee on 3/15/2022

2022 PROJECT PLAN

Recreation Resource Management Plan (RRMP) - Recreation Facility Development

Project Contact
Arthur D. Potts, Avista, (406) 847-1283, arthur.potts@avistacorp.com

Project History
This is a continuing project that has been approved annually by the Management Committee since 1999.

Background
The purpose of this project plan is to address both immediate and long-term modification, improvement, expansion, and repair of existing sites and facilities.

Objective
Provide for appropriate and adequate recreational opportunities and facilities associated with the Clark Fork project.

Tasks
1. See attached spreadsheet identifying all potential facility development projects for 2022. Also note that more projects are listed than time would allow, which provides for flexibility as projects are delayed due to permitting or other constraints. Projects have also been ranked as primary and secondary in terms of priority.

Work Products
- All work associated with this Project Plan will be documented in the 2022 Annual Work Summary. Due Date: December 1, 2022.

Cultural/Historic Resource Review
Each project will be evaluated individually to determine if cultural surveys are needed and the responsible agency, or group, to ensure that compliance is met.

Benefit to the Resource
Provide for appropriate and adequate recreational opportunities and facilities associated with the Clark Fork project.

Budget

Item	Estimated Carryover	2022 Budget Request
Design, permitting, labor and materials	$0	$376,200
Total	$0	$376,200
Anticipated Expenditures		$376,200

2022 Recreation Resource Facility Development Plan

Recreation Sites	Identified Opportunities	Parties Involved	Action/Needs	Est. Cost	Notes/Permits	Project Leader	Ownership
Annual Activity							
Corridor Wide	General clean up, open facilities, end of year cleaning, projects, etc.	Avista/Sanders County/USFS/MFWP	Hire Montana Conservation Corp to work within the Clark Fork Project area (all sites as needed) for one week in the	$11,000	Time will be split among State, USFS, Sanders County, and Avista sites as needed.	Arthur Potts	Avista/MFWP/USFS/Sanders County
Corridor Wide	Noxious Weed Management/Recreation Sites	Avista/Sanders County/USFS/MFWP	Hire a licensed contractor to assist with weed management/spraying throughout the Clark Fork Project at designated	$10,000	N/A	Arthur Potts	Avista/MFWP/USFS/Sanders County
Corridor Wide - boat ramps/docks	Invasive Eurasian watermilfoil control	Avista/Sanders County/USFS/MFWP	Control invasive Eurasian watermilfoil at public boat ramps as needed using bottom barriers.	$6,000	Part of a larger project with Sanders County, MFWP, Montana DNRC, and others.	Arthur Potts	Avista/MFWP/USFS/Sanders County
Corridor Wide	Receive assistance in the removal/installation of docks	Avista	Hire a contractor to install the boat docks in the springs and remove docks in the fall. This would also involve installing/removing 2 swimming areas.	$3,500	N/A	Nate Hall/Arthur Potts	Avista/Sanders County
Finley Flats, Two Rivers RV Park & Campground	Dust control needed	Avista	Apply magnesium chloride or other dust control agent after spring rains.	$6,500	Work with MFWP / USFS/ Sanders County to choose dust control agent and contractor.	Nate Hall/Arthur Potts	Avista
Flat Iron Recreation Area	Dredge boat ramp area	Avista	Have permits and contract in place to take advantage of extended low water levels as they occur.	$10,000	Permits are in place, when low water occurs we can move forward.	Nate Hall/Arthur Potts	Avista/MFWP
Primary Recreation Projects							
Big Eddy Campground	Address access road improvements	Avista/USFS	Lengthen paved apron at access point to Highway 200 and improve interior access road.	$50,000	Cultural Survey	Les Raynor/Arthur Potts	Avista/USFS
Flat Iron Recreation Area	Access road	Avista/Sanders County	Add sand to the chip sealed road to absorb excess oil.	$4,000	N/A	Arthur Potts	Avista
Avista/FS/MT FWP recreation sites	Finish Replacing 15 year old kiosks	Avista/MFWP/USFS	Finish installing kiosks at 3 Idaho sites. Continuation of replacement/new installation at 24 Avista/FS/FWP sites.	$15,000	Cultural Survey	Arthur Potts	Avista/MFWP/USFS/Sanders County
South Shore Boat Dock	Repair aging/damaged deck on dock	Avista	Repair damaed decking with like	$1,200	N/A	Arthur Potts	Avista
Bull River Campground	Address sedimentation issue with potable water tank	Avista/USFS	Evaluate existing tank and determine appropriate actions to address sedimentation issue. Tanks needs to be dug up and reinstalled.	$30,000	Cultural Survey	Les Raynor/Arthur Potts	Avista/USFS
Bull River Campground	Signage for campground	Avista/USFS	Replace highway signs and install Vacancy/Campground Full signs.	$3,000	Cultural Survey	Les Raynor/Arthur Potts	Avista/USFS
Kirby Gulch Boat Ramp	Improve/expand parking lot	Avista	Expand parking lot.	$10,000	Joint Aquatic Resource Permit Application and Cultural Survey	Nate Hall/Arthur Potts	Sanders County
North Shore Campground	Address paving needs for North Shore Parking lot, day use, campground area	USFS, Avista	Repair and pave several areas at North Shore Campground and day use area. Existing roads, entrance to vault toilets, overflow parking, fee site, and kiosk sign.	$40,000	Cultural Survey	Les Raynor	USFS/Avista
Triangle Pond	Complete implementation of master site plan developed in 2019	Avista, USFS	Road work, traffic control structures, parking, picnic tables and fire rings, carry-in launch for kayaks and small water craft, replace existing picnic shelter, 4 small shade structures near beach area, informational signage, concrete sidewalk to ADA restroom. Includes $30,000 in GAOA funding.	$100,000	NEPA	Les Raynor	USFS
Pilgrim Creek Park	Repair baseball field fences	Avista	Repair all fences surrounding baseball	$10,000	N/A	Arthur Potts	Avista
Noxon/Bicentennial Park	Improve boat ramp	Avista	Grout gaps on boat ramp.	$5,000	MT 310 Maintenance Permit covers the work	Arthur Potts	Avista
South Shore Boat Ramp	Reposition section of boat ramp	Avista	Grout gaps on boat ramp.	$3,000	MT 310 Maintenance Permit covers the work	Arthur Potts	Avista
Bull River Campground	Valve Replacement	USFS, Avista	Remove malfunction ball valve from potable water system and replace with larger valve. Excavate area to accommodate replacement and larger equipment following OSHA trenching	$10,000	Cultural Survey	Les Raynor	USFS
North Shore Campground	Sample tap/line repair	USFS, Avista	Excavate and repair/replace water line. Sample tap, valve box, and water meter will also be raised approximately 30 inches for easier access.	$5,000	Cultural Survey	Les Raynor	USFS

2022 Recreation Resource Facility Development Plan

Recreation Sites	Identified Opportunities	Parties Involved	Action/Needs	Est. Cost	Notes/Permits	Project Leader	Ownership
Secondary Recreation Projects							
Noxon and Cabinet Gorge Reservoirs	Work with Appendix B to investigate opportunities for low water boat launch opportunities	MFWP, USFS, Avista and Sanders County	Combination of low water events and increased interest in early spring fishing is creating an increased demand for boat ramps that are accessible during low water periods.	$5,000	Joint Aquatic Resource Permit Application and Cultural Survey	Arthur Potts	MFWP, USFS, Avista and, Sanders County
North Shore Campground	Land purchase to expand parking	MFWP, USFS, Avista and Sanders County	Due diligence for potential land purchase (appraisal, survey work, negotiations, etc.). Looking at least 2 acres up to 10	$10,000	Once a proposal is firmed up, including commitment from landowner, proposal will be sent to the TRTAC, CRMG, and MC for review and	Arthur Potts	USFS/Avista
Corridor Wide	Evaluate access roads previously blocked off; add boulders as needed	Avista	Identify areas that were previously blocked off from vehicle access and address by bringing in larger boulders or replacing boulders that have been moved.	$10,000	N/A	Arthur Potts	Avista
Heron, Centennial, Trout Creek, and South Shore Boat Launches	Address bulkhead approaches at docks	Avista and Sanders County	Create more accessible approach onto bulkhead/dock by bringing in gravel and grading.	$2,000	N/A	Arthur Potts	Avista and Sanders County
Clark Fork Access Site	Entrance and launch ramp grading	Avista	Grade entrance/parking road and boat launch to improve accessibility. Bring in additional material if necessary.	$1,500	N/A	Arthur Potts	Avista
North Shore Boat Launch	Extend boat dock	Avista and USFS	Add extension to existing dock to enable use of dock during low water levels.	$10,000	MT 310 Permit	Arthur Potts	Avista
South Shore Recreation Site	Access road	Avista	Regrade access road and repair rut damage around mud holes; bring in additional road material if necessary.	$1,500	N/A	Arthur Potts	Avista
Frog Pond	Address/regrade roadway	Avista	Regrade access road and repair rut damage around mud holes; bring in additional road material if necessary.	$1,500	N/A	Arthur Potts	Avista
South Shore Recreation Site	Access road	Avista	Regrade access road and repair rut damage around mud holes; bring in additional road material if necessary.	$1,500	N/A	Arthur Potts	Avista
			EST Available $732,162	**$376,200.00**	**TOTAL**		

Also note that more projects are listed than possibly time would allow, this provides for flexibility as projects are delayed due to permitting or other constraints. Projects have also been ranked as annual, primary and secondary in terms of priority. The Recreation Resource Subgroup will evaluate project status on an ongoing basis to adapt implementation as needed.

As approved by the Management Committee on 3/15/2022

2022 PROJECT PLAN

Recreation Resource Management Plan (RRMP) - Monitoring

Project Contact
Arthur D. Potts, Avista, (406) 847-1283, arthur.potts@avistacorp.com

Project History
This is a continuing project that has been approved annually by the Management Committee since 1999.

Background
The purpose of this project plan is to monitor use at developed and undeveloped sites to document trends of overall use and identify potential management needs. Monitoring will occur at two levels:

1. Annual monitoring utilizing data collected during routine management of recreation resources, and
2. More detailed recreation survey work to occur as needed every five to ten years. Based upon annual monitoring we do not believe use has changed enough to warrant a more in-depth survey at this time.

Objective
Through monitoring the use management can be modified if needed to ensure that providing the appropriate and adequate recreational opportunities and facilities associated with the Clark Fork project.

Tasks
1. Work with the recreation subgroup to continue to implement electronic recreation site evaluations developed as part of the 2017 Recreation Resource Management Plan update.
2. Continue to utilize up to 23 automated traffic counters to measure use at various developed and dispersed recreation sites and trails.
3. Continue utilizing standardized reporting for recreation use at Thompson Falls State Park, North Shore Recreation Area, and Bull River Recreation Area.
4. Summarize 2022 recreational use data from Bull River and North Shore campgrounds, MFWP, Thompson Falls State Park, and the Cabinet Gorge Dam and Noxon Rapids Dam viewpoints.
5. Develop maps showing dispersed recreation areas along the projects and permitted dock locations (showing dock densities per 0.5-mile segments of shoreline).

Work Products
- Unless a specific document is created for a task, all work associated with this Project Plan will be documented in the 2022 Annual Work Summary. Due Date: December 1, 2022.
- Report summarizing data from up to 23 automated traffic counters to measure use at various developed and dispersed recreation sites and trails. *January 2022*

- Summary maps showing dispersed recreation areas along the projects and permitted dock locations (showing dock densities per 0.5-mile segments of shoreline). *January 2022*

Cultural/Historic Resources Review
No cultural resource surveys will be needed for this project plan.

Benefit to the Resource
Through monitoring the use management can be modified if needed to ensure that providing the appropriate and adequate recreational opportunities and facilities associated with the Clark Fork project.

Budget

Item	Estimated Carryover	2022 Budget Request
Labor and Materials	$0	$20,000
Total	$0	$20,000
Anticipated Expenditures		$20,000

As approved by the Management Committee on 3/15/2022

2022 PROJECT PLAN

Recreation Resource Management Plan (RRMP) – Operation and Maintenance

Project Contact
Arthur D. Potts, Avista, (406) 847-1283, arthur.potts@avistacorp.com

Project History
This is a continuing project that has been approved annually by the management committee since 1999.

Background
The purpose of this project plan is to ensure adequate funding is available to meet the annual operation and maintenance needs associated with the recreation resources and facilities associated with the Clark Fork Project.

Objective
Ensure that recreation opportunities and facilities are operated and maintained in a manner to provide for appropriate, adequate and safe use.

Tasks
1. Maintain Avista controlled recreation facilities and undeveloped recreation sites on Avista lands.
2. Assist USFS with the maintenance of Finley Flats Recreation Area, North Shore Recreation Area, Marten Creek Recreation Area, Triangle Pond, Bull River Recreation Area, Quinn's Cut Recreation Area, and Big Eddy Recreation Area.
3. Assist MFWP with the maintenance of Thompson Falls State Park and Flat Iron Ridge Fishing Access Site.
4. Provide low cost leases or permits to the community or civic groups providing recreation opportunities. (i.e., Thompson Falls Golf Course)

Work Products
- All work associated with this Project Plan will be documented in the 2022 Annual Work Summary. Due Date: December 1, 2022.

Cultural/Historic Resource Review
If a work specific proposal is developed, Avista will coordinate Cultural Resources Management Group review prior to implementing the project. The work product for this review will be confidential due to the sensitive nature of the content.

Benefit to the Resource
Providing for the operation and maintenance of recreation opportunities and facilities along the Clark Fork Project will help ensure the appropriate and safe use by the public.

Budget

Item	Estimated Carryover	2022 Budget Request
Operations & Maintenance – Avista sites	$0	$165,000
Operations & Maintenance - USFS sites	$0	$32,000
Operations & Maintenance – MFWP – Flat Iron FAS and Thompson Falls State Park	$0	$19,000
Provide low cost permits or leases	$0	$0
Total	$0	$216,000
Anticipated Expenditures		$216,000

2022 PROJECT PLAN

Recreation Resource Management Plan (RRMP) – Interpretation and Education

Project Contact
Arthur D. Potts, Avista, (406) 847-1283, arthur.potts@avistacorp.com

Project History
This is a continuing project that has been approved annually by the Management Committee since 1999.

Background
The purpose of this project plan is to provide funding for the maintenance of existing information and education materials for the recreation resources and facilities associated with the Clark Fork Project.

Objective
Ensure that the existing information and education materials associated with the Clark Fork Project recreation resources and facilities are maintained.

Tasks

1. Implementation of Interpretation and Education Program will be integrated with the measures developed and approved by the CRMG in 2008. The Interpretation and Education Program is funded through the facility development program. Maintenance dollars will be used to inventory, standardize, and maintain informational kiosks and EWM signs throughout the project.

Work Products

- All work associated with this Project Plan will be documented in the 2022 Annual Work Summary. Due Date: December 1, 2022.

Cultural/Historic Resource Review
If a work specific proposal is developed, Avista will coordinate Cultural Resources Management Group review prior to implementing the project. The work product for this review will be confidential due to the sensitive nature of the content

Benefit to the Resource
Provide information and education materials to the public that recreate on the Clark Fork Project.

Budget

Item	Estimated Carryover	2022 Budget Request
Labor and materials	$0	$5,500
Total	$0	$5,500
Anticipated Expenditures		$5,500

2022 ANNUAL IMPLEMENTATION PLAN - APPENDIX I

Clark Fork Project, FERC No. 2058
Cabinet Gorge and Noxon Rapids Hydroelectric Developments

Title
Implementation of the Aesthetics Management Plan

Implementation Staff Lead
Arthur D. Potts, Avista, (406) 847-1283, arthur.potts@avistacorp.com

Project History
This is a continuing project that has been approved annually by the Management Committee.

Background
The purpose of this measure is to provide for the protection and enhancement of aesthetic resources associated with Avista's Clark Fork Projects and to mitigate for project related impacts to those resources through the implementation of the Aesthetics Management Plan (AMP). Aesthetic guidelines and considerations of the AMP are implemented by permit standards and land use classifications of the Land Use Management Plan, site design and monitoring in the Recreation Resource Management Plan, and shoreline stabilization guidelines of the Shoreline Stabilization Guidelines Program. Ongoing coordination with other interest groups and agencies will occur as described for in the AMP.

2022 Project Plans
1. Monitor recreation, land management, erosion, and facility construction programs to ensure AMP guidelines are considered.
2. Continue to investigate measures to restore views and remove vegetation as needed, also addressing any identified issue from the 2018 re-inventory of 41 key viewpoints. Sites will be revisited again in 2023 to take photos to compare to past inventories.

Work Products
- Unless a specific document is created for a task, all work associated with this Project Plan will be documented in the 2022 Annual Work Summary. Due Date: December 1, 2022.

Cultural/Historic Resource Review
If a work specific proposal is developed, Avista will coordinate Cultural Resources Management Group review prior to implementing the project. The work product for this review will be confidential due to the sensitive nature of the content.

Benefit to the Resource
Protect the rural and rustic character of the Clark Fork Project shoreline.

2022 Appendix I Budget

Budget Summary	
Unexpended funds with interest	$0
2022 contribution (estimate) [1]	$7,000
Total available	**$7,000**
2022 MC-approved budget	$7,000
Unobligated funds	**$0**

[1] Estimated costs are projections made now; however, Avista will pay the actual costs as approved by the Management Committee.

2022 Project	Carryover[1]	2022 Budget
Implementation of the Aesthetics Management Plan	$0	$7,000
Total	**$0**	**$7,000**
MC-approved budget		**$7,000**

[1] Estimated carryover of unexpended, approved funds as of January 1.

2022 ANNUAL IMPLEMENTATION PLAN APPENDIX J

Clark Fork Project, FERC No. 2058
Cabinet Gorge and Noxon Rapids Hydroelectric Developments

Title: Implementation of the Wildlife, Botanical and Wetland Management Plan

Implementation Staff Lead:
Arthur D. Potts, Avista, (406) 847-1283, arthur.potts@avistacorp.com

Project History
This is a continuing project that has been approved annually by the Management Committee.

Background
The purpose of this resource protection, mitigation, and enhancement measure is to provide for the organization and presentation of the various wildlife, botanical and wetland management activities and site-specific plans within a single, comprehensive management plan document. The goal is to have a dynamic reference document that the in-field staff, technical advisory committees, and Management Committee (MC) can utilize and refer to for guidance in implementing the required PM&Es and overall wildlife, botanical, and wetland resource management program for the Clark Fork Project. When the management plan was developed, it did not fully account for the detailed annual reports that are developed for each of the PM&E's. As a result, the update to the plan has changed direction in primarily being a summary of accomplishments related to habitat protection. These updates will be made available to the various committees and Management Committee as they are completed. Also, with the removal of Appendix N1-N3, it was approved by the Management Committee in 2016 that observations of bald eagles, peregrine falcons and common loons would be included in the annual summary associated with this PM&E.

2022 Project Plans
- Utilize the Wildlife, Botanical and Wetland Management Plan to help guide implementation of Wildlife, Botanical, and Wetland Protection, Mitigation, and Enhancement programs.
- Continue to update the habitat protection spreadsheet as acquisitions are completed.
- As approved by the Management Committee at their March 15, 2016 meeting, observations regarding bald eagles, peregrine falcons, and common loons will be reported here annually.

Work Products
- Update and provide copies of Habitat Protection Spreadsheet at annual fall Management Committee meeting. Includes discussion of future management of any parcel owned by Avista for more than 10 years, and if continues in Avista ownership after that, each parcel will be revisited every five years after that.
- Unless a specific document is created for a task, all work associated with this Project Plan will be documented in the 2022 Annual Work Summary. Due Date: December 1, 2022.

Cultural/Historic Resource Review
If a work specific proposal is developed, Avista will coordinate Cultural Resources Management Group review prior to implementing the project. The work product for this review will be confidential due to the sensitive nature of the content.

Resource Benefit
Provide the Management Committee an ongoing list of properties protected through the implementation of the CFSA so they can make informed decisions as to ongoing management and final disposition of these properties.

2022 Appendix J Budget

Budget Summary	
Unexpended funds with interest	$0
2022 contribution (estimate) [1]	$5,000
Total available	**$5,000**
2022 MC-approved budget	$5,000
Unobligated funds	**$0**

[1] Estimated costs are projections made now; however, Avista will pay the actual costs as approved by the Management Committee.

2022 Project	**Carryover[1]**	**2022 Budget**
Implementation of the Wildlife, Botanical and Wetland Management Plan	$0	$5,000
Total	**$0**	**$5,000**
MC-approved budget		**$5,000**

[1] Estimated carryover of unexpended, approved funds as of January 1.

2022 ANNUAL IMPLEMENTATION PLAN SUMMARY– APPENDIX K

Clark Fork Project, FERC No. 2058
Cabinet Gorge and Noxon Rapids Hydroelectric Developments

Title
Wildlife Habitat Acquisition, Enhancement and Management Program

Implementation Staff Lead
Arthur D. Potts, Avista, (406) 847-1283, arthur.potts@avistacorp.com

Project History
This is a continuing project that has been approved annually by the Management Committee.

Background
The purpose of this program is to mitigate for the potential effects to wildlife resources and habitat due to the continued operation of the Clark Fork Project. The program will focus on the types of habitat most significantly affected, such as wetland and riparian habitat.

Goal
Provide a continuing source of financial resources that will be used to acquire, protect, enhance, and/or manage important wildlife habitat in the vicinity of the projects.

2022 Project Plans
1. Operation and Maintenance of Acquired Property and Contingency Fund.
2. Habitat Acquisition and Conservation and Contingency Fund.

Work Products
Operation and Maintenance of Acquired Property and Contingency Fund
- All work associated with this Project Plan will be documented in the 2022 Annual Work Summary. Due Date: December 1, 2022.

Habitat Acquisition and Conservation and Contingency Fund
- All work associated with this Project Plan will be documented in the 2022 Annual Work Summary. Due Date: December 1, 2022.

Cultural/Historic Resource Review
If a work specific proposal is developed, Avista will coordinate Cultural Resources Management Group review prior to implementing the project. The work product for this review will be confidential due to the sensitive nature of the content.

Benefit to the Resource
Provide protection to those habitats most significantly affected by the continued operation of the Clark Fork Project, such as wetland and riparian habitat.

2022 Appendix K Budget

Budget Summary	
Unexpended funds with interest	$767,603
2022 contribution (including GDP inflation rate)	$306,493
Total available	**$1,074,096**
2022 MC-approved budget	$104,550
Unobligated funds	**$969,546**

2022 Project	Carryover [1]	2022 Budget
Operation and Maintenance of Acquired Property and Contingency Fund	$0	$44,550
Habitat Acquisition and Conservation and Contingency Fund	$0	$60,000
Total	**$0**	**$104,550**
MC-approved budget		**$104,550**

[1] *Estimated carryover of unexpended, approved funds as of January 1.*

2022 PROJECT PLAN

Operation and Maintenance of Acquired Property and Contingency Fund

Project Contact
Arthur D. Potts, Avista, (406) 847-1281, arthur.potts@avistacorp.com

Project History
This is a continuing project that has been approved annually by the Management Committee.

Background
This program is in recognition of the long-term commitment required for the operation and maintenance that comes with purchasing and protecting habitat. These activities include monitoring, weed control, development of infrastructure (roads, parking areas, and fences), vegetation management, enforcement, etc. Without these activities it is possible that the properties would no longer provide the habitat benefits for which the properties were originally protected for.

Objectives
1. Provide a funding source for operation and maintenance to ensure that habitat properties continue to provide the resource benefits that the properties were originally protected for.

Tasks
1. Operation and maintenance, including fence/gate maintenance, noxious weed treatment, forest management plan development and implementation, public information and management, and taxes on Avista owned and managed habitat protection properties. Specific projects include:
    a. Twin Creek – Continue to develop site plan and install infrastructure that will allow public use of this property that was acquired in 2016. Work will include noxious weed control, enforcement, and development of revegetation/wetland enhancement plans for the property.
    b. South Fork Bull River Wildlife Management Area complex – Activities include monitoring, weed control, development of infrastructure (roads, parking areas, fences), development of timber management plan, enforcement, etc.
    c. Monitoring of other Avista owned habitat properties and implementing management measures as needed.
    d. Wood Duck Property Re-Vegetation Maintenance.

Work Products
- All work associated with this Project Plan will be documented in the 2022 Annual Work Summary. Due Date: December 1, 2022.

Cultural Resource Survey Needs
Work proposed under this Project Plan will either: 1) not involve any ground disturbing activities or impact historic resources, or 2) will be performed under the cultural assessment associated with the specific proposed project.

Benefit to the Resource
Helps ensure that habitat properties held by Avista continue to provide the resource benefits for which they were originally protected for.

Budget

Item	Estimated Carryover	2022 Budget Request
Contract/Avista Labor and materials (Task 1a, b, c)	$0	$43,000
Contract/Avista Labor and materials (Task 1 d)	$0	$1,550
Total	$0	$44,550
Anticipated Expenditures		$44,550

2022 PROJECT PLAN

Wood Duck Re-Vegetation Maintenance

Project Contact

Brita Olson, Lower Clark Fork Watershed Group (LCFWG), (208) 304-3852,
brita@lowerclarkforkwatershedgroup.org
Arthur D. Potts, Avista, (406) 847-1283, arthur.potts@avistacorp.com

Project History

This project is part of a continuing effort to improve the riparian area and habitat quality on Avista's Wood Duck property. After the Wood Duck property was purchased in 2004, wetland improvements (plugging drainage ditches) and re-vegetation work was initiated in 2010 and fully implemented in 2012. Ongoing maintenance of revegetation efforts has been completed in the years since with support from Appendix K and Appendix B.

Background

The original re-vegetation effort consisted of installing 13 large exclosures built of weed matting meant to suppress reed canary and other pasture grasses and metal fencing (in 2010). After two years (in 2012), the exclosures were planted with native tree and shrub species. In 2016 and 2017, extensive maintenance was completed throughout the project area to fix damaged fencing, remove failing exclosures (located in the sedge wetland that is inundated late into the summer and not conducive to becoming a willow nursery as the contractor who designed the project had intended), and plant additional trees and shrubs in exclosures that had seen heavy browse or low initial survival. The project now consists of 11 exclosures that are well established and quite robust (Figure 1).

Next year (2022) will be the vegetation's 11th growing season and time for the exclosures to be "released". Already, many of the shrub species are growing through the fencing, and it is important to remove the fencing before it causes a hinderance to continued growth. Because much of the vegetation is now well-established shrub species, such as alder, willow and red osier dogwood, and well above the height of existing fences (>6 feet), it should be resilient to ungulate browse. Should beaver utilize the area, this is now likely to stimulate, rather than inhibit growth for beaver-adapted shrub species like those listed above. In order to reduce pressure on any individual exclosures, all will be removed in a short time frame (1-2 weeks during spring of 2021). Because tree species (cottonwood, conifers, etc.) may still be vulnerable to browse, as exclosures are removed, materials will be repurposed to provide protection for select tree species that project partners would like to persist in the riparian corridor over the long-term (50-100 years or more).

Monitoring (photo points, vegetation survival – method TBD) will be completed as exclosures are removed and at least 1 year after (2022), in order to quantify any impacts from browse. It may be repeated in future years, as desired, in order to inform adaptive management of revegetation efforts throughout the drainage.

Figure 1. A robust hedge of riparian vegetation now lines the Bull River on the Wood Duck property.

Following the completion of the above tasks, it is expected that the established vegetation will require considerably less ongoing maintenance in the future – only annual or biennial monitoring/maintenance of individually protected trees will be needed. This invites the opportunity to consider any additional opportunities on the property and long-term management goals for habitat and vegetation. In 2022, LCFWG Coordinator will also work with Arthur Potts (Avista) to evaluate habitat restoration opportunities to inform a long-term management strategy for the property.

Goal

Enhance riparian habitat along the mainstem Bull River, for the long-term benefit of native salmonids, birds, and other wildlife species.

Objectives

1. Maintain existing revegetation project on the Wood Duck property in order to promote its long-term sustainability and maximize the benefit it provides to fish and wildlife.
2. Inform the development of a property management plan for the Wood Duck property.

Tasks

1. Remove 11 metal fenced exclosures from established vegetation along the riparian area

on the Wood Duck property. (Objective 1; ***Completed 2021***)
2. Use salvaged material to protect individual trees (5-10 per exclosure) throughout the project area. (Objective 1; ***Completed 2021***)
3. Cache salvage material for future use and dispose of or recycle waste materials – likely bent and unusable t-posts and mangled welded wire fencing. (Objective 1 and, possibly, Objective 2; ***Completed 2021***)
4. Finalize monitoring methods and collect "baseline" data as exclosures are removed. Monitoring will include, at minimum, photo points and a measure of plant survival. (Objective 1 and 2)
5. Develop priorities for long-term habitat restoration and enhancement on the Wood Duck property in consultation with Arthur Potts (Avista) and other stakeholders, such as Kaniksu Land Trust and Montana Fish, Wildlife & Parks. (Objective 2)

Work Products
- Mid-Year Report (2022); due to Avista by August 1, 2022
- Annual Work Summary (2022); due to Avista by November 15, 2022

Permitting Requirements
No in-stream/bank disturbances will be made as a part of this project plan. As such, no permits are required.

Cultural/Historic Resource Review
This project consists of maintenance of an ongoing project, and no new ground disturbance will be made in the removal of exclosures. Cultural/historic resource work is the responsibility of Avista Corporation (owner of the property) and MFWP (manager of the property).

Benefit to the Resource
The project will help to restore native vegetation (including large woody vegetation) to the riparian area and replace some of the non-native reed canarygrass that dominates much of the Bull River banks. While woody species may eventually provide improved habitat for fish in the river, the more diverse regime of native plants will also provide improved riparian habitat for wildlife species such as birds, ungulates and beaver. This is one of many re-vegetation projects in the Bull River of similar design. Collectively, the conversion of grassy riverbanks to woody shrubs and trees with more extensive and diverse root structures will contribute to improved water quality along the Bull River. The river is impaired for sediment, which comes largely from bank erosion, and this project will ideally be helping meet the Bull River's TMDL for sediment, increase bank stabilization, improve riparian health and the overall function of this river system.

Located on one of the CFSA's first habitat acquisitions, this project is in line with the goals of Appendix K. It also supports the habitat enhancement goals of Appendix B.

Budget

Item	Estimated Carryover	2022 Budget Request
Contract labor (Montana Conservation Corps crew), 1 week of 4-6 person fully equipped crew. Additional labor (if-needed) will be recruited from volunteers and in-kind contributions from partners.	$0	$0
LCFWG staff time (in 2022, volunteer oversight, monitoring, project coord., and long-term planning)	$0	$1,320
LCFWG travel (crew and volunteer oversight, site visit with property stakeholders, etc.)	$0	$230
Miscellaneous tools and materials (post-puller, wire snips, etc.)	$0	$0
Total	$0	$1,550
Anticipated Expenditures		$1,550

2022 PROJECT PLAN

Habitat Acquisition and Conservation and Contingency Fund

Project Contact
Arthur D. Potts, Avista, (406) 847-1283, arthur.potts@avistacorp.com

Project History
This is a continuing project that has been approved annually by the Management Committee.

Background
This program is focused on protecting habitat associated with the Clark Fork Project, with a focus on those areas that provide riparian and wetland resource values.

Objectives
1. Provide a funding source for due diligence on potential habitat protection projects in order to provide a detailed proposal for Management Committee consideration.
2. Once approved by the Management Committee, provide funding to acquire and protect habitat properties.

Tasks
1. Funding is available to conduct due diligence (landowner discussions, property inspection, habitat information, title search, and appraisal), in order to provide the Management Committee a detailed proposal for their consideration. Includes working with partners such as Kaniksu Land Trust on identifying and vetting potential projects.

Work Products
- All work associated with this Project Plan will be documented in the 2022 Annual Work Summary. Due Date: December 1, 2022.

Cultural Resource Survey Needs
Work proposed under this Project Plan will either: 1) not involve any ground disturbing activities or impact historic resources, or 2) will be performed under the cultural assessment associated with the specific proposed project.

Benefit to the Resource
Provides mechanism to fully evaluate habitat protection opportunities to ensure that resource benefits are aligned with Clark Fork Settlement Agreement goals and priorities.

Budget

Item	Estimated Carryover	2022 Budget Request
Contract/Avista Labor	$0	$60,000
Total	$0	$60,000
Anticipated Expenditures		$60,000

2022 ANNUAL IMPLEMENTATION PLAN SUMMARY– APPENDIX L

Clark Fork Project, FERC No. 2058
Cabinet Gorge and Noxon Rapids Hydroelectric Developments

Title
Black Cottonwood Habitat Protection and Enhancement

Implementation Staff Lead
Arthur D. Potts, Avista, (406) 847-1283, arthur.potts@avistacorp.com

Project History
This work is a continuation of work previously approved by the Management Committee.

Background
The purpose of this measure is to provide for the protection of black cottonwood trees and stands on Avista owned project lands through the development of site-specific management and enhancement plans for three specific cottonwood sites identified by the Wildlife, Botanical, and Wetlands Work Group. Additionally, existing stands and trees will be protected through the implementation of land use classifications in the Land Use Management Plan (LUMP).

Site-specific management plans were developed in 2000. Efforts in 2022 will focus on the continued protection of black cottonwood stands and trees through the implementation of land use classifications in the LUMP. The site-specific enhancement efforts at Hereford Slough (completed in early 2003 and treated again in 2007) will continue to be monitored to determine response and implement additional management efforts as needed.

An 80 x 80-foot woven wire exclosure was built in the spring of 2015 and a 160 x 160-foot exclosure in December 2020 in the Hereford Slough cottonwood stand. Regeneration occurs from exposed roots, cutoff stumps and seed germination. Efforts in 2022 will include continued monitoring of the exclosures and conduct any needed maintenance to the fence that is needed.

2022 Project Plans
- Continue to protect black cottonwood stands along the Clark Fork Project through the implementation of the Land Use Management Plan.
- Continue to monitor and maintain the exclosures at Hereford Slough.

Work Products
- All work associated with this Project Plan will be documented in the 2022 Annual Work Summary. Due Date: December 1, 2022.

Cultural/Historic Resource Review
Ground and vegetation disturbance will take place in an area previously surveyed for the original enclosure construction in 2015. Therefore, no additional cultural resource surveys will be required.

Benefit to the Resource
Benefits are protecting and managing existing black cottonwood stands. These stands provide high wildlife value but are relatively limited in distribution along the Clark Fork Project.

2022 Appendix L Budget

Budget Summary	
Unexpended funds with interest	$97,079
2022 contribution (including GDP inflation rate)	$7,475
Total available	**$104,554**
2022 MC-approved budget	$15,000
Unobligated funds	**$89,554**

2022 Project	Carryover[1]	2022 Budget
Black Cottonwood Habitat Protection and Enhancement	$15,000	$0
Total	**$15,000**	**$0**
MC-approved budget		**$15,000**

[1] *Estimated carryover of unexpended, approved funds as of January 1.*

2022 ANNUAL IMPLEMENTATION PLAN SUMMARY– APPENDIX M

Clark Fork Project, FERC No. 2058
Cabinet Gorge and Noxon Rapids Hydroelectric Developments

Title
Wetland Protection and Enhancement Program

Implementation Staff Lead
Arthur D. Potts, Avista, (406) 847-1283, arthur.potts@avistacorp.com

Project History
This is a continuation of work previously approved by the Management Committee (MC).

Background
The purpose of this measure is to provide for the protection of wetlands occurring on Avista owned project lands, and for the evaluation and potential enhancement of selected wetland areas. The overall goal is to ensure no net loss of wetlands, or of wetland function and values in certain high-priority wetland areas while also evaluating opportunities for enhancements.

2022 Project Plans
- Continue to explore potential wetland enhancement for the 2016 Twin Creek acquisition.
- Monitor enhancements previously completed at Hereford Slough, McKay Creek, Finley Flats, and Blacktail Bay/Islands.

Work Products
- All work associated with this Project Plan will be documented in the 2022 Annual Work Summary. Due Date: December 1, 2022.
- If it appears either project is feasible, a specific proposal will be developed for MC review.

Cultural/Historic Resource Review
No ground or vegetation disturbance is planned for 2022, therefore no cultural resource surveys will be required.

Benefit to the Resource
Benefits are preserving or enhancing of certain high value wetland habitat, including their function and values.

2022 Appendix M Budget

Budget Summary	
Unexpended funds with interest	$136,430
2022 contribution (including GDP inflation rate)	$0
Total available	**$136,430**
2022 MC-approved budget	$12,000
Unobligated funds	**$124,430**

2022 Project	Carryover[1]	2022 Budget
Continue to develop Twin Creek wetland enhancement plan	$10,000	$0
Monitoring previously completed enhancement projects	$0	$2,000
Total	**$10,000**	**$2,000**
MC-approved budget		**$12,000**

[1] *Estimated carryover of unexpended, approved funds as of January 1.*

2022 ANNUAL IMPLEMENTATION PLAN SUMMARY– APPENDIX P

Clark Fork Project, FERC No. 2058
Cabinet Gorge and Noxon Rapids Hydroelectric Developments

Title
Forest Habitat Protection and Enhancement

Implementation Staff Lead
Arthur D. Potts, Avista, (406) 847-1283, arthur.potts@avistacorp.com

Project History
This is a continuation of work previously approved by the Management Committee.

Background
The purpose of this measure is to provide for the protection and enhancement of specific forest habitat parcels of Avista project land along the reservoirs. The Wildlife, Botanical, and Wetland Work Group identified these parcels as having significant wildlife habitat value.

2022 Project Plans
1. Continue to manage those areas that have been classified as Conservation 1, and as such are afforded the maximum protection provided through the Land Use Management Plan.
2. Honey Flats is being managed to minimize impacts to the site (e.g., no motorized vehicles, no timber harvest, and minimize human use of site). The Confederated Salish and Kootenai Tribe and CRMG have expressed an interest in having this site managed for traditional plants and uses. Continue to work with the Confederated Salish and Kootenai Tribe to define management options.
3. Continue to monitor and enforce the road closure to Stevens Creek Point (closure was instituted in 2001).
4. Continue to prohibit motorized use of Finley Flats Point.
5. Continue to utilize the Montana Fish Wildlife and Parks Block Management Program to provide hunter access to the Tuscor, South Fork Bull River, and Wood Duck properties.
6. Continue weekly patrols of the forested lands surrounding the State Shop property and continue to reduce the amount of disturbance and litter in this area.
7. Initiate timber stand improvement efforts in stands that have disease (beetle kill, root rot, mistletoe, etc.), high fire danger or other problems. This work will be evaluated on a case by case basis and specific proposals will be presented to the TRTAC and MC as they are developed.

Work Products
- All work associated with this Project Plan will be documented in the 2022 Annual Work Summary. Due Date: December 1, 2022.

Cultural/Historic Resource Review
If a specific proposal is developed in 2022, it will be evaluated by CRMG to determine cultural resource survey needs.

Benefit to the Resource
Benefits include the protection, and where appropriate, enhancement of timber stands on specific Avista owned project lands.

2022 Appendix P Budget

Budget Summary	
Unexpended Timber Revenue [1]	$226,818
Total available	**$226,818**
2022 MC-approved budget	$5,000
Unobligated funds	**$221,818**

[1] Costs associated with implementing Appendix P projects are generally funded by timber sale revenue. Pursuant to the CFSA, some costs are covered through administration of the Land Use Management Plan (Appendix G).

2022 Project	Carryover[1]	2022 Budget
Timber stand improvement project initiation	$0	$5,000
Total	**$0**	**$5,000**
MC-approved budget		**$5,000**

[1] Estimated carryover of unexpended, approved funds as of January 1.

2022 ANNUAL IMPLEMENTATION PLAN SUMMARY– APPENDIX Q

Clark Fork Project, FERC No. 2058
Cabinet Gorge and Noxon Rapids Hydroelectric Developments

Title
Reservoir Island Protection

Implementation Staff Lead
Arthur D. Potts, Avista, (406) 847-1283, arthur.potts@avistacorp.com

Project History
This is a continuation of work previously approved by the Management Committee.

Background
The purpose of this measure is to provide for the protection of islands owned by Avista in the project reservoirs. The goal is to maintain the unique and high-quality wildlife habitat functions and values of these islands.

2022 Project Plans
- Continue to ensure restrictions developed for the protection of these areas utilizing the land use classifications described in the Land Use Management Plan.

Work Products
- All work associated with this Project Plan will be documented in the 2022 Annual Work Summary. Due Date: December 1, 2022.

Cultural/Historic Resource Review
No cultural resource surveys will be needed for this Protection, Mitigation, and Enhancement measure.

Benefit to the Resource
Protect and maintain the unique and high-quality wildlife habitat functions and values of these islands.

2022 Appendix Q Budget

Budget Summary	
Unexpended funds	$0
2022 contribution	$0
Total available[1]	**$0**
2022 MC-approved budget	$0
Unobligated funds	**$0**

[1] *Pursuant to the CFSA, costs associated with reservoir island protection are covered through administration of the Land Use Management Plan (Appendix G).*

2022 ANNUAL IMPLEMENTATION PLAN SUMMARY – APPENDIX R

Clark Fork Project, FERC No. 2058
Cabinet Gorge and Noxon Rapids Hydroelectric Developments

Title
Clark Fork Heritage Resource Program

Implementation Staff Lead
Lisa Vollertsen, Avista, (406) 847-1288, lisa.vollertsen@avistacorp.com

Background
The Clark Fork Heritage Resource Program was an interim program developed in collaboration with the Cultural Resources Management Group (CRMG) during the Clark Fork relicensing process. The program emphasized specific cooperative stewardship strategies for the management of cultural and historic resources, to be implemented by the CRMG following the development of the Clark Fork Heritage Resource Management Plan (HRMP). In 2000, the CRMG developed the HRMP in accordance with the Clark Fork Heritage Resource Program, Clark Fork Settlement Agreement (CFSA), and Programmatic Agreement, to guide the management and mitigation of effects to historic and/or cultural resources associated with the Clark Fork Project. The HRMP was developed to ensure coordination of the protection, mitigation, and enhancement (PM&E) measures associated with the Clark Fork Project with representatives from Coeur d'Alene, Kootenai, Confederated Salish and Kootenai, and Kalispel Tribes, Idaho and Montana State Historic Preservation offices, U.S. Forest Service, and Avista, which collectively make up the CRMG.

2022 Project Plans
1. Clark Fork Heritage Resource Program

Work Products
- Annual Work Summary*; due December 1, 2022
  **Due to potential confidentiality issues associated with cultural resources, some or all of the information collected may not be available to the Management Committee and/or the general public.*

2022 Appendix R Budget

Budget Summary	
Unexpended funds with interest	$0
2022 contribution (estimate)[1]	$73,000
Total available	**$73,000**
2022 MC-approved budget	$73,000
Unobligated funds	**$0**

[1] Estimated costs are projections made now; however, Avista will pay the actual costs as approved by the Management Committee.

2022 Project	Carryover[1]	2022 Budget
Clark Fork Heritage Resource Program	$25,000	$73,000
Total	**$25,000**	**$48,000**
MC-approved budget		**$73,000**

[1] Estimated carryover of unexpended, approved funds as of January 1.

As approved by the Management Committee on 3/15/2022

2022 PROJECT PLAN

Clark Fork Heritage Resource Program

Project Contact
Lisa Vollertsen, Avista, (406) 847-1288, lisa.vollertsen@avistacorp.com

Project History
This is a continuing project. In 2000, the Cultural Resources Management Group (CRMG) developed the Clark Fork Heritage Resource Management Plan (HRMP) in accordance with the Clark Fork Heritage Resource Program, Clark Fork Settlement Agreement (CFSA), and Programmatic Agreement, to guide the management and mitigation of effects to historic and/or cultural resources associated with the Clark Fork Project. The scope and budget for this project are reviewed by the Management Committee annually.

Background
The Clark Fork Heritage Resource Program was an interim program developed in collaboration with the CRMG during the Clark Fork relicensing process. The program emphasized specific cooperative stewardship strategies for the management of cultural and historic resources, to be implemented by the CRMG following the development of a Programmatic Agreement and the HRMP. The HRMP was developed to ensure coordination of the protection, mitigation, and enhancement (PM&E) measures associated with the Clark Fork Project with representatives from Coeur d'Alene, Kootenai, Confederated Salish and Kootenai, and Kalispel Tribes, Idaho and Montana State Historic Preservation offices, U.S. Forest Service, and Avista, which collectively make up the CRMG.

Goal
The goal of this program is to provide cooperative, long-term, and flexible management of eligible historic and prehistoric resources on Avista project lands.

Objectives
1. Protect and preserve culturally and historically sensitive areas within the Avista Clark Fork project area.

2. Increase public awareness of the historic evolution to provide future generations the opportunities to better understand and respect the past.

3. Meet legal regulatory obligations and responsibilities of the Programmatic Agreement and CFSA.

Tasks
1. Schedule and host CRMG meeting(s). Review project plans for aquatic and terrestrial resources that have the potential to impact historic or cultural resources to determine if additional survey or documentation is necessary prior to the initiation of the project. (Objectives 1 and 3)

2. Continue annual monitoring of culturally-sensitive sites as determined by the CRMG. (Objectives 1 and 3)

3. Continue implementation of the Cultural Interpretation and Education Plan (i.e., camas interpretive display at Cabinet Gorge). (Objectives 2 and 3)

4. Continue working on the Honey Flats Botanical Assessment. (Objectives 1 and 2)

5. Conduct site-specific surveys and/or monitoring for projects, as needed (i.e., projects with proposed ground-disturbing activities, land transactions, and land use requests). Review, assess, and mitigate potential impacts of maintenance and upgrade of Avista's Clark Fork Project historic properties. (Objectives 1 and 3)

Work Products

- Annual Work Summary*; due December 1, 2022
  **Due to potential confidentiality issues associated with cultural resources, some or all of the information collected may not be available to the Management Committee and/or the general public.*

Permitting Requirements

Not applicable for the tasks proposed in this project plan.

Cultural/Historic Resource Review

Not applicable for the tasks proposed in this project plan, there are no ground disturbing activities or proposed impacts to cultural/historic resources.

Benefit to the Resource

The CRMG was developed as a result of CFSA Appendix R Clark Fork Heritage Resource Program, and corresponds to the FERC License Article 427 for the Clark Fork Project No. 2058 and Programmatic Agreement. Implementation of the Clark Fork Heritage Resource Program, HRMP, and Programmatic Agreement satisfies Section 106 of the National Historic Preservation Act for the Cabinet Gorge and Noxon Rapids projects.

Budget

Item	Estimated Carryover[1]	2022 Budget Request
Meeting(s)	$0	$15,000
Annual Site Monitoring	$0	$30,000
Cultural Interpretation and Education Plan	$12,500	$0
Honey Flats Botanical Assessment	$12,500	$0
Avista Cultural Resource Specialist conference(s) and professional development training(s)	$0	$3,000
Total	$25,000	$48,000
Anticipated Expenditures		$73,000

[1] *Estimated carryover of unexpended, approved funds as of January 1.*

Site-specific surveys and/or monitoring for projects are funded through individual project plans.

2022 ANNUAL IMPLEMENTATION PLAN SUMMARY– APPENDIX S

Clark Fork Project, FERC No. 2058
Cabinet Gorge and Noxon Rapids Hydroelectric Developments

Title
Erosion Fund and Shoreline Stabilization Guidelines Program

Implementation Staff Lead
Arthur D. Potts, Avista, (406) 847-1283, arthur.potts@avistacorp.com

Project History
This is a continuation of work previously approved by the Management Committee.

Background
The purpose of this measure is to provide funds to ameliorate adverse impacts to resources of interest caused by the continued operation of the Clark Fork Projects. Resources of interest include important cultural or natural resources, and private or public property not covered by applicable easement. The PM&E measure also calls for the distribution of the Erosion Control Guidelines Manual, developed in 2000, to interested individuals.

A geotechnical firm will be retained for review of proposals Avista receives from adjacent landowners for erosion control projects.

2022 Project Plans
- Address erosion concerns identified by the Cultural Resources Management Group (CRMG).
- Continue to evaluate and provide technical assistance for an erosion control project being undertaken by an adjacent landowner on Noxon Reservoir (Vermilion Point Area). This is a continuation of a 2017 project. The ability to complete this project will depend upon the adjacent landowner's availability.
- Utilize a geotechnical contractor to assist with evaluating erosion control proposals received by Avista.

Work Products
- Due to the confidential nature of cultural sites, CRMG directed work will not be reported on as part of the public reporting process.
- Work with the adjacent landowner on Noxon Reservoir to complete the project, although completion of this project will be based on the landowner's availability to do the work. November 1, 2022.
- All work associated with this Project Plan will be documented in the 2022 Annual Work Summary. Due Date: December 1, 2022.

Cultural/Historic Resource Review
Work proposed under this fund will be addressed by the CRMG for each project as they are identified.

Benefit to the Resource

Benefits are provided by addressing impacts to resources of interest caused by erosion attributed to the continued operation of the Clark Fork Project. Resources of interest include important cultural or natural resources, and private or public property not covered by applicable easement.

2022 Appendix S Budget

Budget Summary	
Unexpended funds with interest[1]	$200,000
2022 contribution (including GDP inflation rate)	$0
Total available	**$200,000**
2022 MC-approved budget	$58,000
Unobligated funds	**$142,000**

[1] *Annual contributions of $40,000 plus GDP inflation are contributed to this fund until reaching the $200,000 cap.*

2022 Project	Carryover[1]	2022 Budget
Address erosion concerns identified by CRMG	$0	$50,000
Geotechnical support and working with adjacent landowner on Noxon Reservoir	$0	$8,000
Total	**$0**	**$58,000**
MC-approved budget		**$58,000**

[1] *Estimated carryover of unexpended, approved funds as of January 1.*

2022 ANNUAL IMPLEMENTATION PLAN SUMMARY – APPENDIX T

Clark Fork Project, FERC No. 2058
Cabinet Gorge and Noxon Rapids Hydroelectric Developments

Title
Project Operations Package

Implementation Staff Lead
Eric Oldenburg, Avista, (406) 847-1290, eric.oldenburg@avistacorp.com

Background
The Project Operations Package outlines the General Operating Limits (minimum flow below the Cabinet Gorge Dam and water level fluctuation limits in both project reservoirs) that were agreed to in the Clark Fork Settlement Agreement (CFSA). Within these limits, Avista utilizes peaking operations at Noxon Rapids and Cabinet Gorge dams. Mitigation for any negative effects of peaking operations within the General Operating Limits is carried out within other Protection, Mitigation, and Enhancement (PM&E) programs (e.g., the Montana and Idaho tributary enhancement programs, the Bull Trout Protection and Public Education Project, and the Watershed Council Program). Therefore, historically, the Project Operations Package has only encompassed maintenance of the General Operating Limits and the requirement to coordinate project operations with the operators of the Albeni Falls Project.

Prior to the CFSA, the minimum discharge requirement through Cabinet Gorge Dam was 3,000 cubic feet per second (cfs). Through the CFSA, this minimum discharge requirement was increased to 5,000 cfs. However, the CFSA also defined a 10-year period of study to evaluate any effects of the change in minimum flow. This evaluation was completed in 2011 and concluded that the increased minimum discharge requirement provided no measurable benefit to fish populations in the lower Clark Fork River when compared to the previous minimum flow of 3,000 cfs (Ryan and Jakubowski 2012). Thus in 2017, as part of the first amendment to the CFSA, the Management Committee (MC) agreed to reinstate the 3,000 cfs minimum flow requirement for Cabinet Gorge Dam from November 1 through September 14 and the minimum flow will remain at 5,000 cfs from September 15 to October 31. An order issued by FERC on December 18, 2017 approved the new minimum flows which are now effective. Along with this agreement, Avista made an additional funding commitment to address any remaining uncertainty over any question of potential effects of the reduced minimum flow. The funding commitment was a one-time addition of $1,000,000 (not subject to escalation) to the CFSA Appendix T fund, which Avista holds in trust. Use of these dollars is restricted to capital projects and may not be used for operations or maintenance of existing or new sites or facilities. Further, any use of these funds shall be approved by the MC pursuant to the Annual Implementation Plan process.

2022 Project Plans
1. Project Operations and Coordination
2. Cabinet Gorge Fish Hatchery Spring Water Collection System Upgrade
3. Clark Fork River (Derr Island) Boating Access Site Improvement

Work Products

Project Operations and Coordination

- Annual Work Summary; due December 1, 2022

Cabinet Gorge Fish Hatchery Spring Water Collection System Upgrade

- Technical memoranda describing project progress at appropriate intervals
- Annual Work Summary; due December 1, 2022

Clark Fork River (Derr Island) Boating Access Site Improvement

- Annual Work Summary; due December 1, 2022

2022 Appendix T Budget

Budget Summary	
Unexpended funds[1]	$578,957
2022 contribution	$0
Total available	**$578,957**
2022 MC-approved budget	$130,558
Unobligated funds	**$448,399**

[1] A one-time $1 million allocation made available beginning in 2018 and not subject to interest.

2022 Project	**Carryover[1]**	**2022 Budget**
Project Operations and Coordination	$0	$0
Cabinet Gorge Fish Hatchery Spring Water Collection System Upgrade	$44,000	$70,000
Clark Fork River (Derr Island) Boating Access Site Improvement	$16,558	$0
Total	**$60,558**	**$70,000**
MC-approved budget		**$130,558**

[1] Estimated carryover of unexpended, approved funds as of January 1.

2022 PROJECT PLAN

Project Operations and Coordination

Project Contact
Eric Oldenburg, Avista, (406) 847-1290, eric.oldenburg@avistacorp.com

Project History
This is a continuing project that has been implemented since the Clark Fork Settlement Agreement (CFSA) became effective; however, this is the fifth year Project Operations and Coordination have been outlined in a Project Plan.

Background
Prior to 2018, project operations and coordination were the only activities conducted under Appendix T. In light of this, and because all associated costs are borne by Avista, these activities were simply described in the Annual Implementation Plan Summary. Now that additional funding has been added and additional projects proposed within Appendix T, the project operations and coordination information has been removed from the Summary and transferred to this Project Plan.

The General Operating Limits for Noxon Rapids (Table 1) and Cabinet Gorge (Table 2) dams were defined in the CFSA and Amendment No. 1 to the CFSA. Any deviations from the General Operating Limits will be conducted in accordance with the Appendix F4 Water Quality Protection and Monitoring Plan. Note the General Operating Limit for Cabinet Gorge Dam minimum discharge was changed from 5,000 cubic feet per second (cfs) to 3,000 cfs in accordance with Amendment No. 1 to the CFSA; however, minimum discharge remains at 5,000 cfs during the "Bull Trout window" from September 15 through October 31.

TABLE 1. Noxon Rapids Dam General Operating Limits

Operation	General Operating Limit
Maximum forebay elevation (feet)	2,331.0
Minimum forebay elevation (feet)	2,327.0 (May 15–Sept. 30)
	2,321.0 (Oct. 1–May 14)
Maximum forebay draft rate	2 feet per day (net)
	5 feet per week (net)

TABLE 2. Cabinet Gorge Dam General Operating Limits

Operation	General Operating Limit
Maximum forebay elevation (feet)	2,175.0
Minimum forebay elevation (feet)	2,168.0
Minimum discharge (cfs)	3,000 (Nov. 1–Sept. 14)
	5,000 (Sept. 15–Oct. 31)

Goal
Ensure appropriate operations at Noxon Rapids and Cabinet Gorge dams in the interest of protecting the natural resources and access to those resources.

Objective

1. Ensure appropriate project operations and coordination at Noxon Rapids and Cabinet Gorge dams.

Tasks

1. Maintain operating procedures for Cabinet Gorge Dam that will ensure compliance with the minimum flow (i.e., discharge) General Operating Limit. Ensure that the specified minimum flow was maintained, either through discharge or operational data available at the dam and/or utilizing the USGS Clark Fork River below Cabinet Gorge Dam gaging station data (located approximately ¼ mile downstream of dam). In the event that these operating procedures are interrupted, implement the Water Quality Protection and Monitoring Plan as identified in CFSA Appendix F4.

2. Maintain operating procedures for the Cabinet Gorge and Noxon Rapids dam that will ensure that the reservoir (i.e., forebay) water level fluctuation limitations, as outlined in the General Operating Limits tables above, are maintained. Maintain appropriate documentation of forebay water levels utilizing data available at the dam/powerhouse control room. In the event that these operating procedures are interrupted, implement the Water Quality Protection and Monitoring Plan as identified in CFSA Appendix F4.

3. Continue to provide daily discharge forecasts for Cabinet Gorge to the Albeni Falls (USACE) Project, per a January 7, 1999 Letter of Agreement.

Work Products

- Annual Work Summary; due December 1, 2022

Permitting Requirements

Not applicable for the tasks proposed in this project plan.

Endangered Species Act consultation for this project plan is associated with the 2019 Biological Opinion on the effects of continued operation of the Clark Fork Hydroelectric Project on Bull Trout and designated Bull Trout critical habitat. Incidental take reporting for this project plan will be included in the annual Biological Opinion report as required by Term and Conditions 15–18 of the 2019 Incidental Take Statement.

Cultural/Historic Resource Review

Not applicable for the tasks proposed in this project plan, there are no ground and/or vegetation disturbing activities, or proposed impacts to cultural/historic resources.

Benefit to the Resource

The General Operating Limits and coordination protocols are requirements of the CFSA. The General Operating Limits are designed to minimize negative effects of project operations on fisheries and other natural resources as well as recreational interests.

Budget

- All costs associated with this Project Plan are borne by Avista and are not part of any PM&E funds.
- The cost of maintenance of all General Operating Limits and accurate FERC reporting are borne by Avista as part of general project administration and operation costs and are not part of any PM&E funds.
- The costs of developing coordination protocols and providing the daily discharge forecasts for Cabinet Gorge Dam will be borne by Avista as part of general project administration and operation costs and are not part of any PM&E funds.

2022 PROJECT PLAN

Cabinet Gorge Fish Hatchery Spring Water Collection System Upgrade

Project Contact

Shana Bernall, Avista, (406) 847-1293, Shana.Bernall@avistacorp.com *and*
Ken Bouwens, Idaho Department of Fish and Game (IDFG), (208) 769-1414,
ken.bouwens@idfg.idaho.gov

Project History

This is a carryover project that was originally approved in 2018. Additional funding is being requested for 2022, and the funding approved in 2021 is being reallocated.

Background

The Cabinet Gorge Fish Hatchery (hatchery) is in Idaho, approximately one mile downstream of Cabinet Gorge Dam, and is operated by IDFG. The hatchery utilizes wells and a spring collection system to supply water for hatchery fish production. The spring collection system is also utilized by Avista to operate a fish ladder trap near the hatchery from August through mid-October for the purpose of capturing Bull Trout. The spring water is also used for holding adult Bull Trout and Westslope Cutthroat Trout at the Cabinet Gorge Fish Handling Facility (CGFHF) prior to upstream transport which occurs from late-March through mid-October (Bernall and Duffy 2019) and for acclimating transported Montana subadult Bull Trout to Clark Fork River temperatures prior to release (March through November).

The water supply from the spring collection system has been sufficient for all activities when minimum flows in the Clark Fork River downstream of Cabinet Gorge Dam are 5,000 cubic feet per second (cfs) and it is not a drought year. In the fall of 2017, the Management Committee (MC) approved the Clark Fork Settlement Agreement amendment modifying the minimum flows below Cabinet Gorge Dam to 3,000 cfs, except for a minimum flow requirement of 5,000 cfs between September 15 and October 31. This change in minimum flow can affect the water level in the spring collection system, especially in years of drought; therefore, reducing the amount of spring water available when the hatchery, the CGFHF and fish ladder trap are being operated at the same time (August through October time-frame).

The spring water supply to these facilities is monitored closely during low flow conditions to better define what, if any, scenarios lead to issues with the current water supply system. To date, there have been a few instances where spring water supply to the facilities has been limited resulting in a suboptimal amount of water being available to operate the fish ladder trap. One occurrence took place in 2015. Clark Fork River incoming flows were lower than 5,000 cfs and the amount of spring water available to meet the needs of all three facilities was insufficient. Another occurrence took place in 2019. From mid-August through mid-September flows in the lower Clark Fork River were near the minimum flow requirement of 3,000 cfs for a 12-hour period during construction of the Cabinet Gorge Dam Fishway cofferdam. During this time the amount of spring water available in the collection basin was limited, and to compensate for the lack of available water the flow used to operate the fish ladder trap was decreased to 25% of normal. This low flow was not effective at attracting Bull Trout into the ladder trap. No Bull

Trout were captured in the ladder trap until flows were increased to normal operation in mid-September.

In 2021 the water temperatures in the hatchery wells (separate from the spring collection basin) that supply water to the hatchery reached a record high that required more spring water from the collection basin to be used than in past years. This limited the amount of spring water available for use in the ladder trap until late September. The ladder trap was supplemented with water from the settling pond during this time although water temperature in the settling pond was much higher than the spring water temperature (on average 5.8°C warmer than the spring water), although it was still much colder than ambient river temperature. There have been other instances when one of the hatchery spring water pumps have failed resulting in a limited supply of spring water. In addition, adjusting a valve at any location in the system affects the water flow to the other facilities requiring close communication and coordination between the user groups.

These observations have highlighted the need to improve the existing spring collection basin and develop a solution to increase the reliability of spring water that is available for use at the hatchery, CGFHF, and fish ladder trap. An investigation was led in 2002 to evaluate options for making additional water available at the hatchery. This evaluation provided recommendations to increase spring water available at the site (Land & Water Consulting, Inc, 2002). The first recommendation was to rehabilitate the collection gallery and spring box by installing a drain curtain or deepening the collection gallery to intercept a thicker saturated portion of the water table aquifer.

Avista and IDFG selected an engineer (RivHab) in early 2020 to assist with the project. To get a better understanding of the substrate at the project site, a test pit was dug to the west of the current spring collection system in a location where spring water had been observed exiting the bank in recent years. Pump drawdown tests at the site produced consistent flow ranging up to 100 gpm during 3,000 cfs minimum flows in September. The project team had considered developing this test pit as a water supply for the CGFHF, but the cost of construction of the project came in higher than budget. A soil boring investigation conducted at the site in the summer of 2021 provided additional information on bedrock and water elevations in the project area that will assist with future design and construction.

The project team has decided to completely redo the current spring collection system that supplies water to the hatchery, CGFHF, and fish ladder trap with a focus on replacing the spring collection basin. The project team plans to send out a proposal for a design/build for the project, so some of the risk related to the design will be on the contractor selected. The plan is to select a contractor and work with the contractor on the design, permitting and planning in 2022 with construction slated for July/August 2023. The construction window for this project is likely a few months; therefore, IDFG is developing a plan to move fish off site, so construction can occur in the summer of 2023. IDFG and Avista will be working with the engineer to develop design drawings for the project and to come up with a project timeline.

There is still potential for a water shortage in the fall of 2022, if drought conditions occur, so IDFG and Avista will continue to work together to come up with a plan for water use over the short-term, until the larger spring system upgrade can take place. This project plan describes the

funding needed to work with a contractor on the design, permitting, and planning in 2022 and ultimately construction of the project in 2023.

Goal
Maintain a reliable and redundant source of spring water for use at the hatchery, CGFHF and fish ladder.

Objective
1. Reconstruct the hatchery spring water collection system to maintain reliable spring water available for use at the hatchery, CGFHF, and fish ladder trap.

Tasks
1. Continue to monitor hatchery spring water availability and operation of pumps that supply spring water during low flows.

2. Select a contractor through a design/build process to develop drawings and assist with permitting and planning and ultimately reconstruct the spring water collection system.

3. Make sure contractor has a plan in place to maintain a spring water supply to the CGFHF during construction.

4. As part of the design/build contract have the contractor develop a backup water supply for the CGFHF.

5. Procure permits and approvals needed for reconstruction of the hatchery spring water collection system.

Work Products
- Technical memoranda describing project progress at appropriate intervals
- Annual Work Summary; due December 1, 2022

Permitting Requirements
In 2020, the Cultural Resources Management Group reviewed the plan for excavation of test pits and proposed upgrades. Avista cultural staff will coordinate a cultural/historic resource review for the new design. The work product for this review will be confidential due to the sensitive nature of the content. The engineer hired for this project will assist Avista and IDFG personnel in obtaining the required permits.

Endangered Species Act consultation for this project plan is associated with the 2019 Biological Opinion on the effects of continued operation of the Clark Fork Hydroelectric Project on Bull Trout and designated Bull Trout critical habitat (BiOp). This project plan is consistent with the analyses and conclusions contained in the 2019 BiOp and will adhere to all appropriate Terms and Conditions designed to reduce the extent and effects of incidental take on Bull Trout. No incidental take of Bull Trout is anticipated as a result of this project plan; therefore, no take reporting is required.

Cultural/Historic Resource Review

In 2020, the Cultural Resources Management Group reviewed the test pits and upgrades. Avista cultural staff will coordinate a cultural/historic resource review for the new design. The work product for this review will be confidential due to the sensitive nature of the content.

Benefit to the Resource

Kokanee are reared at the hatchery for stocking in Lake Pend Oreille to assist in restoration of the species, which is important as a prey species for Bull Trout. These efforts are part of the IDFG management plan and continuing to optimize the water supply to the hatchery is essential for continuation of this program (IDFG 2019). The spring collection system is also being utilized at the fish ladder trap to capture Bull Trout and at the CGFHF to provide cold water for Bull Trout and Westslope Cutthroat Trout that are held prior to upstream transport. The Native Salmonid Restoration Plan (NSRP) is part of the Clark Fork Settlement Agreement (CFSA) and identifies a need to "establish and maintain connectivity in the Clark Fork Basin for migratory trout" (Avista 1999, Kleinschmidt and Pratt 1998). Montana Fish, Wildlife and Parks (MFWP) and IDFG also support reconnecting native salmonid populations in the lower Clark Fork River through fish passage as detailed in their current state-wide management plans (MFWP 2019, IDFG 2019). The U.S. Fish and Wildlife Service describes fragmentation as a threat to Bull Trout recovery, further emphasizing the importance of improving Bull Trout capture and holding conditions in the project area (U.S. Fish and Wildlife Service 2015). This project plan lays out a plan to improve the amount of spring water available to the CGFHF and ladder trap, which will ultimately improve conditions for capture and holding of Bull Trout prior to upstream transport. The funds set aside in Appendix T are to address any remaining uncertainty over effects of the change of minimum flow to 3,000 cfs. This project will directly address one of these potential effects.

Budget

Item	Estimated Carryover[1]	2022 Budget Request
Design/Build Contract	$0	$50,000*
Engineering support	$5,000	$20,000
Project coordination, planning, permitting and cultural/historic review	$39,000	$0
Total	$44,000	$70,000
Anticipated Expenditures		$114,000

[1] *Estimated carryover of unexpended, approved funds as of January 1.*

[*] *If a contractor is selected prior to the spring MC meeting additional funds may be added for the design/build contract. Otherwise funds will be approved through the consent mail process.*

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2022 PROJECT PLAN

Clark Fork River (Derr Island) Boating Access Site Improvement

Project Contact

Andy Dux, Idaho Department of Fish and Game (IDFG), (208) 769-1414,
andy.dux@idfg.idaho.gov *and*
Nathan Demmons, Bonner County Parks and Waterways (BCPW), (208) 255-5681 Ext. 4,
nathan.demmons@bonnercountyid.gov

Project History

This is a continuing project that was originally approved in 2021. A first phase of improvements at this site were completed in 2020 using IDFG funding sources. The requested funding would allow remaining upgrades to be completed.

Background

The Clark Fork River has increased in popularity with anglers in recent years in response to better fishing. Increased angler interest has created a need for improved boating access to the river, which has been somewhat limited. Prior to 2020, the only developed access sites on the river were located at Johnson Creek and the Clark Fork Driftyard. Both of these sites provide good access when the lake is at summer pool, but are difficult to use during winter pool conditions.

Anglers have increasingly used an unimproved boat launch off of the Johnson Creek Road at the Derr Island bridge to access lower reaches of the river during winter pool conditions. The site is located on Bonner County (County) property and parking has occurred along the Johnson Creek Road. During times of high use, this results in congestion along the roadway and at times has blocked access to the adjacent private hayfield. Boat launching has been done by driving onto a gravel bar that is accessible from the Johnson Creek Road. Further complicating use at this site is a gravel bar located between the launch site and the mainstem Clark Fork River. At low river flows, boaters cannot navigate across the gravel bar. The site is not a managed access site and with higher amounts of use the potential for issues is higher.

In an effort to improve access to the river and address the unmanaged use of the Derr Island site, Idaho Department of Fish and Game (IDFG) and the County cooperated on a first phase of access improvements that were completed in 2020. During construction activities associated with the Clark Fork Delta Restoration Project, IDFG was able to coordinate with contractors to build a gravel access road and boat launch from the Johnson Creek Road to the river channel. This facilitates boat launching at all water levels. The work was done without added cost since a temporary haul road needed to be built in this location for the restoration work to occur. Idaho Department of Fish and Game did provide $5,000 from the statewide Fishing and Boating Access Program to dredge a channel that allows boats to pass from the boat launch into the mainstem Clark Fork River at low river flows. Overall, the work completed in 2020 allowed for much easier boating access and numerous positive comments were received from anglers.

Idaho Department of Fish and Game and the County are proposing additional improvements in 2021 that would allow the site to be managed as a formal access site. These improvements would include widening 350 feet of the Johnson Creek Road to allow for safer parking of boats and trailers, installing signage (i.e., rules of use, define parking area boundaries) and seasonally having a portable toilet on site. As part of this, IDFG and the County are in the process of developing an agreement that defines the roles of each agency as they relate to operation and maintenance of the site. Although not yet formally defined, we anticipate that IDFG will provide routine maintenance at the site as part of the Fishing and Boating Access Program. The County will likely handle any road and parking area maintenance needs. Both agencies are planning to cost-share the annual portable toilet expenses and the cost of installing necessary signage. We are requesting funding to complete the road widening work, which would be contracted out to a construction company.

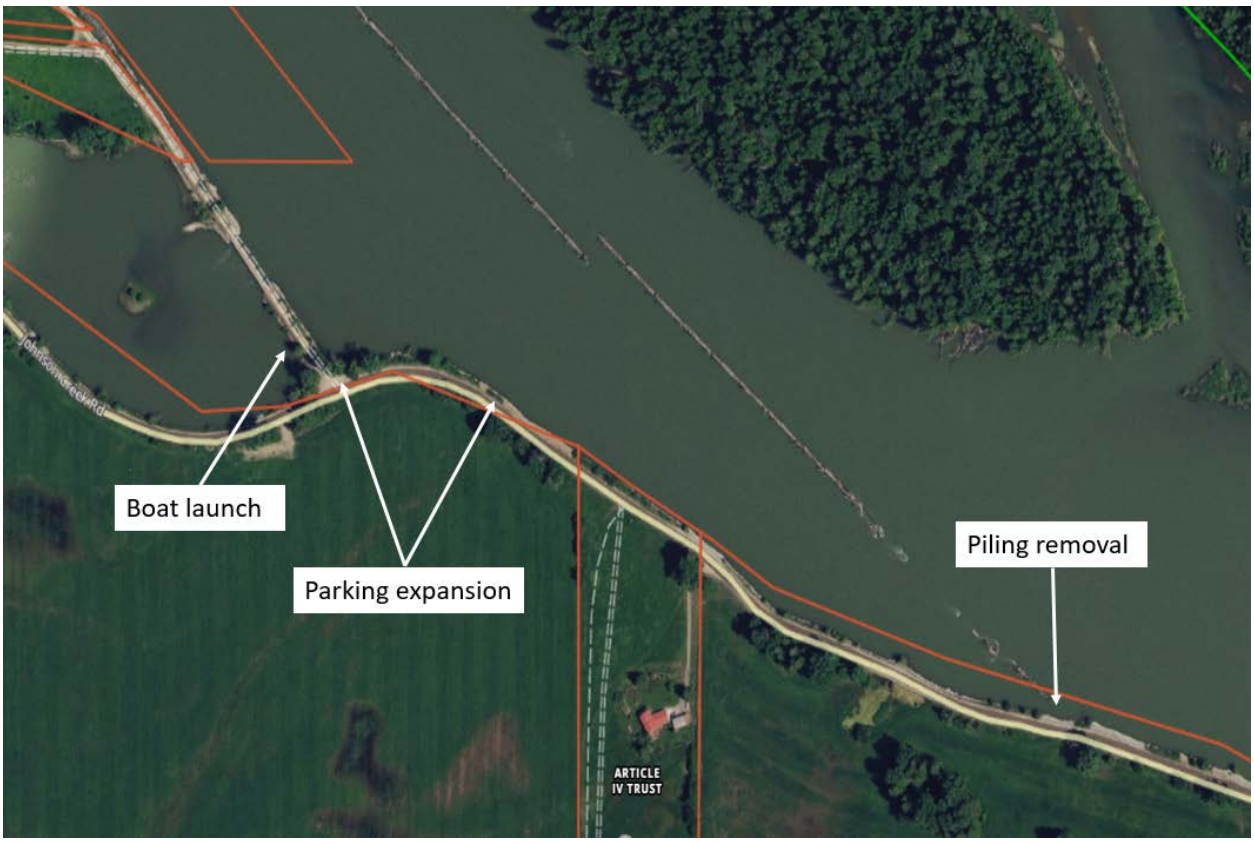

FIGURE 1. Map of the Clark Fork River – Derr Island access site and Clark Fork log boom.

FIGURE 2. Photo of Derr Island bridge and improved access road and boat launch entering from Johnson Creek Road. These upgrades were completed in 2020.

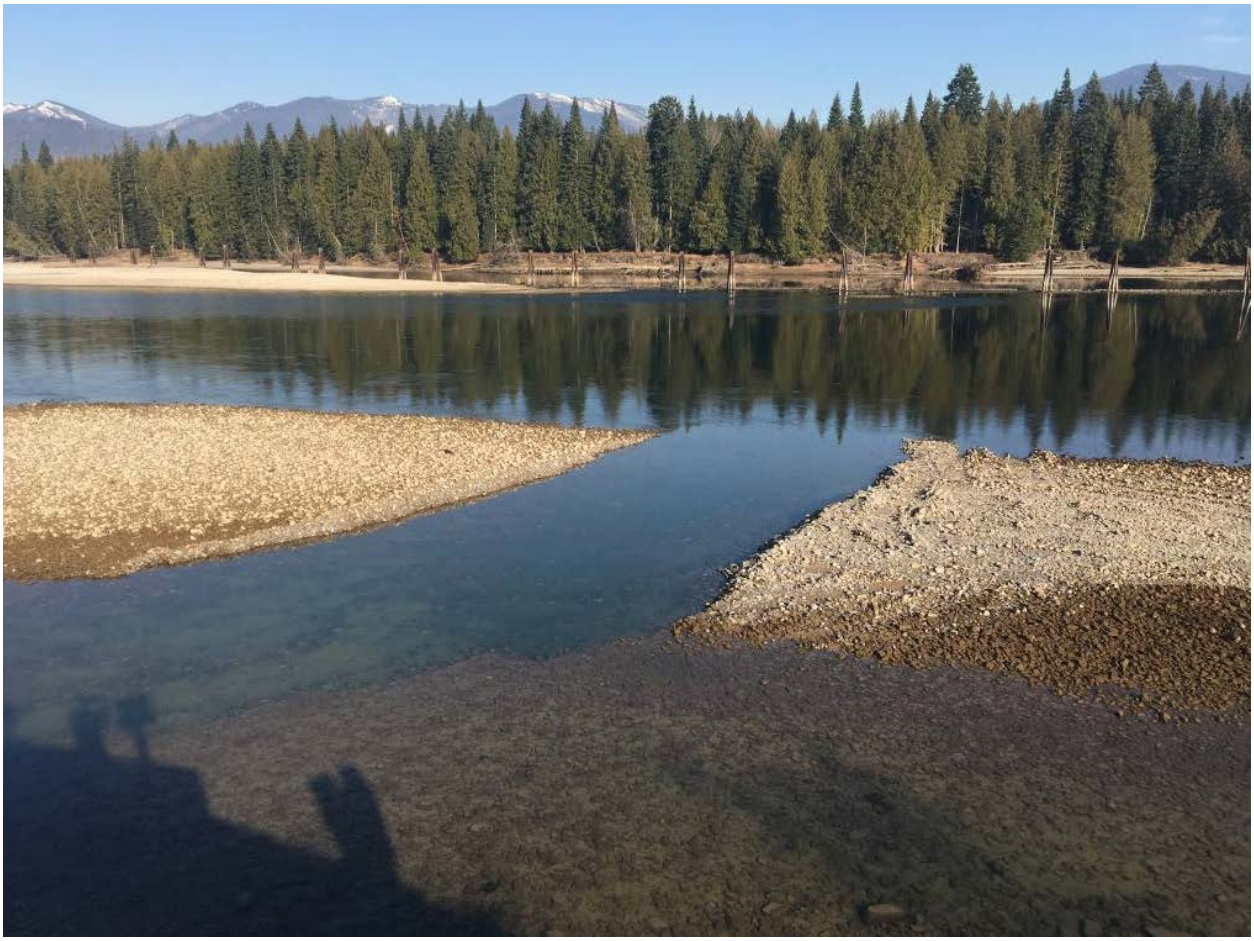

FIGURE 3. Dredged channel that provides low-water access for boats entering the Clark Fork River from the Derr Island access site.

In 2020, Avista opened a boating access site located about two miles downstream of Cabinet Gorge Dam. This site historically provided boating access, but was closed for many years. Re-opening of this site will improve access to the upper reaches of the Clark Fork River and provide a launch site for floating boats that currently does not exist. In order for float boaters to take advantage of this new access site, there is a need for a suitable downstream take-out. Development of the Derr Island access site will provide this; however, it requires boaters to negotiate the log boom that stretches across the channel just upstream of the take-out. This is very difficult to do at times when the river is free flowing. The easiest passage past the log boom is on the upstream end of the structure adjacent to the Johnson Creek Road. However, a group of three old log pilings presents a navigation hazard. These pilings also pose a hazard to motorized boaters who often use this area to pass upstream of the log boom. We are requesting funding to hire a contractor to remove these log pilings. This will remove a navigation hazard for boaters and open up safe float boat access during times of year that it is currently not available.

FIGURE 4. Clark Fork log boom structure and wood pilings proposed for removal. After piling removal, navigation past the log boom by float and motorized boats will be much easier and safer.

Goal

Improve boating access and navigation on the Clark Fork River.

Objectives

1. Complete remaining upgrades to a partially developed access site adjacent to Johnson Creek Road and the Derr Island bridge.

2. Remove old wood pilings at the upstream end of the Clark Fork log boom that currently poses a navigation hazard to boaters. (**Complete**)

3. Complete remaining construction activities during 2022.

Tasks

1. Finalize agreement between IDFG and the County that defines roles of each agency as they relate to long-term operation and maintenance of the Clark Fork – Derr Island access site. (**Complete**)

2. The County or contractor will conduct site prep work (i.e., vegetation pruning/removal in advance of road widening by contractor).

3. Receive bids/hire contractors to widen the roadway and remove log pilings. (**Complete**)

4. Complete remaining tasks during the spring and summer of 2022.

Work Products

- Annual Work Summary; due December 1, 2022

Permitting Requirements

There are minimal permitting requirements associated with the proposed project. Idaho Department of Fish and Game has already received authorization from the U.S. Army Corps of Engineers to remove the pilings in the Clark Fork River adjacent to the log boom. This is the only proposed activity that requires any permitting beyond the County level. Because the County is involved in the project, they will be able to authorize any work that is contracted out. Both IDFG and the County have met on-site with the adjacent landowner to inform him of the proposed access site developments. While the work does not require landowner permission, this step was taken to avoid any potential conflict associated with perceived ownership and property boundaries. The landowner was supportive of the proposed work.

Cultural/Historic Resource Review

Not applicable for the tasks proposed in this project plan. All construction activities will occur on County property and within the County road right-of-way. There are no proposed impacts to cultural/historic resources.

Benefit to the Resource

The Clark Fork River supports a diverse and dynamic fishery and is limited by both low-water and floating access. Providing access for anglers on the Clark Fork River is one component of a negotiated agreement associated with the 2019 amendment to the Clark Fork Settlement Agreement.

Budget

Item	Estimated Carryover[1]	2022 Budget Request
Flaggers (one day)	$700	$0
Excavator (one day)	$1,500	$0
Dump truck (one day)	$1,000	$0
Compaction/roller (one day)	$1,000	$0
Finish work (labor; $240 x 4 people)	$960	$0
Filter fabric	$600	$0
Fill ¾” minus (506 yards with delivery)	$8,298	$0
Piling removal equipment and labor	$2,500	$0
Total	$16,558	$0
Anticipated Expenditures		$16,558

[1] *Estimated carryover of unexpended, approved funds as of January 1.*

In addition to the cost-share provided via the first phase of development in 2020 (~$7,000), IDFG and the County each plan to provide $1,000–2,000 in labor cost-share in 2021. This will include project planning and implementation by IDFG and County staff and vegetation pruning/removal by the County to prepare for the road widening. Additionally, IDFG and the County will be taking on costs associated with the long-term operation and maintenance of this site (estimated at $3,000 annually).