



The Clark Fork Project

FERC Project No. 2058

2021 Annual Report



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Section 1: Introduction

1.1 Document Background and Purpose

Avista owns and operates the Noxon Rapids and Cabinet Gorge hydroelectric developments [hereafter, “HEDs”; Clark Fork Project, the Federal Energy Regulatory Commission (FERC) License No. 2058]. Operation of the Clark Fork Project is conditioned by the Clark Fork Settlement Agreement (CFSA), signed in 1999, and the FERC License No. 2058, effective March 1, 2001.

In 2021, Avista implemented the terms and conditions of the CFSA in consultation with, and full approval of, the Management Committee (MC) for the twenty-third consecutive year and the terms and conditions of the FERC License for the twenty-first consecutive year. Specific Native Salmonid Restoration Plan (CFSA, Appendix C) activities are implemented consistent with the CFSA, FERC License, and the U.S. Fish and Wildlife Service (USFWS) 2019 Biological Opinion (see Section 8.1).

As specified in this report, Avista, in consultation with members of the MC, which is comprised of State and Federal agencies, non-governmental organizations, and five Native American Tribes, continued to implement the current protection, mitigation, and enhancement (PM&E) measures identified in the CFSA and the FERC license. The MC, Terrestrial Resources Technical Advisory Committee (TRTAC), Water Resources Technical Advisory Committee (WRTAC), and Cultural Resources Management Group (CRMG) continued to meet in 2021.

1.2 Summary

The COVID-19 pandemic continued to create new and ongoing challenges in implementing the CFSA. Additional challenges in 2021 included a major windstorm that hit the area in January resulting in widespread damage from downed trees throughout the corridor, and two major forest fires that impacted work during July and August. However, once again relying on the solid foundation of the CFSA and strong working relationships among all the signatories and other partners, we were able to navigate our way through these challenges to successfully implement the vast majority of the 2021 projects. Avista thanks all the parties for their flexibility and dedication that ultimately resulted in being able to meet the procedural and regulatory requirements of the CFSA and the FERC License.

Parties to the CFSA successfully completed the twenty-third year of implementing PM&E measures. Among the 22 PM&E measures, more than 100 projects and programs to benefit aquatic, terrestrial, historical, and cultural resources were implemented. The following paragraphs provide select highlights from the 2021 efforts.

The MC members agreed to utilize a virtual platform for the annual March meeting to approve the 2020 CFSA Budget Report and 2021 Annual Implementation Plans (AIPs) with associated funding for all active PM&E measures identified in the CFSA and the FERC License. All items were approved by consensus.

The annual September meeting also utilized a virtual platform where 2021 AIP updates were given and the MC reviewed and approved four items by consensus: the purchase of five three-foot circular passive integrated transponder (PIT) antennas, creation of a Cabinet Gorge Dam Fishway

decision making subgroup, fall electrofishing in the East Fork Bull River, and review and approval of ongoing management direction and continued ownership by Avista of 13 properties purchased through the CFSA.

Avista, through CFSA Appendix R, continued to work with Idaho and Montana State Historic Preservation offices, the U.S. Forest Service (USFS), and representatives from five Native American Indian tribes (Confederated Salish and Kootenai, Coeur d'Alene, Kootenai, and Kalispel), collectively referred to as the CRMG, to preserve and protect cultural and historic resources associated with the Clark Fork Project. In 2021, the Avista Cultural Resource Specialist and/or the CRMG reviewed 117 CFSA-related projects with proposed ground disturbance and/or projects related to the Noxon Rapids and Cabinet Gorge HEDs.



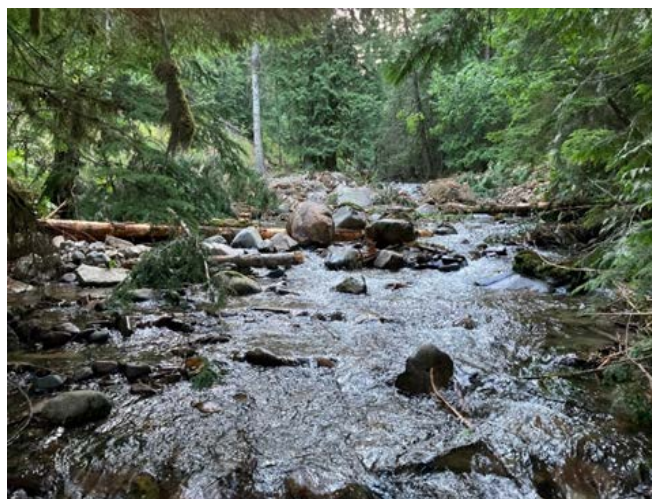
Instream work on Trestle Creek to benefit juvenile Bull Trout rearing habitat

Trestle Creek contains some of the highest quality Bull Trout habitat in the lower Clark Fork River–Lake Pend Oreille tributary system. The Idaho Department of Fish and Game (IDFG) worked with the Federal Highways' Federal Land Access Program, Bonner County, and the CFSA to directly improve approximately 0.33 mile and protect approximately 0.75 mile of habitat where planned improvements to Trestle Creek Road would directly impact Trestle Creek. The collaborative approach allowed us to protect and enhance native fish habitat in coordination with the road upgrades, blending priorities into a project beneficial to all. A video describing the project was produced and is available at

<https://www.youtube.com/watch?v=7CRBiteglOU&t=6s>.



The Trestle Creek work focused on moving the creek channel away from the road and creating slow water habitat for juvenile Bull Trout.



The finished Trestle Creek product.



Trestle Creek Field Office being used as an operations base during suppression efforts of the Trestle Creek forest fire.

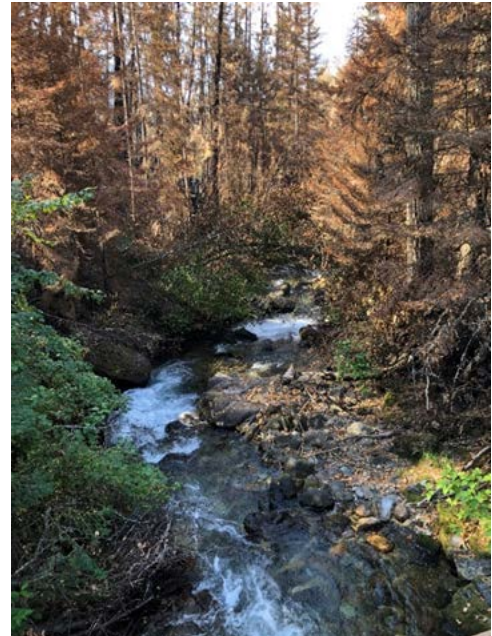
The IDFG-owned Clark Fork Fish Hatchery has served as the base of CFSA activities in Idaho for the past 20 years. While evaluating the buildings for much needed maintenance and upgrades, it became apparent that due to the presence of lead-containing paint and asbestos, this would be a costly endeavor. As an alternative, the MC approved the construction of a new facility on a CFSA-acquired property near Trestle Creek. Construction was initiated in the fall 2020 and complete in the fall of 2021. All Idaho CFSA operations are now based out of this new facility.

While construction was wrapping up, we were able to provide use of the facility and associated lands as an operation base during suppression efforts of the 6,600-acre forest fire in the Trestle and Lightning creek watersheds. Most of the fire was contained to higher elevations and very little riparian area was damaged, and it is not expected to cause any long-term impacts to Trestle Creek.



Avista lands adjacent to the Trestle Creek Field Office were utilized as a camping area for operations staff during the Trestle Creek forest fire suppression efforts.

Wildfires also presented several challenges and concerns in Montana during 2021. The Thorne Creek fire started in early July. Lightning started the fire on a peak between two tributaries to Graves Creek: Thorne and Winniemuck creeks. The fire burned just under 40,000 acres ranging roughly from Graves Creek north to the headwaters of the Vermilion River drainage and east to the Thompson River drainage. Graves Creek was hit the hardest among streams that the CFSA actively works to enhance. Most of the drainage was burned, much of which was a high-intensity fire and included portions of the riparian areas. This poses concerns with regard to the recent growth we have seen in the adfluvial Bull Trout population of Graves Creek. However, we are optimistic that instream conditions will remain good within Graves Creek despite the effects of the fire. Thankfully, a comprehensive suite of thermographs have been deployed within Graves Creek since 2019 and will provide excellent longitudinal pre- and post-fire water temperature information.



Riparian area along Graves Creek that burned as part of the Thorne Creek fire.

The fire did burn parts of the recently acquired 342-acre parcel on the west side of Graves Creek. Fire crews utilized parts of this property to establish dozer and hand lines which have subsequently been rehabbed. Additionally, the smaller parcel, also a recent acquisition, on the east side of Graves Creek was utilized by the fire crew as a staging area. Water tenders used in fighting the fire were able to utilize the Graves Creek permanent weir trap site as a fill site. Collaboration with the USFS was critical during this incident as we were able to continue implementation of ongoing projects in the drainage.



Graves Creek permanent weir trap and associated handling facility constructed in 2021.

Construction to enhance the Graves Creek permanent weir trap started following spring runoff and temporary weir traps were operated throughout construction. The enhanced trap became operational in November of 2021. Preliminary indications are that the enhancements to the trap will meet or exceed all the expectations that were set forth as the project was developed. The new design is very efficient at filtering a lot of water and directing fish to the trap box. Additionally, the shore-based trap box provides a much safer environment both for the fish and for the biologists and technicians working the trap. The new

design also offers the flexibility of capturing upstream-moving fish or operating with volitional upstream fish passage without compromising capture efficiency for downstream migrants. Work

that remains to be done includes minor modifications to some of the fabricated parts, completing the as-built drawings, and revegetating disturbed areas at the site. Completion of the project was delayed by several unforeseen circumstances and we greatly appreciate the help and flexibility of our partners in helping us see this to completion! We are excited to run the trap and optimize its performance in 2022.

A fish handling facility was also completed at the site this year. This facility was developed in response to the documented growth of the local population of Bull Trout in Graves Creek and record-setting catch rates thereof. Ultimately, this facility allows us to minimize stress on these fish as well as provide a controlled environment from which we can obtain more precise measurements and ensure a high level of data integrity. The fish handling facility was also utilized as a temporary holding facility in a collaborative effort with NorthWestern Energy, Montana Fish, Wildlife and Parks (MFWP), and the USFWS to transport juvenile Bull Trout from the Thompson River drainage to Lake Pend Oreille.



Aerial view of Graves Creek permanent weir trap and associated fish handling facility.



Removal of the cofferdam surrounding the CGDF construction site.

Construction of the Cabinet Gorge Dam Fishway (CGDF) project remained on schedule during 2021. The contractor finished all but one concrete pour for the fish trap structure prior to the 2021 spring spill. During spill, one entrance gate was left open a few inches to equalize water pressure inside and outside of the structure. Following spill, the entrance gate was closed and Avista personnel salvaged fish that were entrained within the trap. The final concrete pour within the fish trap structure was completed following the spill season.

During 2021, the contractor also erected and wired the control building, finished laying siphon piping from the forebay down to the fish trap, installed a Hydraulic Power Unit for gate operation, constructed the monorail crane slab, and removed the cofferdam to name a few of the activities. Avista also worked internally to determine the best communication options for transferring the fish monitoring devices and

Programable Logic Controller to data storage locations and for alarms. The monitoring and evaluation plan for the project was finalized and the current schedule is for completion of construction and commissioning all to occur prior to spill 2022.



Cabinet Gorge Dam and CGDF (located on the right side of the photo).



View inside the CGDF control building.



Looking inside the CGDF structure at the six entrance gates.



The CGDF as it is nearing the final stages of construction.



Cabinet Gorge Fish Handling Facility to be used in conjunction with the CGDF.

Numerous upgrades to the Cabinet Gorge Fish Handling Facility were constructed during 2021. Upgrades generally addressed the needs for climate control, additional fish holding capacity, higher water quality supply, remote monitoring and alarm systems, and an office space.

In mid-January, a severe wind event led to an extensive swath of downed and uprooted trees throughout the Clark Fork River valley. In addition to structural damage at Avista facilities, Recreation staff received numerous Work Authorization requests (requests) from adjacent landowners. Sixty-four requests were made throughout 2021, most of which are the result of the January windstorm. This marked a 47% increase in requests from the previous year. Avista staff worked in close coordination with the CRMG to develop a review strategy for requests that allowed adjacent landowners to clean up trees that were blown down as promptly as possible. Due to the extent of damage from the event, Avista will continue to address damages in 2022.



A severe windstorm in mid-January led to an extensive swath of downed and uprooted trees throughout the project area.

Recreation use in the project area was a tale of two seasons in 2021. Indicator sites suggest that visitation for the first 6 weeks of the 2021 season (through July 9) grew by 44% compared to the same timeframe in 2020. However, use dropped precipitously after the 4th of July weekend, largely due to poor air quality, area closures, and recreation use restrictions (e.g., campfires) as a result of numerous forest fires in the region.



Recreation use increased once again in 2021, especially at dispersed sites.



Public boat ramps also experienced some of the highest visitation levels during 2021.

Despite reduced visitation for the last two months of the peak recreation season, over 327,000 people visited the 21 Clark Fork Project recreation sites monitored between May 28 and September 9, 2021 which represents a 2% increase over the record-use levels observed in 2020 (note that 2020 visitation grew by 26% compared to 2019). It will be interesting to see if the increasing trend continues in 2022.

Avista staff partnered with Project ASCENT, a local non-profit organization, to replace the aging playground structure located at Pilgrim Creek Park. Project ASCENT led the design effort for the new structure and organized teams comprised of their supporters, board members, and local alternative schools to assist with construction of the modern playground structure. The new structure was designed to complement Project ASCENT's efforts to provide outdoor adventure opportunities to kids. The structure has a woodland adventure theme which includes multiple universally accessible features and wildlife education aspects.



Construction of new modern playground equipment at Pilgrim Creek Park.



The finished playground equipment at Pilgrim Creek Park showing the general woodland theme.

1.3 Acronyms and Abbreviations

AIP	Annual Implementation Plan
CFS	cubic feet per second
CFSA	Clark Fork Settlement Agreement
CGDF	Cabinet Gorge Dam Fishway
CPUE	Catch per unit effort
CRMG	Cultural Resources Management Group
EWM	Eurasian watermilfoil
FERC	Federal Energy Regulatory Commission
GDP	Gross Domestic Product
GMCD	Green Mountain Conservation District
GSCP	Gas Supersaturation Control Program
HED	hydroelectric development
IDFG	Idaho Department of Fish and Game
KNRD	Kalispel Tribe Natural Resources Department
LCFWG	Lower Clark Fork Watershed Group
LPO	Lake Pend Oreille
LUMP	Land Use Management Plan
MC	Management Committee
M&E	Monitoring and Evaluation
MFWP	Montana Fish, Wildlife and Parks
NP	Northern Pike
NSRP	Native Salmonid Restoration Plan
PIT	passive integrated transponder
PM&E	protection, mitigation, and enhancement
RPMs	Reasonable and Prudent Measures
RRMP	Recreation Resource Management Plan
TDG	total dissolved gas
TRTAC	Terrestrial Resources Technical Advisory Committee
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
WDFW	Washington Department of Fish and Wildlife
WRTAC	Water Resources Technical Advisory Committee

Section 2: Management Committee

2.1 Purpose

Paragraph 26 of the CFSA established a MC composed of representatives from each of the CFSA signatories. The MC oversees all PM&E measures. The MC shall have the authority, subject to such FERC approvals as may be necessary in appropriate cases, to:

- Approve plans developed by Avista and the appropriate technical committee for the implementation of PM&E measures, including the related funding;
- Approve modifications of PM&E measures;
- Oversee the implementation of all PM&E measures by Avista and the appropriate committees;
- Establish such committees as it deems necessary for the purpose of implementing the CFSA and PM&E measures, and determine, as appropriate, the size, membership, and procedures of such committees;
- Establish appropriate procedures for conducting its activities, including procedures for proxy voting and teleconferencing methods;
- Permit additional entities to execute the CFSA and thereby become parties to the CFSA (Parties) and, as appropriate, permit the addition of such new Parties on terms different from those of the original signatories to the CFSA;
- Resolve all disputes regarding implementation of approved PM&E measures and all disputes brought to it for resolution by any of the Parties or committees;
- Amend the CFSA including the PM&E measures, in accordance with the voting provisions set forth in the CFSA.

2.2 List of Representatives

In 2021, the MC consisted of representatives from 27 Parties of the CFSA. Representatives are verified bi-annually through the sign-in sheet distributed at each MC meeting. The 2021 MC representatives and alternates are listed below:

Avista	Nate Hall
Bull River Watershed Council	Kathy Ferguson/Tom McDowell
Cabinet Resource Group	Jim Nash
Coeur d'Alene Tribe	Phillip Cernera
Confederated Salish and Kootenai Tribes	Les Evarts
Green Mountain Conservation District	Terry Hightower
Idaho Department of Environmental Quality	Bob Steed
Idaho Department of Fish and Game	Chip Corsi/Andy Dux
Idaho Rivers United	Kevin Lewis
Kalispel Tribe	Joe Maroney/Ray Entz
Kootenai Tribe of Idaho	Sue Ireland/Scott Soultz
Lake Pend Oreille Idaho Club	Ryan Roslak/David Gillespie
Montana Bass Federation	Bob Beberg
Montana Department of Environmental Quality	Keenan Storrar
Montana Department of Natural Resources and Conservation	Valerie Kurth
Montana Fish, Wildlife and Parks	Jim Williams/Mike Hensler

Montana State Historic Preservation Office
Noxon-Cabinet Shoreline Coalition
Panhandle Chapter Trout Unlimited
Rock Creek Alliance
Sanders County, Montana
U.S. Fish and Wildlife Service
U.S. Forest Service

Jessica Bush
Rick Robinson
Loren Albright/Bill Love
Diane Williams
Tony Cox/Carol Brooker
Ben Conard/Jodi Bush
Michael Fieger/Kira Powell

Management Committee representatives not designated in 2021:

Alliance for the Wild Rockies
Elk Creek Watershed Council
Idaho Department of Parks and Recreation
Idaho State Historic Preservation Office

2.3 Meeting and Activity Summary

Due to COVID-19 concerns and precautions in 2021, the MC again conducted business utilizing an alternative process (virtual meetings) to meet the requirements of Paragraph 28 of the CFSA. These represented the 54th and 55th meetings of this group since the signing of the CFSA. The first meeting of 2021 consisted of sending all members copies of the 2021 AIPs and holding a virtual meeting on March 17, 2021. Through this process all 2021 AIPs were approved as presented by consensus. Although not included in the AIPs, one additional request for the purchase of a 4.64 acre parcel along Graves Creek was also approved at the meeting. The second required meeting of the MC was also held virtually on September 21, 2021 and provided updates on the implementation of the 2021 AIPs. The MC reviewed and approved four items by consensus: the purchase of five three-foot circular PIT antennas, creation of a Cabinet Gorge Dam Fish Passage Facility decision making subgroup, fall electrofishing in the East Fork Bull River, and review and approval of 13 properties purchased through the CFSA process to remain in Avista ownership.

All meetings were open to the public, meeting information was placed on Avista's Clark Fork Project website, and notices were placed in the local newspaper. Annual Implementation Plans and project updates were provided to the MC and anyone that requested them.

2.3.1 2021 Consent Mails

Throughout 2021, the MC reviewed and approved four Consent Mails received through the request process established by the Clark Fork Management Committee Procedures. Consent Mail requests are a business process utilized for decision making between MC meetings. Proposals that are approved move forward, while those that are not approved are discussed at the next regularly scheduled MC meeting. The following proposals were received by Consent Mail, and approved:

- December 28, 2020 Appendix F5 and Appendix D – Idaho Bull Trout and Protection and Education Officer Funding and Idaho Native Fisheries Education Trailer Funding Request (CFSA Appendix F5; approved January 21, 2021).

- April 20, 2021 request for approval for acquisition of 342-acre parcel along Graves Creek (CFSA appendices B and K; approved on June 8, 2021).
- June 8, 2021 request for approval for additional funding for the Temperature Monitoring Data Compilation Project (CFSA Appendix F5; approved on June 23, 2021).
- November 30, 2021 request for approval Appendix C – Cabinet Gorge Fish Passage Facility Monitoring and Evaluation Plan, and Additional Funds for Fish Handling Facility Upgrades (CFSA Appendix C; approved on December 20, 2021).

2.4 Key 2021 References

Avista. 2020. Consent Mail approval of Appendix F5 and Appendix D – Idaho Bull Trout and Protection and Education Officer Funding and Idaho Native Fisheries Education Trailer Funding Request. Avista document identification number 2020-0297.

Avista. 2021. Clark Fork Settlement Agreement Management Committee Meeting Minutes from March 17, 2021 (virtual meeting). Avista document identification number 2021-0067.

Avista. 2021. Consent Mail approval of Appendices B and K – Acquisition of 342-acre parcel along Graves Creek (April 20, 2021). Avista document identification number 2021-0104.

Avista. 2021. Consent Mail approval of Appendix F5 – Additional funding for the Temperature Monitoring Data Compilation Project (June 8, 2021). Avista document identification number 2021-0133.

Avista. 2021. 2021 Annual Fall Management Committee Meeting, Clark Fork Management Committee Meeting Agenda, and Clark Fork Settlement Agreement Management Committee Meeting Record from September 21, 2021 (virtual meeting). Avista document identification number 2021-0218.

Avista. 2021. Consent Mail approval of Appendix C – Cabinet Gorge Fish Passage Facility Monitoring and Evaluation Plan and Additional Funds for Fish Handling Facility Upgrades (November 30, 2021). Avista document identification number 2021-0229.

Avista. 2021. Public webpage for the Clark Fork Project.
<https://www.myavista.com/about-us/celebrate-our-rivers/federal-licensing> (December 2021)

Sanders County Ledger. 2021. Public meeting notice for the March MC Meeting (March 17, 2021). Avista document identification number 2021-0042.

Sanders County Ledger. 2021. Public meeting notice for the September MC Meeting (September 21, 2021). Avista document identification number 2021-0219.

Section 3: Water Resources Technical Advisory Committee

3.1 Purpose

The WRTAC is one of two technical advisory committees designated by Paragraph 32 of the CFSA. The WRTAC provides technical review of water-related PM&E measures (Section 3.2), including those dealing with fishery resources, water quality, and water quantity. The WRTAC is consulted in the development of appropriate implementation plans for water resources PM&E measures and related funding recommendations.

3.2 Water Related PM&E Measures

PM&E Measure	CFSA Appendix	Clark Fork License Article
Idaho Tributary Habitat Acquisition and Fishery Enhancement Program	A	404
Montana Tributary Habitat Acquisition and Recreational Fishery Enhancement Program	B	405
Fish Passage/Native Salmonid Restoration Plan	C	406
Bull Trout Protection and Public Education Project	D	407
Watershed Councils Program	E	408
Clark Fork River Water Quality Monitoring Program	F1	409
Monitoring of Noxon Reservoir Stratification and Mobilization of Sediment Nutrients/Metals	F2	410
Aquatic Organism Tissue Analysis	F3	411
Water Quality Protection and Monitoring Plan for Maintenance, Construction and Emergency Activities	F4	412
Dissolved Gas Supersaturation Control, Mitigation, and Monitoring	F5	413
Project Operations Package	T	429/430/431

3.3 List of Representatives

The WRTAC consists of representatives appointed by MC members. The 2021 representatives are listed below:

Avista	Eric Oldenburg
Bull River Watershed Council	Tom McDowell
Cabinet Resource Group	Jim Nash
Confederated Salish and Kootenai Tribes	Craig Barfoot
Green Mountain Conservation District	Terry Hightower
Idaho Department of Environmental Quality	Bob Steed/Kristin Lowell
Idaho Department of Fish and Game	Ken Bouwens
Kalispel Tribe	Ken Merrill
Kootenai Tribe of Idaho	Shawn Young
Lake Pend Oreille Idaho Club	David Gillespie
Montana Bass Federation	Bob Beberg

Montana Department of Environmental Quality	Keenan Storrar
Montana Department of Fish, Wildlife and Parks	Jason Blakney
Montana Department of Natural Resources and Conservation	Valerie Kurth
Montana State Historic Preservation Office	Jessica Bush
Noxon-Cabinet Shoreline Coalition	Rick Robinson
Panhandle Chapter Trout Unlimited	Bill Love
Rock Creek Alliance	Diane Williams
U.S. Fish and Wildlife Service	Kevin Aceituno
U.S. Forest Service	Chris Rossel

The following parties to the CFSA did not designate WRTAC representatives in 2021:

Alliance for the Wild Rockies
Coeur d'Alene Tribe
Elk Creek Watershed Council
Idaho Department of Parks and Recreation
Idaho Rivers United
Idaho State Historic Preservation Office
Sanders County, Montana

3.4 Meeting and Activity Summary

The WRTAC met twice in 2021, on January 20 and August 24. Both meetings were conducted virtually due to the COVID-19 pandemic restrictions. Notices of the meetings were placed in the local newspaper and posted on Avista's Clark Fork Project website. In addition, the Aquatic Implementation Team scored all the ranked projects and provided the recommended scores to the WRTAC, which were subsequently ratified during the January 20 meeting.

3.5 Key 2021 References

Avista. 2021. Water Resources Technical Advisory Committee Meeting Packet from January 20, 2021. Avista document identification number 2021-0106.

Avista. 2021. Water Resources Technical Advisory Committee Meeting Packet from August 24, 2021. Avista document identification number 2021-0235.

Avista. 2021. Public webpage for the Clark Fork Project.
<https://www.myavista.com/about-us/celebrate-our-rivers/federal-licensing> (December 2021).

Sanders County Ledger. 2021. Public meeting notice for the January WRTAC Meeting (January 20, 2021). Avista document identification number 2021-0043.

Sanders County Ledger. 2021. Public meeting notice for the August WRTAC Meeting (August 24, 2021). Avista document identification number 2021-0154.

Section 4: Terrestrial Resources Technical Advisory Committee

4.1 Purpose

The TRTAC is one of two technical advisory committees designated by Paragraph 32 of the CFSA. The TRTAC provides technical review of terrestrial-related PM&E measures (Section 4.2), including those dealing with wildlife, botanical resources, wetlands, land use, recreation, and aesthetics. The TRTAC is consulted in the development of appropriate implementation plans for terrestrial resource PM&E measures and related funding recommendations.

4.2 Terrestrial Related PM&E Measures

PM&E Measures	CFSA Appendix	Clark Fork License Article
Implementation of the Land Use Management Plan	G	414
Implementation of the Recreation Resource Management Plan	H	415
Implementation of the Aesthetics Management Plan	I	416
Development and Implementation of the Wildlife, Botanical and Wetland Management Plan	J	417
Wildlife Habitat Acquisition, Enhancement and Management Program	K	418
Black Cottonwood Habitat Protection and Enhancement	L	419
Wetlands Protection and Enhancement Program	M	420
Forest Habitat Protection and Enhancement	P	425
Reservoir Island Protection	Q	426
Erosion Fund and Shoreline Stabilization Guidelines Program	S	428

4.3 List of Representatives

The TRTAC consists of representatives appointed by MC members. The 2021 representatives are listed below:

Avista	Nate Hall/Arthur Potts
Bull River Watershed Council	Kathy Ferguson/Tom McDowell
Cabinet Resource Group	Rob Kjos
Elk Creek Watershed Council	Judy Hutchins
Green Mountain Conservation District	Terry Hightower
Idaho Department of Environmental Quality	Bob Steed
Idaho Department of Fish and Game	Evan DeHamer
Kalispell Tribe	Ray Entz/Kevin Lyons
Kootenai Tribe of Idaho	Scott Soult/Shannon Ehlers
Lake Pend Oreille Idaho Club	Will Crook
Montana Bass Federation	Bob Beberg
Montana Department of Environmental Quality	Craig Jones
Montana Fish, Wildlife and Parks	Mike Ebinger/Dave Bennetts
Montana State Historic Preservation Office	Jessica Bush

Noxon-Cabinet Shoreline Coalition
Rock Creek Alliance
Sanders County, Montana
U.S. Fish and Wildlife Service
U.S. Forest Service

Rick Robinson
Mary Costello
Tony Cox
Wayne Kasworm
Les Raynor/Ron Torreta

The following parties to the CFSA did not designate TRTAC representatives in 2021:

Alliance for the Wild Rockies
Coeur d'Alene Tribe
Confederated Salish and Kootenai Tribes
Idaho Department of Parks and Recreation
Idaho Rivers United
Idaho State Historic Preservation Office
Montana Department of Natural Resources and Conservation
Panhandle Chapter Trout Unlimited

4.4 Meeting and Activity Summary

The TRTAC met twice in 2021, on January 21 and August 25. Both meetings were held by Microsoft Teams conference call due to the COVID-19 pandemic restrictions. Notices of the meetings were placed in the local newspaper and posted on Avista's Clark Fork Project website.

4.5 Key 2021 References

Avista. 2021. Terrestrial Resources Technical Advisory Committee Meeting Minutes January 21, 2021. Avista document identification number 2021-0105.

Avista. 2021. Terrestrial Resources Technical Advisory Committee Meeting Minutes August 25, 2021. Avista document identification number 2021-0240.

Avista. 2021. Public webpage for the Clark Fork Project.
<https://www.myavista.com/about-us/celebrate-our-rivers/federal-licensing> (December 2021).

Sanders County Ledger. 2021. Public meeting notice for the January TRTAC Meeting (January 21, 2021). Avista document identification number 2021-0043.

Sanders County Ledger. 2021. Public meeting notice for the August TRTAC Meeting (August 25, 2021). Avista document identification number 2021-0154.

Section 5: Cultural Resources Management Group (License Article 427 – CFSA Appendix R)

5.1 Purpose and Resource Benefit

The CRMG was formed in support of CFSA Appendix R (Clark Fork Heritage Resource Program). Appendix R of the CFSA corresponds to Article 427 in the FERC License for Clark Fork Project No. 2058.

The CRMG consists of representatives from Coeur d’Alene, Kootenai, Confederated Salish and Kootenai, Kalispel Tribes, Idaho and Montana State Historic Preservation offices, USFS, and Avista. Individual representatives of each tribe and agency may vary from meeting to meeting. Due to confidentiality requirements, these meetings are not open to the public. The CRMG reviews all ground-disturbing activities that may impact cultural or historic resources and uses the Clark Fork Heritage Resource Management Plan (Plan) to guide implementation of management efforts.

The purpose of CFSA Appendix R is to provide directives for all eligible properties associated with the Clark Fork Project, including dam sites, homesteading-era properties, pre-historic properties, and sites with traditional cultural significance. The Plan helps to support many of the projects in other CFSA PM&E measures. It also helps to ensure that historic properties are protected and managed. The Plan is intended to extend beyond a mere “treatment plan” and provides the flexibility to be useful to a variety of audiences. The Plan includes public education goals, objectives, and action strategies as important focuses.

5.2 Meeting and Activity Summary

On March 2, 2021, the CRMG held a meeting to discuss the 2021 AIPs for aquatic and terrestrial resources, proposed ground disturbances at recreation sites, various land use permits, and annual monitoring results. The CRMG also reviewed the 2020 meeting minutes and annual work summary prior to finalization. This meeting was held through a conference call due to COVID-19 protocols with attendees representing Confederated Salish and Kootenai Tribes, USFS Kootenai National Forest, Coeur d’Alene Tribe, Montana State Historic Preservation Office, and Avista.

The fall CRMG meeting was cancelled since all projects and monitoring were going as planned.

5.3 2021 Annual Implementation Plan Project Plan

- Clark Fork Heritage Resource Program
 - *Completed per 2021 AIP^{1, 2}*

5.4 Other 2021 Activities

Other projects not specifically tied to aquatic or terrestrial PM&E measures reviewed by the Avista Cultural Resource Specialist and/or the CRMG include:

- Maintenance projects for Noxon Rapids and Cabinet Gorge dams and associated facilities.

5.5 Key 2021 References

¹ Avista. 2020. CRMG Meeting Summary (Public Version) from March 4, 2020. Avista document identification number 2021-0009.

² Avista. *In prep.* CRMG Meeting Summary (Public Version) from March 2, 2021.

Section 6: Water Resources PM&E Measures Implementation Efforts

6.1 Idaho Tributary Habitat Acquisition and Fishery Enhancement Program (License Article 404 – CFSA Appendix A)

6.1.1 Purpose and Resource Benefit

The purpose of this program is to offset the power peaking impacts of the Cabinet Gorge Development to native salmonid species (i.e., Bull Trout, Westslope Cutthroat Trout, and Mountain Whitefish). Resource benefits are accomplished through watershed restoration and enhancement, fishery monitoring and management support, and a public education and enforcement initiative focused on Bull Trout in Idaho.

6.1.2 2021 Annual Implementation Plan Project Plans

Tributary Habitat Acquisition and Enhancement

- Habitat Restoration Scoping Allocation
 - *Completed per 2021 AIP^{1, 2, 3}*
- Habitat Restoration and Acquired Property Maintenance and Monitoring Allocation
 - *Completed per 2021 AIP^{1, 4}*
- Priority Native Salmonid Habitat Acquisition and Conservation Allocation
 - *Completed per 2021 AIP¹*
- Idaho Field Station Construction, Furnishing, and Operation
 - *Completed per 2021 AIP¹*
- Pack River Watershed Management Plan Addendum
 - *Completed per 2021 AIP^{1, 5}*
- Lower Clark Fork River Minimum Flow and Water Temperature Monitoring
 - *Completed per 2021 AIP^{1, 6, 7}*
- Trestle Creek Habitat Enhancement Project Phase I
 - *Completed per 2021 AIP^{1, 8}*

Fishery Resource Monitoring, Enhancement, and Management

- Fish Resource Monitoring, Enhancement, and Management Plan
 - *Variance^{1, 7, 9, 10, 11, 12, 13, 14, 15}; see Section 6.1.3*

6.1.3 Projects with Significant Variances

Project Plan	Variances
Fish Resource Monitoring, Enhancement, and Management Plan	<p>The IDFG Comprehensive Project Report: Clark Fork River Salmonid Abundance Estimates (2014–2018) was not completed. It is being transferred to the Appendix F5 project plan titled “Clark Fork River Population Monitoring” because future lower Clark Fork River population estimate activities have been transferred to this project plan as well. The report will include data collected through 2021 and has a new completion date of November 1, 2022.</p> <p>The IDFG Comprehensive Project Report summarizing the 2009–2018 tributary monitoring data was not completed. New due date: December 1, 2022.</p>

6.1.4 Key 2021 References

- ¹ Bouwens, K., A. Ransom, P. Kusnierz, and J. Erickson. 2021. Idaho Tributary Habitat Acquisition and Fishery Enhancement Program Appendix A 2021. Annual Work Summary. Avista document identification number 2021-0277.
- ² McFall, J. 2021. Rattle Creek Site Visit Summary. Avista document identification number 2021-0213.
- ³ McFall, J. 2021. Granite Creek Site Visit Summary. Avista document identification number 2021-0206.
- ⁴ Dryer, N. 2021. 2021 Twin Creek Property Herbicide Treatment. Avista document identification number 2021-0214.
- ⁵ Erickson, J. *In prep.* Pack River Native Salmonid Restoration Plan.
- ⁶ Kusnierz, P. 2021. Lower Clark Fork River Minimum Flow and Water Temperature Monitoring. Annual Project Update – 2021. Avista document identification number 2021-0258.
- ⁷ Avista. Database for Temperature Monitoring Data Compilation; for more information on this database contact Paul Kusnierz (Paul.Kusnierz@avistacorp.com).
- ⁸ McFall, J. 2021. Trestle Creek Fish Habitat Daily Construction Report. Avista document identification number 2021-0160.
- ⁹ Bouwens, K. A., R. Jakubowski, A. Ransom, J. Johnson, and S. Busmire. 2021. 2020 Idaho Tributary Salmonid Abundance Monitoring. Annual Project Update. Avista document identification number 2021-0162.

- ¹⁰ Ransom, A. L. 2021. 2021 Pend Oreille Redd Count Summary. Avista document identification number 2021-0212.
- ¹¹ Ransom, A. L., R. Jakubowski, and K. A. Bouwens. 2021. 2020 Pend Oreille Basin Bull Trout Redd Monitoring. Annual Project Update. Avista document identification number 2021-0041.
- ¹² Bouwens, K. A., R. Jakubowski, and S. Frawley. *In prep.* 2009–2018 Idaho Tributary Salmonid Abundance Monitoring. Comprehensive Project Report.
- ¹³ Bouwens, K. A., A. L. Ransom, and R. Jakubowski. *In prep.* Lower Clark Fork River Population Monitoring (through 2021). Comprehensive Project Report.
- ¹⁴ Ransom, A. L., R. Jakubowski, and K. A. Bouwens. *In prep.* 2021 Idaho Tributary Salmonid Abundance Monitoring. Annual Project Update.
- ¹⁵ Ransom, A. L., R. Jakubowski, and K. A. Bouwens. *In prep.* 2021 Pend Oreille Basin Bull Trout Redd Monitoring. Annual Project Update.

6.2 Montana Tributary Habitat Acquisition and Recreational Fishery Enhancement Program (License Article 405 – CFSA Appendix B)

6.2.1 Purpose and Resource Benefit

The purpose of this program is to offset the impacts of the power peaking and reservoir operational impacts of the Clark Fork Project to native salmonids and recreational fisheries in Montana. This is achieved through a multiple-component program 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. These programmatic efforts benefit tributary habitats within the project area and the native salmonid and recreational fisheries associated with them.

6.2.2 2021 Annual Implementation Plan Project Plans

Tributary Habitat Acquisition and Enhancement

- Habitat Restoration Monitoring and Native Salmonid Abundance Monitoring Plan
 - ***Variance*** ^{1, 2, 3, 4, 5}; see Section 6.2.4
- Redd Surveys in Montana Tributaries
 - ***Variance*** ^{1, 6, 7}; see Section 6.2.4
- Sims Meander Stream and Floodplain Restoration Project
 - ***Completed per 2021 AIP*** ^{1, 8}
- Stream Gage Monitoring
 - ***Completed per 2021 AIP*** ^{1, 9, 10, 11, 12, 13, 14, 15}
- Cabinet Ranger District Automated Snow Recording Site Operation and Maintenance 2020-2021
 - ***Variance*** ^{1, 16, 17}; see Section 6.2.4
- Crow Creek Bull Trout Investigation
 - ***Variance*** ^{1, 18}; see Section 6.2.4
- Graves Creek Pilot Habitat Enhancement Project
 - ***Variance*** ^{1, 19}; see Section 6.2.4
- Upper Prospect Creek LWD Project
 - ***Completed per 2021 AIP*** ^{1, 20}
- Lower Clark Fork Watershed Group Project Coordination
 - ***Variance*** ^{1, 21}; see Section 6.2.4

- Habitat Restoration Monitoring, Maintenance and Contingency Allocation
 - *Variance*^{1, 22}; see Section 6.2.4
- Habitat Restoration, Property Acquisition, and Conservation Easement Contingency Allocation
 - *Completed per 2021 AIP*¹
- East Fork Bull River Morphology, Connectivity, and Habitat Enhancement Project
 - *Variance*^{1, 23, 24, 25}; see Section 6.2.4

Recreational Fishery Enhancement

- Cabinet Gorge and Noxon Reservoir Fisheries Monitoring Plan
 - *Variance*^{1, 26, 27, 28, 29}; see Section 6.2.4
- Pilot Project: Modification of Eurasian Watermilfoil Beds on Noxon Reservoir for Fishery Benefits
 - *Variance*^{1, 30, 31, 32}; see Section 6.2.4
- Mountain Lake Fisheries Monitoring Project
 - *Variance*^{1, 33}; see Section 6.2.4
- Lower Bull River Day Use Boat Access Site Construction
 - *Completed per 2021 AIP*^{1, 34}
- Noxon Reservoir Boat Ramp Improvements
 - *Completed per 2021 AIP*^{1, 35}
- Managing Aquatic Invasive Plants on Noxon and Cabinet Gorge Reservoirs
 - *Completed per 2021 AIP*^{1, 36}
- Dreissenid Mussel Sampling on Noxon and Cabinet Gorge Reservoirs
 - *Completed per 2021 AIP*^{1, 37}

6.2.3 Other 2021 Activities

- March 17, 2021 proposal for the acquisition of 4.64 acres on Graves Creek was approved by the MC.
 - *Completed*^{1, 38}
- April 20, 2021 request for approval for acquisition of 342-acre parcel along Graves Creek (CFSA appendices B and K; approved on June 8, 2021).
 - *Completed per Consent Mail*^{1, 39}

6.2.4 Projects with Significant Variances

Project Plan	Variances
Habitat Restoration Monitoring and Native Salmonid Abundance Monitoring Plan	Sampling variances that occurred in 2021 included sampling four sites in Crow Creek instead of two and sampling seven sites in the upper Vermilion River and tributaries instead of eight. Additionally, sampling in Upper Graves Creek did not occur due to the Thorne Creek wildfire.
Redd Surveys in Montana Tributaries	High streamflow precluded completion of the Brown Trout redd survey, including the sampling of eggs from Brown Trout redds along a majority of the East Fork Bull River.
Cabinet Ranger District Automated Snow Recording Site Operation and Maintenance 2020-2021	CFSA funds were not utilized in 2021 as long-term maintenance and operation were turned over to the Natural Resource Conservation Service snow survey program. The Project Completion Report (through 2019) was not completed by May 1, 2021.
Crow Creek Bull Trout Investigation	The Project Completion Report was not completed by MFWP in 2021. This report has been rescheduled to be completed by December 31, 2022.
Graves Creek Pilot Habitat Enhancement Project	The technical memo reviewing substrate changes was not received on December 15, 2021. This product will be finalized by March 31, 2022.
Lower Clark Fork Watershed Group Project Coordination	The Lower Clark Fork Stream Restoration Summary 1995–2020 review draft was not completed by December 31, 2021. The draft will be available for review by March 31, 2022.
Habitat Restoration Monitoring, Maintenance, and Contingency Allocation	The finalized Project Completion Report for Mainstem Bull River Reforestation on Forest Service Lands and NEPA Process by the USFS was not received in May 2021. The authors anticipate having the draft for review by June 1, 2022.
East Fork Bull River Morphology, Connectivity, and Habitat Enhancement Project	The beaver management plan and flow management assessment and recommendations memoranda were not completed by July 31 and November 1, 2021, respectively. These will be completed by June 1, 2022.
Cabinet Gorge and Noxon Reservoir Fisheries Monitoring Plan	<p>The 2019 Annual Project Update work product was not completed by July 31, 2021. This report will be completed in 2022.</p> <p>The two scheduled Kid's Fishing Days were not held due to COVID-19 concerns.</p>

Project Plan	Variances
Pilot Project: Modification of Eurasian Watermilfoil Beds on Noxon Reservoir for Fishery Benefits	The Eurasian watermilfoil (EWM) harvest and sampling for the project did not begin in 2021. After consideration of sampling methods, the project proponents plan to modify the project plan to only evaluate the use of mechanical treatment to reduce EWM as compared to using herbicide treatment. The sampling plan for this project will be modified accordingly with implementation of the project intended to begin in 2022.
Mountain Lake Fisheries Monitoring Project	The project completion report was not completed by March 1, 2021. This report will be finalized by December 31, 2022.

6.2.5 Key 2021 References

- ¹ Rehm, T. 2021. Montana Tributary Habitat Acquisition and Recreational Fishery Enhancement Program (Appendix B). Annual Work Summary 2021. Avista document identification number 2021-0281.
- ² Blakney, J., J. Dukovcic, and T. Tholl. 2021. Native Salmonid Abundance and Tributary Habitat Restoration Monitoring. Annual Project Update – 2019. Avista document identification number 2021-0088.
- ³ Blakney, J., T. Rehm, J. Dukovcic, and T. Tholl. 2021. Native Salmonid Abundance and Tributary Habitat Restoration Monitoring. Annual Project Update – 2020. Avista document identification number 2021-0223.
- ⁴ Rehm, T., J. Blakney, and T. Tholl. *In prep.* Native Salmonid Abundance and Tributary Habitat Restoration Monitoring. Annual Project Update – 2021.
- ⁵ Avista. Database for Temperature Monitoring Data Compilation; for more information on this database contact Paul Kusnierz (Paul.Kusnierz@avistacorp.com).
- ⁶ Moran, S. *In prep.* Lower Clark Fork River, Montana – Avista Project Area – 2021 Annual Bull Trout and Brown Trout Redd Survey. Annual Project Update.
- ⁷ Moran, S. 2021. Lower Clark Fork River, Montana – Avista Project Area – 2020 Annual Bull Trout and Brown Trout Redd Survey. Annual Project Update. Avista document identification number 2021-0234.
- ⁸ Neesvig, C. *In prep.* As-Built Monitoring Report – Sims Meander Stream and Floodplain Restoration Project.
- ⁹ USFS. 2021. Water - Temperature - Data Report, WY 2019, Rock Creek at Hwy 200 – Noxon, Montana. Avista document identification number 2021-0291.

- ¹⁰ USFS. 2021. Water - Temperature - Data Report, WY 2021, Bull River @ historic USGS Gaging Station – Noxon, Montana. Avista document identification number 2021-0264.
- ¹¹ USFS. 2021. Water - Temperature - Data Report, WY 2021, East Fork of the Bull River – Noxon, Montana. Avista document identification number 2021-0265.
- ¹² USFS. 2021. Water - Temperature - Data Report, WY 2021, Rock Creek at Hwy 200 – Noxon, Montana. Avista document identification number 2021-0267.
- ¹³ USFS. 2021. Water - Sediment - Temperature - Data Report, WY 2021, Trout Creek at 214 bridge – Trout Creek, Montana. Avista document identification number 2021-0268.
- ¹⁴ USFS. 2021. Water - Sediment - Temperature - Data Report, WY 2021, Vermilion River at red bridge – Trout Creek, Montana. Avista document identification number 2021-0269.
- ¹⁵ USFS. 2021. Water - Temperature - Data Report, WY 2021, Graves Creek at Blue Slide Road – Thompson Falls, Montana. Avista document identification number 2021-0266.
- ¹⁶ Neesvig, C. 2021. Cabinet Ranger District Automated Snow Recording Site 2007–2019 Project Completion Report. Avista document identification number 2021-0293.
- ¹⁷ National Oceanic and Atmospheric Association. 2021. National Operational Hydrologic Remote Sensing Center. Interactive Snow Information. Chicago Ridge. Available: <https://www.nohrsc.noaa.gov/interactive/html/graph.html?ey=2019&em=12&ed=19&units=0&station=CHIM8> (December 2021).
- ¹⁸ Blakney, J. *In prep.* Crow Creek Bull Trout Investigations. Project Completion Report; 2016–2017.
- ¹⁹ Brissette, C. *In prep.* Graves Creek Pilot Habitat Enhancement Project. Two-year, post-runoff technical review of substrate changes.
- ²⁰ Brissette, C. *In prep.* Upper Prospect Creek LWD Project. Two-year, post-runoff technical review of physical habitat and substrate changes.
- ²¹ Olson, B., and J. Blakney. *In prep.* Lower Clark Fork Stream Restoration Summary 1995–2020. Comprehensive Project Report.
- ²² Rossel, C. *In prep.* Mainstem Bull River Reforestation on Forest Service Lands and NEPA Process. Project Completion Report.
- ²³ Oldenburg, E. *In prep.* East Fork Bull River Beaver Management Plan.
- ²⁴ Oldenburg, E. *In prep.* East Fork Bull River Flow Management Assessment and Recommendations.

- ²⁵ Olson, B. 2021. East Fork Bull River Revegetation Plan. Avista document identification number 2021-0238.
- ²⁶ Kreiner, R., J. Blakney, and T. Tholl. 2021. Noxon and Cabinet Gorge Reservoir Fisheries Monitoring. 2017 Annual Project Update. Avista document identification number 2021-0163.
- ²⁷ Blakney, J., R. Kreiner, and T. Tholl. *In prep.* Noxon and Cabinet Gorge Reservoirs Fisheries Monitoring. Annual Project Update 2019.
- ²⁸ Rehm, T., J. Blakney, and T. Tholl. 2021. Noxon Rapids and Cabinet Gorge Reservoirs Fisheries Monitoring. Annual Project Update 2020. Avista document identification number 2021-0260.
- ²⁹ Rehm, T., J. Blakney, and T. Tholl. *In prep.* Noxon and Cabinet Gorge Reservoirs Fisheries Monitoring. Annual Project Update 2021.
- ³⁰ Kusnierz, P., and T. Tholl. 2021. Eurasian Watermilfoil as Fish Habitat. Project Completion Report. Avista document identification number 2021-0113.
- ³¹ Kusnierz, P., and J. Blakney. 2021. Eurasian Watermilfoil, Curlyleaf Pondweed, and Flowering Rush Treatment on Noxon and Cabinet Gorge Reservoirs. Final Environmental Assessment. Online at:
<https://fwp.mt.gov/binaries/content/assets/fwp/news/public-notice/2021/region-1/final-ea-noxon-and-cabinet-gorge-reservoirs-ewm-treatment.pdf>.
- ³² Kusnierz, P. *In prep.* Pilot Project: Treatment of Eurasian Watermilfoil Beds with a Mechanical Harvester. Comprehensive Project Report.
- ³³ Blakney, J., R. Kreiner, J. Dukovic, M. Terrazas, and T. Tholl. *In prep.* Mountain Lake Fisheries Monitoring Project. Comprehensive Project Report: 2016-2020.
- ³⁴ Pinnacle Research and Consulting. 2021. 2021 Clark Fork Recreation Site Visitation. Avista document identification number 2021-0248.
- ³⁵ Avista. 2021. Email exchange between Sean Moran and contractor describing design and materials for Thompson Falls State Park Boat Ramp Extension. Avista document identification number 2021-0278.
- ³⁶ Drumheller, S., T. Rehm, and K. McMahon. 2021. Managing Aquatic Invasive Plants on Noxon and Cabinet Gorge Reservoirs. Annual Project Update 2021. Avista document identification number 2021-0270.

- ³⁷ Kusnierz, P. 2021. 2021 Dreissenid Mussel Sampling on Noxon and Cabinet Gorge Reservoirs. Memorandum to Travis Rehm and Jason Blakney, September 16, 2021. Avista document identification number 2021-0183.
- ³⁸ Avista. 2021. Clark Fork Settlement Agreement Management Committee Meeting Minutes from March 17, 2021 (virtual meeting). Avista document identification number 2021-0067.
- ³⁹ Avista. 2021. Consent Mail approval of appendices B and K – Acquisition of 342-acre parcel along Graves Creek (April 20, 2021). Avista document identification number 2021-0104.

6.3 Fish Passage/Native Salmonid Restoration Plan (License Article 406 – CFSA Appendix C)

6.3.1 Purpose and Resource Benefit

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 the resource benefit is “to increase the long-term population viability of native Salmonids in the Lake Pend Oreille (LPO)-lower Clark Fork River system” (FERC License Article 406). This goal is accomplished through the aggressive implementation of the Clark Fork River Native Salmonid Restoration Plan (NSRP).

6.3.2 2021 Annual Implementation Plan Project Plans

Annual Operations

- Upstream Fish Passage Program
 - ***Variance*** ^{1, 2, 3, 4, 5, 6, 7, 8}; see Section 6.3.4
- Graves Creek and East Fork Bull River Genetic Study
 - ***Variance*** ^{1, 9}; see Section 6.3.4
- Tributary Trapping and Downstream Juvenile Bull Trout Transport Program
 - ***Variance*** ^{1, 10, 11}; see Section 6.3.4
- PIT-Monitoring Station Operation and Maintenance
 - ***Completed per 2021 AIP*** ¹
- Bull Trout Emigration Study
 - ***Completed per 2021 AIP*** ^{1, 12}
- Non-Native Fish Suppression Project in the East Fork Bull River
 - ***Variance*** ^{1, 13}; see Section 6.3.4
- Evaluation of Potential Actions for Reducing Non-native Threats to Native Salmonid Populations
 - ***Variance*** ^{1, 14}; see Section 6.3.4

Facilities

- Fish Capture Facilities Operation, Development, and Testing
 - ***Variance*** ^{1, 15, 16, 17, 18, 19, 20, 21}; see Section 6.3.4
- Graves Creek Permanent Weir Trap Enhancements
 - ***Variance*** ^{1, 22, 23}; see Section 6.3.4

6.3.3 Other 2021 Activities

- September 21, 2021 MC meeting approval of the purchase of five three-foot circular antennas, the Cabinet Gorge Dam Fish Passage Facility decision-making subgroup and fall electrofishing in the East Fork Bull River (CFSA Appendix C and F5; approved on September 21, 2021).
 - *Completed*^{1, 16}
- November 30, 2021 request for approval Appendix C – Cabinet Gorge Fish Passage Facility Monitoring and Evaluation Plan, and Additional Funds for Fish Handling Facility Upgrades (CFSA Appendix C; approved on December 20, 2021).
 - *Completed per Consent Mail*^{1, 17}

6.3.4 Projects with Significant Variances

Project Plan	Variances
Upstream Fish Passage Program	<p>Cabinet Gorge Hatchery settling pond water was used to supplement the fish ladder trap during September due to limited spring water availability.</p> <p>The Comprehensive Project Report was not completed. This report will be completed in 2022 and will include data from 2020 and 2021 to provide a comprehensive summary of fish capture efforts downstream of Cabinet Gorge Dam prior to operation of the CGDF.</p> <p>The Clark Fork River Westslope Cutthroat Trout Experimental Transport Program Comprehensive Project Report was due in July and was finalized in December as additional statistical analysis was needed.</p>
Graves Creek and East Fork Bull River Genetic Study	The Project Completion Report was due in October and finalized in December.
Tributary Trapping and Downstream Juvenile Bull Trout Transport Program	The Comprehensive Project Report including a Graves Creek Monitoring and Evaluation Plan report (appendix within the former) was not completed. This report will be completed by July of 2022 and include data from 2021. The Graves Creek permanent weir trap Monitoring and Evaluation (M&E) Plan was not updated during 2021 due to delays in finishing enhancements to the Graves Creek permanent weir trap. This will be completed during 2022.

Project Plan	Variances
Non-Native Fish Suppression Project in the East Fork Bull River	The Non-Native Fish Suppression Project in the East Fork Bull River Drainage, Montana: 2007–2020 Project Completion Report, was not completed in 2021. Greater than 450 population estimates from monitoring electrofishing are currently being re-run to ensure standardized estimates are consistent with those in the State of Montana database. These estimates will be incorporated into the report. The report will be finalized by September 1, 2022.
Evaluation of Potential Actions for Reducing Non-native Threats to Native Salmonid Populations	A draft of this work product including compilation of past data and listing and evaluating potential actions was completed and reviewed in 2021. This work product will be finalized in early 2022.
Fish Capture Facilities Operation, Development, and Testing	<p>A consent mail approving the Cabinet Gorge Dam Fish Passage Facility Monitoring and Evaluation Plan and additional funds for construction of the modifications to the Fish Handling Facility was approved by the MC in December.</p> <p>As-built drawings for the Fish Handling Facility were not received by the end of 2021. This was due to a change order at the end of the project requesting installation of an exhaust fan in the control room that needs to be added to the drawings. As-built drawings are expected in early 2022.</p>
Graves Creek Permanent Weir Trap Enhancements	Construction was delayed and the trap did not start fishing until November 3. This precluded the completion of the revegetation site plan and as-built drawings which were due October 1 and November 1, respectively. Both documents are now scheduled to be complete by March 1, 2022.

6.3.5 Key 2021 References

- ¹ Bernall, S., E. Oldenburg, and S. Moran. 2021. Fish Passage/Native Salmonid Restoration Plan Appendix C, 2021 Annual Work Summary. Avista document identification number 2021-0282.
- ² Bernall, S., K. Duffy, and J. Johnson. *In prep.* Upstream Fish Passage Program. Comprehensive Project Report (2001–2021).
- ³ Bernall, S., J. Johnson, and P. Kusnierz. 2021. Clark Fork River Westslope Cutthroat Trout Experimental Transport Program. Comprehensive Project Report 2015–2018. Avista document identification number 2021-0257.

- ⁴ Adams, B., M. Piteo, and J. VonBargen. 2021. Genetic Analysis of Native Salmonids from the Lake Pend Oreille and Clark Fork River System, Idaho and Montana. Annual Project Update CY2020. Avista document identification number 2021-0224.
- ⁵ Adams, B., M. Piteo, and J. VonBargen. *In prep.* Genetic Analysis of Native Salmonids from the Lake Pend Oreille and Clark Fork River System, Idaho and Montana. Annual Project Update CY2021.
- ⁶ Sprague, L. 2021. Survey for Selected Fish Pathogens in the Lower Clark Fork River and Lake Pend Oreille in Idaho. Annual Project Update – 2020. Avista document identification number 2021-0047.
- ⁷ Sprague, L. *In prep.* Survey for Selected Fish Pathogens in the Lower Clark Fork River and Lake Pend Oreille in Idaho. Annual Project Update – 2021.
- ⁸ Avista. Passive Integrated Transponder (PIT) Tag Database; for more information on this database contact Shana Bernall (Shana.Bernall@avistacorp.com).
- ⁹ Adams, B., and S. Bernall. 2021. Bull Trout Parentage Analysis in the East Fork Bull River and Graves Creek Drainage, Montana. Project Completion Report. Avista document identification number 2021-0271.
- ¹⁰ Oldenburg, E. W. *In prep.* Tributary Trapping and Downstream Juvenile Bull Trout Transport Program. Comprehensive Project Report - 2018–2021 (includes Graves Creek permanent weir trap monitoring and evaluation plan report as an appendix).
- ¹¹ Avista. Database for Temperature Monitoring Data Compilation; for more information on this database contact Paul Kusnierz (Paul.Kusnierz@avistacorp.com).
- ¹² Lewis, M. C. 2021. Out-migration dynamics of juvenile adfluvial Bull Trout in tributaries to the lower Clark Fork River, Montana. Master’s Thesis. Montana State University, Bozeman. Avista document identification number 2021-0239.
- ¹³ Moran, S., P. Kusnierz, and J. Storaasli. *In prep.* Non-native Fish Suppression Project in the East Fork Bull River Drainage, Montana; 2007–2020. Project Completion Report.
- ¹⁴ Blakney, J., K. Aceituno, and S. Moran. *In prep.* Evaluation of Potential Actions for Reducing Non-native Threats to Native Salmonid Populations.
- ¹⁵ Avista. 2021. Clark Fork Settlement Agreement Management Committee Meeting Minutes from March 17, 2021 (virtual meeting). Avista document identification number 2021-0067.

- ¹⁶ Avista. 2021. 2021 Annual Fall Management Committee Meeting, Clark Fork Management Committee Meeting Agenda, and Clark Fork Settlement Agreement Management Committee Meeting Record from September 21, 2021(virtual meeting). Avista document identification number 2021-0218.
- ¹⁷ Avista. 2021. Consent Mail approval of Appendix C – Cabinet Gorge Fish Passage Facility Monitoring and Evaluation Plan and Additional Funds for Fish Handling Facility Upgrades (November 30, 2021). Avista document identification number 2021-0229.
- ¹⁸ Avista. 2021. E-mail correspondence providing the MC quarterly updates on the progress of the Cabinet Gorge Dam Fishway construction project. Avista document identification number 2021-0259.
- ¹⁹ Bernall, S., K. Aceituno, K. Bouwens, T. Rehm, J. Maroney, and E. Oldenburg. 2021. Cabinet Gorge Dam Fish Passage Facility Monitoring and Evaluation Plan. Avista document identification number 2021-0251.
- ²⁰ Avista. 2021. E-mail correspondence providing final update on the dewatering of the Cabinet Gorge Dam Fishway structure and fish salvage efforts. Avista document identification number 2021-0256.
- ²¹ Koesel, K. *In prep.* Cabinet Gorge Fish Handling Facility as-built drawings.
- ²² Olson, B. *In prep.* Graves Creek permanent weir trap site revegetation plan.
- ²³ Johnson, B. *In prep.* Graves Creek permanent weir trap enhancement as-built drawings.

6.4 Bull Trout Protection and Public Education Project (License Article 407 – CFSA Appendix D)

6.4.1 Purpose and Resource Benefit

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 project will increase the numbers and population viability of Bull Trout by reducing intentional and incidental illegal harvest. In addition, the project increases public awareness on Bull Trout life history, habitat needs, identifying characteristics, and the potential for adverse impacts due to land use and other human activities.

6.4.2 2021 Annual Implementation Plan Project Plans

- Idaho Bull Trout Protection and Education Officer Support
 - *Variance^{1, 2}; see Section 6.4.4*
- Montana Bull Trout Education and Communication Support
 - *Variance¹; see Section 6.4.4*
- Montana Bull Trout Education Outreach Support
 - *Variance¹; see Section 6.4.4*
- Montana Game Warden Support
 - *Variance¹; see Section 6.4.4*
- Trout Unlimited Outreach Coordination
 - *Variance^{1, 2}; see Section 6.4.4*
- Pend Oreille Water Festival
 - *Variance¹; see Section 6.4.4*

6.4.3 Other 2021 Activities

- December 28, 2020 Appendix F5 and Appendix D – Idaho Bull Trout and Protection and Education Officer Funding and Idaho Native Fisheries Education Trailer Funding Request. (CFSA Appendix F5; approved January 21, 2021).
 - *Variance^{1, 2}; see Section 6.4.4*

6.4.4 Projects with Significant Variances

Project Plan	Variances
Idaho Bull Trout Protection and Education Officer Support	COVID-19 impacted the number of patrols and angler contacts and resulted in the cancellation of outreach at field trips and events in early 2021. Lake Patrol boat motor mechanical problems resulted in fewer LPO patrols in late-summer and fall 2021. This motor is scheduled to be replaced in 2022. The small sign in the IDFG office was not upgraded; this sign will be upgraded in 2022.
Montana Bull Trout Education and Communication Support	Outreach efforts for Sanders County did not include television. Due to increased cost and more ads being aired than planned, the radio ad budget saw an overage of \$735. The social media budget of \$1,500 was reduced to \$1,000 to help make up the overage, with MFWP contributing the balance. The on-line Bull Trout identification test has not yet been released to the public; it is anticipated that this test will be available in early 2022.
Montana Bull Trout Education Outreach Support	Due to COVID-19 restrictions, the amount of classroom visits was limited at the beginning of the year and the two Kid's Fishing Days were cancelled. No improvements to the Bull Trout Trailer were made in 2021, and a "Bull Trout Country" sign was not posted along the Bull River. However, a small "Bull Trout Country" sign was posted on the West Fork Thompson River.
Montana Game Warden Support	Due to MFWP Warden staffing and COVID-19 concerns, no adjustments were made to the MFWP summary of interim law enforcement actions. Angler contact and outreach, as well as cooperation with IDFG in shared patrols was limited due to COVID-19 restrictions. Restaffing and training of the new area Warden and part time patrol coverage prior to this restaffing reduced patrols to one-to-three times per week. The limited staffing also resulted in the dropping of remote surveillance and dedicated monitoring for "swimming hole" type dams.
Trout Unlimited Outreach Coordination	No new online curriculum was created in 2021. The Panhandle Chapter of Trout Unlimited Coordinator will be working with the IDFG Bull Trout Officer in 2022 to create a streamlined online Bull Trout educational platform.
Pend Oreille Water Festival	Due to COVID-19 protocols and restrictions, the number of schools that allowed in-classroom lessons was reduced from eleven to four, and a shorter school day resulted in four as opposed to six Water Festival educational stations.
Idaho Native Fisheries Education Trailer	The Native Fisheries Education Trailer has yet to be incorporated into outreach plans as delivery from the manufacturer was delayed.

6.4.5 Key 2021 References

- ¹ Masin, D., D. Tabish, A. Maddigan, M. Post, T. Johnson, L. Bayless Chase, and G. Bolin. 2021. Bull Trout Protection and Public Education Project (Appendix D). 2021 Annual Work Summary. Avista document identification number 2021-0261.
- ² Avista. 2020. Consent Mail approval of Appendix F5 and Appendix D – Idaho Bull Trout and Protection and Education Officer Funding and Idaho Native Fisheries Education Trailer Funding Request. Avista document identification number 2020-0297.

6.5 Watershed Councils Program (License Article 408 – CFSA Appendix E)

6.5.1 Purpose and Resource Benefit

The purpose of this program is to facilitate the protection and restoration of tributary stream habitat in the Lake Pend Oreille (LPO)-lower Clark Fork River watershed. This will improve conditions for aquatic life, including macroinvertebrate communities and native fish species (Bull Trout, Westslope Cutthroat Trout, and Mountain Whitefish). The associated protection and enhancement of tributary streams and the aquatic life inhabiting them will serve as mitigation and resource enhancements to offset impacts to aquatic life due to continued power peaking operation of the Cabinet Gorge and Noxon Rapids projects.

6.5.2 2021 Annual Implementation Plan Project Plans

- Pack River Watershed Council, Bonner Soil and Water Conservation District
 - *Completed per 2021 AIP*^{1, 2, 3}
- Lower Clark Fork Watershed Council Projects
 - *Variance*^{1, 4}; see Section 6.5.3

6.5.3 Projects with Significant Variances

Project Plan	Variances
Lower Clark Fork Watershed Council Projects	A fourth quarter meeting was not held in December, as the Lower Clark Fork Watershed Group (LCFWG) is transitioning away from quarterly meetings to a biannual meeting structure.

6.5.4 Key 2021 References

¹ Garcia, S., J. Erickson, and B. Olson. 2021. Watershed Councils Program (Appendix E). 2021 Annual Work Summary. Avista document identification number 2021-0262.

² Pack River Watershed Council. 2021. The River Ranger. Volume 13, Issue 1. Avista document identification number 2021-0263.

³ Erickson, J., and S. Garcia. 2021. Public webpage for the Pack River Watershed Council. www.bonnerswcd.org/pack-river-watershed-council (December 2021).

⁴ Olson, B. 2021. Public webpage for the Lower Clark Fork Watershed Group. <https://lowerclarkforkwatershedgroup.org/> (December 2021).

6.6 Clark Fork River Water Quality Monitoring Program (License Article 409 – CFSA Appendix F1)

6.6.1 Purpose and Resource Benefit

The purpose of this program is to provide for the systematic, long-term water quality monitoring of nutrients and metals in the Avista project area. Excessive nutrient loading and metals represent high-priority water quality concerns in the LPO-lower Clark Fork River system. Resource benefits are accomplished through providing valuable information on trends in water quality associated with the project and their reported role as nutrient and/or metals retention “sinks.”

6.6.2 2021 Annual Implementation Plan Project Plans

- Clark Fork River Water Quality Monitoring Program
 - *Completed per 2021 AIP*^{1, 2, 3, 4, 5}

6.6.3 Key 2021 References

¹ Kusnierz, P. 2021. Clark Fork River Water Quality Monitoring Program Appendix F1 2021. Annual Work Summary. Avista document identification number 2021-0274.

² Osborne, L. 2021. Estimate of 2020 nutrient loads from the Clark Fork River into Lake Pend Oreille. Avista documentation identification number 2021-0069.

³ Clark Fork Coalition. 2021. Annual water quality and benthic algae monitoring results for the Clark Fork River basin 2020. Avista document identification number 2021-0217.

⁴ Osborne, L. *In prep.* Estimate of 2021 nutrient loads from the Clark Fork River into Lake Pend Oreille.

⁵ Clark Fork Coalition. *In prep.* Annual water quality and benthic algae monitoring results for the Clark Fork River basin 2021.

6.7 Monitoring of Noxon Reservoir Stratification and Mobilization of Sediment Nutrients/Metals (License Article 410 – CFSA Appendix F2)

6.7.1 Purpose and Resource Benefit

The purpose of this measure is to provide for monitoring of Noxon Reservoir during periods when reservoir stratification is possible. If the reservoir stratifies, the program will intensify monitoring of nutrient and metals levels. Resource benefits are accomplished through providing a better understanding of whether nutrients and/or metals in the reservoir sediments are released into the water during periods of low flow and/or high water temperature.

6.7.2 2021 Annual Implementation Plan Project Plans

- Monitoring of Noxon Reservoir Stratification and Mobilization of Sediment Nutrients/Metals
 - *Completed per 2021 AIP*^{1, 2, 3}

6.7.3 Key 2021 References

¹ Kusnierz, P. 2021. Monitoring of Noxon Reservoir Stratification and Mobilization of Sediment Nutrients/Metals Appendix F2 2021. Annual Work Summary. Avista document identification number 2021-0275.

² U.S. Geological Survey. 2021. National Water Information System. 12389000 Clark Fork near Plains MT. Available:
https://nwis.waterdata.usgs.gov/mt/nwis/uv?cb_00060=on&cb_00065=on&format=gif_default&site_no=12389000&period=&begin_date=2021-07-01&end_date=2021-09-30
(November 2021).

³ HydroSolutions. *In prep*. Monitoring of Noxon Reservoir Stratification and Mobilization of Sediment Nutrients/Metals.

6.8 Aquatic Organism Tissue Analysis (License Article 411 – CFSA Appendix F3)

6.8.1 Purpose and Resource Benefit

The purpose of this PM&E measure is to ensure that resources are available to monitor aquatic organisms for the presence of heavy metals and/or other substances of concern. It provides funding to collect fish and other aquatic organism tissue samples. These samples are analyzed to determine the presence of heavy metals or other substances. Resource benefits are accomplished through providing information that can be used to develop and refine fish consumption advisories.

6.8.2 2021 Annual Implementation Plan Project Plans

- Noxon and Cabinet Gorge Reservoirs Fish Mercury Study.
 - *Completed per 2021 AIP*^{1, 2, 3, 4}

6.8.3 Key 2021 References

¹ Kusnierz, P. 2021. Aquatic Organism Tissue Analysis Appendix F3 2021. Annual Work Summary. Avista document identification number 2021-0276.

² MFWP. *In prep.* Lab report on fish tissue analysis.

³ MFWP. *In prep.* Comprehensive Project Report.

⁴ MFWP. *In prep.* Montana fish consumption guidelines.

6.9 Water Quality Protection and Monitoring Plan for Maintenance, Construction and Emergency Activities (License Article 412 – CFSA Appendix F4)

6.9.1 Purpose and Resource Benefit

The purpose of this PM&E measure is to develop and implement a plan that minimizes the impact of project-related maintenance, construction, and emergency activities to the LPO-lower Clark Fork River water quality. The Water Quality Protection and Monitoring Plan for Maintenance, Construction, and Emergency Activities at the Cabinet Gorge and Noxon Rapids Hydroelectric Developments (HED) was developed in 2002 and updated in 2011. The resource benefit is accomplished through water quality, resource protection, and monitoring actions that will be implemented in the event of unforeseen and sudden changes to project operations due to emergencies.

6.9.2 2021 Annual Implementation Plan Project Plans

- Water Quality Protection and Monitoring Plan for Maintenance, Construction, and Emergency Activities
 - *Completed per 2021 AIP*^{1, 2, 3, 4, 5}

6.9.3 Key 2021 References

¹ Oldenburg, E. W. 2021. Water Quality Protection and Monitoring Plan for Maintenance, Construction, and Emergency Activities 2021 Annual Work Summary. Avista document identification number 2021-0289.

² Avista. 2021. Email exchange between Eric Oldenburg and Steve Lentini regarding compliance with General Operating Limits and 2021 operations. Avista document identification number 2021-0272.

³ Avista. 2010. Water Quality Protection and Monitoring Plan for Maintenance, Construction and Emergency Activities. Avista document identification number 2011-0140.

⁴ Avista. 2021. Designated contacts for notification purposes under the Water Quality Protection and Monitoring Plan (December 2021). Avista document identification number 2021-0236.

⁵ Avista. 2021. Memoranda and associated information pertaining to deviations from the Cabinet Gorge Dam General Operating Limit for minimum flow in association with Cabinet Gorge Dam Fishway construction and implementation of the Appendix F4 Water Quality Protection and Monitoring Plan. Avista document identification number 2021-0237.

6.10 Dissolved Gas Supersaturation Control, Mitigation, and Monitoring (License Article 413 – CFSA Appendix F5)

6.10.1 Purpose and Resource Benefit

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 LPO-lower Clark Fork River system related to spill at the Clark Fork Projects. Resource benefits are accomplished through reducing total dissolved gas (TDG) and mitigating for the potential effects of excess TDG on fish in the Clark Fork River downstream of Cabinet Gorge Dam and in LPO.

6.10.2 2021 Annual Implementation Plan Project Plans

Operations

- Operations
 - *Completed per 2021 AIP^{1, 2}*

TDG Monitoring

- Total Dissolved Gas Monitoring
 - *Completed per 2021 AIP^{1, 2, 3}*

TDG Mitigation and Monitoring Program

- Project Scoping Allocation
 - *Completed per 2021 AIP¹*
- Analysis of Gas Bubble Disease Monitoring Data
 - *Completed per 2021 AIP^{1, 4}*
- Lake Pend Oreille Experimental Walleye Angler Incentive Program
 - *Completed per 2021 AIP^{1, 5, 6}*
- Lake Pend Oreille/Clark Fork River Walleye Population Assessment
 - *Completed per 2021 AIP^{1, 5, 6}*
- Lake Pend Oreille Lake Trout Angler Incentive Program
 - *Completed per 2021 AIP^{1, 5, 6}*
- Lake Pend Oreille Lake Trout Netting Program
 - *Completed per 2021 AIP^{1, 5, 6}*
- Demography of Adfluvial Bull Trout in Lake Pend Oreille
 - *Variance^{1, 7}; see Section 6.10.4*

- Lake Pend Oreille Bull Trout Survival Study
 - *Completed per 2021 AIP*^{1, 8}
- Lake Pend Oreille Bull Trout Population Monitoring and Evaluation
 - *Variance*¹; see Section 6.10.4
- Lake Pend Oreille Nearshore Index Netting
 - *Completed per 2021 AIP*^{1, 9}
- Box Canyon Reservoir Northern Pike Suppression
 - *Completed per 2021 AIP*^{1, 10, 11}
- Trophic Monitoring in Lake Pend Oreille and Pend Oreille River Idaho
 - *Variance*¹; see Section 6.10.4
- Temperature Monitoring Data Compilation
 - *Variance*^{1, 3, 12}; see Section 6.10.4
- Walleye Geochemistry Study
 - *Variance*^{1, 13}; see Section 6.10.4
- Priest River Coldwater Bypass Limnology Assessment
 - *Completed per 2021 AIP*^{1, 3, 14}
- Idaho Protection and Education Officer Support
 - *Variance*^{1, 15}; see Section 6.10.4
- Lake Pend Oreille Tributary PIT-Monitoring Station Installation
 - *Variance*¹; see Section 6.10.4
- Lake Pend Oreille Tributary PIT-Monitoring Station Operation and Maintenance
 - *Variance*^{1, 3}; see Section 6.10.4
- Clark Fork River Population Monitoring
 - *Variance*^{1, 16, 17}; see Section 6.10.4
- Lower Clark Fork River PIT-Monitoring Station
 - *Completed per 2021 AIP*^{1, 18}
- Lightning Creek Delta Connectivity Project
 - *Completed per 2021 AIP*^{1, 19}

GSCP Alternative

- Gas Supersaturation Control Program Total Dissolved Gas Abatement
 - *Completed per 2021 AIP*¹

6.10.3 Other 2021 Activities

- December 28, 2020 Appendix F5 and Appendix D – Idaho Bull Trout and Protection and Education Officer Funding and Idaho Native Fisheries Education Trailer Funding Request (CFSA Appendix F5; approved January 21, 2021).
 - *Variance*^{1, 15}; see Section 6.10.4
- June 8, 2021 request for approval for additional funding for the Temperature Monitoring Data Compilation Project (CFSA Appendix F5; approved on June 23, 2021).
 - *Completed per Consent Mail*^{1, 12}
- September 21, 2021 MC meeting approval of the purchase of five three-foot circular antennas, the Cabinet Gorge Dam Fish Passage Facility decision-making subgroup and fall electrofishing in the East Fork Bull River (CFSA Appendix C and F5; approved on September 21, 2021).
 - *Completed*^{1, 18}

6.10.4 Projects with Significant Variances

Project Plan	Variances
Demography of Adfluvial Bull Trout in Lake Pend Oreille	<p>The IDFG Project Completion Report was not completed in 2021. The new due date is August 1, 2022.</p> <p>The IDFG submission of model and results in a peer-reviewed journal did not occur in 2021. The new submission date is December 1, 2022.</p>
Lake Pend Oreille Bull Trout Population Monitoring and Evaluation	<p>The Bull Trout integrated population model is being developed as part of the “Demography of Adfluvial Bull Trout in Lake Pend Oreille” project plan. It is not complete and therefore was not updated and run in 2021. As a result, an annual project update will not be developed for 2021.</p>
Trophic Monitoring in Lake Pend Oreille and Pend Oreille River Idaho	<p>All data met data quality objectives outlined in the Idaho Department of Environmental Quality quality assurance project plan, except for total nitrogen in a field blank and dissolved total phosphorus in a source water blank. Both samples were delivered to the lab in September. These samples are being rerun and quality assurance discussions with the lab will follow.</p> <p>Due to safety issues, the Albeni Falls forebay station in the Pend Oreille River was replaced with Bottle Bay.</p>

Project Plan	Variances
Temperature Monitoring Data Compilation	<p>Due to substantial and unanticipated effort required to prepare data for entry into the temperature database, a consent mail for \$10,000 to facilitate the completion of data entry was sent to the Management Committee on June 8, 2021. It was approved on June 23, 2021.</p> <p>Temperature monitoring did not occur on Granite or Gold creeks in 2021.</p>
Walleye Geochemistry Study	<p>This work is ongoing; thus, the Project Completion Report (or manuscript for publication) have not yet been completed (due July 1, 2021). Mainstem Fish Research and Pacific Northwest National Laboratory did submit a “status report” in June of 2021. The final report is now planned to be complete by July 1, 2022.</p>
Idaho Protection and Education Officer Support	<p>Contacts made by IDFG during fishing and tributary patrols were decreased due to COVID-19 restrictions still in effect during the spring of 2021.</p>
Lake Pend Oreille Tributary PIT-Monitoring Station Installation	<p>The Gold Creek antenna was not installed in 2021 due to access and power issues. Plans are being finalized for installation in 2022.</p> <p>In October, we learned the systems installed in Granite and Trestle creeks in August were not detecting half-duplex PIT tags, which most of the tagged Bull Trout in Idaho carry. It was determined that this was a hardware issue, and the problem was not rectified by BioMark until December, missing the entire fall migration.</p>
Lake Pend Oreille Tributary PIT-Monitoring Station Operation and Maintenance	<p>Temperature data were not collected at the Granite Creek PIT antenna because a temperature logger was not deployed there in 2021. Temperature data were not collected at the South Gold Creek PIT antenna because it was not installed in 2021.</p>
Clark Fork River Population Monitoring	<p>The IDFG Comprehensive Project Report: Lower Clark Fork River Population Monitoring (through 2018), due November 1, 2021 was not completed. The new due date will be November 1, 2022 and the report will include data through 2021.</p> <p>A 2018 Annual Project Update for this project was never produced. As a result, the 2021 Annual Project Update and its title was modified to include the 2018 data. It is anticipated to be completed in 2022.</p>
Idaho Native Fisheries Education Trailer	<p>The Native Fisheries Education Trailer has yet to be incorporated into outreach plans as delivery from the manufacturer was delayed.</p>

6.10.5 Key 2021 References

- ¹ Bouwens, K., D. Masin, A. Ransom, P. Kusnierz, E. Oldenburg, S. Bernall, S. Harvey, N. Bean, and K. Lowell. 2021. Dissolved Gas Supersaturation Control, Mitigation, and Monitoring Appendix F5 2021. Annual Work Summary. Avista document identification number 2021-0288.
- ² Kusnierz, P. 2021. Total Dissolved Gas Monitoring 2021 Cabinet Gorge and Noxon Rapids Dams. Memorandum to the Gas Supersaturation Subcommittee, August 30, 2021. Avista document identification number 2021-0167.
- ³ Avista. Database for Temperature Monitoring Data Compilation; for more information on this database contact Paul Kusnierz (Paul.Kusnierz@avistacorp.com).
- ⁴ Kusnierz, P. *In prep.* Analysis of gas bubble disease monitoring data. Annual Project Update – 2021.
- ⁵ Bouwens, K. A., J. Strait, P. Rust, R. Ryan, A. L. Ransom, and R. Jakubowski. 2021. 2020 Lake Pend Oreille Predator Management Program. Annual Project Update. Avista document identification number 2021-0074.
- ⁶ Bouwens, K. A., J. Strait, P. Rust, R. Ryan, A. L. Ransom, and R. Jakubowski. *In prep.* 2021 Lake Pend Oreille Predator Management Program. Annual Project Update.
- ⁷ Mucciarone, N. G., M. P. Corsi, J. L. McCormick, E. Roche, K. A. Bouwens, and P. Kusnierz. *In prep.* Demography of adfluvial Bull Trout in Lake Pend Oreille, Idaho. Project Completion Report.
- ⁸ Ransom, A. L., S. Frawley, R. Jakubowski, and K. A. Bouwens. 2021. 2011–2019 Lake Pend Oreille Bull Trout Survival Study. Project Completion Report. Avista document identification number 2021-0161.
- ⁹ Ransom, A. L., K. A. Bouwens, and R. Jakubowski. 2021. 2019 Lake Pend Oreille Nearshore Index Netting Survey. Project Completion Report. Avista document identification number 2021-0068.
- ¹⁰ Harvey, S., and N. Bean. 2021. Box Canyon Reservoir Northern Pike Suppression Project. Annual Project Update – 2021. Avista document identification number 2021-0232.
- ¹¹ Bean, N., and S. Harvey. 2021. Box Canyon Reservoir Northern Pike Suppression Project. Comprehensive Report. Reporting period: 2012–2021. Avista document identification number 2021-0233.
- ¹² Avista. 2021. Consent Mail approval of Appendix F5 – Additional funding for the Temperature Monitoring Data Compilation Project (June 8, 2021). Avista document identification number 2021-0133.

- ¹³ Mainstem Fish Research and Pacific Northwest National Laboratory. *In prep.* Walleye Geochemistry Study. Project Completion Report or manuscript for publication.
- ¹⁴ Brandt, D., R. Pieters, and G. Lawrence. 2021. Limnological Threat Assessment – Priest Lake Water Release System. Avista document identification number 2021-0230.
- ¹⁵ Avista. 2020. Consent Mail approval of Appendix F5 and Appendix D – Idaho Bull Trout and Protection and Education Officer Funding and Idaho Native Fisheries Education Trailer Funding Request. Avista document identification number 2020-0297.
- ¹⁶ Bouwens, K. A., A. L. Ransom, and R. Jakubowski. *In prep.* Lower Clark Fork River Population Monitoring (through 2021). Comprehensive Project Report.
- ¹⁷ Ransom, A. L. *In prep.* 2018 and 2021 Lower Clark Fork River Population Monitoring. Annual Project Update.
- ¹⁸ Avista. 2021. 2021 Annual Fall Management Committee Meeting, Clark Fork Management Committee Meeting Agenda, and Clark Fork Settlement Agreement Management Committee Meeting Record from September 21, 2021 (virtual meeting). Avista document identification number 2021-0218.
- ¹⁹ McFall, J. 2021. Lightning Creek Concept Review Meeting Summary, Preliminary Costs, and 30% Conceptual Plan. Avista document identification number 2021-0215.

6.11 Project Operations Package (License Article 429/430/431 – CFSA Appendix T)

6.11.1 Purpose and Resource Benefit

The purpose of this PM&E measure package is to mitigate for the impacts of maintaining flexibility of project operations. This is to be accomplished by implementing measures that enhance native salmonids and provide recreational fishery opportunities. Most of these implementation measures are addressed in other sections of this report; they primarily concern PM&E measures identified in CFSA appendices A, B, D, and E.

The Project Operations Package also establishes general operating limits for the Clark Fork Project and requires Avista to communicate to Albeni Falls, a downstream U.S. Army Corps of Engineers project, forecasts of daily discharge from Cabinet Gorge Dam.

6.11.2 2021 Annual Implementation Plan Project Plans

- Project Operations and Coordination
 - **Completed per 2021 AIP** ^{1, 2, 3, 4, 5, 6, 7, 8, 9}
- Cabinet Gorge Fish Hatchery Spring Water Collection System Upgrade
 - **Variance** ^{1, 10}; see Section 6.11.3
- Clark Fork River (Derr Island) Boating Access Site Improvement
 - **Variance** ¹; see Section 6.11.3

6.11.3 Projects with Significant Variances

Project Plan	Variances
Cabinet Gorge Fish Hatchery Spring Water Collection System Upgrade	The proposed cost of developing the wet well exceeded the budget and the decision was made to not move forward with that task. The project team decided to obtain more information on bedrock at the project site prior to moving forward with final design and construction of an improved spring collection system. Bid-ready design and as-built drawings were not completed in 2021 due to the bedrock investigation.
Clark Fork River (Derr Island) Boating Access Site Improvement	All components of this project were completed in 2021 with the exception of the parking area construction and associated prep work. This will be completed during 2022.

6.11.4 Key 2021 References

- ¹ Oldenburg, E., S. Bernall, and K. Bouwens. 2021. Appendix T 2021 Annual Work Summary. Avista document identification number 2021-0290.
- ² U.S. Geological Survey. 2021. National Water Information System. 12391950 Clark Fork River below Cabinet Gorge Dam ID. Available: [USGS Current Conditions for USGS 12391950 CLARK FORK RIVER BELOW CABINET GORGE DAM ID](#) (December 2021).
- ³ Avista. 2010. Water Quality Protection and Monitoring Plan for Maintenance, Construction and Emergency Activities. Avista document identification number 2011-0140.
- ⁴ FERC. 2019. Order Amending License and Approving Exhibits A and F (August 8, 2019). Avista document identification number 2019-0175.
- ⁵ Avista. 2017. Letter outlining the one-time Avista funding commitment to CFSA Appendix T. Avista document identification number 2017-0432.
- ⁶ FERC. 2017. Order amending minimum flow pursuant to Article 429. Avista document identification number 2017-0382.
- ⁷ Avista. 2022. Email exchange between Eric Oldenburg and Steve Lentini regarding communications with the U.S. Army Corps of Engineers at Albeni Falls. Avista document identification number 2022-0001.
- ⁸ Avista. 2021. Email exchange between Eric Oldenburg and Steve Lentini regarding compliance with General Operating Limits and 2021 operations. Avista document identification number 2021-0272.
- ⁹ Avista. 2021. Memoranda and associated information pertaining to deviations from the Cabinet Gorge Dam minimum flow General Operating Limit associated with Cabinet Gorge Dam Fishway construction and implementation of the Appendix F4 Water Quality Protection and Monitoring Plan. Avista document identification number 2021-0237.
- ¹⁰ RivHab and WET (Water and Environmental Technologies). 2021. Subsurface investigation and monitoring well installation, summary of results, Investigative Work: August 3 – August 13, 2021. Avista document identification number 2021-0231.

Section 7: Terrestrial Resources PM&E Measures Implementation Efforts

7.1 Implementation of Land Use Management Plan (License Article 414 – CFSA Appendix G)

7.1.1 Purpose and Resource Benefit

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 the implementation of the Land Use Management Plan (LUMP). Avista project lands are managed to protect these qualities while still allowing for reasonable public access and other compatible uses.

7.1.2 2021 Annual Implementation Plan Project Plans

Administration of the Land Use Management Plan (LUMP)

- Continue to implement the Private Recreation Permit Program.
 - *Completed per 2021 AIP ¹*
- Continue to address property ownership/trespass issues as they arise.
 - *Completed per 2021 AIP ¹*
- Continue to process requests for leases/easements of Avista Project property.
 - *Completed per 2021 AIP ¹*
- If a request is received, review and process Rock Creek Mine request to place discharge pipe across Project lands.
 - *Completed per 2021 AIP ¹*
- 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.
 - *Completed per 2021 AIP ¹*
- Continue implementation of the Pesticide and Herbicide Use Plan in consultation with the MC.
 - *Completed per 2021 AIP ¹*
- The Land Use Subgroup and other interested parties will complete the 5-year review and update of the LUMP, incorporating information included in the completed Recreation Resource Management Plan update.
 - *Completed per 2021 AIP ^{1, 2}*

- 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.
 - *Completed per 2021 AIP ¹*
- Replace identification for recreation permit sites throughout Project.
 - *Variance ¹; see Section 7.1.3*
- Continue to participate on the Sanders County Aquatic Invasive Plants Task Force (AIPTF) to implement an Integrated Eurasian watermilfoil (EWM) Management Plan.
 - *Completed per 2021 AIP ¹*

Monitoring Associated with the Land Use Management Plan (LUMP)

- 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.
 - *Completed per 2021 AIP ¹*

Enforcement Associated with the Land Use Management Plan (LUMP)

- Continue to provide funding for 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.
 - *Completed per 2021 AIP ¹*
- 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.
 - *Completed per 2021 AIP ¹*
- 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.
 - *Completed per 2021 AIP ¹*

7.1.3 Projects with Significant Variances

Project Plan	Variances
Replace identification for recreation permit sites throughout Project	Due to staffing shortages, Recreation staff were unable to complete this task. The project will be initiated in 2022.

7.1.4 Key 2021 References

¹ Avista. 2021. Terrestrial Resources Program. 2021 Annual Work Summary. Avista document identification number 2021-0255.

² Avista. 2021. Land Use Subgroup Meeting Minutes from December 20, 2021. Avista document identification number 2021-0249.

7.2 Implementation of the Recreation Resource Management Plan (License Article 415 – CFSA Appendix H)

7.2.1 Purpose and Resource Benefit

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). The Land Use, Recreation, and Aesthetics Work Group developed the plan and identified seven goals to be met through its implementation:

- Manage existing recreation resource needs.
- Manage future recreation resource needs.
- Provide adequate and safe public access.
- Preserve recreation resources.
- Coordinate recreation planning and needs.
- Provide cost-effective and desirable recreation opportunities.
- Provide compatible recreation opportunities.

7.2.2 2021 Annual Implementation Plan Project Plans

RRMP Administration and Resource Integration

- Administer the RRMP with Recreational Specialist, clerical, consultant, and technical support.
 - *Completed per 2021 AIP ¹*
- Integrate RRMP programs and projects with land use, cultural resources, wildlife, fisheries, aesthetics, and erosion control programs.
 - *Completed per 2021 AIP ¹*

RRMP Recreation Facility Development

- Implement the 2021 Recreation Resource Facility Development Plan.
 - *Variance ¹; see Section 7.2.3*

RRMP Monitoring

- Work with the recreation subgroup to implement electronic recreation site evaluations developed as part of the 2017 RRMP update.
 - *Variance ^{1,2}; see Section 7.2.3*
- Continue to implement projects identified in the 2017 RRMP update.
 - *Completed per 2021 AIP ^{1,2,3}*

- Continue to utilize up to 23 automated traffic counters to measure use at various developed and dispersed recreation sites and trails.
 - *Completed per 2021 AIP ^{1, 3}*
- Continue utilizing standardized reporting for recreation use at Thompson Falls State Park, North Shore Recreation Area, and Bull River Recreation Area.
 - *Completed per 2021 AIP ^{1, 3}*
- Summarize 2021 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. Also include in this summary will be maps showing dispersed recreation areas along the projects and permitted dock locations (showing dock densities per 0.5-mile segments of shoreline).
 - *Completed per 2021 AIP ^{1, 3, 4}*

RRMP Operation and Maintenance of Recreation Facilities

- Maintain Avista controlled recreation facilities and undeveloped recreation sites on Avista lands.
 - *Completed per 2021 AIP ¹*
- 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.
 - *Completed per 2021 AIP ¹*
- Assist MFWP with the maintenance of Thompson Falls State Park and Flat Iron Ridge Fishing Access Site.
 - *Completed per 2021 AIP ¹*
- Provide low cost leases or permits to the community or civic groups providing recreation opportunities (i.e., Thompson Falls Golf Course).
 - *Completed per 2021 AIP ¹*

RRMP Interpretation and Education Program

- Implementation of the Interpretation and Education Program will be integrated with the measures developed and approved by the CRMG in 2008.
 - *Completed per 2021 AIP ¹*

7.2.3 Projects with Significant Variances

Project Plan	Variances
Implement the 2021 Recreation Resource Facility Development Plan	While more projects are listed than are anticipated to be completed each year under this program, an even greater number of projects were not completed in 2021 due to ongoing challenges with COVID-19 and staffing shortages among our partners.
Electronic Recreation Site Evaluations	Due to staffing changes this Task was not completed in 2021. However, sites were visited at least weekly and any maintenance issues were addressed at that time.

7.2.4 Key 2021 References

¹ Avista. 2021. Terrestrial Resources Annual Work Summary, 2021. Avista document identification number 2021-0255.

² Pinnacle Research and Consulting. 2017. Clark Fork Project Recreation Resource Management Plan, Interim Update. Avista document identification number 2017-0410.

³ Pinnacle Research and Consulting. 2021. 2021 Clark Fork Recreation Site Visitation. Avista document identification number 2021-0248.

⁴ Avista. 2021. Avista 2021 Recreation Permit Locations. Avista document identification number 2021-0243.

7.3 Implementation of the Aesthetics Management Plan (License Article 416 – CFSA Appendix I)

7.3.1 Purpose and Resource Benefit

The purpose of this measure is to provide for the protection and enhancement of aesthetic resources associated with Avista's Clark Fork Project 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 LUMP, site design and monitoring in the RRMP, 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.

7.3.2 2021 Annual Implementation Plan Project Plans

- Monitor recreation, land management, erosion, and facility construction programs to ensure AMP guidelines are considered.
 - *Completed per 2021 AIP¹*
- 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.
 - *Completed per 2021 AIP^{1, 2}*

7.3.3 Key 2021 References

¹ Avista. 2021. Terrestrial Resources Annual Work Summary, 2021. Avista document identification number 2021-0255.

² Pinnacle Research and Consulting. 2018. Aesthetics Management Plan Five-Year Inventory Review, 2018. Avista document identification number 2018-0422.

7.4 Implementation of the Wildlife, Botanical, and Wetland Management Plan (License Article 417 – CFSA Appendix J)

7.4.1 Purpose and Resource Benefit

The purpose of this measure is to provide for the organization and presentation of the various wildlife, botanical, and wetland PM&E measures, site-specific plans, and other management activities within a single, comprehensive management plan document.

7.4.2 2021 Annual Implementation Plan Project Plans

- Utilize the Wildlife, Botanical and Wetland Management Plan to help guide implementation of Wildlife, Botanical, and Wetland Protection, Mitigation, and Enhancement programs.
 - *Completed per 2021 AIP ¹*
- Continue to update the habitat protection spreadsheet as acquisitions are completed.
 - *Completed per 2021 AIP 1, ^{1, 2, 3}*
- 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.
 - *Completed per 2021 AIP ¹*

7.4.3 Key 2021 References

¹ Avista. 2021. Terrestrial Resources Annual Work Summary, 2021. Avista document identification number 2021-0255.

² Avista. 2020. Habitat protected through CFSA 2000–2020. Avista document identification number 2020-0271.

³ Avista. 2021. 2021 Annual Fall Management Committee Meeting, Clark Fork Management Committee Meeting Agenda, and Clark Fork Settlement Agreement Management Committee Meeting Record from September 21, 2021 (virtual meeting). Avista document identification number 2021-0218.

7.5 Wildlife Habitat Acquisition, Enhancement, and Management Program (License Article 418 – CFSA Appendix K)

7.5.1 Purpose and Resource Benefit

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. The goal is to provide for 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.

7.5.2 2021 Annual Implementation Plan Project Plans

Operation and Maintenance of Acquired Property and Contingency Fund

- 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.
 - ***Completed per 2021 AIP ¹***
- 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 road and parking development, installation of gates, signs, noxious weed control, enforcement, and development of revegetation/wetland enhancement plans for the property.
 - ***Completed per 2021 AIP ¹***
- 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.
 - ***Completed per 2021 AIP ¹***
- Monitoring of other Avista owned habitat properties and implementing management measures as needed.
 - ***Completed per 2021 AIP ¹***
- Wood Duck Property Re-Vegetation Maintenance.
 - ***Completed per 2021 AIP ¹***

Habitat Acquisition and Conservation and Contingency Fund

- 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.
 - ***Completed per 2021 AIP ¹***

7.5.3 Other 2021 Activities

- April 20, 2021 Appendices B and K – Acquisition of 342 acres along Graves Creek (CFSA Appendices B and K; approved on June 8, 2021).
 - *Completed per Consent Mail*^{1, 2}

7.5.4 Key 2021 References

¹ Avista. 2021. Terrestrial Resources Annual Work Summary, 2021. Avista document identification number 2021-0255.

² Avista. 2021. Consent Mail approval of Appendices B and K – Acquisition of 342-acre parcel along Graves Creek. (April 20, 2021). Avista document identification number 2021-0104.

7.6 Black Cottonwood Habitat Protection and Enhancement (License Article 419 – CFSA Appendix L)

7.6.1 Purpose and Resource Benefit

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 are protected through the implementation of land use classifications in the Land Use Management Plan (LUMP).

7.6.2 2021 Annual Implementation Plan Project Plans

- Continue to protect black cottonwood stands along the Clark Fork Project through the implementation of the Land Use Management Plan.
 - *Completed per 2021 AIP¹*
- Continue to monitor and maintain the enclosure at Hereford Slough.
 - *Completed per 2021 AIP¹*

7.6.3 Key 2021 References

¹ Avista. 2021. Terrestrial Resources Annual Work Summary, 2021. Avista document identification number 2021-0255.

7.7 Wetlands Protection and Enhancement Program (License Article 420 – CFSA Appendix M)

7.7.1 Purpose and Resource Benefit

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.

7.7.2 2021 Annual Implementation Plan Project Plans

- Continue to develop wetland enhancement plan for the 2016 Twin Creek acquisition.
 - *Competed per 2021 AIP¹*
- Monitor enhancements previously completed at Hereford Slough, McKay Creek, Finley Flats, and Blacktail Bay/Islands.
 - *Completed per 2021 AIP¹*

7.7.3 Key 2021 References

¹ Avista. 2021. Terrestrial Resources Annual Work Summary, 2021. Avista document identification number 2021-0255.

7.8 Forest Habitat Protection and Enhancement (License Article 425 – CFSA Appendix P)

7.8.1 Purpose and Resource Benefit

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.

7.8.2 2021 Annual Implementation Plan Project Plans

- Continue to manage these areas that have been classified as Conservation 1, and as such are afforded the maximum protection provided through the Land Use Management Plan.
 - *Completed per 2021 AIP ¹*
- 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.
 - *Completed per 2021 AIP ¹*
- Continue to monitor and enforce the road closure to Stevens Creek Point (closure was instituted in 2001).
 - *Completed per 2021 AIP ¹*
- Continue to prohibit motorized use of Finley Flats Point.
 - *Completed per 2021 AIP ¹*
- 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.
 - *Completed per 2021 AIP ¹*
- 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.
 - *Completed per 2021 AIP ¹*
- 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.
 - *Completed per 2021 AIP ¹*

7.8.3 Key 2021 References

¹ Avista. 2021. Terrestrial Resources Annual Work Summary, 2021. Avista document identification number 2021-0255.

7.9 Reservoir Island Protection (License Article 426 – CFSA Appendix Q)

7.9.1 Purpose and Resource Benefit

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.

7.9.2 2021 Annual Implementation Plan 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.
 - *Completed per 2021 AIP*¹

7.9.3 Key 2021 References

¹ Avista. 2021. Terrestrial Resources Annual Work Summary, 2021. Avista document identification number 2021-0255.

7.10 Erosion Fund and Shoreline Stabilization Guidelines Program (License Article 428 – CFSA Appendix S)

7.10.1 Purpose and Resource Benefit

The purpose of this measure is to address 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.

7.10.2 2021 Annual Implementation Plan Project Plans

- Address erosion concerns identified by the Cultural Resources Management Group (CRMG).
 - *Completed per 2021 AIP¹*
- 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.
 - *Completed per 2021 AIP¹*
- Utilize a geotechnical contractor to assist with evaluating erosion control proposals received by Avista.
 - *Completed per 2021 AIP¹*

7.10.3 Key 2021 References

¹ Avista. 2021. Terrestrial Resources Annual Work Summary, 2021. Avista document identification number 2021-0255.

Section 8: Other Clark Fork License Articles

This section specifically addresses annual compliance with articles 432 through 443 of the Clark Fork Project License.

8.1 Threatened and Endangered Species Plan and Annual Report (License Article 432 – Amended June 13, 2003)

8.1.1 Purpose

Article 432 of the Federal Energy Regulatory Commission (FERC) License requires that Avista file a Threatened and Endangered Species Plan (T&E Plan) and Annual Report for Commission approval before April 15 of each year, after consultation with the Management Committee (MC). The T&E Plan must address compliance with the Reasonable and Prudent Measures (RPMs) and implementing terms and conditions of the incidental take statement issued by the U.S. Fish and Wildlife Service (USFWS) under Section 7 of the Endangered Species Act. The USFWS issued a biological opinion and incidental take statement with regard to Project relicensing on August 23, 1999, and it was attached as Appendix D to the FERC License Order.

On March 28, 2018, FERC requested formal consultation with USFWS under Section 7 of the Endangered Species Act regarding Avista’s proposed License Amendment to construct and operate a permanent upstream fish passage facility at Cabinet Gorge Dam (the Cabinet Gorge Dam Fishway or “CGDF”). Subsequently, on February 1, 2019, USFWS issued a new biological opinion and incidental take statement analyzing the CGDF as well as Avista’s continued operation of the Project. This 2019 biological opinion updated and superseded USFWS’s 1999 biological opinion for the Project. The 2019 biological opinion included an incidental take statement, which was incorporated into the August 8, 2019 FERC License Order approving construction and operation of the CGDF. Compliance with the RPMs, and implementing terms and conditions, in the February 1, 2019 incidental take statement will be reported in this T&E Plan and Annual Report. References herein to an “incidental take statement” are to the statement that was issued as part of the 2019 biological opinion.

In 2002, Avista and USFWS agreed that Article 432’s T&E planning requirement, as well as Avista’s annual reporting and consultation requirements for several Protection, Mitigation and Enhancement (PM&E) measures, are adequately addressed through the Annual Implementation Plans (AIPs), which are approved by the MC, and by providing the annual activity summaries contained in this section of the Annual Report. Those PM&E measures are:

- Idaho and Montana Tributary Habitat Acquisition and Fishery Enhancement Programs (License Articles 404 and 405).
- Fish Passage/Native Salmonid Restoration Plan (License Article 406).
- Bull Trout Protection and Public Education Project (License Article 407).
- Watershed Councils Program (License Article 408).
- Water Quality Protection and Monitoring Plan for Maintenance, Construction, and Emergency Activities (License Article 412).
- Dissolved Gas Supersaturation Control, Mitigation, and Monitoring (License Article 413).
- Project Operations Package (License Articles 429, 430, and 431).

Section 8.1.2 below provides the 2021 activity report for the PM&E measures listed above, which comprises Avista's T&E Plan and is intended to satisfy Avista's annual reporting requirement for these measures. To assist the Commission and USFWS in evaluating compliance with USFWS's RPMs and their associated terms and conditions, Section 8.1.2 is organized by RPM.

8.1.2 2021 Activity Summary

8.1.2.1 Terms and Conditions to Implement RPM #1 and Corresponding Activities

The incidental take statement's RPM #1 states:

Identify adult bull trout attempting to migrate upstream of Cabinet Gorge and/or Noxon Rapids Dams, and in a manner agreed to by the Service and consistent with the Clark Fork Settlement Agreement (as amended), provide safe, timely and effective fish passage.

The four terms and conditions (1 through 4) and corresponding 2021 activities implementing RPM #1 are listed below.

1) The likely natal origin of adult bull trout captured downstream of Cabinet Gorge Dam shall be determined using genetic testing, or other methods deemed appropriate by the Service.

Genetic sampling and testing to determine the likely natal origin of adult Bull Trout was initiated in 1999 and is an ongoing activity for all adult Bull Trout captured downstream of Cabinet Gorge Dam in the lower Clark Fork River. Genetic sample collection and testing in 2021 was approved by the MC, including the USFWS. In 2021, 28 individual adult Bull Trout (≥ 350 mm in length) were captured downstream of Cabinet Gorge Dam. Twenty-four of these individual fish required rapid-response genetic analysis while the other four Bull Trout had been captured in previous years and had already been genetically tested. Capture histories and genetic analysis results for these fish were then used to make upstream transport decisions. Juvenile Bull Trout fin tissue samples were also collected from tributaries to the Clark Fork River and Lake Pend Oreille (LPO) to allow for an improvement in the accuracy of the genetic baseline that is used to determine transport locations.

2) A permanent fish tagging system shall be implemented for all bull trout handled during monitoring and other fisheries investigation activities in the project area. The tagging system shall have the capability to positively identify bull trout originating from spawning tributaries above Cabinet Gorge and/or Noxon Rapids Dams.

A permanent fish tagging system, utilizing Passive Integrated Transponder (PIT) tags, was utilized again in 2021 as approved by the MC and USFWS. All Bull Trout ≥ 100 mm in length captured during the implementation of Clark Fork Settlement Agreement (CFSA) projects were implanted with PIT tags. A PIT-tag database, originally developed in 2000, continued to be utilized in 2021 to allow for the storage of information on all Bull Trout PIT tagged in the project area. Data from 2021 PIT tagging events were recorded in the PIT-tag database. The PIT-tag database is updated annually, and data requests are processed upon request.

- 3) *A program to capture and transport adult bull trout originating from tributaries above Cabinet Gorge and/or Noxon Rapids Dams shall be implemented to provide safe, timely and effective upstream fish passage, and shall be implemented in a manner consistent with the Native Salmonid Restoration Plan and the Clark Fork Settlement Agreement (as amended).*

Protocols for capture, transport, and release of Bull Trout were approved by the MC, including the USFWS, in March of 2021.

Fish Capture:

Construction of the CGDF remained on schedule during 2021. The contractor finished all, but one concrete pour for the fish trap structure prior to spring spill 2021. During spill one entrance gate was cracked open a few inches to equalize water pressure inside and outside of the structure. Following spill, the entrance gate was closed and Avista personnel salvaged fish that were entrained within the trap. Numerous fry including Yellow Perch and a few Peamouth and Northern Pikeminnow were captured during this fish salvage event. These activities were reported to the appropriate stakeholders. Quarterly updates were also provided to the MC on the progress of the project. Monthly construction reports were submitted as required by permitting and approval agencies (i.e., FERC Portland Regional Office).

The final concrete pour within the fish trap structure was completed following the spill season. During 2021, the contractor also erected and wired the control building, finished laying siphon piping from the forebay down to the fish trap, installed the Hydraulic Power Unit for gate operation, constructed the monorail crane slab, installed fish monitoring equipment, removed the cofferdam and other activities. Avista also worked internally to determine the best communication options for the fish monitoring devices and Programable Logic Controller to data storage locations and for alarms. The current CGDF construction schedule shows a completion date of spring 2022, with commissioning of the CGDF occurring prior to spill 2022.

In 2019, the MC agreed to develop a Cabinet Gorge Dam Fish Passage Facility Monitoring and Evaluation (M&E) Plan as an alternative to updating the basic monitoring program document that was originally developed in 2013. Any changes to the design of the fish trap that may impact the basic monitoring program document were captured in the M&E Plan. The MC approved a subgroup (established at the September 21, 2021 MC meeting comprised of individuals from USFWS, Montana Fish, Wildlife and Parks [MFWP], Idaho Department of Fish and Game [IDFG], Kalispel Tribe, and Avista) to finalize and modify the M&E Plan once the CGDF becomes operational. The M&E Plan was sent to the MC via Consent mail and was approved in December 2021. Other documents needed for operation of the CGDF, including a transport protocol, operations and maintenance plan, Aquatic Invasive Species Prevention Plan, and fish handling protocol are being drafted and will be finalized prior to operation of the CGDF.

No new work was proposed or conducted for the Noxon Rapids Dam Permanent Fishway and fish handling facility project in 2021. Based on agreements made in Amendment No. 1 to the CFSA, final design and construction of the Noxon Rapids Dam Permanent Fishway shall be deferred for an interim period ending no sooner than December 31, 2021 (see previous annual reports for additional information). 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 reinstate these conversations.

All of the originally planned upgrades to the Cabinet Gorge Fish Handling Facility were completed in 2021. However, a number of change orders for unforeseen circumstances resulted in an increase in cost and extension in the project schedule. A Consent mail was sent to the MC and approved in December 2021 for additional funds to complete the project. These unforeseen items included: concrete encasement along the return to river pipe that had to be removed, unforeseen rock excavation in the septic area, adding an extension to the new packed column aerator, addition of an awning, additional construction management and engineering support due to project schedule extension along with support to update the operations and maintenance plan for the Cabinet Gorge Fish Handling Facility, and other miscellaneous items.

In 2021, Avista continued to utilize the Cabinet Gorge Fish Hatchery Ladder Trap (ladder trap), night electrofishing, and hook-and-line sampling to collect adult Bull Trout downstream of Cabinet Gorge Dam (Table 1). These methods were used at a similar level of intensity as previous years, with two exceptions. Due to COVID-19 concerns and trends in fish capture numbers a two-person crew was used for most of the season consisting of a boat captain and one netter. Two netters were used during periods of higher flows when fish abundance and water turbidity increased and in mid-August through early September when Bull Trout are known to congregate on the Cabinet Gorge Hatchery spawning shelf.

The second exception is water from the Cabinet Gorge Hatchery settling pond was used to supplement water in the ladder trap during the month of September. The water temperatures in the Cabinet Gorge 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 the end of September. As a result, spring water supply to the ladder trap was limited to approximately 1.5 cfs. The project team decided to supplement the ladder trap with water from the settling pond as an approx. 20-inch diameter pipe already existed and connects those two structures. Water temperature from all three sources were monitored for at least a portion of the fall. 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. The water supply from the settling pond was shut off at the end of September and the ladder trap was operated with only the spring water supply for the last two weeks of the season (early October). Only two Bull Trout were captured in the ladder trap in 2021, both on September 17th and another was observed on October 14th and escaped.

In 2021, 28 individual adult Bull Trout (≥ 350 mm in length) were captured in the lower Clark Fork River downstream of the Cabinet Gorge Dam. Two Bull Trout had genetic assignments to a tributary downstream of Cabinet Gorge Dam, and another Bull Trout died at the Fish Handling Facility.

Table 1. Number of adult Bull Trout (≥ 350 mm in length) captured downstream of Cabinet Gorge Dam under the Upstream Fish Passage Program in 2021 (not including within year recaptures).

Method of Capture	Dates of Operation	Bull Trout Handled	Adult Bull Trout Transported
Ladder Trap	August 11–October 15	2	2
Electrofishing	April 6–August 31	17	15
Hook-and-Line	April 28–October 12	9	8
Total		28	25

Fish Transport:

Twenty-five Bull Trout were transported upstream to Montana based on genetic assignments, previous capture histories, or other approved criteria in 2021 (Table 2).

Table 2. Release regions for adult Bull Trout captured downstream of Cabinet Gorge Dam and either released in Idaho or transported upstream to Montana in 2021 (the Bull Trout that died at the Fish Handling Facility is not included in the table below).

Release Region	Adult Bull Trout
Lower Clark Fork River (Region 1)	2
Cabinet Gorge Reservoir (Region 2)	4
Noxon Reservoir (Region 3)	12
Thompson Falls Reservoir (Region 4)	9
Total	27

Fish Pathogens:

Avista is required by the CFSA Amendment to lethally sample 60 Bull Trout collected downstream of Cabinet Gorge Dam and test them for pathogens prior to the issuance of a MFWP import permit. There were no pathogens of concern detected in the group of Bull Trout (captured as bycatch from the LPO Lake Trout Netting Program) tested in 2020, which allowed for the upstream transport of Bull Trout in 2021. In 2021, 60 adult Bull Trout were again collected and analyzed for pathogens. No pathogens of concern were detected, and these results will be used to apply for a 2022 MFWP import permit.

- 4) The upstream capture and transport program shall be adaptively managed, with approval from the Service, in a manner that places priority on maintaining and restoring adfluvial bull trout local populations above Cabinet Gorge and/or Noxon Rapids Dams.***

The Appendix C Fish Passage/Native Salmonid Restoration Plan AIP, including the Upstream Fish Passage Program Project Plan, for 2021 was reviewed and approved by the Water Resources Technical Advisory Committee and MC, including a representative from the USFWS. The Upstream Fish Passage Program Project Plan describes activities related to Bull Trout including upstream transport and release protocols. The USFWS also has a representative on the Aquatic Implementation Team, which is a sub-group that reviews AIPs and the progress of projects on a monthly basis to determine if efforts are in line with agency requirements and guidelines. These annual and monthly review processes allow for adaptive management of local Bull Trout populations above Cabinet Gorge and Noxon Rapids dams.

8.1.2.2 Terms and Conditions to Implement RPM #2 and Corresponding Activities

The incidental take statement's RPM #2 states:

Identify juvenile bull trout attempting to migrate downstream to Lake Pend Oreille, and in a manner agreed to by the Service and consistent with the Clark Fork Settlement Agreement (as amended), provide safe, timely and effective fish passage.

The two terms and conditions (5 and 6) and corresponding 2021 activities implementing RPM #2 are listed below.

- 5) A program to trap and transport juvenile bull trout from tributaries above Cabinet Gorge and/or Noxon Rapids Dams shall be implemented to provide safe, timely and effective downstream fish passage, and shall be implemented in a manner consistent with the Native Salmonid Restoration Plan and the Clark Fork Settlement Agreement (as amended).***

Term and Condition 5 of RPM #2 was fulfilled through the adaptively managed Tributary Trapping and Downstream Juvenile Bull Trout Transport Program.

There were a total of 355 capture events of 353 individual juvenile (i.e., <300 mm) Bull Trout during 2021 (26 of these individuals were recaptures from previous years). A total of 255, 120–250 mm, Bull Trout were captured in Montana tributaries and transported to Idaho during 2021 (Table 3). An additional 98 juvenile Bull Trout were captured and released on site (two of these were captured twice) because they did not meet one or more of the transport criteria (i.e., fish length or direction of travel). There was one juvenile Bull Trout mortality observed in 2021. This fish likely died of causes unrelated to tributary trapping at a location upstream of the Graves Creek permanent weir trap and passively drifted downstream into the trap box (see discussion pertaining to Term and Condition 20). Following capture, fish were measured (length and weight) and implanted with a PIT tag if they were greater than 99 mm and if a PIT tag was not already present. All juvenile transports were released in the lower Clark Fork River at the Cabinet Gorge Fish Hatchery site.

There were two capture events of individual adult Bull Trout in tributary traps during 2021. Both fish were captured following the spawn and transported to Idaho (one each from Graves Creek and the East Fork Bull River).

Table 3. Tributary and method of capture for juvenile Bull Trout transported to Idaho under the Tributary Trapping and Downstream Juvenile Bull Trout Transport Program in 2021.

Tributary	Method	Bull Trout Transported
Graves Creek	Permanent Weir/Weir/Minnow Trap	178
East Fork Bull River	Weir/Screw Trap/Stream Electrofishing	47
Vermilion River	Stream Electrofishing	30
Total		255

6) *The downstream trap and transport program shall be adaptively managed, with approval from the Service, in a manner that places priority on maintaining and restoring adfluvial bull trout local populations above Cabinet Gorge and/or Noxon Rapids Dams.*

Avista works closely with the USFWS through the CFSA process to adaptively manage trapping protocols on an inter- and intra-annual basis. Based on information gathered largely through CFSA programs, it is believed that Graves Creek, East Fork Bull River, and the Vermilion River are the only three Montana tributaries to the Clark Fork River within the Avista project area where meaningful numbers of Bull Trout naturally exhibit a migratory life history. In light of this, the USFWS and MFWP have collectively agreed that for the time being juvenile transport efforts should be limited to these three drainages and that these efforts should be, “aggressive but prudent”.

8.1.2.3 Terms and Conditions to Implement RPM #3 and Corresponding Activities

The incidental take statement’s RPM #3 states:

Implement a dissolved gas supersaturation control, mitigation, and monitoring program.

The three terms and conditions (7 through 9) and corresponding 2021 activities implementing RPM #3 are listed below.

7) *The Gas Supersaturation and Control Program (and 2009 Addendum), shall be implemented in a manner consistent with the Clark Fork Settlement Agreement (as amended).*

Appendix F5 of the CFSA requires that “...study, control, mitigation, and monitoring of gas supersaturation...” occur. The Gas Supersaturation Control Program (GSCP) and GSCP Addendum were developed to guide how these requirements would be achieved. The FERC issued an order approving the GSCP on January 11, 2005 and approved the final GSCP Addendum on February 19, 2010. In 2021, high-flow spill protocols were followed as described under Term and

Condition 8 and total dissolved gas monitoring occurred at two established sites as described under Term and Condition 9.

8) High-flow spill protocols shall be finalized and implemented to address total dissolved gas production and shall be consistent with the Clark Fork Settlement Agreement (as amended).

Interim spillgate procedures were formalized in the GSCP approved by the FERC on January 11, 2005 and the GSCP Addendum approved by the FERC on February 19, 2010. Spillway operations at Cabinet Gorge Dam were amended to include the use of spillway 2 in 2014, spillways 4 and 5 in 2016, and spillways 1 and 3 in 2018 after modifications were made to these spillways to reduce total dissolved gas (TDG). The purpose of these spillgate procedures is to achieve the CFSA Appendix F5 requirement to control (i.e., reduce) the amount of TDG produced at Noxon Rapids and Cabinet Gorge dams and reduce potential effects to aquatic organisms downstream. The spillgate procedures were followed to the extent practicable in 2021; however, FERC-required testing resulted in a variance of the spill protocol. Effects to TDG levels were minimal.

The hydraulic capacity of the powerhouse at Noxon Rapids Dam was exceeded on 10 of 153 days between March 1 and July 31, 2021. Spill occurred at various times on May 19 and from May 26 through July 21 under normal operations. In addition to the spill that resulted due to flow conditions, all eight gates were opened to one foot meeting the FERC requirement for annual spillway gate operation tests. Full height gate tests did not occur in 2021; however, these are required once every five years and the most recent occurred in 2020. The peak flow recorded at Noxon Rapids Dam in 2021 was 61,300 cubic feet per second (cfs) on June 5, 2021.

In 2021, spill occurred on May 4, from May 18 through May 23, May 25 through June 21, and July 8 at Cabinet Gorge Dam. Gates 3–5 were opened to a height of one foot on May 19 and gates 1, 2, and 6–8 were opened to a height of one foot on May 20, meeting FERC annual gate operation testing requirements. All eight gates were opened to full height at least once between June 9 and June 10 meeting the FERC requirements that all gates are opened fully at least once every five years. The peak flow recorded at Cabinet Gorge Dam in 2021 was 73,500 cfs on June 7.

9) Total dissolved gas monitoring shall be done at established sites and shall be conducted in a manner that is consistent the Gas Supersaturation and Control Program (and 2009 Addendum), and the Clark Fork Settlement Agreement (as amended).

Prior to deployment in 2021, TDG monitoring equipment was sent to the manufacturer for annual maintenance and calibration. Consistent with the GSCP and CFSA, Avista personnel deployed a TDG probe in the Cabinet Gorge Dam forebay and two TDG probes approximately one mile downstream of Cabinet Gorge Dam on March 10. The Cabinet Gorge Dam Forebay and the Downstream Cabinet Gorge stations operated continuously beyond July 31, well after spilling had ceased. The duplicative Downstream Cabinet Gorge station operated continuously until June 20 when the float boat containing the TDG monitoring equipment flipped and all of the equipment except for the sonde fell off. Most of the equipment was recovered on August 24; however, all of the electronics were unusable. Avista staff maintained the sites and performed field calibration as needed.

Downstream of Noxon Rapids Dam, from May 19 to June 21 (when sustained spill occurred at Noxon Rapids Dam), TDG in the Cabinet Gorge Dam Forebay had a mean of 106.6% saturation with a minimum of 102.4% and a maximum of 112.8%. Downstream of Cabinet Gorge Dam from May 18 to June 21 (when sustained spill occurred at Cabinet Gorge Dam), TDG at the Downstream Cabinet Gorge station, had a mean of 109.4% saturation with a minimum of 100.3% and a maximum of 131.7%. Of the 35 days from May 18 to June 21, TDG downstream of Cabinet Gorge Dam exceeded 110% saturation on 20 days and exceeded 120% on 6 days. The greatest discharge (measured at USGS 12391950 Clark Fork River below Cabinet Gorge Dam, ID) resulting in TDG less than 110% saturation was 57,200 cfs and the greatest discharge with TDG being less than 120% was 69,800 cfs. These values were consistent with those observed in 2019, the most recent year with all four units operating at Cabinet Gorge Dam.

No TDG-reducing modifications were made to Cabinet Gorge Dam in 2021. Proposals for future modifications (if warranted) will be outlined in a future project plan for Appendix F5 (Dissolved Gas Supersaturation Control, Mitigation, and Monitoring) through the AIP process.

8.1.2.4 Terms and Conditions to Implement RPM #4 and Corresponding Activities

The incidental take statement's RPM #4 states:

Maintain sufficient in-stream flow downstream of Cabinet Gorge Dam.

The two terms and conditions (10 and 11) and corresponding 2021 activities implementing RPM #4 are listed below.

10) From September 15 through October 31, the instantaneous minimum flow below Cabinet Gorge Dam shall be maintained at 5,000 cubic feet per second or greater.

Clark Fork River discharge (i.e., “flow”) is estimated both through the project as well as at the U.S. Geological Survey gage station located approximately 500 m downstream of Cabinet Gorge Dam. Computers in the Cabinet Gorge Dam control room constantly monitor discharge through turbines and spillgates. Accusonic flow meters located in the penstocks relay individual unit discharge to the control room computers. The Cabinet Gorge Dam minimum flow General Operating Limit was modified in late 2017 and is 3,000 cfs during the period from November 1 through September 14 and 5,000 cfs from September 15 through October 31. The 5,000 cfs minimum flow was maintained from September 15 through October 31, 2021.

11) From November 1 through September 14, the instantaneous minimum flow below Cabinet Gorge Dam shall be maintained at 3,000 cubic feet per second or greater.

As part of the CGDF construction process, Avista identified there would be a need to deviate from the minimum flow General Operating Limit in order to facilitate construction. On July 15, Avista notified the Appendix F4 designated contacts of the need to operate Cabinet Gorge Dam at less than 3,000 cfs for a period of up to four hours in early September. Another correspondence was sent out in a memo on August 16 specifying the date of September 9 for the “no flow” event. Avista operated in accordance with the Best Management Practices through the event and followed

up with a report on the event through an October 18 memo. The minimum flow of 3,000 cfs was maintained during all other applicable times during 2021.

8.1.2.5 Terms and Conditions to Implement RPM #5 and Corresponding Activities

The incidental take statement's RPM #5 states:

Implement a program that manages non-native species in a manner that is beneficial for bull trout.

The two terms and conditions (12 and 13) and corresponding 2021 activities implementing RPM #5 are listed below.

12) Non-native fish management programs shall be implemented in the Clark Fork Project action area for the benefit of bull trout and shall be implemented in a manner consistent with the Native Salmonid Restoration Plan and the Clark Fork Settlement Agreement (as amended).

In 2018, the MC approved the Clark Fork River Native Salmonid Restoration Plan (NSRP) Five-Year Plan for the 2019 through 2023 time period, consistent with the CFSA and RPM #5. This update highlighted numerous potential actions and data needs for developing non-native species management plans for future implementation. Efforts undertaken in 2021 in accordance with this direction included Lake Trout angler incentive and gill net suppression programs in LPO, assessing the Walleye population and feasibility of Walleye suppression through an angler incentive program on the LPO-lower Clark Fork River, suppression of Northern Pike in Box Canyon Reservoir, compilation of 14 years of data on the non-native fish suppression program in the East Fork Bull River, and the development of potential actions to be implemented in future Project Plans. The details of these activities are described below.

Lake Pend Oreille Lake Trout Angler Incentive Program:

This program has been implemented annually since 2006, in an effort to reduce predator, specifically Lake Trout, abundance in LPO. In 2021, funding of the LPO Angler Incentive Program continued. Anglers participating in the program turned in Lake Trout heads along with information cards at freezers maintained at access points around LPO. In 2021, anglers turned in 2,509 Lake Trout (Table 4), which was a decrease from 2,641 in 2020.

Lake Pend Oreille Angler Incentive Program funds were also used to sponsor angling derbies on LPO. Sponsorship dollars were used to encourage additional anglers to participate in harvest-oriented angling of LPO Lake Trout and to encourage Bull Trout education. In 2021, seven LPO derbies were recipients of sponsorship funding.

Lake Pend Oreille Lake Trout Netting Program:

The goal of this program is to increase kokanee numbers by reducing predator abundance. The focus of this program is Lake Trout reduction and efforts to obtain this goal have been implemented annually in conjunction with the LPO Angler Incentive Program since 2006.

In 2021, the LPO Lake Trout Netting Program was implemented for the sixteenth year and removed 6,221 Lake Trout (Table 4). Since 2006, a combination of angling and netting has removed more than 249,000 Lake Trout. Netting catch rates for Lake Trout have declined substantially since the program was initiated.

Standardized trap net catch rates were the primary index used to track changes in adult Lake Trout abundance since 2006. Idaho Department of Fish and Game discontinued trap net trends in 2018 because they developed a more robust and less expensive assessment tool (cohort analysis) using the harvest data from netting and angler incentive programs, along with an estimation of age structure for each year assessed. They were able to use this tool to estimate the age-specific abundances of Lake Trout back to 2006. Lake Trout abundances declined an average of 7.5% annually from 2006–2017, however the population stopped declining and stabilized after 2015, which may be a result of a premature reduction of fishing effort that started in 2015. The estimated total abundance of age 4+ Lake Trout was 40,336 fish at the end of 2017. In 2018, IDFG further improved the accuracy of the cohort analysis by collecting age structure information using a randomized assessment gill-netting program, which is designed to avoid the size selectivity problems associated with trap nets and gill nets specifically targeting juveniles.

Table 4. Lake Trout harvested and removed from LPO, Idaho in 2021 by collection method.

Collection Method	Lake Trout Harvested
Angling	2,509
Netting	6,221
Total	8,730

An increase in the kokanee population has been associated with the reduction in the Lake Trout population. Age-specific abundance estimates are not yet finalized for 2021. At present, preliminary data suggest kokanee abundance likely remains at a high level. Kokanee abundance has steadily increased since the predator reduction program began in 2006.

The Bull Trout population has remained robust in the Idaho portion of the LPO core area. Idaho Department of Fish and Game continues to observe high Bull Trout catch and low mortality in gill-netting operations. The responses observed to date suggest that suppression of Lake Trout can be achieved and provide benefits for both kokanee and Bull Trout. Lake Pend Oreille predator removal success will continue to be monitored by evaluating the population response of Lake Trout, Bull Trout, and kokanee.

Lake Pend Oreille/Clark Fork River Walleye Population Assessment:

Walleye, which were illegally introduced into Noxon Reservoir approximately 30 years ago, have become well established throughout Noxon and Cabinet Gorge reservoirs and have reached LPO. An expanding Walleye population has the potential to put several fish populations in LPO at risk through direct predation and competition. This project was first implemented in 2018 to establish fundamental information to help 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. There were two major components to this project: 1) tracking acoustic- and radio-tagged Walleye; and 2) gill netting.

From the telemetry efforts, it was determined that Walleye were again concentrated at two main areas during the spring: the Clark Fork River and delta, and the Pack River area west to the eastern edge of Oden Bay. Walleye were more widely distributed during the summer period with loose concentrations of fish located in the Clark Fork River and delta, in shallow warmer bays including Denton Slough, Oden Bay, and Kootenai Bay, and downstream to near the Sandpoint Bridges into the Pend Oreille River.

Gill netting proved to be a very effective method for capturing Walleye during the pre-spawn period. Walleye were concentrated in relatively shallow water and catch rates were relatively high while bycatch was reasonably low. A total of 347 Walleye were removed in 2021 (Table 5).

Lake Pend Oreille Experimental Walleye Angler Incentive Program:

This program was first implemented in 2019 in an effort to evaluate the potential to reduce the Walleye abundance in LPO through angling. Anglers participating in the program turned in Walleye heads along with information cards at freezers maintained at access points around LPO. In 2021, anglers turned in 757 Walleye (Table 5).

Table 5. Walleye harvested and removed from LPO, Idaho in 2021 by collection method.

Collection Method	Walleye Harvested
Angling	757
Netting	347
Total	1,104

Box Canyon Reservoir Northern Pike Suppression:

Northern Pike (NP) were illegally introduced in the Clark Fork drainage in Montana and have since expanded to the Pend Oreille River, where they have caused declines in native species and game fish being managed by the Kalispel Tribe Natural Resources Department (KNRD), Washington Department of Fish and Wildlife (WDFW), and IDFG. Northern Pike range expansion threatens to undermine current and future recovery efforts for Bull Trout and Westslope Cutthroat Trout, as well as other native salmonids, minnows, suckers and introduced game fish within the watershed. Reducing the predatory effect of NP on Bull Trout increases the probability that entrained fish are collected and transported upstream of Albeni Falls Dam to complete their life history and contribute genetic diversity to upstream populations.

After being detected in 2004, the NP population grew exponentially in Box Canyon Reservoir to over 5,500 in 2010. In 2012, KNRD supported by WDFW, and funded in part by Avista under the CFSA, initiated a mechanical suppression program to reduce the population of NP within Box Canyon Reservoir. This suppression has been successful in significantly reducing the NP in Box Canyon Reservoir and efforts since 2015 have been focused on maintaining this greatly reduced NP population through springtime netting and monitoring for effectiveness. The objective of NP suppression is to maintain the abundance of NP in Box Canyon Reservoir at or below the target of

<1.73 NP/net night between Pioneer Park and Riverbend (i.e., the southern half of Box Canyon Reservoir) and <0.5 NP/net night north of Riverbend monitored in the annual Spring Pike Index Netting (SPIN) survey.

A total of 610 NP were removed from 556 net sets in 2021. The effort targeted spawning locations to remove mature individuals as they staged to spawn. The SPIN survey mean catch-per-unit-effort (CPUE) was 0.63 NP/net night in the core area that includes the southern half of the reservoir and all sloughs (target <1.7); and the mean CPUE north of Riverbend was 0.56 (± 0.47) NP/net but fell within the 95% confidence interval (target <0.5). Based on 2021 SPIN results, the adult population relative abundance in the core area has been reduced by more than 93% after multiple years of mechanical suppression.

Non-Native Fish Suppression Project in the East Fork Bull River:

The eight-year non-native fish suppression project in the East Fork Bull River was implemented from 2007 through 2014. Based on the results of this project and increases in numbers of adult Bull Trout transported to the East Fork Bull River (and resultant higher redd counts), an extension of this project using less intensive suppression methods was implemented from 2015 through 2021. The less intensive methods of suppression for the Non-native fish suppression project in the East Fork Bull River included the on-site release of non-native trout captured during electrofishing, the transport and release of non-native trout captured in fish traps to the lower Bull River, and sub-sampling of eggs from Brown Trout redds.

Efforts to remove non-native trout in 2021 began with the March 29 installation of fish traps in the lower East Fork Bull River under the Tributary Trapping and Downstream Juvenile Bull Trout Transport Program. Two weirs in the split channels were partially disabled by a combination of high flows and debris for a total of 23 days from October 29 through November 24. In 2021, a total of 204 non-native salmonids were captured in all traps, with 165 Brown Trout (including 5 recaptures), 38 Brook Trout, and 1 suspected Rainbow and Westslope Cutthroat trout hybrid being transported and released in the lower Bull River. Genetic analysis of eggs sub-sampled from putative Brown Trout redds from 2015 through 2020 confirmed an absence of Bull Trout genetic material. Additional subsamples of eggs were collected from the five Brown Trout redds identified in the lower East Fork Bull River in late November 2021; however, high streamflow precluded completion of the Brown Trout redd survey. Genetic results from eggs sampled in 2021 will be available at a later date.

A comprehensive evaluation of this project was originally anticipated to include data through 2018 and is in progress. Recognizing two additional years of effort has occurred, the comprehensive report will include data through 2020 and will be finalized in 2022.

13) Non-native fish management programs shall be adaptively managed, with approval from the Service, in a manner that places priority on maintaining and restoring adfluvial bull trout local populations within the Lake Pend Oreille Core Area.

The MC, including the USFWS, approved an updated NSRP Five-Year Plan in 2018. The purpose of this NSRP Five-Year Plan is to provide the MC with continued and consistent guidance of implementation of the NSRP for the 2019 through 2023 time period. This includes implementation

of CFSA appendices A, B, C, and F5 and denotes a need to identify, evaluate, and if appropriate, address non-native species concerns. More specifically, under Appendix C of the NSRP Five-Year Plan, there is agreement that management efforts should be concentrated on those streams known to be utilized by migratory native salmonids (of which Bull Trout are a priority). In 2020, a Project Plan that was to summarize non-native salmonid distribution and abundance in these priority streams and develop a prioritized list of potential actions was approved. Personnel turnover resulted in a delay in implementation; however, fisheries data were compiled and a draft report that included a list of potential management actions for the three adfluvial Bull Trout streams (i.e., East Fork Bull River, Vermilion River, and Graves Creek) was completed in 2021. This report will be finalized in early 2022.

8.1.2.6 Terms and Conditions to Implement RPM #6 and Corresponding Activities

The incidental take statement's RPM #6 states:

Implement the Native Salmonid Restoration Plan and Clark Fork Settlement Agreement (as amended) in a manner consistent with the Final Bull Trout Recovery Plan and Columbia Headwaters Recovery Unit Implementation Plan.

The term and condition (14) and corresponding 2021 activities implementing RPM #6 are listed below.

14) Tributary enhancement programs shall be adaptively managed, with approval from the Service, in a manner that places priority on maintaining and restoring adfluvial bull trout local populations within the Lake Pend Oreille Core Area.

Bull Trout upstream and downstream transport programs were implemented in 2021, as described in RPM #1 and #2, above. These programs are implemented annually to restore adfluvial Bull Trout populations in the lower Clark Fork River–Lake Pend Oreille watershed consistent with the intent of the NSRP and CFSA.

Coordination and outreach to inform and facilitate both the public and cooperating agencies' involvement in tributary habitat protection and enhancement efforts is the principal consideration of the Watershed Councils Program (CFSA Appendix E). Efforts in Idaho and Montana in 2021 included holding quarterly meetings between Watershed Council groups and cooperators, the distribution of outreach materials, and assisting with the administration required to help develop watershed restoration plans, secure grants, and execute contracting and permitting necessary for implementing stream enhancement and restoration efforts.

Tributary habitat protection and enhancement to benefit native salmonids is the principal consideration of the Idaho and Montana Tributary Habitat Acquisition and Fishery Enhancement Programs (CFSA appendices A and B). Specific efforts undertaken in 2021 for the furthering of these efforts in Idaho included the cooperative development of stream habitat prioritization evaluations for critical native salmonid tributaries in the Pack River drainage, a project focusing on stream restoration work in Trestle Creek, and planning a project to reconnect lower Lightning Creek for migratory adult Bull Trout under low flow conditions. In Montana, efforts undertaken

in 2021 included the continuation of riparian reforestation efforts along the Bull River and adjacent areas of the lower East Fork Bull River, the purchase of over 346 acres including over a half-mile of channel frontage on Graves Creek, and the recent channel reconstruction project in the Vermilion River. Recently enacted habitat enhancement projects in Graves Creek and upper Prospect Creek were further monitored through the collection of physical habitat measurements in 2021. In addition, a large channel and floodplain restoration project was constructed along 2,400 ft of the Vermilion River, furthering a similar enhancement effort performed just upstream in 2016. Another project initiated in 2021 was investigating channel morphology, the effects of beaver activity, revegetation, and other aspects of the split channels of the lower East Fork Bull River. This effort will help ensure connectivity and enhance habitat to benefit native salmonids in this important Bull Trout rearing tributary. Annual fisheries monitoring is conducted under both the Idaho and Montana programs to inform cooperators of the status, abundance, and distribution of species of special concern, non-native species abundance and distribution, and through redd surveys, monitoring trends in Bull Trout spawning effort.

8.1.2.7 Terms and Conditions to Implement RPM #7 and Corresponding Activities

The incidental take statement's RPM #7 states:

Implement reporting and consultation requirements as outlined in the terms and conditions below in order to minimize take of bull trout related to implementation of the Native Salmonid Restoration Plan and other fisheries monitoring activities.

The six terms and conditions (15 through 20) and corresponding 2021 activities implementing RPM #7 are listed below.

15) An annual assessment of bull trout populations in the Lake Pend Oreille Core Area shall be prepared and submitted to the Service. The assessment shall be conducted in a manner consistent with the Clark Fork Settlement Agreement (as amended), and use the best available information (e.g., tributary redd counts).

Bull Trout Redd Surveys in LPO Core Area Tributaries:

As in past years, the 2021 Idaho annual redd count table was provided, by email, to the USFWS from IDFG on November 22, 2021. Following consolidation of Bull Trout and Brown Trout redd information, redd survey information from Montana tributaries will be included in an annual project update to be forwarded to the USFWS from Avista in early 2022.

Lake Pend Oreille Bull Trout Survival Study:

The LPO Bull Trout Survival Study was initiated in 2011 and involves marking juvenile Bull Trout in both Trestle and Granite creeks using PIT tags. Bull Trout in-lake survival is then estimated through monitoring movement patterns of tagged fish from these LPO tributaries using PIT-tag monitoring stations placed near the outlet of these creeks.

In 2021, 110 additional Bull Trout were implanted with PIT tags in Trestle, Morris, Caribou, Hellroaring, and McCormick creeks. No Westslope Cutthroat Trout were tagged in 2021 as part of this project. The PIT arrays in Trestle and Granite creeks were maintained to passively monitor

movements of these tagged fish and were upgraded to BioMark systems in August. Work to install a new PIT array in Gold Creek was initiated in 2021 with installation anticipated in 2022. Movements of PIT-tagged Bull Trout were documented out of and into Trestle and Granite creeks. Movements of PIT-tagged Bull Trout tagged through the LPO Lake Trout Netting Program were also detected in both tributaries. These PIT tag detections provide valuable information on the timing of Bull Trout migratory movements within the basin. Monitoring of fish movements will be necessary for at least eight years to adequately account for the detection of returning adult Bull Trout used to estimate survival.

The project completion report for this project was finished in 2021. Overall results indicated that in-lake survival (25%) of Bull Trout reared in Trestle Creek has increased since the early 2000s but the rate of repeat spawning (23%) has declined. For fish reared in Granite Creek survival was 19% with repeat spawning being 12%. Juvenile Bull Trout from Trestle and Granite creeks typically emigrate during late fall, and adult returns are focused on the mid-June to late-August time period. In 2022 this project plan will be dropped, and the work being implemented under this project plan will be transferred to the project plan titled “Lake Pend Oreille Bull Trout Population Monitoring and Evaluation.”

Lake Pend Oreille Bull Trout Population Monitoring and Evaluation:

This is a continuing activity that was first approved by the Management Committee in 2021. This project replaces the “Lake Pend Oreille Bull Trout Survival Study” (completed in 2021) and will provide a mechanism to combine the unique and valuable data that has been collected through CFSA projects into one integrated monitoring program. Many of these data sets 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 LPO netting programs (Lake Trout and Walleye), angler incentive programs, tributary monitoring, PIT antennas, and redd counts will be evaluated together in this project. These data will be utilized together to evaluate the LPO Bull Trout metapopulation. In 2021, the majority of the work consisted of data compilation and Bull Trout age determination.

Demography of Adfluvial Bull Trout in LPO:

This was a continuing activity in 2021. The objectives of this project are to: 1) quantify the effects of netting bycatch on Bull Trout survival and growth; 2) estimate abundance of Bull Trout in LPO; and 3) develop optimal sampling and statistical methodologies, as well as an integrated population demographic model to be used for future Bull Trout monitoring. This project will allow IDFG to evaluate scenarios involving recreational fisheries harvest, varying levels of Lake Trout suppression, and techniques to modify Bull Trout bycatch as Lake Trout netting efforts evolve. In 2021, the project team continued work on the final report, which is currently in final review.

16) An assessment of Lake Pend Oreille prey base population trends shall be prepared and submitted to the Service. The assessment shall be conducted in a manner consistent with the Clark Fork Settlement Agreement (as amended), be based on the best available information, and evaluate the need for measures to benefit bull trout prey species in Lake Pend Oreille.

Idaho Department of Fish and Game continued annual monitoring and assessment of LPO prey base population trends. Based upon 2002 interagency discussions and IDFG management actions,

IDFG, in consultation with Avista and USFWS, conducted the sixteenth season of a large-scale spring and fall netting operation on LPO in 2021. Periodic updates of this netting operation are provided to both Avista and USFWS, through email, by IDFG. These program updates constitute Avista's "assessment" and "evaluation of need" for 2021. Annual kokanee total abundance estimates associated with the LPO Lake Trout Netting Program provide further insight into the LPO prey base.

17) An annual report shall be submitted to the Service indicating the actual number of bull trout taken, if any, as well as any relevant biological/habitat data or other pertinent information on bull trout that was collected. This report shall be submitted to the Service by March 31st each year.

This annual report satisfies this Term and Condition. This was the twenty-first year of program implementation. Sampling techniques are always being refined, and new techniques employed. During field activities conducted in 2021, the total number of Bull Trout handled and "the extent of intentional and incidental take" for Bull Trout is described in Table 6. The number of Bull Trout proposed to be intentionally "taken" by each activity in 2022 is also outlined in Table 6.

There were a total of 1,260 Bull Trout capture events during implementation of CFSA Appendix F5 LPO Lake Trout Netting and LPO Angler Incentive programs in 2021, which includes 289 mortalities, and is covered under a separate Section 6 Agreement between the USFWS and IDFG. There were 15 Bull Trout handling events during gill-netting efforts targeting Walleye in LPO under the CFSA Appendix F5 LPO/Clark Fork River Walleye Population Assessment program with 4 incidental Bull Trout mortalities. These mortalities are also reported under the Section 6 agreement between the USFWS and IDFG. There were likely instances where Bull Trout were handled multiple times under the programs described previously and some of these Bull Trout may have been handled during implementation of CFSA Appendix C programs in 2021.

Bull Trout "take" numbers for CFSA Appendix A and Appendix B programs are also reported by MFWP and IDFG personnel as part of their reporting requirements. These numbers are included with CFSA Appendix C Bull Trout "take" numbers in Table 6. There were a total of 324 Bull Trout captured under Appendix A, and none were recaptured in 2021. Appendix B project implementation resulted in the intentional take of 82 unique Bull Trout. A total of 382 unique Bull Trout were handled during CFSA Appendix C program implementation. Four of these fish were captured twice during 2021. Two of these four were adult Bull Trout transported upstream of Cabinet Gorge Dam in 2021 and later captured in tributary traps in either Graves Creek or East Fork Bull River.

Table 6. Bull Trout take and mortalities reported in 2021 along with proposed intentional take for 2022.

CFSA Program	Capture Events	Unique Bull Trout	Bull Trout Mortalities	Proposed 2022 Bull Trout Take
Appendix A	324	324	1	300
Appendix B	82	82	0	350
Appendix C	386	382	2	1,300
Total	792	788	3	1,950

18) An annual report shall be prepared and submitted to the Service that details the next year's proposed activities under the Native Salmonid Restoration Plan and other fisheries monitoring that may result in intentional as well as incidental take of bull trout. The report shall quantify the number of bull trout proposed to be intentionally "taken" by each activity and summarize the extent of intentional take from all previous year's activities. This report shall be submitted to the Service by March 31st each year.

The USFWS, as a member of the MC, reviews and approves AIPs for the NSRP and other fisheries monitoring plans that have the potential to result in take of Bull Trout. This review process begins at the technical level with the Aquatic Implementation Team and continues through the Water Resource Technical Advisory Committee, with final approval of all proposed AIPs occurring at the March MC meeting.

The USFWS also verified that the information reported in this Annual Report is sufficient to cover the requirement for a report quantifying the number of Bull Trout proposed to be intentionally “taken” (see Table 6, above) and summarizing the extent of intentional take from all previous year’s activities.

19) During project implementation the FERC or licensee shall promptly notify the Service of any emergency or unanticipated situations arising that may be detrimental for bull trout relative to the proposed activity.

No such emergency or unanticipated situations were observed during 2021.

20) Upon locating dead or injured bull trout, or upon observing destruction of bull trout redds, the FERC or licensee shall notify the Service within 24 hours. The FERC or licensee shall record information relative to the date, time, and location of dead or injured bull trout when found, and possible cause of injury or death of each fish and provide this information to the Service.

As directed by the USFWS, notifications of all dead or injured Bull Trout were sent to the USFWS representatives Kevin Aceituno and Ben Conard within 24 hours. Bull Trout mortalities were reported to the USFWS on two occasions during 2021. The first report was submitted to the USFWS on May 10 and to the FERC on June 1. This report pertained to one juvenile Bull Trout mortality that was observed on May 9. This juvenile Bull Trout mortality was found near the

Graves Creek permanent trap and based on coloration and state of rigor mortis Avista staff believe the juvenile Bull Trout died upstream and passively drifted into the permanent weir trap box. The second report was for an adult Bull Trout that succumbed to injuries sustained at the Cabinet Gorge Fish Handling Facility on September 1. This mortality was reported to the USFWS on September 2 and submitted to FERC on September 29.

8.1.2.8 Terms and Conditions to Implement RPM # 8 and Corresponding Activities

The incidental take statement's RPM #8 states:

Construct and operate the CGDF consistent with Amendment #1 of the Clark Fork Settlement Agreement, and the Clark Fork Project License (including amendments).

The five terms and conditions (21 through 25) and corresponding 2021 activities implementing RPM #8 are listed below.

21) The FERC or licensee shall ensure that construction, operation, and maintenance of the CGDF remain consistent with the proposed action described in the final Biological Assessment (Avista and FERC 2017). The Service shall be promptly notified of any changes to construction, operations or maintenance activities.

Avista plans to continue with construction and operate and maintain the CGDF consistent with the proposed action described in the final Biological Assessment. There were no changes identified in 2021 that would impact construction, operations or maintenance activities.

22) The fish salvage plan shall be completed and approved by the Service prior to construction of the cofferdam.

The USFWS approved the CGDF Fish Salvage Plan on February 12, 2019; followed by approval by the FERC on November 19, 2019. During spill of 2021 one entrance gate was opened a few inches to equalize water pressure inside and outside of the structure. Following spill, the entrance gate was closed and Avista personnel salvaged fish that were entrained within the trap structure. Numerous fry including Yellow Perch and a few Peamouth and Northern Pikeminnow were captured during this fish salvage event. These activities were consistent with the CGDF Fish Salvage Plan and reported to the appropriate stakeholders.

23) The FERC or licensee shall provide an annual report to the Service detailing the progress of CGDF construction. This report shall be submitted to the Service by March 31st each year.

This annual report, including the discussion under Term and Condition 3, satisfies this requirement.

24) The FERC or licensee shall provide an annual report to the Service detailing the past year's operation of the CGDF, including the number of bull trout that interacted with the CGDF and any mortality. This information can be included in the annual report required under T&C 17 above and shall be submitted to the Service by March 31st each year.

The CGDF is currently under construction and is scheduled to be operational in the spring of 2022.

25) Any shut-downs of the CGDF during normal operating conditions, as agreed to in the Clark for Settlement Agreement (as amended), shall be reported within 24 hours to the Service.

The CGDF is currently under construction and is scheduled to be operational in the spring of 2022.

8.1.3 Key 2021 References

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8.2 Fishway Plan and Annual Report (License Article 433 – Amended June 13, 2003)

8.2.1 Purpose

Article 433 of the FERC License (License) requires that, on or before April 15 of each year and after consultation with the MC, the Licensee file for Commission approval a Fishway Plan and Annual Report. The Plan must address the Licensee's compliance with the USFWS Section 18 fishway prescriptions contained in CFSA Appendix C to the License, including a detailed description of any fish passage devices or measures and any proposed modifications to project facilities or operations; documentation of any consultations; copies of comments and recommendations received on the completed plan; and specific descriptions of how entities' comments are accommodated by the Plan or Avista's reasons for not including such comments, based on Project-specific information.

In 2002, Avista and USFWS agreed that the Article 433 Fishway Plan requirement, as well as Avista's annual reporting and consultation requirements for CFSA appendices A, B, and C (License Articles 404, 405 and 406) are adequately addressed through the AIPs, which are approved by the MC, and by providing the annual activity summaries contained in this section of the Annual Report. Section 8.2.2 below provides the 2021 activity report for these PM&E measures, which comprises Avista's Fishway Plan and is intended to satisfy Avista's annual reporting requirement for these measures.

8.2.2 2021 Activity Summary

8.2.2.1 Prescription 1 Conditions and Corresponding Activities

Prescription 1 Description

USFWS's Section 18 Prescription 1 states the following:

The licensee shall assess, plan, design, construct, operate, and maintain upstream fishway devices or measures and downstream fish protection devices or measures in accordance with the Native Salmonid Restoration Plan (Plan) (License Application Volume IV.A). Construction, operation, and maintenance of fishways will proceed in a stepwise manner, beginning at the effective date of the Settlement Agreement (License Application Volume III), utilizing the principles of adaptive management (i.e., the ability to change program direction based on new information provided by monitoring and evaluation of experimental measures). Following initial feasibility assessments, and within one year of the effective date of the Settlement Agreement, an experimental fish trap and truck program for the purpose of moving bull trout from below Cabinet Gorge Dam to the Cabinet Gorge Reservoir pool shall be constructed, operated, and maintained. Assessment and implementation of other fish stock enhancement measures shall begin at the effective date of the Settlement Agreement, as described in the Plan. Evaluation of the effectiveness of the fish trap and truck program below Cabinet Gorge, and evaluation of other stock enhancement measures will determine the timing of construction, operation, and maintenance of other upstream fishway

facilities and measures and downstream fish entrainment protection devices at Cabinet Gorge and Noxon Rapids Dams.

2021 Activities Associated with Prescription 1

Adult Bull Trout Capture and Transport:

Bull Trout capture efforts downstream of Cabinet Gorge Dam and subsequent upstream transport have occurred annually since 2001. The goal of this program is to reconnect adult Bull Trout with their most likely tributary of origin based on genetic testing or capture history, in order to increase the number of spawning Bull Trout in Montana tributaries. Efforts to collect adult Bull Trout occurred from early April through mid-October 2021, with a total of 28 individual adult Bull Trout (defined as greater than 350 mm in length for upstream transport purposes) captured in the lower Clark Fork River downstream of Cabinet Gorge Dam utilizing three collection methods: night electrofishing, hook-and-line sampling, and the Cabinet Gorge Hatchery Ladder trap. Captured fish were held at the Cabinet Gorge Fish Handling Facility while awaiting a genetic population assignment from the genetics laboratory. Twenty-five Bull Trout were transported upstream to Montana based on genetic assignments or previous capture histories and were released in: Cabinet Gorge Reservoir or its tributaries (4), Noxon Reservoir or its tributaries (12), or upstream of Thompson Falls Dam (9). No Bull Trout genetically assigning to Lightning Creek tributaries were captured or transported to the East Fork Bull River in 2021.

A new study was initiated in 2020 to evaluate the reproductive contribution of Bull Trout (both those transported upstream and those that reside in the stream or reservoir) in Graves Creek and East Fork Bull River. Fin tissue samples were collected from juvenile Bull Trout captured in Graves Creek and the East Fork Bull River during stream electrofishing activities in 2020 that were implemented under the Bull Trout Emigration Study. Additional fin tissue samples were collected from juvenile Bull Trout captured in tributary traps in the East Fork Bull River and were shipped to the lab over the winter. A final report was received in December 2021. Some noteworthy findings include 59% of the 143 juvenile Bull Trout analyzed in the East Fork Bull River were assigned as offspring of Lightning Creek assigned upstream transport adults. Ninety-nine percent of the 341 juvenile Bull Trout analyzed in Graves Creek were assigned as offspring of upstream transport adults. The results of this study also provided evidence that beaver dams prevented some Bull Trout from ascending the East Fork Bull River to spawning areas as no Bull Trout released downstream of these beaver dams in 2018 produced offspring. Bull Trout transported to East Fork Bull River later in the spawning season (mid-October) successfully produced offspring.

Westslope Cutthroat Trout Experimental Transport:

The management goal for passage is to reestablish connectivity and increase the number of large migratory Westslope Cutthroat Trout available to spawn in Montana tributaries. This was the seventh year Westslope Cutthroat Trout were captured downstream of Cabinet Gorge Dam and transported upstream to Cabinet Gorge Reservoir. Night electrofishing and hook-and-line sampling were utilized to capture 17 fish for upstream transport. No radio transmitters were implanted in Westslope Cutthroat Trout transported upstream in 2021. Fish were transported upstream from mid-April through mid-June and were released at the Big Eddy Recreation Area boat ramp in Cabinet Gorge Reservoir. One fish was detected entering the Bull River drainage during the spring spawning time period.

Cabinet Gorge Dam Permanent Fishway:

Construction of the CGDF remained on schedule during 2021. The contractor finished all, but one concrete pour for the fish trap structure prior to spring spill 2021. During spill one entrance gate was cracked open a few inches to equalize water pressure inside and outside of the structure. Following spill, the entrance gate was closed and Avista personnel salvaged fish that were entrained within the trap. Numerous fry including Yellow Perch and a few Peamouth and Northern Pike minnow were captured during this fish salvage event. These activities were reported to the appropriate stakeholders. Quarterly updates were also provided to the Management Committee (MC) on the progress of the project. Monthly construction reports were submitted as required by permitting and approval agencies (i.e., FERC Portland Regional Office).

The final concrete pour within the fish trap structure was completed following the spill season. During 2021, the contractor also erected and wired the control building, finished laying siphon piping from the forebay down to the fish trap, installed the Hydraulic Power Unit for gate operation, constructed the monorail crane slab, installed fish monitoring equipment, removed the cofferdam and other activities. Avista also worked internally to determine the best communication options for the fish monitoring devices and Programmable Logic Controller to data storage locations and for alarms. The current CGDF construction schedule shows a completion date of spring 2022, with commissioning of the CGDF occurring prior to spill 2022.

In 2019, the MC agreed to develop a Cabinet Gorge Dam Fish Passage Facility Monitoring and Evaluation (M&E) Plan as an alternative to updating the basic monitoring program document that was originally developed in 2013. Any changes to the design of the fish trap that may impact the basic monitoring program document were captured in the M&E Plan. The MC approved a subgroup (established at the September 21, 2021 MC meeting comprised of individuals from USFWS, MFWP, IDFG, Kalispel Tribe, and Avista) to finalize and modify the M&E Plan once the CGDF becomes operational. The M&E Plan was sent to the MC via Consent mail and was approved in December 2021. Other documents needed for operation of the CGDF, including a transport protocol, operations and maintenance plan, Aquatic Invasive Species Prevention Plan, and fish handling protocol are being drafted and will be finalized prior to operation of the CGDF.

All of the originally planned upgrades to the Cabinet Gorge Fish Handling Facility were completed in 2021. However, a number of change orders for unforeseen circumstances resulted in an increase in cost and extension in the project schedule. A Consent mail was sent to the MC and approved in December 2021 for additional funds to complete the project. These unforeseen items included: concrete encasement along the return to river pipe that had to be removed, unforeseen rock excavation in the septic area, adding an extension to the new packed column aerator, addition of an awning, additional construction management and engineering support due to project schedule extension along with support to update the operations and maintenance plan for the Cabinet Gorge Fish Handling Facility, and other miscellaneous items.

Noxon Rapids Dam Permanent Fishway:

No new work was proposed or conducted for the Noxon Rapids Dam Permanent Fishway and fish handling facility project in 2021. Based on agreements made in Amendment No. 1 to the CFSA, final design and construction of the Noxon Rapids Dam Permanent Fishway shall be deferred for an interim period ending no sooner than December 31, 2021 (see previous annual reports for

additional information). 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 reinstate these conversations.

Downstream Fish Passage:

Safe downstream passage of Bull Trout is addressed through the Tributary Trapping and Downstream Juvenile Bull Trout Transport Program. Under this program, juvenile Bull Trout are captured in traps during their outmigrations, or through targeted stream electrofishing efforts. Following capture, juvenile Bull Trout are measured, implanted with a PIT tag, and transported to the Clark Fork River downstream of Cabinet Gorge Dam where they are released. In addition, adult Bull Trout that were previously transported upstream and are recaptured in tributaries following the spawn are transported back to the Clark Fork River downstream of Cabinet Gorge Dam (albeit, in consultation with the USFWS, the decision was made to release one-half of the post-spawn adults captured within Graves Creek on site so that the benefits and limitations of this strategy can be directly evaluated).

Fish trapping and transport for 2021 was conducted from March 29 through July 2 and September 13 through December 3 in Graves Creek (traps were disabled for the Thanksgiving break). The permanent weir trap was fished during the spring and a temporary weir trap was fished from September 13 until November 3 when the enhanced permanent weir trap started fishing. Volitional passage was opened up at Graves Creek once per week through October 6. Minnow traps were opportunistically operated in Graves Creek during 2021. The East Fork Bull River was trapped from March 29 through July 2 and August 30 through November 24 with the exception of the Labor Day holiday. The new trap box, lift, and pipe supports were constructed and installed on October 26. East Fork Bull River stream electrofishing was conducted during five days from October 18 through October 22. Vermilion River electrofishing occurred on ten days from October 25 through November 5.

There were a total of 355 capture events of 353 individual juvenile (i.e., <300 mm) Bull Trout during 2021 (26 of these individuals were recaptures from previous years). A total of 255, 120–250 mm, Bull Trout were captured in Montana tributaries and transported to Idaho during 2021 (Table 1). An additional 98 juvenile Bull Trout were captured and released on site (two of these were captured twice) because they did not meet one or more of the transport criteria (i.e., fish length or direction of travel). There was one juvenile Bull Trout mortality observed in 2021. This fish likely died of causes unrelated to tributary trapping at a location upstream of the Graves Creek permanent weir trap and passively drifted downstream into the trap box. Following capture, fish were measured (length and weight) and implanted with a PIT tag if they were greater than 99 mm and if a PIT tag was not already present. All juvenile transports were released in the lower Clark Fork River at the Cabinet Gorge Fish Hatchery site.

There were two capture events of individual adult Bull Trout in tributary traps during 2021. Both fish were captured following the spawn and transported to Idaho (one each from Graves Creek and the East Fork Bull River).

Table 1. Tributary and method of capture for juvenile Bull Trout transported to Idaho under the Tributary Trapping and Downstream Juvenile Bull Trout Transport Program in 2021.

Tributary	Method	Bull Trout Transported
Graves Creek	Permanent Weir/Weir/Minnow trap	178
East Fork Bull River	Weir/Screw Trap/Stream Electrofishing	47
Vermilion River	Stream Electrofishing	30
Total		255

Following a feasibility investigation, Avista constructed a concrete-bedded weir trap (permanent weir trap) on lower Graves Creek in late 2012 and initiated operation in 2013. Operation of the permanent weir trap was anticipated to facilitate higher capture efficiencies for outmigrating juvenile Bull Trout, particularly during periods of higher streamflow that proved difficult to trap with existing methodologies. The Graves Creek Permanent Weir Trap Monitoring and Evaluation Plan was completed in 2013 and was designed to evaluate the operation and fish capture effectiveness of the permanent weir trap. The plan was updated during 2017 and continues to be implemented.

From the inception of permanent weir operation through 2018, a number of issues were identified and iteratively addressed by Avista, MFWP, and USFWS. After careful consideration and extensive testing of a prototype, an engineering firm was hired to design substantial enhancements to the permanent weir trap. Design was finalized in 2020 and construction of the enhancements occurred in the summer and fall of 2021. The enhancements became operational on November 3 and preliminary results suggest the new trap meets and exceeds the various goals and expectations that warranted the change. In addition, due to the marked increase in the number of juvenile Bull Trout being handled during 2019 and 2020, Avista constructed a fish handling facility near the permanent weir trap that also became operational this year. This facility provides protected, flow-through stream water to minimize stress while holding and working up fish prior to transport or release.

8.2.2.2 Prescription 2 Conditions and Corresponding Activities

Prescription 2 Description

USFWS's Section 18 Prescription 2 states the following:

At the effective date of the Settlement Agreement (License Application Volume III), the licensee shall develop and implement a fish passage program in accordance with the terms of the Clark Fork Settlement Agreement and the Native Salmonid Restoration Plan (License Application Volume IV.A). Implementation of the Plan shall include initial project scoping activities resulting in goals and objectives; background information, compilation and updating in areas of fish genetics, fish pathogens, exotic fish control, existing fish populations, stream and mainstem habitat conditions; assessment of suitable fish stock availability, fish transfer options, and fish hatchery options; and implementation of experimental and comprehensive fish passage measures,

as appropriate, and a monitoring program to assess the effectiveness of fishways and other measures.

2021 Activities Associated with Prescription 2

Avista continued to provide safe, timely, and efficient fish passage in 2021, adaptively managed in consultation with USFWS and other MC members. Following approval of the CFSA Amendment by the MC, Avista and stakeholders reinitiated development of the next NSRP Five-Year Plan. The updated NSRP Five-Year Plan for the 2019–2023 time period was approved at the September 25, 2018 MC meeting. In 2021, the USFWS reviewed and approved AIPs, including those related to Bull Trout passage. The USFWS received the project plans that were approved by the MC, which the USFWS is a member of, in April 2021. The pertinent project plans include:

- Upstream Fish Passage Program
- Graves Creek and East Fork Bull River Genetic Study
- Tributary Trapping and Downstream Juvenile Bull Trout Transport Program
- Bull Trout Emigration Study
- Non-Native Fish Suppression Project in the East Fork Bull River
- Redd Surveys in Montana Tributaries
- Evaluation of Potential Actions for Reducing Non-native Threats to Native Salmonid Populations
- Fish Capture Facilities Operation, Development, and Testing
- Graves Creek Permanent Weir Trap Enhancements

Assessing and/or improving stream and mainstem habitat conditions and the implementation of a monitoring program to assess the effectiveness of fishways and other measures are activities addressed through the coordinated implementation of CFSA appendices A, B, C, and F5.

8.2.3 Key 2021 References

Adams, B., M. Piteo, and J. VonBargen. 2021. Genetic Analysis of Native Salmonids from the Lake Pend Oreille and Clark Fork River System, Idaho and Montana. Annual Project Update CY2020. Avista document identification number 2021-0224.

Adams, B., M. Piteo, and J. VonBargen. *In prep.* Genetic Analysis of Native Salmonids from the Lake Pend Oreille and Clark Fork River System, Idaho and Montana. Annual Project Update CY2021.

Adams, B., and S. Bernall. 2021. Bull Trout Parentage Analysis in the East Fork Bull River and Graves Creek Drainage, Montana. Project Completion Report. Avista document identification number 2021-0271.

Aquatic Implementation Team. 2018. Clark Fork River Native Salmonid Restoration Plan. Five-Year Plan (2019–2023). Avista document identification number 2018-0318.

- Avista. 2021. Clark Fork Settlement Agreement Management Committee Meeting Minutes from March 17, 2021 (virtual meeting). Avista document identification number 2021-0067.
- Avista. 2021. 2021 Annual Fall Management Committee Meeting, Clark Fork Management Committee Meeting Agenda, and Clark Fork Settlement Agreement Management Committee Meeting Record from September 21, 2021(virtual meeting). Avista document identification number 2021-0218.
- Avista. 2021. Consent Mail approval of Appendix C – Cabinet Gorge Fish Passage Facility Monitoring and Evaluation Plan and Additional Funds for Fish Handling Facility Upgrades (November 30, 2021). Avista document identification number 2021-0229.
- Avista. 2021. E-mail correspondence providing final update on the dewatering of the Cabinet Gorge Dam Fishway structure and fish salvage efforts. Avista document identification number 2021-0256.
- Avista. 2021. E-mail correspondence providing the MC quarterly updates on the progress of the Cabinet Gorge Dam Fishway construction project. Avista document identification number 2021-0259.
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- Bernall, S., J. Johnson, and P. Kusnierz. 2021. Clark Fork River Westslope Cutthroat Trout Experimental Transport Program. Comprehensive Project Report 2015–2018. Avista document identification number 2021-0257.
- Bernall, S., K. Aceituno, K. Bouwens, T. Rehm, J. Maroney, and E. Oldenburg. 2021. Cabinet Gorge Dam Fish Passage Facility Monitoring and Evaluation Plan. Avista document identification number 2021-0251.
- Bernall, S., K. Duffy, and J. Johnson. *In prep.* Upstream Fish Passage Program. Comprehensive Project Report (2001–2021).
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- FERC. 2019. Order Amending License and Approving Exhibits A and F (August 8, 2019). Avista document identification number 2019-0175.
- FERC. 2019. Order Approving Fish Salvage Plan (November 19, 2019). Avista document identification number 2019-0298.

FERC. 2021. Order Approving 2020 Annual Report and 2021 Implementation Plans Per Article 402, Annual Threatened and Endangered Species Plan Per Article 432, and Annual Fishway Plan Per Article 433 (September 1, 2021). Avista document identification number 2021-0165.

Oldenburg, E. W. *In prep.* Tributary Trapping and Downstream Juvenile Bull Trout Transport Program. Comprehensive Project Report - 2018–2021 (includes Graves Creek permanent weir trap monitoring and evaluation plan report as an appendix).

USFWS. 2019. Endangered Species Act Section 7 Consultation Biological Opinion. Avista document identification number 2019-0026.

8.3 Other Clark Fork License Articles

8.3.1 Purpose

This section of the Annual Report highlights any annual activities (Section 8.3.2) that occurred in 2021 associated with other License Articles for the Clark Fork Project No. 2058 that do not directly tie to a specific CFSA PM&E measure.

8.3.2 2021 Activity Table

License Article Number	License Article Description	2021 Activity
438	Dispute Resolution	No activity occurred
439	Rock Creek Mine Discharge Facility	No activity occurred
440	Revised License Exhibit G	No activity occurred
441	Alterations per Fish and Wildlife Program	No activity occurred
442	Permission for Use and Occupancy of Project Lands and Waters	See Section 8.3.2.1
443	Construction, Operation, and Maintenance of Fishways	See Section 8.2.2.1

8.3.2.1 Permission for use and Occupancy of Project Lands and Waters

In 2021, Avista granted permission for certain types of use and occupancy of Project lands and waters to comply with CFSA appendices G and H (License Articles 414 and 415). Uses and occupancy are included in sections 7.1 and 7.2 of this report. Avista conveyed no new easements in 2021.

8.3.3 Key 2021 References

Avista. 2021. Avista Property Use Permits, 2021. Avista document identification number 2021-0292.

Section 9: Federal Energy Regulatory Commission Issues and Actions

9.1 Purpose

The purpose of this section is to inform FERC of any “out of the ordinary” issues pertaining to the implementation of the Clark Fork License No. 2058 and any items requiring FERC action through December 31, 2021. The FERC-related activities for 2021 (such as FERC filings, FERC orders, and FERC correspondence), and FERC awareness items (such as Clark Fork Settlement Agreement PM&E measure modifications and clarifications and specific issues of interest) are also included in this section of the Annual Report.

9.2 FERC Activities/Awareness

In 2021, FERC activities related to the Clark Fork Project included the following:

- Avista’s April 14, 2021 submittal of the 2020 Clark Fork Annual Report and the 2021 Clark Fork Annual Implementation Plans.
- Avista’s June 1, 2021 submittal of a Biological Opinion Condition 20 Report regarding Bull Trout Mortality for May 2021.
- FERC’s September 1, 2021 Order Approving 2020 Annual Report and 2021 Annual Implementation Plans Per Article 402, Annual Threatened and Endangered Species Plan Per Article 432, and Annual Fishway Plan Per Article 433.
- Avista’s September 29, 2021 submittal of a Biological Opinion Condition 20 Report regarding Bull Trout Mortality for September 2021.

9.3 Key 2021 References

Avista. 2021. 2020 Clark Fork Annual Report and the 2021 Clark Fork Annual Implementation Plans (April 14, 2021). Avista document identification number 2021-0056.

Avista. 2021. Biological Opinion Condition 20 Report regarding Bull Trout (June 1, 2021). Avista document identification number 2021-0097.

Avista. 2021. Biological Opinion Condition 20 Report regarding Bull Trout (September 29, 2021). Avista document identification number 2021-0188.

FERC. 2021. Order Approving 2020 Annual Report and 2021 Implementation Plans Per Article 402, Annual Threatened and Endangered Species Plan Per Article 432, and Annual Fishway Plan Per Article 433 (September 1, 2021). Avista document identification number 2021-0165.

Section 10: Amendments, Modifications, and Clarification of License Articles

10.1 Purpose

This portion of the Annual Report highlights and summarizes all amendments, modifications, and/or clarifications (other than one-time filing extensions or Exhibits and annual approvals) made to the License for Clark Fork Project No. 2058, through December 31, 2021. Note that terms and conditions of the original license took effect on March 1, 2001.

Each FERC amendment, modification, or clarification to/of an existing license article are included in Section 10.2. The date of each amendment, modification, or clarification is also documented. There were no activities in 2021.

10.2 Amendments/Modifications/Clarifications of License Articles for Clark Fork Project No. 2058

Article Number	Description	Date Amended or Clarified
L-2	Exhibit Drawings	10/29/2013
201	Authorized Installed Capacity and Annual Charges	07/13/2006
201	Authorized Installed Capacity and Annual Charges	10/10/2006
201	Annual Charges and Exhibit A	06/15/2007
201	Authorized Installed Capacity and Annual Charges	04/10/2008
201	Exhibit G Drawings and Annual Charges	02/10/2009
201	Exhibit G Drawings and Annual Charges	10/09/2014
204	Exhibit F and Exhibit G Drawings	01/09/2002
412	Water Quality Protection and Monitoring Plan	12/10/2002
412	Water Quality Protection and Monitoring Plan	06/23/2011
413	Exhibit F Drawings	11/18/2016
413	Exhibit F Drawings	03/01/2018
413	Exhibit A and Exhibit F Drawings	08/08/2019
427	Programmatic Agreement	10/30/2000
429	Minimum Flows	12/18/2017
431	Coordination of Flows with Albeni Falls	11/22/2002
432	Threatened and Endangered Species Plan	06/13/2003
433	Fishway Plan	06/13/2003
434	Erosion Plan	03/04/2003
435	Solid Waste and Waste Water Plan	12/10/2002
436	Oil and Hazardous Substance Plan	12/10/2002
437	Pesticide & Herbicide Use Plan	11/22/2002
438	Dispute Resolution	10/30/2000
438	Dispute Resolution	11/22/2002
442	Use and Occupancy of Project Lands and Waters	11/22/2002
443	Fishway Prescriptions	10/30/2000
n/a	Approval to Replace Transmission Lines	03/05/2014

Section 11: Clarifications and Modifications to Clark Fork Settlement Agreement and PM&E Measures

11.1 Purpose

This portion of the Annual Report highlights and summarizes all clarifications and modifications to the CFSA and PM&E measures.

Each clarification or modification document are included in Section 11.2, with the date of MC (or, in the case of the Programmatic Agreement, CRMG) approval. There were no activities in 2021.

11.2 Clarifications/Modifications to Clark Fork Settlement Agreement and PM&E Measures

Document or Appendix	Document Title	Date Approved
CFSA ¶ 26	Cost Over-Run Guidelines	09/27/2000
CFSA ¶ 26	Management Committee Membership Application	12/29/2000
CFSA ¶ 26	Management Committee Procedures	09/30/2003
CFSA	Amendment No. 1	09/26/2017
CFSA Appendix C	Clarification of Usage of Funding Sources	09/30/2003
CFSA Appendix C	Joint Agreement Regarding Fish Passage	03/16/2010
CFSA Appendix C	Resolution of O&M Funding for CGDF	09/26/2017
CFSA Appendix F1	Title Revised	10/26/2016
CFSA Appendix N1	Obligation Fulfilled	10/26/2016
CFSA Appendix N2	Obligation Fulfilled	10/26/2016
CFSA Appendix N3	Obligation Fulfilled	10/26/2016
CFSA Appendix O	Obligation Fulfilled	10/26/2016
CFSA Appendix T	Project Operations during Low Inflows	09/26/2001
CFSA Appendix V	Guidelines for Acquisition of Land Interests	03/26/2010
PA	Programmatic Agreement (CRMG) Reporting	04/12/2001
PA	Programmatic Agreement (CRMG) Reporting	11/23/2004

11.3 Key 2021 References

Avista. 2021. Clark Fork Settlement Agreement Management Committee Meeting Minutes from March 17, 2021 (virtual meeting). Avista document identification number 2021-0067.

Avista. 2021. 2021 Annual Fall Management Committee Meeting, Clark Fork Management Committee Meeting Agenda, and Clark Fork Settlement Agreement Management Committee Meeting Record from September 21, 2021 (virtual meeting). Avista document identification number 2021-0218.

FERC. 2021. Order Approving 2020 Annual Report and 2021 Implementation Plans Per Article 402, Annual Threatened and Endangered Species Plan Per Article 432, and Annual Fishway Plan Per Article 433 (September 1, 2021). Avista document identification number 2021-0165.

Section 12: Annual Budget and Grant Summary

12.1 Budget Summary

On the following page is a spreadsheet summary of budget activities for each of the PM&E measures for the 2021 calendar year (January – December). The MC approved activity year is from April through March therefore, the following budget spreadsheet summary includes the fourth quarter of 2020 approved activities and the first through third quarters of the 2021 approved activities.

The first dollar amount column in the budget spreadsheet shows funding obligations carried over from 2020 (unspent 2020 dollars plus .39% interest). Total carryover (including interest) was \$12,295,161.

The “2021 Funding Obligation” column, totaling \$4,371,759, details Avista’s annual funding obligation per Appendix U (Funding Summary Table) of the CFSA.

Under terms of Paragraph 23 of the CFSA, the “GDP” (Gross Domestic Product) column adjusts certain annual funding obligations for inflation (1.16% for 2021). This equates to an additional \$50,844 for 2021.

The “Total Funding Obligation” column is the sum of the “Carryover Funding with Interest” column, plus the “2021 Funding Obligation” column, plus the “GDP Amount” column. For 2021, the “Total Funding Obligation” was \$16,662,981. Note that the MC approved the removal of CFSA appendices N1, N2, N3, and O from the ongoing list of CFSA PM&E measures, as Avista has met the obligation under these appendices for the remainder of the current FERC license.

The “2021 Annual Implementation Plan Budget” column, totaling \$28,028,120, shows the implementation budget amounts determined by the TRTAC and WRTAC and approved by the MC. Note that, due to TRTAC, WRTAC, and MC decisions, some 2021 AIP budgets were more or less than the actual 2021 funding obligations. Note there were no approved budgets for CFSA appendices F4, P, or Q.

The “O&M & Capital Expenditures” column shows expenditures for each of the PM&E measures, totaling \$15,561,749.

The “Carryover Dollars” column shows the amount of unspent dollars for certain annual funding obligations totaling \$11,944,140. In 2012, expenditures from CFSA Appendix C (Annual Facilities Obligation) Fund exceeded the annual obligation and all carryover dollars were depleted. Since then the dollar amounts represented in the “Appendix C Facilities” row have been represented as negative amounts. The negative amounts accurately reflect the expenditures above and beyond the annual obligation.

Under terms of Paragraph 23 of the CFSA, the “Treas constant maturity 1-year” column adjusts the carryover dollars for interest (.39% for 2021). This equates to an additional \$43,440 for 2021.

The final column on the spreadsheet is the “2021 Dollars with Interest”. For more details regarding the current interest rates utilized, refer to both Paragraph 23 and Appendix U (Funding Summary Table) of the CFSA. Total 2021 end-of-year carryover, plus interest, is \$12,001,799.

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App.	PM&E - Description	Carryover Funding Oblig w/int.	Notes	2021 Funding Obligation*	Notes	III qtr GDP 1.16%	GDP*** Amt	2021 Funding Obligation w/GDP	Total Funding Obligation	Funds Transfer	2021 Annual Implementation Plan Budget	Consent Mail	Clearing Spent	Capital Spent	O&M & Capital Expenditures	Unspent Dollars	Carryover Dollars	Treas constant maturity 1-year 27-Nov 9.39%	Interest Amount	2021 Dollars with Interest
A	Idaho Tributary & Fishery Enhancement Program																			
	Tributary Habitat Acquisition & Enhancement	\$2,777,511		\$583,079		0.0116	\$6,781	\$589,860	\$3,366,719	3, 4	\$964,380		\$24,785	\$618,528	\$643,314	\$2,723,405	\$2,723,405	0.0039	\$10,621	\$2,734,027
Fish	Resource Monitoring, Enhancement & Management	\$0		\$50,343		0.0116	\$585	\$50,928	\$81,580	4	\$104,095		\$81,580		\$81,580	\$0	\$0	0.0039	\$0	\$0
B	Montana Tributary Habitat Acquisition & Recreational Fishery Enhancement																			
	Tributary Habitat Acquisition & Enhancement	\$2,596,912		\$415,445		0.0116	\$4,832	\$420,276	\$3,267,188	2	\$1,599,591	2	\$79,102	\$1,104,806	\$1,183,907	\$2,083,281	\$2,083,281	0.0039	\$8,125	\$2,091,406
	Recreational Fishery Enhancement	\$1,276,571		\$276,960		0.0116	\$3,221	\$280,181	\$1,556,752		\$222,493		\$64,177	\$183,980	\$248,157	\$1,308,595	\$1,308,595	0.0039	\$5,104	\$1,313,699
C	Fish Passage/Native Salmonid Restoration Plan																			
	Annual Operation	\$1,050,177		\$803,190		0.0116	\$9,341	\$812,531	\$1,862,708		\$1,100,062	5	\$541,480	\$20,683	\$562,163	\$1,300,545	\$1,300,545	0.0039	\$5,072	\$1,305,617
	Facilities	-\$20,374,650		\$583,081		0.0116	\$6,781	\$589,862	\$589,862		\$20,576,340	4		\$11,083,379	\$11,083,379	-\$10,493,517	-\$10,493,517	0.0039	-\$40,925	-\$30,909,091
D	Bull Trout Protection & Public Education Project	-\$2,134		\$179,784		0.0116	\$2,091	\$181,875	\$279,741	1	\$85,437		\$112,907		\$112,907	\$166,834	\$166,834	0.0039	\$651	\$167,485
E	Watershed Council Program	\$6,923		\$14,382		0.0116	\$167	\$14,549	\$21,472		\$14,441		\$3,600		\$3,600	\$17,873	\$17,873	0.0039	\$70	\$17,942
F1	Clark Fork River Water Quality Monitoring Program	\$11,798		\$21,575		0.0116	\$251	\$21,826	\$33,624		\$33,624		\$22,346		\$22,346	\$11,278	\$11,278	0.0039	\$44	\$11,322
F2	Monitoring Noxon Reservoir Stratification			**					\$0		\$55,107				\$0	\$0	\$0			
F3	Aquatic Organism Tissue Analysis	\$15,000		*****					\$15,000		\$10,000				\$0	\$15,000	\$0			\$15,000
F4	Water Quality Protection & Monitoring Plan for Maintenance, Construction & Emergency Activities			****					\$0		\$0				\$0	\$0	\$0			
F5	Gas Supersaturation								\$0		\$0				\$0	\$0	\$0			
	TDG Monitoring			**					\$0		\$48,987		\$22,848	\$4,734	\$27,582	-\$27,582	\$0			
	Mitigation	\$2,109,682		\$870,659		0.0116	\$10,126	\$880,785	\$2,860,467	1, 3	\$1,784,083	1	\$882,640	\$143,447	\$1,026,087	\$1,834,381	\$1,834,381	0.0039	\$7,154	\$1,841,535
	GSCP Alternative			**					\$0		\$123,000	3, 5	\$184		\$184	-\$184	\$0			
G	Implementation of Land Use Mgmt Plan			**					\$0		\$187,500		\$91,783		\$91,783	-\$91,783	\$0			
H	Implementation of Recreation Resource Mgmt Plan			**					\$0		\$229,500		\$190,083		\$190,083	-\$190,083	\$0			
	Management			**					\$0		\$439,000		\$35,684		\$35,684	\$494,950	\$494,950	0.0039	\$1,930	\$496,880
	Facilities Fund	\$374,328		\$222,370		0.0116	\$2,586	\$224,956	\$599,284		\$439,000		\$35,684		\$35,684	\$494,950	\$494,950	0.0039	\$1,930	\$496,880
I	Implementation of Aesthetics Mgmt Plan			**					\$0		\$7,000				\$0	\$0	\$0			
J	Implementation of Wildlife, Botanical & Wetland Mgmt Plan			**					\$0		\$5,000				\$0	\$0	\$0			
K	Wildlife Habitat Acquisition & Enhancement Fund	\$741,353		\$289,674		0.0116	\$3,369	\$293,042	\$784,396	2	\$108,100	2	\$18,297	\$1,478	\$19,774	\$764,621	\$764,621	0.0039	\$2,982	\$767,603
L	Black Cottonwood Habitat on Avista Property	\$89,555		\$7,065		0.0116	\$82	\$7,147	\$96,702		\$15,000				\$0	\$96,702	\$96,702	0.0039	\$377	\$97,079
M	Wetlands on Avista Property	\$135,900							\$135,900		\$10,000				\$0	\$135,900	\$135,900	0.0039	\$530	\$136,430
P	Forest Habitat for Selected Avista Lands																			
	Annual Fund			****					\$0		\$5,000				\$0	\$0	\$0			
	Improvement Fund								\$0		\$0				\$0	\$0	\$0			
	Timber Revenue	\$226,818							\$226,818		\$0				\$0	\$226,818	\$226,818			\$226,818
Q	Reservoir Islands Owned by Avista								\$0		\$0				\$0	\$0	\$0			
R	Clark Fork Heritage Resource Program			**					\$0		\$65,000		\$54,758		\$54,758	-\$54,758	\$0			
S	Erosion Fund & Shoreline Stabilization - Guidelines								\$0		\$0				\$0	\$0	\$0			
	Annual Fund	\$200,000		\$54,151		0.0116	\$630	\$54,781	\$200,000		\$58,000				\$0	\$200,000	\$200,000	0.0039	\$780	\$200,000
T	Project Operating Limits	\$684,767		**					\$684,767		\$177,380			\$105,810	\$105,810	\$578,957	\$578,957			\$578,957
	Total	\$12,295,161	1	\$4,371,759			\$50,844	\$4,422,603	\$16,662,981		\$28,028,120		\$2,226,254	\$13,335,495	\$15,561,749	\$11,594,749	\$11,944,140		\$43,440	\$12,001,799

* Refers to Appendix U "Funding Summary Table"

** Estimate based on current work level

*** Used Qtr3 GDP for Implicit price deflators.

**** Period one-time obligation, does not receive GDP or Interest inflators

***** Pay actual costs up to not-to-exceed limit

App S Total Fund amount capped at \$200,000

APP E Total fund amount capped at \$20,000

Note 1 The totals of "Carryover Funding Obligations w/int", "Unspent Dollars", "Carryover Dollars", and "Carryover Dollars with Interest" columns exclude App C Facilities Fund balance. The negative amounts depict total expenditures exceeding the defined annual App C Facility Fund contribution in the CFSA. If the App C Facility Fund carryover was included in the total it would not accurately reflect the total funding carryover.

ONSENT MAILS:

1 App F5 Mitigation Fund utilization of \$22,000 from App F5 mitigation fund to purchase Idaho Native Fisheries Education Trailer. As well as \$100k one-time funds transfer from App F5 to App D

2 App B Habitat Tributary Acquisition & Enhancement Fund \$1,000,000 (\$750k from App B, \$250k from App K) purchase 342-acre parcel along Graves Creek (Shear acquisition)

3 App F5 GSCP fund, \$10,000 additional funding for the temperature monitoring data compilation project

4 App C Facility Fund \$265,000, Fish Handling Facility Upgrades additional funds need

5 App C & App F5 purchase PIT antennas \$60k, (\$35k App C Operation Fund, \$25k App F5 GSCP Fund)

INDS TRANSFER:

1 App F5 Mitigation to App D \$100k, consent mail for one time transfer

2 App K to App B \$250k, 342-acre parcel along Graves Creek (Shear acquisition)

3 App F5 to App A \$30k, Idaho field station cost share

4 App A Fisheries to App A Enhancement 53,167, only needed 30,652 therefore transferred 30,652

Fund refers to dollars that are made available annually. These funds are adjusted annually by the percentage change of the GDP-IDP as reported by the Bureau of Economic Analysis. Unused funds are carried forward to the next year and increased by the yield in percent as reported in the Federal Reserve Statistical Release H-15 of US treasury securities as a constant maturity.

Estimate refers to dollars that are projections made now however; Avista will pay the actual costs of implementation. Unused funds are not carried forward to the next year.

Budget refers to dollars that support initiatives within programs that are the responsibility of other parties. Avista will pay the actual costs in an amount not to exceed the agreed budget. Unused funds are carried forward to the next year and increased by the yield in percent as reported in the Federal Reserve Statistical Release H-15 of the US treasury securities as a constant maturity.

Periodic refers to dollars that are periodic or a one-time cost. Avista will pay the actual costs in an amount not to exceed the specified budget.

12.2 Grant Summary

Appendices B and H of the CFSA included a provision intended to leverage PM&E measure funds through grants. Avista has employed a grant writer who pursues creative funding opportunities to match and enhance the financial commitments being made to implement the PM&E measures. It is important to note that any funding received does not reduce Avista's contribution to the implementation effort; rather, the funds create additional protection, mitigation, and enhancement opportunities.

The grant writer coordinates with program leaders, technical committees, MC members and other local constituencies to identify projects for grant funding, research funding sources, prepare grant applications, and conduct grant project follow-up and reporting.

Since project start-up in October 1999, \$12,908,491 in federal, state, and private foundation grants have been acquired to assist with implementation of a variety of on-the-ground aquatic and terrestrial projects. Grants received in 2021 totaled \$46,500. Grant requests made in 2021 that are still pending total \$58,500.

Projects receiving funding so far this year will help educate anglers regarding native fisheries, revegetate riparian areas along the Bull River, as well as support outreach and project development with private landowners in the Lower Clark Fork Watershed.

In Idaho, the Panhandle Chapter of Trout Unlimited applied for funds through the Kalispel Tribe of Indians and the IDFG Commission for a project to educate anglers about, and introduce new anglers to, the native fisheries of the North Idaho's rivers. The organization was awarded \$2,000 from the Kalispel Tribe and a \$5,000 IDFG Commission Challenge grant to create a Westslope Cutthroat Challenge program, the core of which will be a new website for outreach and engagement with new and existing anglers. While acting as a hub for the challenge, which rewards anglers for catching Westslope Cutthroat Trout in each of the major watersheds of North Idaho, the website will also be a vehicle for teaching about native fisheries and their habitat needs.



The new Pilgrim Creek Park Playground was funded in part through grants awarded to Project Ascent in 2020.

In Montana, the LCFWG and Green Mountain Conservation District (GMCD) received funding to further their work with private landowners and other partners in the Bull River and other tributaries of the Lower Clark Fork River. The LCFWG and GMCD teamed up to apply for funds through the Montana Department of Natural Resources Watershed Management Grant to expand capacity for private landowner engagement and to develop projects that improve water quality and

benefit natural resources. The GMCD was awarded and will administer the \$17,500 grant, while the LCFWG staff will implement the project. The LCFWG was awarded \$3,500 from the Trout and Salmon Foundation to support revegetation efforts on the East Fork of the Bull River. The LCFWG was the recipient of a \$15,000 grant from the Star Peak Foundation to support ongoing revegetation efforts on private lands along the mainstem of the Bull River. The LCFWG was also awarded a \$3,500 grant to fund staff time and expenses for the study of alternatives to the LCFWG's usual method of riparian revegetation with the goal of increasing its efficacy in tackling the long-term conservation goal of restoring the native riparian vegetation along the Bull River.

Three grant applications were still pending at the end of 2021. Sanders County applied for a \$20,000 grant from Aquatic Invasive Species Grant Program to treat invasive EWM in priority areas in both Noxon and Cabinet Gorge reservoirs in the summer of 2022. Also pending was a \$33,000 grant proposal from MFWP to the Reservoir Fisheries Habitat Partnership, a quasi-governmental agency that directs federal funding to fisheries-related projects that advance the management of reservoirs for fisheries. The requested funds were for a proposed pilot project to test a harvester on the Noxon Reservoir as a management tool for EWM in areas where a harvester could increase edge habitat for sport fish. The grant award announcement has been delayed, but due to limited funding and the fact that harvester project did not rank among the top contenders, MFWP is not expecting to be awarded the funds. The LCFWG is waiting to hear on a \$5,500 proposal to the Sanders County Resource Advisory Committee to fund riparian revegetation work with the goal of restoring the historic closed canopy cedar forest on U.S. Forest Service and private land along the East Fork of the Bull River near the historic Bull River Ranger Station.

Along with Avista CFSA PM&E funds, a variety of partners provide funds and in-kind match support for grant proposals. In 2021, matching partners included:

- Sanders County, Montana
- Sanders County Aquatic Invasive Plants Task Force
- Natural Resource Conservation Service
- Trout Unlimited
- Idaho Department of Fish and Game
- U.S. Forest Service
- Montana Fish, Wildlife and Parks
- Lower Clark Fork Watershed Group
- Green Mountain Conservation District
- Montana Watershed Coordination Council
- Kalispel Tribe
- Private landowners