

COLUMBIA BASIN FISH AND WILDLIFE AUTHORITY

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Coordinating and promoting effective protection and restoration of fish, wildlife, and their habitat in the Columbia River Basin

The Authority includes the following tribes and fish and wildlife agencies:

Burns Paiute Tribe
Coeur d'Alene Tribe

Confederated Salish and Kootenai Tribes of the Flathead Reservation

Confederated Tribes of the Colville Reservation

Confederated Tribes of the Umatilla Indian Reservation

Confederated Tribes of the Warm Springs Reservation

Confederated Tribes and Bands of the Yakama Nation

Idaho Department of Fish & Game

Kootenai Tribe of Idaho

Montana Fish Wildlife & Parks

National Marine Fisheries Service

Nez Perce Tribe

Oregon Department of Fish & Wildlife

Shoshone-Bannock Tribes of Fort Hall

Shoshone-Paiute Tribes of Duck Valley

U.S. Fish & Wildlife Service

Washington Department of Fish and Wildlife

Coordinating Agencies

Columbia River Inter-Tribal Fish Commission

Compact of the Upper Snake River Tribes

Upper Columbia United Tribes

December 1, 2008

Mr. Bill Booth, Chairman
Northwest Power and Conservation Council
851 SW Sixth Avenue, Suite 1100
Portland, OR 97204-1348

Dear Chairman Booth:

The fish and wildlife agencies and Tribes of the Columbia Basin Fish and Wildlife Authority (CBFWA)¹ thank you for the opportunity to provide comments on the draft Columbia River Basin Fish and Wildlife Program (Draft Program) which the Northwest Power and Conservation Council (Council) released on September 2, 2008. We would also like to thank you for the consultation meeting that took place on September 26, 2008, which has helped us to better understand the Draft Program. We are optimistic that this discussion, combined with additional consultation, and your extension of time for providing comments will lead to a final Program that is consistent with the fish and wildlife agencies' and Tribes' recommendations.

We agree on and support numerous aspects of the Draft Program. These include maintaining the overall structure of the 2000 Program, the development of multi-year work plans, focused research in areas of scientific uncertainty, the emphasis to deliver effective "on-the-ground" actions, and perhaps most importantly for adopting many, if not all, of the individual agencies' and Tribes' recommendations as measures that are part of the Fish and Wildlife Program.

There are some areas in the Draft Program where we recommend a clarification, revisions, edits, and reconsideration of our original recommendations for inclusion in the final Program. These areas include:

- A. defining the roles and responsibilities of the various entities involved in developing and implementing the Columbia Basin Fish and Wildlife Program;
- B. defining an explicit adaptive management architecture as the framework of the final Program; and,
- C. providing additional detail to fill in the adaptive management framework. This detail includes:

1. quantified losses for anadromous fish, resident fish and wildlife;
2. biological objectives of focal species to mitigate for these losses at the various Program scales;
3. an explicit list of strategies and measures organized to support development of multi-year work plans;

¹ The Confederated Tribes of the Colville Reservation abstain.

4. an inclusive process to update subbasin management plans which would include the agencies' and Tribes' subbasin summaries that will include updated information from final and proposed recovery plans, a refinement of basinwide biological objectives based on the subbasin scale objectives contained in these summaries, and development of multi-year work to implement the measures included in the program; and,
5. the basinwide monitoring and reporting measures recommended by the agencies and tribes to evaluate successful implementation of the Program.

Attachment 1 provides our recommendations to address each of these areas in the final Program. If the Council decides not to include any of our recommendations, we request the Council provide an explanation in the final Program.

It is important that the final Program clearly identify, in one source, the measures that are included within the Program. Attachment 2 is our attempt to consolidate and organize the measures, submitted by the agencies and Tribes, that the Council is adopting into the Program. These tables summarize the measures that have been provided by the fish and wildlife agencies and Tribes individually and collectively. It is not our consensus position to support every measure in these tables; however, we fully support this organizational structure. In working with your staff, we agreed that specific tables of measures may be useful in communicating our understanding of what specifically is in the Program.

The purpose of our participation is to ensure the Fish and Wildlife Program remains scientifically sound, biologically effective, and provides a convincing rationale for the ratepayer funding that will be directed at protecting, mitigating, and enhancing fish and wildlife resources in the Columbia Basin in the near future. We look forward to working closely with the Council during the steps leading to the final Program and we continue to offer our expertise and support in this process.

Attachments:

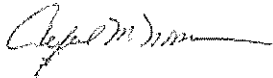
1. 9/2/08 F&W Agencies & Tribes' comments on the draft Columbia River Basin Fish and Wildlife Program
2. 12/1/08 F&W Agencies & Tribes' tables of measures for basinwide, anadromous fish, and resident fish provisions organized for adoption into the Program

cc: Council Members and Staff
CBFWA Members
Stephen J. Wright, BPA
Greg Delwiche, BPA
Bill Maslen, BPA

Respectfully submitted:



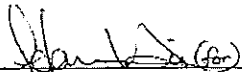
Gary Aitken, Sr., Tribal Chair Member
Kootenai Tribe of Idaho



Alfred M. Nomee, Cd'AT for
Chairman Chief J. Allan
Coeur d'Alene Tribe



Jay Minthorn, Board Member
Confederated Tribes of the Umatilla Indian
Reservation



Adam Hill for
Alonzo A. Coby, Chairman
Shoshone-Bannock Tribes of Fort Hall



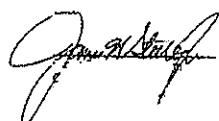
Robert A. Brunoe, General Manager, Natural
Resources
Confederated Tribes of the Warm Springs
Reservation



Dean Adams, Chairman
Burns Paiute Tribe



Robert Bear, Vice Chairman
Shoshone-Paiute Tribes of the Duck Valley
Reservation



James Steele Jr., Chairman
Confederated Salish and Kootenai Tribes of the
Flathead Reservation



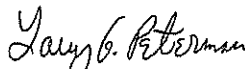
Roy Elicker, Director
Oregon Department of Fish and Wildlife



Cal Groen, Director
Idaho Department of Fish and Game



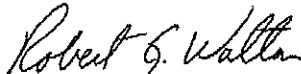
Jeffrey P. Koenings, Director
Washington Department of Fish and Wildlife



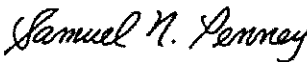
Larry Peterman, Chief of Operations
Montana Department of Fish, Wildlife and Parks



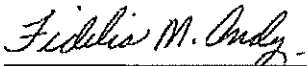
Daniel H. Diggs, Assistant Regional Director,
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U.S. Fish and Wildlife Service



Robert G. Walton, Assistant Regional Administrator
NOAA Fisheries



Samuel N. Penney, Chairman
Nez Perce Tribe Executive Committee



Fidelia Andy, Fish and Wildlife Committee Chair
Confederated Tribes of the Yakama Nation

Attachment 1.

The fish and wildlife agencies and Tribes provided the following comments on the September 2, 2008 draft of the Fish and Wildlife Program:

A) The Draft Program does not include our recommendations for outlining the role of the fish and wildlife agencies and tribes and others in planning, implementing, and evaluating the Fish and Wildlife Program.

The Northwest Power Act outlines specific roles and responsibilities for various entities including the fish and wildlife agencies, the Columbia Basin Tribes, the Bonneville Power Administration, and the Northwest Power and Conservation Council. We believe the final Program should include a description of the statutory role of each of these entities as outlined in the Northwest Power Act. This would provide a statutory context for the role of the fish and wildlife managers in planning, implementing and evaluating the Program. In fact, much of our suggested language was included in your original solicitation for Program amendments. Our intent is not to be exclusionary of other participants in the process. Rather, it is to clarify the roles of all participants in planning, implementing and evaluating the Program.

To address this, the Council should include the programmatic language provided in our recommended Amendment 1.1 at Page 5 Line 16 and 17 of the Draft Program. Secondly, the Council should replace paragraph 2 on Page 5 with language provided in our recommended Amendment 1.7. In addition, we support the inclusion of the role of the other entities involved in planning, implementing, and evaluating the Program, as outlined in the Northwest Power Act.

B) The Draft Program does not include a well-defined adaptive management architecture as recommended by the fish and wildlife agencies and Tribes.

Although the Draft Program discusses adaptive management on Page 6 Line 39 and a monitoring and evaluation framework on Page 43, the Draft Program does not include the adaptive management architecture as provided in our recommended Amendment 1.4 as the framework of the Program. The Council's proposed adaptive management framework should depend on defining and using the important linkages between biological objectives, limiting factors, strategies, and measures to address those limiting factors, as well as the monitoring and reporting necessary to support appropriate accountability and transparency. To address this, the Council should include the programmatic language provided in our recommended Amendment 1.4 on Page 7 Line 8 of the Draft Program. Also, the Council should include our basinwide provisions as described in C.2 and C.5, and our subbasin provisions as described in C.2 and

C.4, of this attachment. The adaptive management framework is essential to support the development of multi-year implementation plans.

C.1a) The Draft Program does not include the agencies' and Tribes' recommendations to develop and implement a common methodology for performing resident fish loss assessments and operational loss assessments for wildlife across the basin.

Developing objectives for mitigation is a fundamental basis for defining mitigation goals and implementing adaptive management in a large resource-based mitigation program. This provides the transparency and accountability that is necessary for an effective Fish and Wildlife Program. Loss assessments are indeed feasible and can be completed in a cost effective manner with proper preparation and planning and would support development of long-term work plans.

To address this, the Council should include the measures recommended by the agencies and Tribes to develop and implement a methodology for performing resident fish loss assessments and operational loss assessments for wildlife. This is important for establishing consistency across the basin and for establishing a foundation for setting biological objectives.

The Council should include Amendments 2.2.4A and 2.3.4A of the agencies' and Tribes' recommendations in Section II.C.a (pages 19-20) of the Draft Program. On Page 19 Line 11 delete the words "Where feasible."

C.1b) The Draft Program does not include the agencies' and Tribes' recommendations for the wildlife portion of the Program.

The wildlife sections of the Draft Program are significantly different than the agencies' and Tribes' recommendations in substance and context. In many ways, it contradicts our recommendations. As such, the Council should reconsider the wildlife sections of the Draft Program. For example, the role of the crediting committee described in the Draft Program is one of developing policy recommendations, rather than one of implementing policies already established in the Program. Another example is our recommendation for doubling of the loss assessments, which was not fully included in the Draft Program.

The agencies' and Tribes' recommendations include the measures in our recommended Amendment 2.3.4 which: 1) direct BPA to fund operational loss assessments, 2) direct BPA to enter into long-term funding agreements that meet specific criteria, 3) direct BPA to fund existing projects at levels adequate to implement management plans, 4) establish a Wildlife Crediting Forum for maintaining the crediting ledger, and 5) direct BPA to fund adequate wildlife

monitoring and evaluation. These measures will provide greater accountability for the ratepayers and certainty for wildlife mitigation implementation.

To address this, the Council should replace Pages 38-41 of the Draft Program with the narrative and measures for wildlife contained in Section 2.3 of our recommendations. These recommendations identify specific measures to address the 2:1 crediting ratio, long-term funding agreements, operational losses, and project monitoring and evaluation.

C.2) The Draft Program does not include the agencies' and Tribes' recommendations for objectives for biological performance at the basinwide and subbasin scales.

We appreciate the Council's willingness to work with the fish and wildlife agencies and Tribes and others to assess the value for the Program of quantitative biological objectives at the basinwide level as articulated on Page 18 Line 12 of the Draft Program. This appears to be a positive step toward implementation of adaptive management. However, we have provided the Council with scientifically sound biological goals and objectives that represent the best scientific knowledge at this time for the purposes of developing a final Program. And it is important to note that biological objectives at all levels of the Program are an essential element for effective adaptive management architecture, without them there is no transparent standard for measuring success.

We do however agree that we can always improve upon these objectives. So, as a compromise we suggest that the Council adopt our recommended biological goals and objectives while simultaneously beginning a basin-wide process to further refine these goals and objectives. The agencies and Tribes are prepared to complete this as part of the subbasin management plan update described below.

Specifically, the Council should include our recommendations provided in our Amendment 2.0.1 in regards to Section II.C.a of the Draft Program (Objectives for Biological Performance, pages 17-18). Further, the original 2000 Program language describing "Objectives for Biological Performance" should be retained. The changes on pages 17-18 of the Draft Program significantly modify and weaken the original language contained in the 2000 Fish and Wildlife Program. These changes should be retracted.

C.3) The Draft Program is not clear which recommendations the Council is adopting as measures in the Final Program.

We commend the Council for adopting the individual recommendations of the agencies and Tribes into the Program as measures necessary to protect, mitigate, and enhance fish and wildlife resources affected by hydropower development in the basin. However, to ensure clarity, the Council should explicitly identify all measures that are being adopted into the Program. For example, in Attachment 2, we have attempted to compile all the fish and wildlife managers' recommendations that appear to fit within the Council's definition of the measures that is currently in the Draft Program in Section VIII.A. Our table is organized by subbasin and species, which should support development of multi-year work plans and monitoring and evaluating implementation of those work plans. We encourage the Council to maintain a similar organizational structure in whatever method they use to express the measures adopted into the final Program. These tables summarize the measures that have been provided by the fish and wildlife agencies and Tribes individually and collectively, or have been ongoing in the Program, and as such it is not our consensus position to support every measure in these tables; however, we fully support the organizational structure of these tables.

C.4) The Council should implement an inclusive process to update subbasin management plans which would include the agencies' and Tribes' subbasin summaries which will include updated information from final and proposed recovery plans, a refinement of basinwide biological objectives based on the subbasin scale objectives contained in these summaries, and development of multi-year work to implement the measures included in the Program.

In the Draft Program, the Council outlines a three-year process for updating Subbasin Plans. It is not necessary at this time to update the entire plans. The focus of an update should be targeted at integrating the Management Plan portions of the Subbasin Plans with other processes ongoing in the basin, and updating the implementation portion of those plans. In performing those updates, the Council should focus on the adaptive management elements necessary to support future evaluations.

The Council should replace lines 13 – 45 on page 103 and lines 1 & 2 on page 104 with the following:

“The Council will initiate a process in January 2009 to update subbasin Management Plans to include:

- o Explicit measures (as organized and verified in Appendix 2 as described above);

- Subbasin Plan summaries (along with a process to work with the fish and wildlife agencies and Tribes and others to vet them regionally by June of 2009 before inclusion in the final Program); and,
- Multi-year work plans for each subbasin, including a work plan for the Mainstem and Systemwide portion of the Program, also by June of 2009.”

We commend the Council for recommending the development of multi-year work plans to implement the measures in the Program. We believe these multi-year plans need to be developed as part of the subbasin management plans and as with other areas of the Program, these multi-year work plans need to reflect the essential elements for adaptive management as well as tie together numerous initiatives in the Region, including Biological Opinions, the Columbia River Basin Fish Accords, the Council’s Fish and Wildlife Program, ESA recovery plans, and the current and future plans of the fish and wildlife managers. These work plans should also provide budgetary certainty and improved accountability for on-the-ground activities. To achieve these things the final Program should include the following as the explicit description of the “essential elements that comprise multi-year work plans:

- Clear linkages from biological objectives to the limiting factors that prevent their achievement, to threats that cause the limiting factors, and strategies and measures that address the threats;
- Budgets to implement actions sequenced and agreed to over time;
- Expected environmental and biological response to implementing the action or suite of actions (anticipated progress towards biological objectives);
- Predicted timing for biological response to the suite of actions; and,
- Targeted monitoring to support evaluation of implementation of the suites of actions to assess whether they were successful or not.”

C.5) The Draft Program should include the agencies’ and Tribes’ recommendations for basinwide measures for monitoring and reporting.

The Draft Program overlooks the significant advances in monitoring and evaluation in the Columbia River Basin and elsewhere. Since the release of the 2000 Fish and Wildlife Program, significant efforts have been underway to guide and coordinate monitoring and evaluation in the basin and in the Pacific Northwest region. To address this, the Council should rely on the best available scientific information and incorporate explicit basinwide measures for monitoring and reporting as included in Section 2 of the agencies’ and Tribes’ amendment recommendations. The Council should replace Pages 44-48 in the draft amendment with the M&E framework described in the agencies’ and Tribes’ Section 2 (including Sections 2.1.5 – 2.1.8).

D) With the adoption of our recommendations, the distinction between measures and projects should not be necessary.

The footnote 16 on Page 105 of the Draft Program, Lines 44-46 on Page 106, and Lines 1-12 on Page 107 should not be included in the final Program. With the above process the fish and wildlife agencies and Tribes are committed to work with the Council and others to move from measures to projects through the development of multi-year work plans. However, at this time the fish and wildlife agencies and Tribes are not prepared to agree with or provide an interpretation of the Northwest Power Act for inclusion in the final Program regarding the distinction between actions, measures, and projects.

E) The Program should not discuss personnel requirements related to the Fish Passage Center manager.

We commend the Council for including many of our recommendations related to the Fish Passage Center (FPC) into the Draft Program. However, we are concerned that the Draft Program includes language that directs the management of personnel within a specific project. Contract management details such as this should not be addressed in an overarching planning document. In addition, the current language is not consistent with the amendment recommendations of the agencies and Tribes.

To address these concerns, the Council should adopt our recommendations for Fish Passage Center consistent with our recommended Amendment 2.1.5.4 without modification.

Attachment 2:

A. Basinwide Provisions (Pages 2-29)

B. Anadromous Fish Provisions (Pages 30-173)

C. Resident Fish Provisions (Pages 174-379)

Attachment 2a:
Basinwide Provisions

Strategy	Amendment Recommendation	Recommended Measure		Source of Measure
M&E	Include a Research, Monitoring and Evaluation Plan in the Overarching Strategies Section	See description of RME plan in CBFWA Amendment 2.0.3.	Include CBFWA language in Program	CBFWA Recommendation
M&E	Status of the Resource Report	Bonneville will fund the production of an annual <i>Status of the Resource Report</i> to report progress towards Biological Objectives and implementation of the Fish and Wildlife Program, consistent with requirements of other regional reports such as the Council's Fish and Wildlife Expenditures Report to the Governors and the <i>Washington State of Salmon in Watersheds Report</i> .		CBFWA Recommendation
M&E	Cooperative data compilation, development, distribution and reporting	Provide information management services to assist the agencies and Tribes to make their data available to support regional reporting for the Program.	StreamNet (198810804)* StreamNet – WDFW enhanced eastside (198810804)** Translocation and other data (200845200)*** Columbia River operations administration and program implementation (200830300)***	CBFWA Recommendation *ODFW recommendation **WDFW comment ***LRT MOA
		Coordinate with the Status of the Resource Project to provide access support to agency and tribal fish and wildlife data.		CBFWA Recommendation

		Maintain and update databases of fish and aquatic data (e.g., fish distribution, adult abundance, GIS streams layer, hatchery releases, hatchery returns, dams and fish passage facilities, hatchery facilities, harvest, Council Protected Areas, smolt density model data, Subbasin Planning data, independent data sets, genetics, etc.).		CBFWA Recommendation
		Maintain the appropriate web sites to allow access to regionally consistent short and long-term time series data in both tabular and GIS formats.		CBFWA Recommendation
		Support data inventory and other regional requirement for RM&E as necessary.		CBFWA Recommendation
		Support development of advanced data management systems within data creating agencies to improve data flow to the <i>Status of the Resource Project</i> and other regional scale data outlets.		CBFWA Recommendation
		Coordinate basinwide monitoring and data programs through interagency forums.	Monitoring trends in habitat conditions (200851700)	CBFWA Recommendation
		Maintain depositories of region-wide fish and wildlife reports and publications, linked to StreamNet data where appropriate.	StreamNet Library (200850500)*	CBFWA Recommendation *LRT MOA
		Continue to use PISCES to track project implementation information.		CBFWA Recommendation

<p>Coordination</p>	<p>Add Coordination Measures as a Strategy in the Overarching Section</p>	<p>Bonneville will fund the fish and wildlife agencies and Tribes' coordination efforts to ensure appropriate and meaningful participation in Program decision making. The fish and wildlife agencies and Tribes will define their coordination needs, which may or may not include membership organizations, and provide recommendations to Council and BPA.</p>	<p>Annual Work Plan CBFWA (198906201) NPT technical staff support for regional process participation (risk assessments, TRT, USCOE, AFEP, recovery planning, subbasin planning, etc.) Focus watershed coordinator (199706000) PNAMP Funding (200400200) Colville Tribe umbrella planning project (200810000) Implement Wy-Kan-Ush-Mi Wa-Kis-Wit (199803100) Columbia River Inter-Tribal Fish Commission umbrella planning project (200850000) CTUIR umbrella planning project (200820000) CTWSR umbrella planning project (200830000) Yakama Nation umbrella planning project (200840000) Idaho umbrella planning project (20086000) SBT umbrella planning project Kalispel Tribe fish and wildlife coordination (200716200) Spokane Tribe fish and wildlife coordination (200710600) Regional coordination for</p>	<p>CBFWA Recommendation ODFW recommendation NPT recommendation 2008 FCRPS BiOp CCT MOA LRT MOA ID MOA SBT MOA Kalispel recommendation Spokane recommendation UCUT recommendation</p>
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		Bonneville will fund data management and reporting that will support the monitoring and evaluation requirements for the Program.	Tribal Monitoring Data (200850700)*	CBFWA Recommendation *LRT MOA
Habitat	Fully Integrate the Columbia Basin Water Transactions Program into the Program	Bonneville will fund the continuation of the Columbia Basin Water Transactions Program (CBWTP) to pursue acquisition of water rights in subbasins where water quantity has been identified as a primary limiting factor to meet the biological objectives within the subbasin plans.	Water Entity (200201301) Water transactions fund (200860800)	CBFWA Recommendation 2008 FCRPS BiOp and Accords
Predation	Add Provisions to Reduce Sea Lion Predation	Support land and water based harassment efforts by NOAA Fisheries, ODFW, WDFW and the Tribes to keep sea lions away from the area immediately downstream of Bonneville Dam.	Other predation factors identified as threats to ESA listed salmon and steelhead*	CBFWA Recommendation WDFW Comment *NOAA Fisheries comment
		Provide and improve Sea Lion Exclusion Devices (SLEDs) to protect fishway entry at Bonneville Dam.		CBFWA Recommendation
		Support development, testing, and implementation of non-lethal deterrence alternatives.		CBFWA Recommendation WDFW Comment
		Provide assistance and support to the states for the removal of animals as authorized under Section 120 of the Marine Mammal Protection Act.		CBFWA Recommendation WDFW Comment
		Document foraging activities of individually identifiable pinnipeds in the Columbia River below Bonneville Dam.		CBFWA Recommendation WDFW Comment
		Provide assistance and support to states for the removal of animals as authorized under section 120 of the MMPA.		CBFWA Recommendation WDFW Comment

		Estimate overall sea lion abundance immediately below Bonneville Dam.	Include Status and trends*	CBFWA Recommendation WDFW Comment NOAA Fisheries comment*
		Monitor the spatial and temporal distribution of sea lion predation attempts and estimate predation rates.		CBFWA Recommendation WDFW Comment
Hydrosystem	Hydrosystem-related strategies and measures for Anadromous Fish	Provide velocities to enhance migration conditions.	FCRPS water management studies (200810700)*	CBFWA Recommendation *CCT MOA
		Provide spill.		CBFWA Recommendation
		Provide and evaluate surface bypass.		CBFWA Recommendation
		Reduce turbine passage and improve bypass survival.	John Day reprogramming and construction – expense (200852700)*	CBFWA Recommendation *LRT MOA
		Manage risk associated with transportation.		CBFWA Recommendation
		Reduce delayed and latent mortality of juveniles.	Evaluate delayed mortality associated with passage of yearling Chinook salmon through Snake River dams (200304100)* Post Bonneville mortality research workshop (200872500)*	CBFWA Recommendation *Ongoing measure/2008 FCRPS BiOp
Artificial Production	Consider Results from Hatchery Review Processes	Results from Columbia River Basin hatchery review processes (e.g., USFWS National Fish Hatchery review, Hatchery Scientific Review Group, etc.) may be used to evaluate hatchery and harvest performance and improvement options.	Columbia River Review – HSRG (200601400)	CBFWA Recommendation WDFW Comment

		Incorporation of appropriate recommendations from these review processes will supplement existing and ongoing analyses of hydrosystem and habitat performance options.		
Habitat	Add Language Supporting Water Quality Measures	The Program includes measures that improve cold water refugia and improve thermal conditions to meet federal and state Water Quality Temperature criteria.	Multi-scale assessment of hyporheic flow, temperature and fish distribution in Columbia River Tributaries (200725200)*	CBFWA Recommendation *LRT MOA
		The Council calls on BPA and other federal agencies responsible for managing, operating, and regulating Columbia River hydroelectric facilities to develop water quality plans for total dissolved gas and temperature in the mainstem Columbia and Snake Rivers which includes a comprehensive update of both total dissolved gas and temperature with dam specific structural and operational objectives and implementation strategies to benefit juvenile and adult fish.	Water quality monitoring (200851200)*	CBFWA Recommendation *LRT MOA
		The Council directs the federal operators and regulators to work with state, Tribal, and federal water quality agencies to meet the Total Maximum Daily Load (TMDL) implementation and Total Dissolved Gas (TDG) waiver requirements and to implement the recommendations of the state, Tribal, and federal fishery managers.	Gas bubble disease research and monitoring of juvenile salmonids (199602100)*	CBFWA Recommendation WDFW Comment *ongoing measure
		The Council supports Columbia River monitoring to better understand toxics and the relationship between fish abundance and return rates in watersheds with high levels of contaminants and to better understand how those contaminants are taken up by juvenile salmon and their effects on out migration.		CBFWA Recommendation
		Also, source identification in the watersheds would help to better understand the toxic loadings of contaminants of concern to the mainstem Columbia Basin.		CBFWA Recommendation

M&E	Collaborative Systemwide Monitoring and Evaluation	<p>Coordinate, assemble, evaluate and report on fish status and trend monitoring metrics including abundance, productivity, spatial structure and diversity (VSP).</p> <ol style="list-style-type: none"> 1. Develop standardized descriptions of the primary indicators used to assess VSP parameters in collaboration with fish and wildlife agencies and Tribes 2. Characterize the metrics and methodologies used to estimate the primary indicators of VSP parameters 3. Inventory the available primary indicators used to estimate VSP parameters and identify populations without coverage. 4. Assess the metrics and methodologies used to estimate the primary indicators characterizing the adequacy of the information and identify the deficiencies 5. Evaluate and recommend the alternative integration and mix of monitoring activities that promote consistency so the data are comparable among all subbasins, and to optimize cost effective monitoring across all levels. 6. Annually report the VSP indicators through the <i>Status of the Resource Report</i>. Report on the findings and recommendations from the inventory, and the assessment of adequacies and deficiencies of the metrics and methodologies. 	<p>CBFWA collaborative systemwide monitoring and evaluation program (200303600)*</p> <p>Regional RM&E coordination (200852800)**</p> <p>Monitoring adult abundance and spatial distribution for Snake River spring/summer Chinook salmon ESU populations (new measure)***</p> <p>Pacific Northwest Aquatic Monitoring Partnership – fish population monitoring (200721600)****</p> <p>WDFW participation in Columbia basin monitoring and evaluation project****</p> <p>Implement NOAA Fisheries VSP indicators*****</p>	<p>CBFWA Recommendation</p> <p>*ODFW recommendations</p> <p>**LRT MOA</p> <p>***NPT recommendation</p> <p>****2008 FCRPS BiOp</p> <p>****WDFW comment</p> <p>*****NOAA Fisheries comment</p>
		<p>Develop monitoring designs (informed by the findings and recommendations above), and estimate their accuracy, precision and cost to describe population status and trends that inform biological objectives. Ensure that the estimated metrics represent appropriate spatial, temporal, and population scales.</p>		<p>CBFWA Recommendation</p>
		<p>Periodically estimate population status and trends of fish species (e.g. every five years).</p>		<p>CBFWA Recommendation</p>

		Work with land and water resource management agencies to assemble and report habitat metrics at appropriate biological scales in the <i>Status of the Resource Report</i> . These may include watershed condition, miles of accessible stream, 303D listings Clean Water Act standards (examples: temperature, turbidity, contaminants). Coordinate with other regional reports such as EPA’s <i>State of the River Report</i> , <i>Washington State of Salmon in Watersheds Report</i> .		CBFWA Recommendation
		Periodically assess the monitoring associated with management decisions and recommend improved designs integrated across the monitoring levels.		CBFWA Recommendation
		Develop and maintain run-reconstructions (systematic organization of all mortality sources by origin (hatchery or wild) and age in lifecycle framework data sets) for each appropriate biological scale. Continue maintenance of TRT data sets and include populations and focal species that are not protected under ESA.	Post all existing run reconstructions on the web and make available for public review and comment*	CBFWA Recommendation *NOAA Fisheries comment
		Work with the Ad Hoc Supplementation Work Group (AHSWG) to implement the recommended Stray Ratio and Relative Reproductive Success designs as outlined in the Collaborative Systemwide Monitoring and Evaluation Project (CSMEP) Snake Basin Pilot reports (Marmorek et al. 2007a and b) and largely incorporated and expanded upon in the AHSWG report (Galbreath et al. 2008 draft), and in future habitat effectiveness monitoring. Annually oversee implementation of the regional monitoring program and reporting (Level 3b). Work jointly with the U.S. vs. Oregon Technical Advisory Committee and technical committees under the Pacific Salmon Commission to develop an improved modeling interface between Columbia River and ocean fisheries.		CBFWA Recommendation
		Review the results of Intensively Monitored Watersheds (IMW) and other habitat restoration programs. Facilitate the integration between the intensively monitored watersheds and other monitoring programs. Provide a forum so results from habitat restoration programs and research can be incorporated into future restoration programs.		CBFWA Recommendation

M&E	PIT Tag Needs	PIT tagging to support monitoring of salmon and steelhead will occur in three general release areas: the Snake River and its tributaries, the Columbia River and tributaries upriver from Priest Rapids Dam, and the Columbia River and its tributaries downstream from Priest Rapids Dam.		CBFWA Recommendation WDFW Comment
Coordination	Fish Passage Center	<p>Retain the existing Fish Passage Center language (2003 Mainstem Amendment, pages 27-28) in the Program with the following exceptions:</p> <ul style="list-style-type: none"> • Remove the reference to dual management/supervisory authority over the fish passage manager. • Remove the reference to CBFWA providing a liaison position between the public and the Center. • Remove the last paragraph that makes reference to a technical advisory committee. • Add the following language to the Program: Bonneville will fund a position within the Fish Passage Center whose expertise can support storage reservoir operations analyses and identify in-season resident fish impacts of the FCRPS. • Replace the language describing the Fish Passage Center Oversight Board (FPCOB) with the following to clarify it's role: <p><i>"The Council has established an oversight board for the Center, with representation from NOAA Fisheries, state fish and wildlife agencies, tribes, the Council, and others to provide policy guidance for the Center. And to ensure that the Center carries out its functions in a way that assures regional accountability and compatibility with the regional data management system. The oversight board 's responsibilities will include conducting conduct an the annual review of the performance of the Center and developing develop a goal-oriented plan for next year's the Center's operation <u>to ensure that the Center carries out its functions in a way that assures regional accountability and compatibility with the regional data management system.</u> The Center shall prepare an annual report to the oversight board and the Council, summarizing its</i></p>	The Fish Passage Center (199403300)	CBFWA Recommendation

		<i>activities and accomplishments. There will be no other oversight board or board of directors for the Center.”</i>		
M&E	Salmon and Steelhead Life Cycle Monitoring	Bonneville will fund elements of the life cycle monitoring field sampling, marking and real time data necessary to report on migration characteristics, smolt survival, travel time, passage distribution, migration characteristics, and other monitoring data required by regional fish and hydrosystem managers.	PSMFC-smolt monitoring (200850600)* PIT-tag SR sockeye and UC spring Chinook and steelhead (200874300)* Canada-USA shelf salmon survival study (200300900)** Acoustic tracking for survival (200311400)** Survival estimates for the passage of juvenile salmonids through Snake and Columbia river dams and reservoirs (199302900)** Ocean survival of salmonids (199801400)** Evaluate spawning of fall Chinook and chum salmon just below the four lowermost mainstem dams (199900301)*** PIT tagging spring/summer Chinook (199602000)*** Smolt monitoring by non-federal agencies (198712700)*** Adult salmon and steelhead passage investigations (200810800)****	CBFWA Recommendation WDFW Comment *LRT MOA **2008 FCRPS BiOp ***ODFW recommendation ****CCT MOA

		<p>Fund fishery managers to provide post season analysis to the region on indices of migration abundance and migration timing, smolt to adult return via passage route, and migration characteristics related to environmental factors and hydrosystem operations for fish migration.</p> <ul style="list-style-type: none"> ○ The federal, state, and Tribal fish management agencies will review the design and implementation of the life cycle monitoring program annually. ○ The life cycle monitoring data will be made available to the region on the Fish Passage Center Website and updated daily to facilitate hydro system fish passage management. The Fish Passage Center will report migration characteristics and life cycle parameters to the region in their annual report. 	<p>Power analysis to determine catch sampling rates (200850800)*</p> <p>Upstream migration timing (200851800)*</p> <p>Modeling survival scenarios for spring Chinook (200851500)*</p> <p>Genetic monitoring of Snake River Chinook salmon and steelhead (198909600)**</p>	<p>CBFWA Recommendation</p> <p>*LRT MOA</p> <p>**ongoing measure/2008 FCRPS BiOp</p>
M&E	Columbia River PIT Tag Information System	<p>The PTAGIS project will carry out the following tasks:</p> <ul style="list-style-type: none"> • Management of a long term Columbia River Basin-wide database system accessible to all entities; • Maintenance and documentation of fish tagging and interrogation software; • Operation and maintenance of equipment at the remote sites; • Provision of technical support for the software and hardware; • Provision of training to users; and • Purchase and distribution of PIT tags and associated equipment. 	<p>Columbia Basin Pit-tag Information System (199008000)</p> <p>Adult PIT detector installation (200100300)*</p>	<p>CBFWA Recommendation</p> <p>WDFW Comment</p> <p>*ongoing measure</p>
M&E	Regional Mark Processing Center (RMPC)	<p>Fund the Regional Mark Processing Center (RMPC) to maintain the BPA funded hatchery portion of the coded wire tag database, known as the Regional Mark Information System (RMIS), and to implement and coordinate coded wire tag recovery programs for Columbia River Basin origin fish with the basin's fish and wildlife agencies and Tribes.</p>	<p>Annual stock assessment – coded wire tag program (ODFW) (198201302)*</p> <p>Coded-wire tag recovery (198201301)*</p> <p>Coded wire tag (USFWS)</p>	<p>CBFWA Recommendation</p> <p>*ODFW recommendation</p> <p>**ongoing measure</p>

		<p>Specific activities related to the BPA funded hatchery portion of the RMPC and RMIS include:</p> <ul style="list-style-type: none"> • Provide a regional database and information management services used by the agencies and Tribes to support regional reporting of coded wire tagged releases and recoveries. • Maintain, update and improve the RMIS database, especially as needs change and new methods are developed. • Cooperate with other regional data reporting projects to support data access for all entities within the region. • Maintain the RMPC web site to provide public access to the coded wire tag information and provide standardized reports for the regional fish managers. • Coordinate standardization of data formats so that collected coded wire tag data can be seamlessly entered into the RMIS database. • Provide custom queries and reports to scientists and managers as needed. • Coordinate the maintenance of a coded wire tag recovery laboratory for extracting, and reading and recording tags retrieved from salmon and steelhead. • Coordinate with regional fisheries agencies and Tribes to implement sampling programs for tribal, sport and commercial fisheries, and at spawning grounds, hatcheries, fishways, and other sampling locations. • Support data inventory for the CSMEP project as needed. • Participate in regional data coordination programs such as StreamNet, PNAMP and NED. 	<p>(198201303)**</p> <p>Coded wire tag (WDFW) (198201304)***</p> <p>Coded wire tag (WDFW expanded) (198201304)***</p>	<p>***WDFW comment</p>
Hydrosystem	Anadromous Fish Evaluation Program (AFEP)	The Corps will continue improvements in collaboration with the fish and wildlife agencies and Tribes to achieve objectives within the Fish and Wildlife Program.		CBFWA Recommendation

M&E - Harvest	Harvest Specific Monitoring Measures	Fund deployment of PIT-tag detectors for fisheries sampling. Expand deployment of PIT-tag detectors in terminal areas.	Fishery conservation effectiveness monitoring (field sampling – recovery of PIT tag, take non-lethal fish samples for SNPS analysis)* Fishery conservation effectiveness monitoring (genetic SNPS lab analysis)*	CBFWA Recommendation *WDFW comment
		Support the application of coded wire tags in representative groups of hatchery releases and appropriate naturally produced fish and the necessary sampling programs for recovering coded wire tags in sport, commercial and tribal fisheries.	Expanded tribal catch sampling (200850200)* Nez Perce harvest monitoring (20020600)**	CBFWA Recommendation WDFW Comment *LRT MOA **NPT recommendations
		Develop a regional Genetic Stock Identification (GSI) program with an emphasis on species for which broad-scale PIT tagging and/or coded wire tagging is not a viable option. The program shall include systematic establishment and maintenance of a regional fish stock DNA baseline, and systematic non-lethal tissue sampling of catch and encountered fish in the fisheries. This will require a central, standardized database that is closely coordinated with the genetics laboratories processing the tissue samples. In addition to baseline data, the database will contain the results of the samples for access by the fisheries managers and the public.	GSI to evaluate catch (200850100)* Bonneville GSI (200851100)*	CBFWA Recommendation *LRT MOA
		Determine the run timing and entry patterns of adult salmon returns of major population groups.	Snake River fall Chinook salmon life history investigations (200203200)*	CBFWA Recommendation *2008 FCRPS BiOp

M&E - Hatchery	Hatchery Specific Monitoring Measures	Council supported hatchery monitoring programs as required under ESA consultation (HGMP monitoring programs) should be fully funded as a required cost for operating the facilities.	Supplementation monitoring (200852300)* Operation of Lower Granite Dam adult trap (200500200)**	CBFWA Recommendation WDFW Comment *LRT MOA **ongoing measure/2008 FCRPS BiOp
		Implementation and compliance monitoring and reporting should be required for all Program funded hatcheries.		CBFWA Recommendation
M&E – Habitat	Habitat Specific Monitoring Measures	Council should provide a web-based system for habitat project implementation reporting integrated with other funding sources.		CBFWA Recommendation
		BPA should be directed to fund CBFWA to annually report implementation of fish and wildlife restoration projects through the Status of the Resource consistent with requirements for the Council’s Fish and Wildlife Expenditures Report to the Governors and with the needs of other regional reports such as the Washington <i>State of Salmon in Watersheds Report</i> .		CBFWA Recommendation
		A basic level of effectiveness monitoring and reporting should be required for all projects to determine if stated project habitat objectives have been achieved.		CBFWA Recommendation
		Intensively Monitored Watersheds – The Council, working with the fish and wildlife managers, NOAA Fisheries, Independent Scientific Advisory Board (ISAB), Salmon Recovery Funding Board (SRFB) and Oregon Watershed Enhancement Board (OWEB) should facilitate development of a process to identify a network of intensively monitored watersheds. Process should be established within one year of adoption of this program and a recommended network of IMWs within 2 years of Program adoption. All IMWs should have specific study objectives, regular reporting requirements and an estimated timeframe for completion.	Integrated status and effectiveness monitoring program (200301700)* Add PNAMP IMW Committee to list of cooperators**	CBFWA Recommendation *ongoing measure/2008 FCRPS BiOp **NOAA Fisheries comment
Research	Critical Uncertainties	Some examples of identified research needs are: o The feasibility of using genetic parental analysis of hatchery fish to determine its effectiveness as a monitoring tool	Basin-wide evaluation of supplementation benefits and risks (200852200)*	*LRT MOA **Ongoing measure

		<p>compared to other marking techniques.</p> <ul style="list-style-type: none"> ○ Use of genetic stock identification of adult steelhead and Chinook salmon at Lower Granite Dam (and/or any other facility) can be assessed in the research context as it might be applied and developed for Level 1 monitoring. ○ Describe Elastomer tag (VIE) retention and detection rates by age class for Snake River fall Chinook salmon. ○ Support increased monitoring of encounter rates to better characterize harvest impacts in fisheries that release by catch. ○ Hatchery critical uncertainties include: <ul style="list-style-type: none"> ● The effects of stray hatchery (harvest augmentation or supplementation) origin adults on the productivity of non-target natural populations. ● The effects of supplementation hatchery origin adults on the long term productivity of target natural populations. ● The effects of hatchery programs on hatchery/wild fish competition in terms of habitat use and nutrition/growth. ● The effects of hatchery programs on mortality rates of natural populations due to predation by hatchery origin fish. 	<p>SNP discovery (20085100)*</p> <p>Expression of traits related to recovery (200851900)*</p> <p>Genetic baseline expansion (200852000)*</p> <p>Landscape genetics (200852100)*</p> <p>Develop progeny marker for salmonids to evaluate supplementation (20020300)*</p> <p>Evaluate the relative reproductive success of reconditioned kelt steelhead (200306200)*</p> <p>Research to advance hatchery reform (199305600)**</p> <p>Reproductive success of steelhead in Hood River (200305400)**</p> <p>Reproductive success in Abernathy Creek (200306300)**</p> <p>Evaluation of reproductive success of steelhead (200305000)**</p> <p>Evaluating relative reproductive success of wild and hatchery origin Snake River fall Chinook spawners upstream of LGR (200306000)**</p> <p>Manchester Spring Chinook</p>	<p>in Program and/or 2008 FCRPS BiOp</p> <p>***NPT recommendation</p> <p>****WDFW comment</p>
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			<p>Captive Broodstock Program (199606700)**</p> <p>Listed stock Chinook salmon gamete preservation (199703800)***</p> <p>Genetic analysis of anadromous salmonid populations****</p>	
M&E – anadromous fish	Identify Specific Reporting Requirements for the Program	<p>Bonneville will fund adequate monitoring to fill data gaps, to answer the following questions in an annual report to Council and the region -</p> <ul style="list-style-type: none"> • What rivers and reaches are currently accessible by anadromous salmon? • How many salmon and steelhead populations occur above Bonneville Dam? How many of those populations demonstrate an increasing trend in abundance? • How many naturally producing populations of salmon and steelhead occur within each relevant province? How many of those populations are healthy as defined by the Program? • How many salmon and steelhead pass Bonneville Dam annually? How are they allocated across the Basin (harvest, hydrosystem and natural mortality, hatchery brood stock, and subbasin escapement)? • What is the current knowledge about the characteristics of healthy lamprey populations? 	New marking and monitoring techniques (198331900)*	<p>CBFWA Recommendation</p> <p>*ongoing measure/2008 FCRPS BiOp</p>
Program Support	Evaluation	A programmatic evaluation of the anadromous fish basinwide strategies will occur preceding Program amendments, to determine whether anadromous fish measures are moving the Program towards its biological objectives for performance.		CBFWA Recommendation
Program Support	Adjustment in Program Direction	The project solicitation process identified in Implementation Provisions of this Program will rely on conclusions from the evaluation of the anadromous fish to set project selection	Implement hatchery reform actions identified in HGMPs (200871200)*	CBFWA Recommendation

		priorities. Monitoring, evaluation and reporting efforts will be used to help develop measures and amendments.		*2008 FCRPS BiOp
M&E - Resident Fish	Report the Current Biological Condition for Resident Fish Populations	The Council will work with the agencies and Tribes to develop a summary of the current status of resident fish populations in the Columbia River Basin. This information will be presented annually in the Status of the Resource Report.	Migratory patterns, structure, abundance and status of bull trout populations (199405400)*	CBFWA Recommendation *ODFW recommendation
M&E – Resident Fish	Develop Resident Fish Loss Assessment Methodology and Continue to Fund Existing Projects in the Interim	Bonneville will fund the fish and wildlife agencies and Tribes to develop and implement a Columbia River Basin Resident Fish Loss Assessment Methodology that will be applied by each agency and/or Tribe in their specific geographical area. This methodology may be customized to fit specific circumstances within a given subbasin. Include recommendations, to be completed by 2010, for assessing, in a consistent manner, resident fish and habitat losses due to: 1) development and 2) operation of hydropower facilities throughout the Columbia River Basin, notwithstanding existing resident fish projects.		CBFWA Recommendation
		Implementation of existing and new resident fish mitigation and substitution measures and strategies will not be delayed pending the completion of loss assessments.		CBFWA Recommendation
Research	Complete Resident Fish Loss Assessments	Upon completion of the best scientifically based most feasible methodology, the fishery managers will complete assessments of resident fish losses related to construction and operation of each hydropower facility throughout the Columbia River Basin and submit to Council for inclusion into the Program, notwithstanding existing projects.	Resident fish loss assessment*	CBFWA Recommendation *WDFW comment

Hydrosystem – Resident Fish	Restore natural hydrograph to provide appropriate flow during critical periods.	Reduce flow fluctuations.		CBFWA Recommendation	
		Minimize short-term flow reductions.		CBFWA Recommendation	
		Reduce drawdown and improve reservoir refill.		CBFWA Recommendation	
		Provide appropriate flows for white sturgeon, bull trout and burbot.		CBFWA Recommendation	
		Implement VARQ		CBFWA Recommendation	
	Improve degraded water quality	Restore channel maintenance flows.		CBFWA Recommendation	
		Minimize effects of dissolved gas.		CBFWA Recommendation	
		Implement measures to restore normative hydrograph.		CBFWA Recommendation	
	Restore floodplain connectivity and function	Reconnect floodplains to channels.		CBFWA Recommendation	
		Reconnect side channels and off-channel habitats to stream channels.		CBFWA Recommendation	
	Restore channel structure and complexity	Restore natural channel form where feasible.		CBFWA Recommendation	
		Stabilize stream banks.		CBFWA Recommendation	
	M&E	Include a Statement Regarding Monitoring of Resident Fish Populations	The Program relies on the monitoring efforts of the fish and wildlife agencies and Tribes for a majority of the information related to resident fish. Bonneville will fund monitoring efforts at the project scale where necessary to fill in information gaps necessary for supporting Program decision making. The monitoring for resident fish will be facilitated for the Program through collaboration and the coordination of the fish and wildlife agencies and Tribes.		CBFWA Recommendation

<p>M&E</p>	<p>Collaborative Systemwide Monitoring and Evaluation</p>	<ul style="list-style-type: none"> ○ Fund the fish and wildlife managers to work with others to: ○ Coordinate, assemble, evaluate and report on fish status and trend monitoring metrics including abundance, productivity, spatial structure and diversity. ○ Develop standardized descriptions of the primary indicators used to assess VSP parameters in collaboration with fish and wildlife agencies and Tribes. ○ Characterize the metrics and methodologies used to estimate the primary indicators of VSP parameters. ○ Inventory the available primary indicators used to estimate VSP parameters and identify populations without coverage. ○ Assess the metrics and methodologies used to estimate the primary indicators characterizing the adequacy of the information and identify the deficiencies. ○ Evaluate and recommend the alternative integration and mix of monitoring activities that promote consistency so the data are comparable among all subbasins, and to optimize cost effective monitoring across all levels. ○ Annually report the VSP indicators through the <i>Status of the Resource Report</i>. Report on the findings and recommendations from the inventory, and the assessment of adequacies and deficiencies of the metrics and methodologies. ○ Develop monitoring designs (informed by the findings and recommendations in 6. above), and estimate their accuracy, precision and cost to describe population status and trends that inform biological objectives. Ensure that the estimated metrics represent appropriate spatial, temporal, and population scales. ○ Periodically estimate population status and trends of 		<p>CBFWA Recommendation</p>
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		<p>fish species (e.g. every 5 years).</p> <ul style="list-style-type: none"> ○ Work with land and water resource management agencies to assemble and report habitat metrics at appropriate biological scales in the <i>Status of the Resource Report</i>. These may include watershed condition, miles of accessible stream, 303D listings Clean Water Act standards (examples: temperature, turbidity, contaminants). Coordinate with other regional reports such as EPA’s <i>State of the River Report</i>, Washington <i>State of Salmon in Watersheds Report</i>. ○ Periodically assess the monitoring associated with management decisions and recommend improved designs. ○ Develop and maintain run-reconstructions (systematic organization of all mortality sources by origin (hatchery or wild) and age in lifecycle framework data sets) for each appropriate biological scale. ○ Review the results of Intensively Monitored Watersheds and other habitat restoration programs. Facilitate the integration between the intensively monitored watersheds and other monitoring programs. Provide a forum so results from habitat restoration programs and research can be incorporated into future restoration programs. 		
M&E – Resident Fish	Identify Specific Reporting Requirements for the Program	<p>Bonneville will fund adequate monitoring to fill data gaps, to answer the following questions in an annual report to Council and the region -</p> <ul style="list-style-type: none"> ● How many native resident fish species (subspecies, stocks and populations) occur in areas affected by the FCRPS? How many of those populations demonstrate abundance similar to historic conditions? ● What actions have been taken to reintroduce anadromous fish into blocked areas? ● When loss assessments have been completed, what is 		CBFWA Recommendation

		<p>the FCRPS mitigation responsibility for resident fish?</p> <ul style="list-style-type: none"> • What rivers and reaches currently have low ecological connectivity between aquatic areas, riparian zones, floodplains and uplands? • Which rivers and reaches currently have poor water quality (temperature, toxics, etc.)? • Which rivers and reaches have insufficient water quantity to support all life stages of resident and anadromous fish? • Are hatchery projects meeting their production goals in terms of adult fish? • Is the Program meeting its harvest objectives for resident fish populations? • What actions are being taken to provide opportunities for consumptive and non-consumptive resident fisheries? 		
Program Support	Identify How Evaluation of the Resident Fish Section of the Program Will Occur	A programmatic evaluation of the Resident Fish Section of the Program will occur preceding Program amendments, to determine whether resident fish measures are moving the Program towards its biological objectives for performance.		CBFWA Recommendation
Program Support	Explain How Adjustment in Program Direction Will Occur Over Time	The project solicitation process identified in Implementation Provisions of this Program (Amendment 5.2) will rely on conclusions from the evaluation of the Resident Fish Section of the Program to set project selection priorities. Monitoring, evaluation and reporting efforts will be used to help develop measures and amendments.		CBFWA Recommendation
M&E - Wildlife	Fund Operational Loss Assessments:	Bonneville will fund the Agencies and Tribes to complete operational loss assessments using methods that provide a systematic approach to characterize active physical and biological processes in watersheds and describes spatial distributions, histories and linkages among important ecosystem components. A framework for assessing operational losses shall be in place by the end of 2009 with loss assessments initiated in 2010.	Wildlife operational loss assessment*	CBFWA Recommendation *WDFW comment

		Bonneville will fund assessments of ecological impacts to wildlife from the reduction or loss of anadromous fish as part of the operational loss assessment. The assessments need to evaluate an array of core ecological parameters (e.g., biological/biotic and physical/abiotic) with the understanding that habitats, communities, and processes are ecologically linked (Figure 2.3.3). The results of these assessments will be the basis for quantification of operational impacts and subsequent mitigation obligation. Existing and future habitat actions implemented to benefit anadromous fish may be suitable mitigation for some of these impacts.		CBFWA Recommendation
Wildlife	Long-term funding agreements:	<p>Bonneville will enter into long-term funding agreements for existing and future (wildlife) mitigation projects that:</p> <ul style="list-style-type: none"> • Assure continuity of funding for the life of the hydroelectric project impact. • Assure sufficient funding levels to implement the habitat management strategies and monitoring and evaluation needs identified in project area management plans. • Provide flexibility to respond to uncertainties and unforeseen events. • Provide adjustment for annual inflation. 		CBFWA Recommendation
Wildlife	Fund existing projects at levels adequate to implement management plans:	Bonneville will fund existing wildlife projects at levels determined to be consistent with the project management plans. Funding must be sufficient for habitat maintenance and enhancement, and appropriate monitoring as agreed upon in the management plans. Where management plans are not in place BPA will provide interim funding to manage the wildlife projects and complete the management plans.	<p>Amazon Basin/Eugene Wetlands (199205900)</p> <p>Northeast Oregon Wildlife Project (NPT) Precious Lands (199608000)</p> <p>Willamette Basin Mitigation (199206800)</p> <p>Securing Wildlife Mitigation Sites - Oregon Ladd Marsh WMA and Grande Ronde Subbasin Wetlands (200002100)</p>	<p>CBFWA Recommendation</p> <p>WDFW Comment</p>

			Burlington Bottoms Wildlife Mitigation Project (199107800)	
			Southern Idaho Wildlife Mitigation (199505703)	
			Southern Idaho Wildlife Mitigation (199505702)	
			Spokane Tribe Wildlife Mitigation (199106200)	
			Spokane Tribe Wildlife Mitigation Operations & Maintenance (199800300)	
			Tualatin River NWR Additions (200001600)	
			Wenas Wildlife Area O&M (200600400)	
			Scotch Creek Wildlife Area (199609401)	
			Shillapoo Wildlife Area (200301200)	
			Sunnyside Wildlife Mitigation (200201400)	
			Enhance, protect and maintain shrub-steppe habitat on the Sagebrush Flat Wildlife Area (SFWA) (199404400)	
			Swanson Lake Wildlife Mitigation Project (Swanson Lakes Wildlife Area) (199106100)	

			Desert Wildlife Area O&M (Wetland Enhancement) (200600300)	
			Asotin Creek Wildlife Area O&M (Schlee Acquisitions) (200600500)	
			Western Pond Turtle Recovery – Columbia River Gorge (200102700)	
			Yakama Nation - Riparian/Wetlands Restoration (199206200)	
Wildlife	Establish a Wildlife Crediting Forum for maintaining the crediting ledger:	Bonneville, the Council, and the fish and wildlife managers will establish a BPA funded forum to develop a regional protocol for establishment and maintenance of a crediting ledger documenting progress towards achieving mitigation obligations. This crediting ledger will be formally included in the Program. The forum will track crediting of construction, inundation and operational mitigation actions and will address disputes, inconsistencies, and other issues related to application of credit against wildlife losses. This forum is to be in place by no later than one year after the adoption of the revised Program.		CBFWA Recommendation
M&E - Wildlife	Fund Adequate M&E:	Bonneville will fund research, monitoring and evaluation of wildlife mitigation projects adequately to assure tracking of crediting, to evaluate trends in ecological functions of managed ecosystems, and provide managers the ability to assess the effectiveness of their strategies by evaluating species and habitat responses that contributes to broader monitoring efforts.		CBFWA Recommendation
		Bonneville will continue funding HEP surveys on acquired land in support of the Wildlife Crediting Forum to track mitigation implementation progress.		CBFWA Recommendation

M&E – Wildlife	Identify Specific Reporting Requirements for the Program	<p>Bonneville will fund adequate monitoring, data management, and reporting to answer the following questions in an annual report to Council and the region -</p> <ul style="list-style-type: none"> • How many habitat units have been mitigated for FCRPS construction and inundation caused losses of wildlife? • How many of those habitat units are secured through long term funding? • How are wildlife species and habitats responding to FCRPS mitigation actions? • What is the FCRPS mitigation responsibility for wildlife operational losses? 	<p>Habitat Evaluation Procedures (200600600)*</p> <p>UCUT M&E program (200800700)**</p>	<p>CBFWA Recommendation</p> <p>*Ongoing measure</p> <p>**UCUT recommendation</p>
		<p>Bonneville will fund the following activities in support of the Program:</p> <ul style="list-style-type: none"> • Operate and maintain the regional Interactive Habitat and Biodiversity Information System (IBIS), • Update and refine wildlife basin, eco-province, and subbasin habitat maps, • Develop wildlife and habitat GIS tools and services, and • Develop and implement new Habitat Assessment protocols to evaluate mitigation impact and sites. 	<p>Habitat and biodiversity information system for Columbia River basin (200307200)*</p>	<p>CBFWA Recommendation</p> <p>*ongoing measure</p>
Program Support	Identify How Evaluation of the Wildlife Section of the Program Will Occur	A programmatic evaluation of the Wildlife Section of the Program will occur preceding Program amendments, to determine whether wildlife measures are moving the Program towards its biological objectives for performance.		CBFWA Recommendation
Program Support	Explain How Adjustment in Program Direction Will Occur Over Time	The project solicitation process identified in the Implementation Provisions of this Program will rely on conclusions from the evaluation of the Wildlife Section of the Program to set project selection priorities.		CBFWA Recommendation
Predation			Avian predation on juvenile	2008 FCRPS BiOp

			salmonids in the lower Columbia River (199702400) Development of systemwide predator control for northern pikeminnows (199007700)	
Conservation Enforcement			Conservation Enforcement (200739100) Conservation Enforcement (200739000) Conservation Enforcement (200739200)*	LRT MOA WDFW Comment *NPT recommendation
Selective Harvest			Evaluation of live capture, selective fishing gear (200724900) Selective gear deployment (200810500)	CCT MOA WDFW Comment
Climate Change			Management scenarios for climate change (200851400) Climate change database (200851600)	LRT MOA
Fertilization			Fertilization experiment (200105500)	2008 FCRPS BiOp
Outreach			Columbia Basin Bulletin (199800401)	Ongoing measure

Attachment 2b:
Anadromous Fish Provisions

Lower Columbia and Estuary Provinces

Columbia Estuary Subbasin

Strategy	Recommended Measure		Source of Measure
Operate the hydrosystem to more closely approximate the shape of the natural hydrograph and to enhance flows and water quality to improve juvenile and adult fish survival.	Establish minimum instream flows for the estuary that will help prevent further degradation.		CBFWA recommendation
	Operate the hydrosystem to reduce the effects of reservoir surface heating.		CBFWA recommendation
	Adjust the timing, magnitude, and frequency of flows entering the estuary and plume to provide better transport of coarse sediments and access to habitats in the estuary and plume.		CBFWA recommendation
	Protect intact riparian areas in the estuary and restore riparian areas that are degraded.	Lower Columbia River and Estuary Ecosystem Monitoring	FCRPS BiOp Action/New Recommendation (200300700)
		Columbia R/Estuary Habitat	FCRPS BiOp Action/New Recommendation (200301100)
		Eelgrass Enhancement and Restoration in the Columbia River Estuary Through Innovative Site Selection and Planting Techniques	FCRPS BiOp Action/New Recommendation (200751300)

Restore floodplain connectivity and function.	Breach or lower dikes and levees to improve access to off-channel habitats.	Lower Columbia River and Estuary Ecosystem Monitoring	FCRPS BiOp Action/New Recommendation (200300700)
		Columbia R/Estuary Habitat	FCRPS BiOp Action/New Recommendation (200301100)
	Remove pilings and pile dikes with low economic value.	Lower Columbia River and Estuary Ecosystem Monitoring	FCRPS BiOp Action/New Recommendation (200300700)
		Columbia R/Estuary Habitat	FCRPS BiOp Action/New Recommendation (200301100)
	Protect remaining high-quality off-channel habitat from degradation.	Lower Columbia River and Estuary Ecosystem Monitoring	FCRPS BiOp Action/New Recommendation (200300700)
		Columbia R/Estuary Habitat	FCRPS BiOp Action/New Recommendation (200301100)
Restore channel structure and complexity.	Reduce the export of sand and gravels via dredge operations by using dredged materials beneficially.		CBFWA recommendation
	Reduce entrainment and habitat effects resulting from main and side-channel dredge activities in the estuary.		CBFWA recommendation
Restore degraded water quality.	Implement pesticide and fertilizer best management practices to reduce estuary and	Lower Columbia River and Estuary Ecosystem Monitoring	FCRPS BiOp Action/New Recommendation (200300700)

	upstream sources of toxic contaminants.		
	Identify and reduce industrial, commercial, and public sources of pollutants.	Lower Columbia River and Estuary Ecosystem Monitoring	FCRPS BiOp Action/New Recommendation (200300700)
Address food web-related threats.	Manage northern pikeminnow and other piscivorous fish to reduce predation.	Development of Systemwide Predator Control for Northern Pikeminnows.	FCRPS BiOp Action/ODFW Recommendation (199007700)
	Identify and implement actions to reduce predation by pinnipeds.	Sea Lion Predation Rate Estimation and Non-lethal Hazing	CRITFC MOA (200800400)
		Capture, Marking, Hazing & Removal of California Sea Lions at Bonneville Dam	FCRPS BiOp Action/New Recommendation (200800300)
		Integrated Non-Lethal Electric Barrier and Sonar System to Deter Marine Mammal Predation on Fish in the Columbia River System: A Demonstration Project	FCRPS BiOp Action/New Recommendation (200752400)
		Avian and Pinniped Predation	WDFW Comment
	Implement projects to reduce Caspian tern and double-crested cormorant predation.	Avian and Pinniped Predation	WDFW Comment
Mitigate for reduced productivity resulting from inundated spawning habitat and impeded or blocked passage	Implement a mix of artificial propagation Recommendations, habitat restoration actions, improved mainstem passage and survival in an integrated approach to improve anadromous fish returns	Select Area Fisheries Enhancement Project	ODFW Recommendation/WDFW Comment (199306000)

	to the Columbia River Estuary subbasin and to achieve objectives.		
	Implement select area fisheries to mitigate for lost mainstem fishing opportunities	Select Area Fisheries Enhancement Project	ODFW Recommendation/ WDFW Comment (199306000)
Monitor status and trends of focal species and populations.	Gather and analyze harvest data to aid in run reconstruction to evaluate status and action effectiveness		CBFWA recommendation

Grays River Subbasin

Strategy	Recommended Measure		Source of Measure
Protect and conserve natural ecological processes	Continue existing protections, and increase protection of high quality habitats through acquisition, conservation easements, and cooperative agreements.	Grays River Watershed Restoration	FCRPS BiOp (200301300)
Restore floodplain connectivity and function.	Reconnect floodplains to channels.		CBFWA recommendation
	Reconnect side channels and off-channel habitats to stream channels.		CBFWA recommendation
	Remove dikes and levies.		CBFWA recommendation
Restore channel structure and complexity.	Restore natural channel form.		CBFWA recommendation
	Increase role and abundance of wood and large organic debris in streambeds.	Grays River Watershed Restoration	FCRPS BiOp (200301300)
	Stabilize and protect streambanks.	Grays River Watershed Restoration	FCRPS BiOp (200301300)
Restore riparian condition and LWD recruitment	Restore natural riparian vegetative communities.	Grays River Watershed Restoration	FCRPS BiOp (200301300)
	Implement grazing strategies that promote riparian recovery.		CBFWA recommendation

Restore natural hydrograph to provide sufficient flow during critical periods.	Implement agricultural water conservation Recommendations.		CBFWA recommendation
	Improve irrigation conveyance and efficiency.		CBFWA recommendation
	Obtain water rights and convert to instream water rights.		CBFWA recommendation
Improve degraded water quality	Restore natural functions and processes through Recommendations identified to address physical habitat quality/quantity limitations.	Grays River Watershed Restoration	FCRPS BiOp (200301300)
Monitor status and trends of focal species and populations	Establish or use preexisting index sites to gather baseline, trend, and comparative data.	Historic Habitat Opportunities and Food-Web Linkages of Juvenile Salmon in the Columbia River Estuary and Their Implications for Managing River Flows and Restoring Estuarine Habitat	FCRPS BiOp (200301000)
		Grays River Watershed Restoration	FCRPS BiOp (200301300)
		Expand Salmonid Monitoring in Grays River to Meet Monitoring Needs Identified in the Lower Columbia Salmon Recovery and Subbasin Plan and maintain an at risk Chum Salmon Population through Supplementation.	New WDFW Recommendation (200715000*)

Monitor and evaluate effectiveness of actions taken to implement Recommendations.	Develop methods to monitor biological response to habitat improvement.	Historic Habitat Opportunities and Food-Web Linkages of Juvenile Salmon in the Columbia River Estuary and Their Implications for Managing River Flows and Restoring Estuarine Habitat	FCRPS BiOp (200301000)
		Grays River Watershed Restoration	FCRPS BiOp (200301300)
	Monitor effectiveness of hatchery and natural production Recommendations.	Historic Habitat Opportunities and Food-Web Linkages of Juvenile Salmon in the Columbia River Estuary and Their Implications for Managing River Flows and Restoring Estuarine Habitat	FCRPS BiOp (200301000)
		Grays River Watershed Restoration	FCRPS BiOp (200301300)
		Expand Salmonid Monitoring in Grays River to Meet Monitoring Needs Identified in the Lower Columbia Salmon Recovery and Subbasin Plan and maintain an at risk Chum Salmon Population through Supplementation.	New WDFW Recommendation (200715000*)

Elochoman River Subbasin

Strategy	Recommended Measure		Source of Measure
Protect and conserve natural ecological processes	Continue existing protections, and increase protection of high quality habitats through acquisition, conservation easements, and cooperative agreements.		CBFWA recommendation
Restore floodplain connectivity and function.	Reconnect floodplains to channels.		CBFWA recommendation
	Reconnect side channels and off-channel habitats to stream channels.		CBFWA recommendation
	Remove dikes and levies.		CBFWA recommendation
Restore channel structure and complexity.	Restore natural channel form.		CBFWA recommendation
	Increase role and abundance of wood and large organic debris in streambeds.		CBFWA recommendation
	Stabilize and protect streambanks.		CBFWA recommendation

Restore riparian condition and LWD recruitment	Restore natural riparian vegetative communities.		CBFWA recommendation
	Implement grazing strategies that promote riparian recovery.		CBFWA recommendation
Improve degraded water quality	Restore natural functions and processes through Recommendations identified to address physical habitat quality/quantity limitations.		CBFWA recommendation
Monitor status and trends of focal species and populations	Establish or use preexisting index sites to gather baseline, trend, and comparative data.		CBFWA recommendation
Monitor and evaluate effectiveness of actions taken to implement Recommendations.	Develop methods to monitor biological response to habitat improvement.		CBFWA recommendation
	Monitor effectiveness of hatchery and natural production Recommendations.		CBFWA recommendation

Cowlitz River Subbasin

Strategy	Recommended Measure		Source of Measure
Protect and conserve natural ecological processes	Continue existing protections, and increase protection of high quality habitats through acquisition, conservation easements, and cooperative agreements.		CBFWA recommendation
Restore floodplain connectivity and function.	Reconnect floodplains to channels.		CBFWA recommendation
	Reconnect side channels and off-channel habitats to stream channels.		CBFWA recommendation
	Remove dikes and levies.		CBFWA recommendation
Restore channel structure and complexity.	Restore natural channel form.		CBFWA recommendation
	Increase role and abundance of wood and large organic debris in streambeds.		CBFWA recommendation
	Stabilize and protect streambanks.		CBFWA recommendation
Restore riparian condition and LWD recruitment	Restore natural riparian vegetative communities.		CBFWA recommendation
	Implement grazing strategies that promote riparian recovery.		CBFWA recommendation

Improve degraded water quality	Restore natural functions and processes through Recommendations identified to address physical habitat quality/quantity limitations.		CBFWA recommendation
Monitor status and trends of focal species and populations	Establish or use preexisting index sites to gather baseline, trend, and comparative data.		CBFWA recommendation
Monitor and evaluate effectiveness of actions taken to implement Recommendations.	Develop methods to monitor biological response to habitat improvement.		CBFWA recommendation
	Monitor effectiveness of hatchery and natural production Recommendations.		CBFWA recommendation

Kalama River Subbasin

Strategy	Recommended Measure		Source of Measure
Protect and conserve natural ecological processes	Continue existing protections, and increase protection of high quality habitats through acquisition, conservation easements, and cooperative agreements.		CBFWA recommendation
Restore floodplain connectivity and function.	Reconnect floodplains to channels.		CBFWA recommendation
	Reconnect side channels and off-channel habitats to stream channels.		CBFWA recommendation
	Remove dikes and levies.		CBFWA recommendation
Restore channel structure and complexity.	Restore natural channel form.		CBFWA recommendation
	Increase role and abundance of wood and large organic debris in streambeds.		CBFWA recommendation
	Stabilize and protect streambanks.		CBFWA recommendation
Restore riparian condition and LWD recruitment	Restore natural riparian vegetative communities.		CBFWA recommendation
	Implement grazing strategies that promote riparian recovery.		CBFWA recommendation

Restore natural hydrograph to provide sufficient flow during critical periods.	Implement agricultural water conservation Recommendations.		CBFWA recommendation
	Improve irrigation conveyance and efficiency.		CBFWA recommendation
	Obtain water rights and convert to instream water rights.		CBFWA recommendation
	Restore natural functions and processes through Recommendations identified to address physical habitat quality/quantity limitations.		CBFWA recommendation
Improve degraded water quality	Restore natural functions and processes through Recommendations identified to address physical habitat quality/quantity limitations.		CBFWA recommendation
Monitor status and trends of focal species and populations	Establish or use preexisting index sites to gather baseline, trend, and comparative data.		CBFWA recommendation

Monitor and evaluate effectiveness of actions taken to implement Recommendations.	Develop methods to monitor biological response to habitat improvement.		CBFWA recommendation
	Monitor effectiveness of hatchery and natural production Recommendations.		CBFWA recommendation

Lewis River Subbasin

Strategy	Recommended Measure		Source of Measure
Protect and conserve natural ecological processes	Continue existing protections, and increase protection of high quality habitats through acquisition, conservation easements, and cooperative agreements.		CBFWA recommendation
Restore passage and connectivity to habitats blocked or impaired by artificial barriers.	Remove or replace culverts and other passage barriers per priorities described in the draft recovery plan.		CBFWA recommendation
Restore floodplain connectivity and function.	Reconnect floodplains to channels.		CBFWA recommendation
	Reconnect side channels and off-channel habitats to stream channels.		CBFWA recommendation
	Remove dikes and levies.		CBFWA recommendation
Restore channel structure and complexity.	Restore natural channel form.		CBFWA recommendation
	Increase role and abundance of wood and large organic debris in streambeds.		CBFWA recommendation
	Stabilize and protect streambanks.		CBFWA recommendation
Restore riparian condition and LWD recruitment	Restore natural riparian vegetative communities.		CBFWA recommendation
	Implement grazing strategies that promote riparian recovery.		CBFWA recommendation

Restore natural hydrograph to provide sufficient flow during critical periods.	Operate the tributary hydrosystem to provide appropriate flows for spawning and rearing.		CBFWA recommendation
	Implement agricultural water conservation Recommendations.		CBFWA recommendation
	Restore natural functions and processes through Recommendations identified to address physical habitat quality/quantity limitations.		CBFWA recommendation
Improve degraded water quality	Restore natural functions and processes through Recommendations identified to address physical habitat quality/quantity limitations.		CBFWA recommendation
Monitor status and trends of focal species and populations	Establish or use preexisting index sites to gather baseline, trend, and comparative data.		CBFWA recommendation
Monitor and evaluate effectiveness of actions taken to implement Recommendations.	Develop methods to monitor biological response to habitat improvement.		CBFWA recommendation
	Monitor effectiveness of hatchery and natural production Recommendations.		CBFWA recommendation

Willamette River Subbasin

Strategy	Recommended Measure		Source of Measure
Protect and conserve natural ecological processes	Continue existing protections, and increase protection of high quality habitats through acquisition, conservation easements, and cooperative agreements.		CBFWA recommendation
Restore passage and connectivity to habitats blocked or impaired by artificial barriers.	Remove or replace culverts and other passage barriers per priorities described in the draft recovery plan.		CBFWA recommendation
	Provide adequate screening at all irrigation diversions.		CBFWA recommendation
	Reintroduce native salmon species in areas where they have been extirpated by human activities.	Development of protocols and priorities for re-establishing naturally reproducing populations of Upper Willamette River Chinook Salmon above US Army Corps of Engineers dams in the Willamette Subbasin	Willamette BiOp RPA/ODFW Recommendation (200722900)*
Restore floodplain connectivity and function.	Reconnect floodplains to channels.		CBFWA recommendation
	Reconnect side channels and off-channel habitats to stream channels.		CBFWA recommendation
Restore channel structure and complexity.	Restore natural channel form.		CBFWA recommendation
	Increase role and abundance of wood and large organic debris in streambeds.		CBFWA recommendation
	Stabilize and protect streambanks.		CBFWA recommendation

Restore riparian condition and LWD recruitment	Restore natural riparian vegetative communities.		CBFWA recommendation
	Implement grazing strategies that promote riparian recovery.		CBFWA recommendation
Restore natural hydrograph to provide sufficient flow during critical periods.	Operate the tributary hydrosystem to provide appropriate flows for spawning and rearing.		CBFWA recommendation
	Implement agricultural water conservation Recommendations.		CBFWA recommendation
	Improve irrigation conveyance and efficiency.		CBFWA recommendation
	Obtain water rights and convert to instream water rights. Protect and rehabilitate springs.		CBFWA recommendation
Improve degraded water quality	Restore natural functions and processes through Recommendations identified to address physical habitat quality/quantity limitations.		CBFWA recommendation
Mitigate for impeded and blocked passage within the subbasin	Implement artificial propagation Recommendations to mitigate for lost habitat access and habitat productivity.		CBFWA recommendation

Increase hatchery effectiveness for restoration and mitigation	Explore and implement innovative hatchery actions to achieve both restoration and mitigation objectives.		CBFWA recommendation
Monitor status and trends of focal species and populations	Establish or use preexisting index sites to gather baseline, trend, and comparative data.	Leaburg separator	Willamette BiOp RPA
	Gather and analyze harvest data to aid in run reconstruction to evaluate status and action effectiveness.		CBFWA recommendation
Monitor and evaluate effectiveness of actions taken to implement Recommendations.	Develop methods to monitor biological response to habitat improvement.		CBFWA recommendation
	Monitor effectiveness of hatchery and natural production Recommendations.		CBFWA recommendation

Sandy River Subbasin

Strategy	Recommended Measure		Source of Measure
Protect and conserve natural ecological processes	Continue existing protections, and increase protection of high quality habitats through acquisition, conservation easements, and cooperative agreements.		CBFWA recommendation
Restore passage and connectivity to habitats blocked or impaired by artificial barriers.	Remove or replace culverts and other passage barriers per priorities described in the draft recovery plan.		CBFWA recommendation
	Provide adequate screening at all irrigation diversions.		CBFWA recommendation
Restore floodplain connectivity and function.	Reconnect floodplains to channels.	Sandy River Delta Habitat Restoration	ODFW Recommendation (199902500)
	Reconnect side channels and off-channel habitats to stream channels.	Sandy River Delta Habitat Restoration	ODFW Recommendation (199902500)
	Restore wet meadows.	Sandy River Delta Habitat Restoration	ODFW Recommendation (199902500)
Restore channel structure and complexity.	Restore natural channel form.		
	Increase role and abundance of wood and large organic debris in streambeds.	Sandy River Delta Habitat Restoration	ODFW Recommendation (199902500)
	Stabilize and protect streambanks.	Sandy River Delta Habitat Restoration	ODFW Recommendation (199902500)

Restore riparian condition and LWD recruitment	Restore natural riparian vegetative communities.	Sandy River Delta Habitat Restoration	ODFW Recommendation (199902500)
	Implement grazing strategies that promote riparian recovery.		CBFWA recommendation
Restore natural hydrograph to provide sufficient flow during critical periods.	Implement agricultural water conservation Recommendations.		CBFWA recommendation
	Improve irrigation conveyance and efficiency.		CBFWA recommendation
	Obtain water rights and convert to instream water rights.		CBFWA recommendation
	Protect and rehabilitate springs.		CBFWA recommendation
Improve degraded water quality	Upgrade or remove problem forest roads.		CBFWA recommendation
	Restore natural functions and processes through Recommendations identified to address physical habitat quality/quantity limitations.	Sandy River Delta Habitat Restoration	ODFW Recommendation (199902500)
Mitigate for impeded and blocked passage within the subbasin	Implement artificial propagation Recommendations to mitigate for lost habitat access and habitat productivity.		CBFWA recommendation
Increase hatchery effectiveness for restoration and mitigation	Explore and implement innovative hatchery actions to achieve both restoration and mitigation objectives.		CBFWA recommendation

Monitor status and trends of focal species and populations	Establish or use preexisting index sites to gather baseline, trend, and comparative data.		CBFWA recommendation
	Gather and analyze harvest data to aid in run reconstruction to evaluate status and action effectiveness.		CBFWA recommendation
Monitor and evaluate effectiveness of actions taken to implement Recommendations.	Develop methods to monitor biological response to habitat improvement.		CBFWA recommendation
	Monitor effectiveness of hatchery and natural production Recommendations.		CBFWA recommendation

Washougal River Subbasin

Strategy	Recommended Measure		Source of Measure
Protect and conserve natural ecological processes	Continue existing protections, and increase protection of high quality habitats through acquisition, conservation easements, and cooperative agreements.		CBFWA recommendation
Restore floodplain connectivity and function.	Reconnect floodplains to channels.		CBFWA recommendation
	Reconnect side channels and off-channel habitats to stream channels.		CBFWA recommendation
	Restore wet meadows.		CBFWA recommendation
Restore channel structure and complexity.	Restore natural channel form.		CBFWA recommendation
	Increase role and abundance of wood and large organic debris in streambeds.		CBFWA recommendation
	Stabilize and protect streambanks.		CBFWA recommendation
Restore riparian condition and LWD recruitment	Restore natural riparian vegetative communities.		CBFWA recommendation
	Implement grazing strategies that promote riparian recovery.		CBFWA recommendation

Restore natural hydrograph to provide sufficient flow during critical periods.	Implement agricultural water conservation Recommendations.		CBFWA recommendation
	Improve irrigation conveyance and efficiency.		CBFWA recommendation
	Obtain water rights and convert to instream water rights. Protect and rehabilitate springs.		CBFWA recommendation
Improve degraded water quality	Restore natural functions and processes through Recommendations identified to address physical habitat quality/quantity limitations.		CBFWA recommendation
Monitor status and trends of focal species and populations	Establish or use preexisting index sites to gather baseline, trend, and comparative data.		CBFWA recommendation
Monitor and evaluate effectiveness of actions taken to implement Recommendations.	Develop methods to monitor biological response to habitat improvement.		CBFWA recommendation
	Monitor effectiveness of hatchery and natural production Recommendations.		CBFWA recommendation

Columbia Lower Subbasin

Recommended Measure	Source of Measure
Sea Lion Predation Rate Estimation and Non-lethal Hazing	CRITFC MOA (200800400)
Capture, Marking, Hazing & Removal of California Sea Lions at Bonneville Dam	FCRPS BiOp Action/New Recommendation (200800300)
Integrated Non-Lethal Electric Barrier and Sonar System to Deter Marine Mammal Predation on Fish in the Columbia River System: A Demonstration Project	FCRPS BiOp Action/New Recommendation (200752400)
Pilot Study for Research, Monitoring, and Evaluation of Subyearling Salmon in Tidal Freshwater of the Columbia River	FCRPS BiOp Action/New Recommendation (200500100)
Reintroduction of Chum Salmon into Duncan Creek	FCRPS BiOp Action/New Recommendation (200105300)
Evaluate Factors Limiting Columbia River Chum Salmon	FCRPS BiOp Action/New Recommendation (200001200)
Adult Coho Salmon Monitoring Proposal for the Lower Columbia Province.	WDFW Comment (200736800*)
PIT tag monitoring in Lower Columbia, including IMW streams	WDFW Comment
Lower Columbia IMW restoration projects, including LWD structures, riparian enhancements, fish passage barrier replacements, etc	WDFW Comment
Ongoing Mitchell Act Regional Evaluation	WDFW Comment
Ongoing Mitchell Act Hatchery Operations and Evaluation Oversight	WDFW Comment
Live Capture Commercial Fishing Gears and Methods - Region 5	WDFW Comment
Enforcement--Selective Fishery, HPA, Aquatic Nuisance, etc.	WDFW Comment
Avian and Pinniped Predation	WDFW Comment
Implement chum reintroduction below Bonneville dam	LRT MOA (200871100)
Assess habitat potential for reintroduction of CR chum in tributaries below Bonneville dam.	LRT MOA (200871000)

Columbia Gorge Province

Wind River Subbasin

Strategy	Recommended Measure		Source of Measure
Protect and conserve natural ecological processes	Continue existing protections, and increase protection of high quality habitats through acquisition, conservation easements, and cooperative agreements.		CBFWA recommendation
Restore passage and connectivity to habitats blocked or impaired by artificial barriers.	Remove or replace culverts and other passage barriers per priorities described in the draft recovery plan.		CBFWA recommendation
	Provide adequate screening at all irrigation diversions.		CBFWA recommendation
	Restore passage at Hemlock Dam.	Hemlock Dam Removal	WDFW Comment (200707700)
Restore floodplain connectivity and function.	Reconnect floodplains to channels.		CBFWA recommendation
	Reconnect side channels and off-channel habitats to stream channels.		CBFWA recommendation
	Restore wet meadows.		CBFWA recommendation

Restore channel structure and complexity.	Restore natural channel form.	Wind River Watershed Restoration	WDFW Comment (199801900)
	Increase role and abundance of wood and large organic debris in streambeds.	Wind River Watershed Restoration	WDFW Comment (199801900)
	Stabilize and protect streambanks.	Wind River Watershed Restoration	WDFW Comment (199801900)
Restore riparian condition and LWD recruitment	Restore natural riparian vegetative communities.	Wind River Watershed Restoration	WDFW Comment (199801900)
	Implement grazing strategies that promote riparian recovery.		CBFWA recommendation
Restore natural hydrograph to provide sufficient flow during critical periods.	Implement agricultural water conservation Recommendations.		CBFWA recommendation
	Improve irrigation conveyance and efficiency.		CBFWA recommendation
	Obtain water rights and convert to instream water rights.		CBFWA recommendation
	Protect and rehabilitate springs.		CBFWA recommendation

Improve degraded water quality	Upgrade or remove problem forest roads.	Wind River Watershed Restoration	WDFW Comment (199801900)
	Restore natural functions and processes through Recommendations identified to address physical habitat quality/quantity limitations.	Wind River Watershed Restoration	WDFW Comment (199801900)
		Hemlock Dam Removal	WDFW Comment (200707700)
Monitor status and trends of focal species and populations	Establish or use preexisting index sites to gather baseline, trend, and comparative data.	Wind River Watershed Restoration	WDFW Comment (199801900)
		Hemlock Dam Removal	WDFW Comment (200707700)
		Adult and Juvenile Abundance Monitoring -- Region 5	New WDFW Recommendation
Monitor and evaluate effectiveness of actions taken to implement Recommendations.	Develop methods to monitor biological response to habitat improvement.		CBFWA recommendation
	Monitor effectiveness of hatchery and natural production Recommendations.	Wind River Watershed Restoration	WDFW Comment (199801900)

Little White Salmon River Subbasin

Strategy	Recommended Measure		Source of Measure
Protect and conserve natural ecological processes	Continue existing protections, and increase protection of high quality habitats through acquisition, conservation easements, and cooperative agreements.		CBFWA recommendation
Restore passage and connectivity to habitats blocked or impaired by artificial barriers.	Provide adequate screening at all irrigation diversions.		CBFWA recommendation
Restore floodplain connectivity and function.	Reconnect floodplains to channels.		CBFWA recommendation
	Reconnect side channels and off-channel habitats to stream channels.		CBFWA recommendation
	Restore wet meadows.		CBFWA recommendation
Restore channel structure and complexity.	Restore natural channel form.		CBFWA recommendation
	Increase role and abundance of wood and large organic debris in streambeds.		CBFWA recommendation
	Stabilize and protect streambanks.		CBFWA recommendation
Restore riparian condition and LWD recruitment	Restore natural riparian vegetative communities.		CBFWA recommendation
	Implement grazing strategies that promote riparian recovery.		CBFWA recommendation

Restore natural hydrograph to provide sufficient flow during critical periods.	Implement agricultural water conservation Recommendations.		CBFWA recommendation
	Improve irrigation conveyance and efficiency.		CBFWA recommendation
	Obtain water rights and convert to instream water rights.		CBFWA recommendation
Improve degraded water quality	Upgrade or remove problem forest roads.		CBFWA recommendation
	Restore natural functions and processes through Recommendations identified to address physical habitat quality/quantity limitations.		CBFWA recommendation
Monitor status and trends of focal species and populations	Establish or use preexisting index sites to gather baseline, trend, and comparative data.		CBFWA recommendation
Monitor and evaluate effectiveness of actions taken to implement Recommendations.	Develop methods to monitor biological response to habitat improvement.		CBFWA recommendation
	Monitor effectiveness of hatchery and natural production Recommendations.		CBFWA recommendation

White Salmon River Subbasin

Strategy	Recommended Measure		Source of Measure
Protect and conserve natural ecological processes	Continue existing protections, and increase protection of high quality habitats through acquisition, conservation easements, and cooperative agreements.		CBFWA recommendation
Restore passage and connectivity to habitats blocked or impaired by artificial barriers.	Remove or replace culverts and other passage barriers per priorities described in the draft recovery plan.		CBFWA recommendation
	Provide adequate screening at all irrigation diversions.		CBFWA recommendation
	Restore passage at Condit Dam.	Recolonization of Anadromous Salmonids after Condit Dam Removal	New WDFW Recommendation
Restore floodplain connectivity and function.	Reconnect floodplains to channels.		CBFWA recommendation
	Reconnect side channels and off-channel habitats to stream channels.		CBFWA recommendation
	Restore wet meadows.		CBFWA recommendation
Restore channel structure and complexity.	Restore natural channel form.		CBFWA recommendation
	Increase role and abundance of wood and large organic debris in streambeds.		CBFWA recommendation
	Stabilize and protect streambanks.		CBFWA recommendation

Restore riparian condition and LWD recruitment	Restore natural riparian vegetative communities.		CBFWA recommendation
	Implement grazing strategies that promote riparian recovery.		
Restore natural hydrograph to provide sufficient flow during critical periods.	Implement agricultural water conservation Recommendations. Improve irrigation conveyance and efficiency.		CBFWA recommendation
	Obtain water rights and convert to instream water rights.		CBFWA recommendation
	Protect and rehabilitate springs.		CBFWA recommendation
Improve degraded water quality	Upgrade or remove problem forest roads.		CBFWA recommendation
	Restore natural functions and processes through Recommendations identified to address physical habitat quality/quantity limitations.		CBFWA recommendation
Monitor status and trends of focal species and populations	Establish or use preexisting index sites to gather baseline, trend, and comparative data.		CBFWA recommendation

Monitor and evaluate effectiveness of actions taken to implement Recommendations.	Develop methods to monitor biological response to habitat improvement.		CBFWA recommendation
Recommendations.	Monitor effectiveness of hatchery and natural production Recommendations.		CBFWA recommendation

Hood River Subbasin

Strategy	Recommended Measure		Source of Measure
Protect and conserve natural ecological processes	Continue existing protections, and increase protection of high quality habitats through acquisition, conservation easements, and cooperative agreements.	Hood River Fish Habitat	Warm Springs Tribe MOA/ODFW Recommendation (199802100)
Restore passage and connectivity to habitats blocked or impaired by artificial barriers.	Improve passage at Powerdale Dam.		CBFWA recommendation
	Provide adequate screening at all irrigation diversions.	Hood River Fish Habitat	Warm Springs Tribe MOA/ODFW Recommendation (199802100)
Restore floodplain connectivity and function.	Reconnect floodplains to channels.		CBFWA recommendation
	Reconnect side channels and off-channel habitats to stream channels.	Hood River Fish Habitat	Warm Springs Tribe MOA/ODFW Recommendation (199802100)
	Restore wet meadows.		CBFWA recommendation

Restore channel structure and complexity.	Restore natural channel form.	Hood River Fish Habitat	Warm Springs Tribe MOA/ODFW Recommendation (199802100)
	Increase role and abundance of wood and large organic debris in streambeds.	Hood River Fish Habitat	Warm Springs Tribe MOA/ODFW Recommendation (199802100)
	Stabilize and protect streambanks.	Hood River Fish Habitat	Warm Springs Tribe MOA/ODFW Recommendation (199802100)
Restore riparian condition and LWD recruitment	Restore natural riparian vegetative communities.		CBFWA recommendation
	Implement grazing strategies that promote riparian recovery.	Hood River Fish Habitat	Warm Springs Tribe MOA/ODFW Recommendation (199802100)
Restore natural hydrograph to provide sufficient flow during critical periods.	Implement agricultural water conservation Recommendations.	Hood River Fish Habitat	Warm Springs Tribe MOA/ODFW Recommendation (199802100)
	Improve irrigation conveyance and efficiency.	Hood River Fish Habitat	Warm Springs Tribe MOA/ODFW Recommendation (199802100)
	Obtain water rights and convert to instream water rights.		CBFWA recommendation

Improve degraded water quality	Restore natural functions and processes through Recommendations identified to address physical habitat quality/quantity limitations.	Hood River Fish Habitat	Warm Springs Tribe MOA/ODFW Recommendation (199802100)
Mitigate for impeded and blocked passage	Implement artificial propagation Recommendations to mitigate for lost habitat access and habitat productivity.	Hood River Production Program - ODFW M&E	FCRPS BiOp Action/ODFW Recommendation (198805304)
Increase hatchery effectiveness for restoration and mitigation	Explore and implement innovative hatchery actions to achieve both restoration and mitigation objectives.	Hood River Production M&E - Ws	Warm Springs Tribe MOA/ODFW Recommendation (198805303)
		Hood R Prod O&M - Ws/ODFW	Warm Springs Tribe MOA/ODFW Recommendation (198805307)
		Master plan expansion and tributary weir development for Hood River facility	Warm Springs Tribe MOA (200830900)
		Hood River Production Program - ODFW M&E	FCRPS BiOp Action/ODFW Recommendation (198805304)
		Hood River Powerdale Dam Fish Trap/Oak Springs/Pelton Ladder -Operation and Maintenance	ODFW Recommendation (198805308)
		Hood River Adult Salmonid Trapping Facilities/Parkdale Fish Facility Expansion	ODFW Recommendation (198805315)
Monitor status and trends of focal species and populations	Establish or use preexisting index sites to gather baseline, trend, and comparative data.	Hood River Production M&E - Ws	Warm Springs Tribe MOA/ODFW Recommendation (198805303)

Monitor and evaluate effectiveness of actions taken to implement Recommendations.	Develop methods to monitor biological response to habitat improvement.		CBFWA recommendation
	Monitor effectiveness of hatchery and natural production Recommendations.	Hood River Production M&E - Ws	Warm Springs Tribe MOA/ODFW Recommendation (198805303)
		Hood River Production Program - ODFW M&E	FCRPS BiOp Action/ODFW Recommendation (198805304)

Klickitat River Subbasin

Strategy	Recommended Measure		Source of Measure
Protect and conserve natural ecological processes	Continue existing protections, and increase protection of high quality habitats through acquisition, conservation easements, and cooperative agreements.	Klickitat Watershed Enhancement	Yakama Nation MOA (199705600)
Restore passage and connectivity to habitats blocked or impaired by artificial barriers.	Remove or replace culverts and other passage barriers per priorities described in the draft recovery plan.	Klickitat Watershed Enhancement	Yakama Nation MOA (199705600)
	Provide adequate screening at all irrigation diversions		CBFWA recommendation
	Monitor effectiveness of passage improvements at Castile Falls.		CBFWA recommendation
	Continue restoration in Snyder Creek Mill reach.		CBFWA recommendation

Restore floodplain connectivity and function.	Reconnect floodplains to channels.	YKFP Klickitat Management, Data, and Habitat	Yakama Nation MOA (198812035)
		Klickitat Watershed Enhancement	Yakama Nation MOA (199705600)
	Reconnect side channels and off-channel habitats to stream channels.	YKFP Klickitat Management, Data, and Habitat	Yakama Nation MOA (198812035)
		Klickitat Watershed Enhancement	Yakama Nation MOA (199705600)
	Restore wet meadows.	Klickitat Watershed Enhancement	Yakama Nation MOA (199705600)
	Restore channel structure and complexity.	Restore natural channel form.	Klickitat Watershed Enhancement
Increase role and abundance of wood and large organic debris in streambeds.		YKFP Klickitat Management, Data, and Habitat	Yakama Nation MOA (198812035)
		Klickitat Watershed Enhancement	Yakama Nation MOA (199705600)
Stabilize and protect streambanks.		YKFP Klickitat Management, Data, and Habitat	Yakama Nation MOA (198812035)
Increase instream habitat through manual placement of structures.		YKFP Klickitat Management, Data, and Habitat	Yakama Nation MOA (198812035)
Restore riparian condition and LWD recruitment	Restore natural riparian vegetative communities.	YKFP Klickitat Management, Data, and Habitat	Yakama Nation MOA (198812035)
		Klickitat Watershed Enhancement	Yakama Nation MOA (199705600)
	Implement grazing strategies that promote riparian recovery.	Klickitat Watershed Enhancement	Yakama Nation MOA (199705600)

Restore natural hydrograph to provide sufficient flow during critical periods.	Implement agricultural water conservation Recommendations.	Klickitat Watershed Enhancement	Yakama Nation MOA (199705600)
	Improve irrigation conveyance and efficiency.		CBFWA recommendation
	Obtain water rights and convert to instream water rights.		CBFWA recommendation
	Protect and rehabilitate springs.	YKFP Klickitat Management, Data, and Habitat	Yakama Nation MOA (198812035)
Improve degraded water quality	Upgrade or remove problem forest roads.	Klickitat Watershed Enhancement	Yakama Nation MOA (199705600)
	Construct water and sediment control basins.		CBFWA recommendation
	Restore natural functions and processes through Recommendations identified to address physical habitat quality/quantity limitations.	Klickitat Watershed Enhancement	Yakama Nation MOA (199705600)
	Implement short-term fertilization of streams with carcasses or carcass analogs	Klickitat Watershed Enhancement	Yakama Nation MOA (199705600)
Mitigate for impeded and blocked passage	Implement artificial propagation Recommendations to mitigate for lost habitat access and habitat productivity.	Klickitat Fishery YKFP Design	Yakama Nation MOA (198811535)
		Klickitat Fishery YKFP O & M	Yakama Nation MOA (199701335)

Monitor status and trends of focal species and populations	Establish or use preexisting index sites to gather baseline, trend, and comparative data.	YKFP - Klickitat Subbasin Monitoring and Evaluation	Yakama Nation MOA (199506335)
Monitor and evaluate effectiveness of actions taken to implement Recommendations.	Develop methods to monitor biological response to habitat improvement.		CBFWA recommendation
	Monitor effectiveness of hatchery and natural production Recommendations.	YKFP - Klickitat Subbasin Monitoring and Evaluation	Yakama Nation MOA (199506335)

Fifteenmile Creek Subbasin

Strategy	Recommended Measure		Source of Measure
Protect and conserve natural ecological processes	Continue existing protections, and increase protection of high quality habitats through acquisition, conservation easements, and cooperative agreements.	Fifteenmile Creek Habitat Restoration and Monitoring Project	FCRPS BiOp Action/ODFW Recommendation (199304000)
		15 Mile Creek Riparian Buffers	FCRPS BiOp Action/ODFW Recommendation (200102100)
Restore passage and connectivity to habitats blocked or impaired by artificial barriers.	Remove or replace culverts and other passage barriers per priorities described in the draft recovery plan.		CBFWA recommendation
	Provide adequate screening at all irrigation diversions.		CBFWA recommendation
Restore floodplain connectivity and function.	Reconnect floodplains to channels.	15 Mile Creek Riparian Buffers	FCRPS BiOp Action/ODFW Recommendation (200102100)
	Reconnect side channels and off-channel habitats to stream channels.	15 Mile Creek Riparian Buffers	FCRPS BiOp Action/ODFW Recommendation (200102100)
	Restore wet meadows.		CBFWA recommendation

Restore channel structure and complexity.	Restore natural channel form.		CBFWA recommendation
	Increase role and abundance of wood and large organic debris in streambeds.	Fifteenmile Creek Habitat Restoration and Monitoring Project	FCRPS BiOp Action/ODFW Recommendation (199304000)
		15 Mile Creek Riparian Buffers	200102100
Stabilize and protect streambanks.	Fifteenmile Creek Habitat Restoration and Monitoring Project	FCRPS BiOp Action/ODFW Recommendation (199304000)	
Restore riparian condition and LWD recruitment	Restore natural riparian vegetative communities.	Fifteenmile Creek Habitat Restoration and Monitoring Project	FCRPS BiOp Action/ODFW Recommendation (199304000)
		15 Mile Creek Riparian Buffers	FCRPS BiOp Action/ODFW Recommendation (200102100)
	Implement grazing strategies that promote riparian recovery.		CBFWA recommendation
Restore natural hydrograph to provide sufficient flow during critical periods.	Implement agricultural water conservation Recommendations.	Fifteenmile Creek Habitat Restoration and Monitoring Project	FCRPS BiOp Action/ODFW Recommendation (199304000)
	Improve irrigation conveyance and efficiency.		CBFWA recommendation
	Obtain water rights and convert to instream water rights. Protect and rehabilitate springs.		CBFWA recommendation

Improve degraded water quality	Restore natural functions and processes through Recommendations identified to address physical habitat quality/quantity limitations.	Fifteenmile Creek Habitat Restoration and Monitoring Project	FCRPS BiOp Action/ODFW Recommendation (199304000)
		15 Mile Creek Riparian Buffers	FCRPS BiOp Action/ODFW Recommendation (200102100)
Monitor status and trends of focal species and populations	Establish or use preexisting index sites to gather baseline, trend, and comparative data.	Fifteenmile Creek Habitat Restoration and Monitoring Project	FCRPS BiOp Action/ODFW Recommendation (199304000)
	Gather and analyze harvest data to aid in run reconstruction to evaluate status and action effectiveness.		CBFWA recommendation
Monitor and evaluate effectiveness of actions taken to implement Recommendations.	Develop methods to monitor biological response to habitat improvement.	Fifteenmile Creek Habitat Restoration and Monitoring Project	FCRPS BiOp Action/ODFW Recommendation (199304000)
	Monitor effectiveness of hatchery and natural production Recommendations.		CBFWA recommendation

Columbia Plateau Province

Deschutes River Subbasin

Strategy	Recommended Measure		Source of Measure
Protect and conserve natural ecological processes	Continue existing protections, and increase protection of high quality habitats through acquisition, conservation easements, and cooperative agreements.	Wasco Riparian Buffers	FCRPS BiOp Action/ODFW Recommendation (200201900)
Restore passage and connectivity to habitats blocked or impaired by artificial barriers.	Restore passage at Pelton-Round Butte Complex.		CBFWA recommendation
	Remove or replace culverts and other passage barriers per priorities described in the draft recovery plan.	Trout Creek Watershed Restoration Project	FCRPS BiOp Action/ODFW Recommendation (199802800)
		Trout Creek Fish Habitat Restoration Project	FCRPS BiOp Action/ODFW Recommendation (199404200)
		Deschutes River Basin Restoration Program	Warm Springs Tribe MOA (200830100)
	Provide adequate screening at all irrigation diversions.		CBFWA recommendation
	Reintroduce native salmon species in areas where they have been extirpated by human activities.	Deschutes River Sockeye Development	Warm Springs Tribe MOA (200830700)
Anadromous natural production management and monitoring		Warm Springs Tribe MOA (200831100)	

Restore floodplain connectivity and function.	Reconnect floodplains to channels.	Trout Creek Watershed Restoration Project	FCRPS BiOp Action/ODFW Recommendation (199802800)
		Trout Creek Fish Habitat Restoration Project	FCRPS BiOp Action/ODFW Recommendation (199404200)
		Deschutes River Basin Restoration Program	Warm Springs Tribe MOA (200830100)
	Reconnect side channels and off-channel habitats to stream channels.	Trout Creek Watershed Restoration Project	FCRPS BiOp Action/ODFW Recommendation (199802800)
		Trout Creek Fish Habitat Restoration Project	FCRPS BiOp Action/ODFW Recommendation (199404200)
		Deschutes River Basin Restoration Program	Warm Springs Tribe MOA (200830100)
	Promote the creation and maintenance of beaver dams.	Trout Creek Watershed Restoration Project	FCRPS BiOp Action/ODFW Recommendation (199802800)
		Trout Creek Fish Habitat Restoration Project	FCRPS BiOp Action/ODFW Recommendation (199404200)

Restore channel structure and complexity.	Restore natural channel form.	Trout Creek Watershed Restoration Project	FCRPS BiOp Action/ODFW Recommendation (199802800)
		Trout Creek Fish Habitat Restoration Project	FCRPS BiOp Action/ODFW Recommendation (199404200)
		Deschutes River Basin Restoration Program	Warm Springs Tribe MOA (200830100)
	Increase role and abundance of wood and large organic debris in streambeds.	Trout Creek Watershed Restoration Project	FCRPS BiOp Action/ODFW Recommendation (199802800)
		Trout Creek Fish Habitat Restoration Project	FCRPS BiOp Action/ODFW Recommendation (199404200)
		Deschutes River Basin Restoration Program	Warm Springs Tribe MOA (200830100)
	Stabilize and protect streambanks (Eastside tributaries).	Trout Creek Watershed Restoration Project	FCRPS BiOp Action/ODFW Recommendation (199802800)
		Trout Creek Fish Habitat Restoration Project	FCRPS BiOp Action/ODFW Recommendation (199404200)
		Deschutes River Basin Restoration Program	Warm Springs Tribe MOA (200830100)
	Increase instream habitat in Westside tributaries through manual placement of structures.	Deschutes River Basin Restoration Program	Warm Springs Tribe MOA (200830100)

Restore riparian condition and LWD recruitment	Restore natural riparian vegetative communities.	Trout Creek Watershed Restoration Project	FCRPS BiOp Action/ODFW Recommendation (199802800)
		Trout Creek Fish Habitat Restoration Project	FCRPS BiOp Action/ODFW Recommendation (199404200)
		Wasco Riparian Buffers	FCRPS BiOp Action/ODFW Recommendation (200201900)
		Deschutes River Basin Restoration Program	Warm Springs Tribe MOA (200830100)
	Implement grazing strategies that promote riparian recovery.	Trout Creek Watershed Restoration Project	FCRPS BiOp Action/ODFW Recommendation (199802800)
		Trout Creek Fish Habitat Restoration Project	FCRPS BiOp Action/ODFW Recommendation (199404200)
		Wasco Riparian Buffers	FCRPS BiOp Action/ODFW Recommendation (200201900)
	Eradicate invasive plant species from riparian areas where opportunities exist.	Trout Creek Watershed Restoration Project	FCRPS BiOp Action/ODFW Recommendation (199802800)
		Trout Creek Fish Habitat Restoration Project	FCRPS BiOp Action/ODFW Recommendation (199404200)
		Wasco Riparian Buffers	FCRPS BiOp Action/ODFW Recommendation (200201900)
	Install and maintain fencing to exclude livestock.	Trout Creek Watershed Restoration Project	FCRPS BiOp Action/ODFW Recommendation (199802800)
		Trout Creek Fish Habitat Restoration Project	FCRPS BiOp Action/ODFW Recommendation

			(199404200)
		Wasco Riparian Buffers	FCRPS BiOp Action/ODFW Recommendation (200201900)
		Deschutes River Basin Restoration Program	Warm Springs Tribe MOA (200830100)
Restore natural hydrograph to provide sufficient flow during critical periods.	Implement agricultural water conservation Recommendations.		CBFWA recommendation
	Improve irrigation conveyance and efficiency. Obtain water rights and convert to instream water rights.		CBFWA recommendation
Improve degraded water quality	Manage irrigation return flow to reduce stream temperatures. Reduce chemical pollution inputs from agricultural lands throughout the subbasin.		CBFWA recommendation
Mitigate for impeded and blocked passage	Implement artificial propagation Recommendations to mitigate for lost habitat access and habitat productivity.	Deschutes River Sockeye development	Warm Springs Tribe MOA (200830700)
		White River Supplementation program	Warm Springs Tribe MOA (200831000)
Increase hatchery effectiveness for restoration and mitigation	Explore and implement innovative hatchery actions to achieve both restoration and mitigation objectives.	White River Supplementation program	Warm Springs Tribe MOA (200831000)

Monitor status and trends of focal species and populations	Establish or use preexisting index sites to gather baseline, trend, and comparative data.	Warm Springs watershed spring Chinook production monitoring	Warm Springs Tribe MOA (200830400)
		Warm Springs Reservation steelhead production monitoring	Warm Springs Tribe MOA (200830500)
		Develop and adopt biologically based escapement goals for Deschutes R. fall Chinook salmon	Warm Springs Tribe MOA (200830600)
		Steelhead Straying study	ODFW Recommendation (200729900*)
	Gather and analyze harvest data to aid in run reconstruction to evaluate status and action effectiveness.	Steelhead Straying study	ODFW Recommendation (200729900*)
Monitor and evaluate effectiveness of actions taken to implement Recommendations.	Develop methods to monitor biological response to habitat improvement.	Warm Springs watershed spring Chinook production monitoring	Warm Springs Tribe MOA (200830400)
		Warm Springs Reservation steelhead production monitoring	Warm Springs Tribe MOA (200830500)
		Develop and adopt biologically based escapement goals for Deschutes R. fall Chinook salmon	Warm Springs Tribe MOA (200830600)
	Monitor effectiveness of hatchery and natural production Recommendations.	Warm Springs watershed spring Chinook production monitoring	Warm Springs Tribe MOA (200830400)
		Warm Springs Reservation steelhead production monitoring	Warm Springs Tribe MOA (200830500)
		Develop and adopt biologically based escapement goals for Deschutes R. fall Chinook salmon	Warm Springs Tribe MOA (200830600)
		Steelhead Straying study	ODFW Recommendation (200729900*)

John Day River Subbasin

Strategy	Recommended Measure		Source of Measure
Protect and conserve natural ecological processes	Continue existing protections, and increase protection of high quality habitats through acquisition, conservation easements, and cooperative agreements.	North Fork John Day Basin Anadromous Fish Habitat Enhancement Project	Umatilla Tribe MOA (200003100)
		Oxbow Conservation Area Management	Warm Springs Tribe MOA (200001500)
		Forrest Conservation Area Management	Warm Springs Tribe MOA (200104101)
		Convert BPA Term Riparian Lease Agreements to Permanent Riparian Conservation Easements	New Recommendation (200701300*)
		Mainstem, Middle Fork, John Day Rivers Fish Habitat Enhancement Project	FCRPS BiOp Action/ODFW Recommendation (198402100)
Restore passage and connectivity to habitats blocked or impaired by artificial barriers.	Remove or minimize use of push up dams per priorities described in the draft recovery plan.	John Day Watershed Restoration	Warm Springs Tribe MOA (199801800)
		John Day Tributary/Passage & Flow	Warm Springs Tribe MOA (200739700)
		North Fork/Mid-John Day Fish Passage Improvement	New Recommendation (199801700*)
	Remove or replace culverts and other passage barriers per priorities described in the draft recovery plan.	North Fork John Day Basin Anadromous Fish Habitat Enhancement Project	Umatilla Tribe MOA (200003100)
		John Day Watershed Restoration	Warm Springs Tribe MOA (199801800)
		Oxbow Conservation Area Management	Warm Springs Tribe MOA (200001500)
		Forrest Conservation Area Management	Warm Springs Tribe MOA (200104101)
		John Day Tributary/Passage & Flow	Warm Springs Tribe MOA (200739700)
		Canyon Creek Culvert Replacements	New Recommendation (200736500*)
		Mainstem, Middle Fork, John Day Rivers Fish Habitat Enhancement Project	FCRPS BiOp Action/ODFW Recommendation

			(198402100)
		Oregon Fish Screens Project	FCRPS BiOp Action/ODFW Recommendation (199306600)
		North Fork/Mid-John Day Fish Passage Improvement	New Recommendation (199801700*)
	Construct ladder over existing permanent dams in Beech Creek.		CBFWA recommendation
	Provide adequate screening at all irrigation diversions.	John Day Watershed Restoration	Warm Springs Tribe MOA (199801800)
		Oxbow Conservation Area Management	Warm Springs Tribe MOA (200001500)
		Forrest Conservation Area Management	Warm Springs Tribe MOA (200104101)
		John Day Tributary/Passage & Flow	Warm Springs Tribe MOA (200739700)
		North Fork/Mid-John Day Fish Passage Improvement	New Recommendation (199801700*)
Restore floodplain connectivity and function.	Reconnect floodplains to channels.	John Day Watershed Restoration	Warm Springs Tribe MOA (199801800)
		John Day Tributary/Passage & Flow	Warm Springs Tribe MOA (200739700)
		Pine Hollow/Jackknife Habitat	FCRPS BiOp Action/New Recommendation (199901000)
		Provide Coordination and Technical Assistance to Watershed Councils and Individuals in Sherman County, Oregon	FCRPS BiOp Action/New Recommendation (200201500)
	Restore wet meadows	John Day Watershed Restoration	Warm Springs Tribe MOA (199801800)
		John Day Tributary/Passage & Flow	Warm Springs Tribe MOA (200739700)

		Pine Hollow/Jackknife Habitat	FCRPS BiOp Action/New Recommendation (199901000)	
		Provide Coordination and Technical Assistance to Watershed Councils and Individuals in Sherman County, Oregon	FCRPS BiOp Action/New Recommendation (200201500)	
	Reconnect side channels and off-channel habitats to stream channels.	John Day Watershed Restoration	Warm Springs Tribe MOA (199801800)	
		John Day Tributary/Passage & Flow	Warm Springs Tribe MOA (200739700)	
		Pine Hollow/Jackknife Habitat	FCRPS BiOp Action/New Recommendation (199901000)	
		Provide Coordination and Technical Assistance to Watershed Councils and Individuals in Sherman County, Oregon	FCRPS BiOp Action/New Recommendation (200201500)	
	Promote the creation and maintenance of beaver dams.		CBFWA recommendation	
	Restore channel structure and complexity.	Restore natural channel form.	North Fork John Day Basin Anadromous Fish Habitat Enhancement Project	Umatilla Tribe MOA (200003100)
			Oxbow Conservation Area Management	Warm Springs Tribe MOA (200001500)
			Forrest Conservation Area Management	Warm Springs Tribe MOA (200104101)
Gilliam Co Riparian Buffers			FCRPS BiOp Action/New Recommendation (200203500)	
Mainstem, Middle Fork, John Day Rivers Fish Habitat Enhancement Project			FCRPS BiOp Action/ODFW Recommendation (198402100)	
Wheeler Co Riparian Buffers			FCRPS BiOp Action/New Recommendation (200203400)	

	Place stable wood and other large organic debris in streambeds.	North Fork John Day Basin Anadromous Fish Habitat Enhancement Project	Umatilla Tribe MOA (200003100)
		Oxbow Conservation Area Management	Warm Springs Tribe MOA (200001500)
		Forrest Conservation Area Management	Warm Springs Tribe MOA (200104101)
		Mainstem, Middle Fork, John Day Rivers Fish Habitat Enhancement Project	FCRPS BiOp Action/ODFW Recommendation (198402100)
	Stabilize and protect stream banks.	North Fork John Day Basin Anadromous Fish Habitat Enhancement Project	Umatilla Tribe MOA (200003100)
		Oxbow Conservation Area Management	Warm Springs Tribe MOA (200001500)
		Forrest Conservation Area Management	Warm Springs Tribe MOA (200104101)
		Gilliam Co Riparian Buffers	FCRPS BiOp Action/New Recommendation (200203500)
		Mainstem, Middle Fork, John Day Rivers Fish Habitat Enhancement Project	FCRPS BiOp Action/ODFW Recommendation (198402100)
		North Fork/Mid-John Day Fish Passage Improvement	New Recommendation (199801700*)
		Wheeler Co Riparian Buffers	FCRPS BiOp Action/New Recommendation (200203400)

Restore riparian condition and LWD recruitment	Restore natural riparian vegetative communities.	North Fork John Day Basin Anadromous Fish Habitat Enhancement Project	Umatilla Tribe MOA (200003100)
		John Day Watershed Restoration	Warm Springs Tribe MOA (199801800)
		Oxbow Conservation Area Management	Warm Springs Tribe MOA (200001500)
		Forrest Conservation Area Management	Warm Springs Tribe MOA (200104101)
		John Day Tributary/Passage & Flow	Warm Springs Tribe MOA (200739700)
		Gilliam Co Riparian Buffers	FCRPS BiOp Action/New Recommendation (200203500)
		Convert BPA Term Riparian Lease Agreements to Permanent Riparian Conservation Easements	New Recommendation (200701300*)
		Mainstem, Middle Fork, John Day Rivers Fish Habitat Enhancement Project	FCRPS BiOp Action/ODFW Recommendation (198402100)
		Pine Hollow/Jackknife Habitat	FCRPS BiOp Action/New Recommendation (199901000)
		Provide Coordination and Technical Assistance to Watershed Councils and Individuals in Sherman County, Oregon	FCRPS BiOp Action/New Recommendation (200201500)
		Wheeler Co Riparian Buffers	FCRPS BiOp Action/New Recommendation (200203400)
	Implement grazing strategies that promote riparian recovery.	North Fork John Day Basin Anadromous Fish Habitat Enhancement Project	Umatilla Tribe MOA (200003100)
		John Day Watershed Restoration	Warm Springs Tribe MOA (199801800)
		Oxbow Conservation Area Management	Warm Springs Tribe MOA (200001500)
John Day Tributary/Passage & Flow		Warm Springs Tribe MOA (200739700)	
	Mainstem, Middle Fork, John Day Rivers Fish Habitat	FCRPS BiOp Action/ODFW	

		Enhancement Project	Recommendation (198402100)
Restore natural hydrograph to provide sufficient flow during critical periods.	Implement agricultural water conservation Recommendations.	John Day Watershed Restoration	Warm Springs Tribe MOA (199801800)
		John Day Tributary/Passage & Flow	Warm Springs Tribe MOA (200739700)
		North Fork/Mid-John Day Fish Passage Improvement	New Recommendation (199801700*)
	Improve irrigation conveyance and efficiency.	John Day Watershed Restoration	Warm Springs Tribe MOA (199801800)
		John Day Tributary/Passage & Flow	Warm Springs Tribe MOA (200739700)
		North Fork/Mid-John Day Fish Passage Improvement	New Recommendation (199801700*)
	Obtain water rights and convert to instream water rights.	Oxbow Conservation Area Management	Warm Springs Tribe MOA (200001500)
		Forrest Conservation Area Management	Warm Springs Tribe MOA (200104101)
	Improve degraded water quality	Increase riparian shading.	North Fork John Day Basin Anadromous Fish Habitat Enhancement Project
John Day Watershed Restoration			Warm Springs Tribe MOA (199801800)
Forrest Conservation Area Management			Warm Springs Tribe MOA (200104101)
John Day Tributary/Passage & Flow			Warm Springs Tribe MOA (200739700)
Oxbow Conservation Area Management			Warm Springs Tribe MOA (200001500)
Gilliam Co Riparian Buffers			FCRPS BiOp Action/New Recommendation (200203500)
Convert BPA Term Riparian Lease Agreements to Permanent Riparian Conservation Easements			New Recommendation (200701300*)
Mainstem, Middle Fork, John Day Rivers Fish Habitat			FCRPS BiOp Action/ODFW

		Enhancement Project	Recommendation (198402100)
		Pine Hollow/Jackknife Habitat	FCRPS BiOp Action/New Recommendation (199901000)
		Provide Coordination and Technical Assistance to Watershed Councils and Individuals in Sherman County, Oregon	FCRPS BiOp Action/New Recommendation (200201500)
		Wheeler Co Riparian Buffers	FCRPS BiOp Action/New Recommendation (200203400)
	Address contamination from mine-related discharge		CBFWA recommendation
	Reduce chemical pollution and nutrient inputs		CBFWA recommendation
Monitor status and trends of focal species and populations	Establish or use preexisting index sites to gather baseline, trend, and comparative data.	Improved escapement estimation	CRITFC MOA (200851300)
		Salmonid Productivity, Escapement, Trend, and Habitat Monitoring in the John Day River Subbasin	FCRPS BiOp Action/ODFW Recommendation (199801600)
		Assessment of Interactions between Hatchery and Wild Summer Steelhead in the John Day River Subbasin	200705100*
	Gather and analyze harvest data to aid in run reconstruction to evaluate status and action effectiveness.	Improved escapement estimation	CRITFC MOA (200851300)
		Salmonid Productivity, Escapement, Trend, and Habitat Monitoring in the John Day River Subbasin	FCRPS BiOp Action/ODFW Recommendation (199801600)

Monitor and evaluate effectiveness of actions taken to implement Recommendations.	Develop methods to monitor biological response to habitat improvement.	Salmonid Productivity, Escapement, Trend, and Habitat Monitoring in the John Day River Subbasin	FCRPS BiOp Action/ODFW Recommendation (199801600)
	Monitor effectiveness of hatchery and natural production Recommendations.	Assessment of Interactions between Hatchery and Wild Summer Steelhead in the John Day River Subbasin	ODFW Recommendation (200705100*)

Umatilla River Subbasin

Strategy	Recommended Measure		Source of Measure
Protect and conserve natural ecological processes	Continue existing protections, and increase protection of high quality habitats through acquisition, conservation easements, and cooperative agreements.	Umatilla Subbasin Fish Habitat Improvement Project	FCRPS BiOp Action/ODFW Recommendation (198710002)
Restore passage and connectivity to habitats blocked or impaired by artificial barriers.	Remove or replace culverts and other passage barriers per priorities described in the draft recovery plan.	Umatilla Subbasin Fish Habitat Improvement Project	FCRPS BiOp Action/ODFW Recommendation (198710002)
		Inventory and assess fish habitat, passage and screening needs and develop plan for steelhead reintroduction in Willow Creek, Butter Creek and McKay Creek.	Umatilla Tribe MOA (200820300)
	Construct ladders over existing concrete or earth-fill dams per priorities described in the draft recovery plan.	Umatilla Fish Passage Operations	Umatilla Tribe MOA/ODFW Recommendation (198802200)
		Inventory and assess fish habitat, passage and screening needs and develop plan for steelhead reintroduction in Willow Creek, Butter Creek and McKay Creek.	Umatilla Tribe MOA (200820300)
	Provide adequate screening at all irrigation diversions.	Umatilla Fish Passage Operations	Umatilla Tribe MOA/ODFW Recommendation (198802200)
		Umatilla Subbasin Fish Habitat Improvement Project	FCRPS BiOp Action/ODFW Recommendation (198710002)
		Inventory and assess fish habitat, passage and screening needs and develop plan for steelhead reintroduction in Willow Creek, Butter Creek and McKay Creek.	Umatilla Tribe MOA (200820300)
Reintroduce native salmon species in areas	Umatilla Fish Passage Operations	Umatilla Tribe MOA/ODFW Recommendation	

	where they have been extirpated by human activities.		(198802200)
		Inventory and assess fish habitat, passage and screening needs and develop plan for steelhead reintroduction in Willow Creek, Butter Creek and McKay Creek.	Umatilla Tribe MOA (200820300)
Restore floodplain connectivity and function.	Reconnect floodplains to channels.	Umatilla Subbasin Fish Habitat Improvement Project	FCRPS BiOp Action/ODFW Recommendation (198710002)
	Reconnect side channels and off-channel habitats to stream channels.	Umatilla Subbasin Fish Habitat Improvement Project	FCRPS BiOp Action/ODFW Recommendation (198710002)
	Remove dikes and levies.	Umatilla Subbasin Fish Habitat Improvement Project	FCRPS BiOp Action/ODFW Recommendation (198710002)
Restore channel structure and complexity.	Restore natural channel form.	Umatilla Anadromous Fish Habitat – CTUIR	Umatilla Tribe MOA/ODFW Recommendation (198710001)
		Umatilla Subbasin Fish Habitat Improvement Project	FCRPS BiOp Action/ODFW Recommendation (198710002)
	Place stable wood and other large organic debris in streambeds.	Umatilla Anadromous Fish Habitat – CTUIR	Umatilla Tribe MOA/ODFW Recommendation (198710001)
		Umatilla Subbasin Fish Habitat Improvement Project	FCRPS BiOp Action/ODFW Recommendation (198710002)
	Stabilize and protect stream banks.	Umatilla Anadromous Fish Habitat – CTUIR	Umatilla Tribe MOA/ODFW Recommendation (198710001)
		Umatilla Subbasin Fish Habitat Improvement Project	FCRPS BiOp Action/ODFW Recommendation

			(198710002)
	Construct rock and log weirs to create pool habitats or elevate incised channels.	Umatilla Subbasin Fish Habitat Improvement Project	FCRPS BiOp Action/ODFW Recommendation (198710002)
Restore riparian condition and LWD recruitment	Restore natural riparian vegetative communities.	Umatilla Anadromous Fish Habitat – CTUIR	Umatilla Tribe MOA/ODFW Recommendation (198710001)
		Umatilla Subbasin Fish Habitat Improvement Project	FCRPS BiOp Action/ODFW Recommendation (198710002)
	Implement grazing strategies that promote riparian recovery.	Umatilla Anadromous Fish Habitat – CTUIR	Umatilla Tribe MOA/ODFW Recommendation (198710001)
	Develop riparian buffers and setbacks.	Umatilla Anadromous Fish Habitat – CTUIR	Umatilla Tribe MOA/ODFW Recommendation (198710001)
		Umatilla Subbasin Fish Habitat Improvement Project	FCRPS BiOp Action/ODFW Recommendation (198710002)
	Install riparian exclosure fencing.	Umatilla Anadromous Fish Habitat – CTUIR	Umatilla Tribe MOA/ODFW Recommendation (198710001)
		Umatilla Subbasin Fish Habitat Improvement Project	FCRPS BiOp Action/ODFW Recommendation (198710002)
	Close, remove, and restore riparian road prisms.	Umatilla Anadromous Fish Habitat – CTUIR	Umatilla Tribe MOA/ODFW Recommendation (198710001)

Restore natural hydrograph to provide sufficient flow during critical periods.	Implement Umatilla Basin Project Phases I-III.	Umatilla Fish Passage Operations	Umatilla Tribe MOA/ODFW Recommendation (198802200)
		Power Repay Umatilla Basin Project	Umatilla Tribe MOA (198902700)
		Umatilla Passage O&M	FCRPS BiOp Action/New Recommendation (198343600)
	Obtain additional instream water rights.	Umatilla Fish Passage Operations	Umatilla Tribe MOA/ODFW Recommendation (198802200)
		Instream flow restoration projects, including water rights purchase from willing sellers and development and replacement of water sources for agricultural uses in Umatilla tributaries.	Umatilla Tribe MOA (200820600)
	Implement agricultural water conservation Recommendations.	Umatilla Fish Passage Operations	Umatilla Tribe MOA/ODFW Recommendation (198802200)
Instream flow restoration projects, including water rights purchase from willing sellers and development and replacement of water sources for agricultural uses in Umatilla tributaries.		Umatilla Tribe MOA (200820600)	
Improve degraded water quality	Address point sources of water pollution in the Umatilla River and Birch Creek.		CBFWA recommendation
Mitigate for impeded and blocked passage	Implement artificial propagation Recommendations to mitigate for lost habitat access and habitat productivity.		CBFWA recommendation

Increase hatchery effectiveness for restoration and mitigation	Explore and implement innovative hatchery actions to achieve both restoration and mitigation objectives.	Umatilla Hatchery Satellite Facilities O&M	Umatilla Tribe MOA (198343500)
		Umatilla Hatchery Operation and Maintenance and Fish Liberations	ODFW Recommendation (198903500)
		Umatilla Passage O&M	FCRPS BiOp Action/New Recommendation (198343600)
Monitor status and trends of focal species and populations	Establish or use preexisting index sites to gather baseline, trend, and comparative data.	Umatilla Fish Passage Operations	Umatilla Tribe MOA/ODFW Recommendation (198802200)
		Umatilla Basin Natural Production Monitoring and Evaluation Project	Umatilla Tribe MOA/ODFW Recommendation (199000501)
		Evaluation of Juvenile Salmonid Outmigration and Survival in the Lower Umatilla River Basin.	ODFW Recommendation (198902401)
	Gather and analyze harvest data to aid in run reconstruction to evaluate status and action effectiveness.		CBFWA recommendation
Monitor and evaluate effectiveness of actions taken to implement Recommendations.	Develop methods to monitor biological response to habitat improvement.	Umatilla Basin Natural Production Monitoring and Evaluation Project	Umatilla Tribe MOA/ODFW Recommendation (199000501)
		Umatilla Subbasin Fish Habitat Improvement Project	FCRPS BiOp Action/ODFW Recommendation (198710002)
		Evaluation of Juvenile Salmonid Outmigration and Survival in the Lower Umatilla River Basin.	ODFW Recommendation (198902401)
	Monitor effectiveness of hatchery and natural production Recommendations.	Umatilla Hatchery - M&E	FCRPS BiOp Action/ODFW Recommendation (199000500)

Walla Walla River Subbasin

Strategy	Recommended Measure		Source of Measure
Protect and conserve natural ecological processes	Continue existing protections, and increase protection of high quality habitats through acquisition, conservation easements, and cooperative agreements.	Walla Walla River Basin Fish Habitat Enhancement	Umatilla Tribe MOA (199604601)
Restore passage and connectivity to habitats blocked or impaired by artificial barriers.	Remove or replace culverts and other passage barriers per priorities described in the draft recovery plan.	Walla Walla Juvenile and Adult Passage Improvements	Umatilla Tribe MOA (199601100)
		Walla Walla River Fish Passage Operations	Umatilla Tribe MOA/ODFW Recommendation (200003300)
		CTUIR Ceded Area Tributary Culvert/Passage Assessment, Prioritization and Implementation	Umatilla Tribe MOA (200820100)
		Operation and Maintenance for Walla Walla Basin Passage Projects	FCRPS BiOp Action/New Recommendation (200721700)
		Gardena Farms Irrigation District Irrigation Efficiency and Instream Flow Project	FCRPS BiOp Action/New Recommendation (200733000)
		Walla Walla Basinwide Tributary Passage and Instream Flow	Umatilla Tribe MOA (200739600)
	Construct ladders over existing concrete or earth-fill dams per priorities described in the draft recovery plan.	Walla Walla Juvenile and Adult Passage Improvements	Umatilla Tribe MOA (199601100)
		CTUIR Ceded Area Tributary Culvert/Passage Assessment, Prioritization and Implementation	Umatilla Tribe MOA (200820100)
		Operation and Maintenance for Walla Walla Basin Passage Projects	FCRPS BiOp Action/New Recommendation (200721700)
		Gardena Farms Irrigation District Irrigation Efficiency and Instream Flow Project	FCRPS BiOp Action/New Recommendation

			(200733000)
		Walla Walla Basinwide Tributary Passage and Instream Flow	Umatilla Tribe MOA (200739600)
Provide adequate screening at all irrigation diversions.		Walla Walla Juvenile and Adult Passage Improvements	Umatilla Tribe MOA (199601100)
		Walla Walla River Fish Passage Operations	Umatilla Tribe MOA/ODFW Recommendation (200003300)
		CTUIR Ceded Area Tributary Culvert/Passage Assessment, Prioritization and Implementation	Umatilla Tribe MOA (200820100)
		Operation and Maintenance for Walla Walla Basin Passage Projects	FCRPS BiOp Action/New Recommendation (200721700)
		Gardena Farms Irrigation District Irrigation Efficiency and Instream Flow Project	FCRPS BiOp Action/New Recommendation (200733000)
		Walla Walla Basinwide Tributary Passage and Instream Flow	Umatilla Tribe MOA (200739600)
		CTUIR Ceded Area Tributary Culvert/Passage Assessment, Prioritization and Implementation	Umatilla Tribe MOA (200820100)
Reintroduce native salmon species in areas where they have been extirpated by human activities.		CTUIR Ceded Area Tributary Culvert/Passage Assessment, Prioritization and Implementation	Umatilla Tribe MOA (200820100)

Restore floodplain connectivity and function.	Reconnect floodplains to channels.	Walla Walla River Basin Fish Habitat Enhancement	Umatilla Tribe MOA (199604601)
	Reconnect side channels and off-channel habitats to stream channels.	Walla Walla River Basin Fish Habitat Enhancement	Umatilla Tribe MOA (199604601)
	Remove dikes and levies.	Walla Walla River Basin Fish Habitat Enhancement	Umatilla Tribe MOA (199604601)
	Promote the creation and maintenance of beaver dams.		CBFWA recommendation
Restore channel structure and complexity.	Restore natural channel form.	Walla Walla River Basin Fish Habitat Enhancement	Umatilla Tribe MOA (199604601)
	Place stable wood and other large organic debris in streambeds.	Walla Walla River Basin Fish Habitat Enhancement	Umatilla Tribe MOA (199604601)
	Stabilize and protect stream banks.	Walla Walla River Basin Fish Habitat Enhancement	Umatilla Tribe MOA (199604601)
	Construct rock and log weirs to create pool habitats or elevate incised channels.	Walla Walla River Basin Fish Habitat Enhancement	Umatilla Tribe MOA (199604601)
Restore riparian condition and LWD recruitment	Restore natural riparian vegetative communities.	Walla Walla River Basin Fish Habitat Enhancement	Umatilla Tribe MOA (199604601)
	Implement grazing strategies that promote riparian recovery.	Walla Walla River Basin Fish Habitat Enhancement	Umatilla Tribe MOA (199604601)
	Develop riparian buffers and setbacks	Walla Walla River Basin Fish Habitat Enhancement	Umatilla Tribe MOA (199604601)

	Install riparian enclosure fencing.	Walla Walla River Basin Fish Habitat Enhancement	Umatilla Tribe MOA (199604601)
	Close, remove, and restore riparian road prisms.	Walla Walla River Basin Fish Habitat Enhancement	Umatilla Tribe MOA (199604601)
Restore natural hydrograph to provide sufficient flow during critical periods.	Investigate feasibility of water storage or exchange to improve instream flows.	Restore Walla Walla River Flow	Umatilla Tribe MOA (200203600)
		Walla Walla Basinwide Tributary Passage and Instream Flow	Umatilla Tribe MOA (200739600)
	Obtain additional instream water rights.	Restore Walla Walla River Flow	Umatilla Tribe MOA (200203600)
		Walla Walla Basinwide Tributary Passage and Instream Flow	Umatilla Tribe MOA (200739600)
	Improve irrigation conveyance and efficiency. .	Restore Walla Walla River Flow	Umatilla Tribe MOA (200203600)
		Walla Walla Basinwide Tributary Passage and Instream Flow	Umatilla Tribe MOA (200739600)
		Touchet Eastside and Westside Irrigation District Piping	FCRPS BiOp Action/New Recommendation (200728800)
	Enhance hyporheic flows and spring inputs.	Restore Walla Walla River Flow	Umatilla Tribe MOA (200203600)
		Walla Walla Basinwide Tributary Passage and Instream Flow	Umatilla Tribe MOA (200739600)
	Improve degraded water quality	Address point sources of water pollution in the Walla Walla River and Pine Creek.	

Mitigate for impeded and blocked passage	Implement artificial propagation Recommendations to mitigate for lost habitat access and habitat productivity.	Walla Walla Steelhead Supplementation Hatchery O&M	Umatilla Tribe MOA (200820900)
		Transition the Touchet River steelhead supplementation program to local broodstock (hatchery reform)	Umatilla Tribe MOA (200871600)
Increase hatchery effectiveness for restoration and mitigation	Explore and implement innovative hatchery actions to achieve both restoration and mitigation objectives.	NEOH Walla Walla Hatchery - Three Step Master Planning Process (capital)	Umatilla Tribe MOA (200003800)
		NEOH Walla Walla Hatchery - Three Step Master Planning Process (expense)	Umatilla Tribe MOA (200003801)
		NEOH Walla Walla Hatchery - Three Step Master Planning Process (O&M beginning in 2011)	Umatilla Tribe MOA (20000380)
		NEOH Walla Walla Hatchery - Three Step Master Planning Process (M&E beginning in 2011)	Umatilla Tribe MOA (200003803)
		Walla Walla Steelhead Supplementation Hatchery O&M	Umatilla Tribe MOA (200820900)
		Transition the Touchet River steelhead supplementation program to local broodstock (hatchery reform)	Umatilla Tribe MOA (200871600)
Monitor status and trends of focal species and populations	Establish or use preexisting index sites to gather baseline, trend, and comparative data.	Walla Walla Subbasin Collaborative Salmonid Monitoring & Evaluation Project	Umatilla Tribe MOA/ODFW Recommendation (200003900)
		Anadromous Adult and Juvenile Abundance Monitoring Region 1 (WDFW expansion)	New WDFW Recommendation (200205300*)
	Gather and analyze harvest data to aid in run reconstruction to evaluate status and action effectiveness.	Walla Walla Subbasin Collaborative Salmonid Monitoring & Evaluation Project	Umatilla Tribe MOA/ODFW Recommendation (200003900)
		Anadromous Adult and Juvenile Abundance Monitoring Region 1 (WDFW expansion)	New WDFW Recommendation (200205300*)

Monitor and evaluate effectiveness of actions taken to implement Recommendations.	Develop methods to monitor biological response to habitat improvement.	Walla Walla Subbasin Collaborative Salmonid Monitoring & Evaluation Project	Umatilla Tribe MOA/ODFW Recommendation (200003900)
		Anadromous Adult and Juvenile Abundance Monitoring Region 1 (WDFW expansion)	New WDFW Recommendation (200205300*)
	Monitor effectiveness of hatchery and natural production Recommendations.	NEOH Walla Walla Hatchery - Three Step Master Planning Process (expense)	Umatilla Tribe MOA (200003801)
		NEOH Walla Walla Hatchery - Three Step Master Planning Process (M&E beginning in 2011)	Umatilla Tribe MOA (200003803)
		Walla Walla Subbasin Collaborative Salmonid Monitoring & Evaluation Project	Umatilla Tribe MOA/ODFW Recommendation (200003900)
		Anadromous Adult and Juvenile Abundance Monitoring Region 1 (WDFW expansion)	New WDFW Recommendation (200205300*)

Yakima River Subbasin

Strategy	Recommended Measure		Source of Measure
Protect and conserve natural ecological processes	Continue existing protections, and increase protection of high quality habitats through acquisition, conservation easements, and cooperative agreements.	Teanaway Watershed - Protect critical habitat from development, reduce water temperatures and increase instream flows, restore habitat forming processes in the floodplain.	FCRPS BiOp Action/New Recommendation (200711200)
		Yakima Tributary Access & Habitat Program	FCRPS BiOP RPA (200202501*)
		Cowiche Restoration and Protection Project (Easement/Fee Simple Acquisition)	WDFW Comment (200711300*)
		Yakama Nation - Riparian/Wetlands Restoration	Yakama Nation MOA (199206200)
		Yakama Reservation Watersheds Project	Yakama Nation MOA (199603501)
		Yakima Basin Side Channels	Yakama Nation MOA (199705100)
Restore passage and connectivity to habitats blocked or impaired by artificial barriers.	Remove or replace culverts and other passage barriers per priorities described in the draft recovery plan.	Yakima River Basinwide Tributary/Passage & Flow	FCRPS BiOp Action/New Recommendation (200739800)
		Yakima Tributary Access & Habitat Program	FCRPS BiOP RPA (200202501*)
		Yakama Reservation Watersheds Project	Yakama Nation MOA (199603501)
	Improve juvenile passage and survival through mainstem Yakima River diversion dams.	O&M Yakima Basin Fish Screens	FCRPS BiOp Action/New Recommendation (199503300)
	Provide adequate screening at all irrigation diversions.	O&M Yakima Basin Fish Screens	FCRPS BiOp Action/New Recommendation (199503300)
		Yakima Tributary Access & Habitat Program	FCRPS BiOP RPA (200202501*)
		Manastash Creek Passage & Screening	FCRPS RPA/New

			Recommendation (200300100*)
		Yakima Phase II/Huntsville Screen Operation & Maintenance	FCRPS BiOp Action/WDFW Comment (199200900)
Provide upstream and downstream passage at USBR irrigation storage dams (Cle Elum & Bumping).	O&M Yakima Basin Fish Screens		FCRPS BiOp Action/New Recommendation (199503300)
	Yakama Nation - Riparian/Wetlands Restoration		Yakama Nation MOA (199206200)
	Yakama Reservation Watersheds Project		Yakama Nation MOA (199603501)
Reconnect side channels and off-channel habitats to stream channels.	Teanaway Watershed - Protect critical habitat from development, reduce water temperatures and increase instream flows, restore habitat forming processes in the floodplain.		FCRPS BiOp Action/New Recommendation (200711200)
	Yakama Reservation Watersheds Project		Yakama Nation MOA (199603501)
Remove dikes and levies.	Yakima Tributary Access & Habitat Program		FCRPS BiOP RPA (200202501*)
Promote the creation and maintenance of beaver dams.			CBFWA recommendation
Restore channel structure and complexity.	Restore natural channel form.	Yakama Reservation Watersheds Project	Yakama Nation MOA (199603501)
	Place stable wood and other large organic debris in streambeds.	Teanaway Watershed - Protect critical habitat from development, reduce water temperatures and increase instream flows, restore habitat forming processes in the floodplain.	FCRPS BiOp Action/New Recommendation (200711200)
	Stabilize and protect stream banks.	Yakama Reservation Watersheds Project	Yakama Nation MOA (199603501)

Restore riparian condition and LWD recruitment	Restore natural riparian vegetative communities.	Teanaway Watershed - Protect critical habitat from development, reduce water temperatures and increase instream flows, restore habitat forming processes in the floodplain.	FCRPS BiOp Action/New Recommendation (200711200)
		Manastash Creek Passage & Screening	FCRPS RPA/New Recommendation (200300100*)
		Yakama Reservation Watersheds Project	Yakama Nation MOA (199603501)
	Implement grazing strategies that promote riparian recovery.	Yakama Reservation Watersheds Project	Yakama Nation MOA (199603501)
	Develop riparian buffers and setbacks.		CBFWA recommendation
	Install riparian exclosure fencing.	Yakima Tributary Access & Habitat Program	FCRPS BiOP RPA (200202501*)
		Yakama Reservation Watersheds Project	Yakama Nation MOA (199603501)
Close, remove, and restore riparian road prisms.	Yakama Reservation Watersheds Project	Yakama Nation MOA (199603501)	
Restore natural hydrograph to provide sufficient flow during critical periods.	Adjust flow regulation and reservoir operations.	Manastash Instream Flow Enhancement	New Recommendation (200702000)
		Yakima River Basinwide Tributary/Passage & Flow	FCRPS BiOp Action/New Recommendation (200739800)
	Obtain additional instream water rights.	Teanaway Watershed - Protect critical habitat from development, reduce water temperatures and increase instream flows, restore habitat forming processes in the floodplain.	FCRPS BiOp Action/New Recommendation (200711200)
	Improve irrigation conveyance and efficiency.	Manastash Instream Flow Enhancement	New Recommendation (200702000)
Yakima Tributary Access & Habitat Program		FCRPS BiOP RPA	

			(200202501*)
		Manastash Creek Passage & Screening	FCRPS RPA/New Recommendation (200300100*)
	Enhance hyporheic flows and spring inputs.	Yakama Reservation Watersheds Project	Yakama Nation MOA (199603501)
Improve degraded water quality	Increase riparian shading.	Teanaway Watershed - Protect critical habitat from development, reduce water temperatures and increase instream flows, restore habitat forming processes in the floodplain.	FCRPS BiOp Action/New Recommendation (200711200)
		Manastash Creek Passage & Screening	FCRPS RPA/New Recommendation (200300100*)
		Yakama Reservation Watersheds Project	Yakama Nation MOA (199603501)
	Reduce chemical pollution and nutrient inputs.		CBFWA recommendation
Mitigate for impeded and blocked passage	Implement artificial propagation Recommendations to mitigate for lost habitat access and habitat productivity.	Yakima/Klickitat Fisheries Project Operations and Maintenance	Yakama Nation MOA (199701325)
		Yakima coho production facility and marking	Yakama Nation MOA (200846500)
		Yakima fall Chinook - JDM move 1.7M URBs from PR to Prosser	Yakama Nation MOA (200846600)
		Yakima steelhead - acclimation facilities	Yakama Nation MOA (200846700)
		Yakima/Naches coho - mobile acclimation units	Yakama Nation MOA (200846800)
		Yakima/Naches coho - nutrient supplementation	Yakama Nation MOA (200845900)

Monitor status and trends of focal species and populations	Establish or use preexisting index sites to gather baseline, trend, and comparative data.	YKFP Policy/Plan/Technical	FCRPS BiOp Action/WDFW Comment (199506425)
		YKFP Management, Data, Habitat	Yakama Nation MOA (198812025)
Monitor and evaluate effectiveness of actions taken to implement Recommendations.	Develop methods to monitor biological response to habitat improvement.		CBFWA recommendation
	Monitor effectiveness of hatchery and natural production Recommendations.	Growth modulation in salmon supplementation	FCRPS BiOp (200203100)
		YKFP Policy/Plan/Technical	FCRPS BiOp Action/WDFW Comment (199506425)
		YKFP - Design & Construction (Nelson Springs replacement facility)	Yakama Nation MOA (198811525)
		YKFP Management, Data, Habitat	Yakama Nation MOA (198812025)
		Yakama Nation - Riparian/Wetlands Restoration	Yakama Nation MOA (199206200)
		Yakima Klickitat Fisheries Project - Monitoring And Evaluation	Yakama Nation MOA (199506325)
		YKFP - Design & Construction / M&E Replacement Facility	Yakama Nation MOA (198811525)
		Program coordination and administration	Yakama Nation MOA (200845400)

Tucannon River Subbasin

Strategy	Recommended Measure		Source of Measure
Protect and conserve natural ecological processes	Continue existing protections, and increase protection of high quality habitats through acquisition, conservation easements, and cooperative agreements.	Tucannon Stream and Riparian Protection, Enhancement, and Restoration	FCRPS BiOp Action/New Recommendation (199401806)
		Protect and Restore Tucannon Watershed	Umatilla Tribe MOA (200820200)
		Improve Habitat For Fall Chinook, Steelhead in the Lower Snake and Tucannon Sub basins.	FCRPS BiOp Action/New Recommendation (199401807)
Restore passage and connectivity to habitats blocked or impaired by artificial barriers.	Remove or replace culverts and other passage barriers per priorities described in the draft recovery plan.		CBFWA recommendation
	Provide adequate screening at all irrigation diversions.		CBFWA recommendation
Restore floodplain connectivity and function.	Reconnect floodplains to channels.	Protect and Restore Tucannon River	Nez Perce Tribe Recommendation (200712500*)
	Reconnect side channels and off-channel habitats to stream channels.	Protect and Restore Tucannon River	Nez Perce Tribe Recommendation (200712500*)
	Promote the creation and maintenance of beaver dams.	Improve Habitat For Fall Chinook, Steelhead in the Lower Snake and Tucannon Sub basins.	FCRPS BiOp Action/New Recommendation (199401807)
Restore channel structure and complexity.	Restore natural channel form.	Tucannon Stream and Riparian Protection, Enhancement, and Restoration	FCRPS BiOp Action/New Recommendation (199401806)

	Place stable wood and other large organic debris in streambeds.	Tucannon Stream and Riparian Protection, Enhancement, and Restoration	FCRPS BiOp Action/New Recommendation (199401806)
	Stabilize and protect stream banks.	Protect and Restore Tucannon Watershed	FCRPS BiOp Action/New Recommendation (199401807)
Restore riparian condition and LWD recruitment	Restore natural riparian vegetative communities.	Tucannon Stream and Riparian Protection, Enhancement, and Restoration	FCRPS BiOp Action/New Recommendation (199401806)
		Protect and Restore Tucannon River	Nez Perce Tribe Recommendation (200712500*)
		Improve Habitat For Fall Chinook, Steelhead in the Lower Snake and Tucannon Sub basins.	FCRPS BiOp Action/New Recommendation (199401807)
	Implement grazing strategies that promote riparian recovery.	Tucannon Stream and Riparian Protection, Enhancement, and Restoration	FCRPS BiOp Action/New Recommendation (199401806)
		Improve Habitat For Fall Chinook, Steelhead in the Lower Snake and Tucannon Sub basins.	FCRPS BiOp Action/New Recommendation (199401807)
	Develop riparian buffers and setbacks.	Tucannon Stream and Riparian Protection, Enhancement, and Restoration	FCRPS BiOp Action/New Recommendation (199401806)
		Improve Habitat For Fall Chinook, Steelhead in the Lower Snake and Tucannon Sub basins.	FCRPS BiOp Action/New Recommendation (199401807)
	Install riparian exclosure fencing.	Tucannon Stream and Riparian Protection, Enhancement, and Restoration	FCRPS BiOp Action/New Recommendation (199401806)
		Improve Habitat For Fall Chinook, Steelhead in the Lower Snake and Tucannon Sub basins.	FCRPS BiOp Action/New Recommendation

			(199401807)
Restore natural hydrograph to provide sufficient flow during critical periods.	Obtain additional instream water rights.		CBFWA recommendation
	Improve irrigation conveyance and efficiency.	Improve Habitat For Fall Chinook, Steelhead in the Lower Snake and Tucannon Sub basins.	FCRPS BiOp Action/New Recommendation (199401807)
Improve degraded water quality	Increase riparian shading.	Tucannon Stream and Riparian Protection, Enhancement, and Restoration	FCRPS BiOp Action/New Recommendation (199401806)
		Protect and Restore Tucannon River	Nez Perce Tribe Recommendation (200712500*)
		Improve Habitat For Fall Chinook, Steelhead in the Lower Snake and Tucannon Sub basins.	FCRPS BiOp Action/New Recommendation (199401807)
Mitigate for impeded and blocked passage	Implement artificial propagation Recommendations to mitigate for lost habitat access and habitat productivity	Transition the Tucannon River steelhead supplementation program to local broodstock (hatchery reform)	FCRPS BiOp Action/New Recommendation (200871700)
		Tucannon River Spring Chinook Captive Broodstock Program	FCRPS BiOp Action/WDFW Comment (200001900)
		HSRG Recommendation Implementation - Region 1	FCRPS BiOp Action/WDFW Comment (200871700)
Monitor status and trends of focal species and populations	Establish or use preexisting index sites to gather baseline, trend, and comparative data.		CBFWA recommendation

Monitor and evaluate effectiveness of actions taken to implement Recommendations.	Develop methods to monitor biological response to habitat improvement.	Improve Habitat For Fall Chinook, Steelhead in the Lower Snake and Tucannon Sub basins.	FCRPS BiOp Action/New Recommendation (199401807)
	Monitor effectiveness of hatchery and natural production Recommendations.	Enhancing Summer Instream Flow and Reducing Temperature in Agricultural Watersheds	200751600

Columbia Lower Middle Subbasin

Recommended Measure	Source of Measure
Selective Harvest Evaluation and Sampling (recreational)/ Fishery Conservation Effectiveness Program Monitoring, Region 3	WDFW Comment
Rock Creek Fish and Habitat Assessment for the Prioritization of Restoration and Protection	Yakama Nation MOA (200715600)

Crab Creek Subbasin

Recommended Measure	Source of Measure
Stock Assessment for salmon, steelhead, and other fish species in Lower Crab Creek, Washington	WDFW Comment (200710800*)
Crab Creek Subbasin Plan	WDFW Comment (200724300*)

Snake Lower Subbasin

Recommended Measure	Source of Measure
Protect and Restore Alpowa Creek	Nez Perce Tribe Recommendation (200712600*)
Investigate Snake River Sockeye Salmon smolt mortality between the Stanley Basin and Lower Granite Dam by tracking radio-tagged smolts in Salmon and Snake rivers	FCRPS BiOp (200872100)
Watershed Projects - Region 1	WDFW Comment
HSRG Recommendation Implementation - Region 1	WDFW Comment
Selective Harvest Evaluation and Sampling (recreational)/ Fishery Conservation Effectiveness Program Monitoring, Region 1	WDFW Comment

Columbia Cascade Province

Wenatchee River Subbasin

Strategy	Recommended Measure		Source of Measure
Protect and conserve natural ecological processes	Continue existing protections, and increase protection of high quality habitats through acquisition, conservation easements, and cooperative agreements.	Programmatic Riparian Floodplain Habitat Protection Program for Wenatchee Subbasin.	Yakama Nation MOA (200842300)
Restore passage and connectivity to habitats blocked or impaired by artificial barriers.	Remove or replace culverts and other passage barriers per priorities described in the recovery plan.	UPA Wenatchee Passage Program	FCRPS BiOp Action/New Recommendation (200704200)
		UPA Wenatchee Subbasin Access Proposal	FCRPS BiOp Action/New Recommendation (200728300)
		UPA Wenatchee Basinwide Passage	FCRPS BiOp Action/New Recommendation (200740000)
		Install stream structures to increase thalweg depth on lower Peshastin Creek.	Yakama Nation MOA (200840700)
		Culvert Replacement (11-13 structures) at private landowner access in Chumstick watershed.	Yakama Nation MOA (200841000)
		Culvert replacement Clear Creek (1)	Yakama Nation MOA (200843700)
		Culvert replacement Clear Creek (2)	Yakama Nation MOA (200841900)
		Culvert replacement Alder Creek and Misc. for Chiwawa Watershed.	Yakama Nation MOA (200842200)
		North Road culvert passage: provide year-around passage through North Road culvert on Chumstick Creek.	Yakama Nation MOA (200843200)
Replace culverts at Beaver Creek in Upper Wenatchee	Yakama Nation MOA		

		Watershed.	(200844400)
	Provide adequate screening at all irrigation diversions.		CBFWA recommendation
Restore floodplain connectivity and function.	Reconnect floodplains to channels.	Programmatic Side/Off channel reconnections and restoration in the Nason Creek Watershed.	Yakama Nation MOA (200844600)
	Reconnect side channels and off-channel habitats to stream channels.	UPA Nason Creek Oxbow Reconnection Project	FCRPS BiOp Action/New Recommendation (200708500)
		Reconnect main stem Wenatchee River side channel at Monitor in Lower Wenatchee Watershed	Yakama Nation MOA (200840300)
		Reconnect main stem Wenatchee River side channel at Sleepy Hollow in Lower Wenatchee Watershed.	Yakama Nation MOA (200842400)
		Reconnect main stem Wenatchee River side channel Cashmere in Lower Wenatchee Watershed	Yakama Nation MOA (200843100)
		Programmatic Side/Off channel reconnections and restoration in the Nason Creek Watershed.	Yakama Nation MOA (200844600)
	Remove dikes and levies.		CBFWA recommendation
Restore channel structure and complexity.	Place stable wood and other large organic debris in streambeds.	Assess, design and build large wood structures for habitat diversity in Upper Wenatchee Watershed.	Yakama Nation MOA (200843000)
		Increase pool quality and quantity in Nason Creek Watershed by installing in-channel structures.	Yakama Nation MOA (200844500)
		Develop lower Nason Creek Restoration Plan	Yakama Nation MOA (200842500)
Restore riparian condition and LWD recruitment	Restore natural riparian vegetative communities.	UPA Wenatchee Subbasin Riparian Enhancement Proposal	FCRPS BiOp Action/New Recommendation (200708600)
		UPA Wenatchee Subbasin Complexity Proposal	FCRPS BiOp Action/New Recommendation (200732500)
		Programmatic Riparian Floodplain Habitat Protection Program for Wenatchee Subbasin.	Yakama Nation MOA (200842300)

		Restoration (on National Forests and Private lands) of riparian and channel conditions to relieve sediment inputs in Chiwawa River Watershed.	Yakama Nation MOA (200842600)
		Programmatic Stream Bank Restoration in the Icicle Creek Watershed.	Yakama Nation MOA (200843900)
		Develop lower Nason Creek Restoration Plan	Yakama Nation MOA (200842500)
Improve degraded water quality	Reduce sediment recruitment by improving road maintenance.	Restoration (on National Forests and Private lands) of riparian and channel conditions to relieve sediment inputs in Chiwawa River Watershed.	Yakama Nation MOA (200842600)
		Evaluate NF (National Forest) riparian roads and develop restoration plan in upper Peshastin Watershed	Yakama Nation MOA (200843600)
	Reduce high water temperatures by restoring natural functions and processes through Recommendations identified to address physical habitat quality/quantity limitations.	Programmatic Riparian Floodplain Habitat Protection Program for Wenatchee Subbasin.	Yakama Nation MOA (200842300)
		UPA Wenatchee Subbasin Riparian Enhancement Proposal	FCRPS BiOp Action/New Recommendation (200708600)
	Increase stream/lake productivity to near historic levels to increase growth and survival of juvenile salmonids.	Add nutrients using hatchery carcasses and/or carcass analogs - 9-watersheds identified	Yakama Nation MOA (200841200)
Restore natural hydrograph to provide sufficient flow during critical periods.	Obtain additional instream water rights.		CBFWA recommendation
	Improve irrigation conveyance and efficiency.	Improve Irrigation delivery and use efficiency at Dryden Ditch, Pioneer and Jones/Shotwell (Efficiency)	Yakama Nation MOA (200842000)
		Increase irrigation delivery and on-site efficiencies in Peshastin Creek watershed.	Yakama Nation MOA (200844500)

Improve hatchery practices	Reduce or eliminate presence of out of subbasin stock on spawning grounds	Mid-Columbia Coho Restoration Project	Yakama Nation MOA (199604000)
		Wenatchee spring Chinook - Chiwawa River & Nason Ck acclimation	Yakama Nation MOA (199646100)
		Wenatchee spring Chinook - Little Wenatchee 150K smolts	Yakama Nation MOA (199646200)
		Wenatchee spring Chinook - Peshastin 100K smolts	Yakama Nation MOA (199646300)
		Wenatchee steelhead - Wenatchee, Peshastin, Chumstick, Mission acclimation	Yakama Nation MOA (199646400)
Monitor status and trends of focal species and populations	Establish or use preexisting index sites to gather baseline, trend, and comparative data.	UPA Wenatchee Passage Program	FCRPS BiOp Action/New Recommendation (200704200)
		Monitor Reproduction In Wenat/Tuc/Kal	FCRPS BiOp Action/WDFW Comment (200303900)
Monitor and evaluate effectiveness of actions taken to implement Recommendations.	Develop methods to monitor biological response to habitat improvement.		CBFWA recommendation
	Monitor effectiveness of hatchery and natural production Recommendations.	UPA Wenatchee Passage Program	FCRPS BiOp Action/New Recommendation (200704200)
		Sockeye Studies	CRITFC MOA (200850300)
		Monitor Reproduction In Wenat/Tuc/Kal	FCRPS BiOp Action/WDFW Comment (200303900)
		Mid-Columbia Coho Restoration Project	Yakama Nation MOA (199604000)

Entiat River Subbasin

Strategy	Recommended Measure		Source of Measure
Protect and conserve natural ecological processes	Continue existing protections, and increase protection of high quality habitats through acquisition, conservation easements, and cooperative agreements.	Work with willing landowners to protect larger, undisturbed riparian areas by first pursuing conservation easement, lease, and options other than outright property acquisition	Yakama Nation MOA (200842100)
Restore passage and connectivity to habitats blocked or impaired by artificial barriers.	Remove or replace culverts and other passage barriers per priorities described in the recovery plan.	Entiat River - UPA - Lower Entiat River Off-Channel Restoration Project	FCRPS BiOp Action/New Recommendation (200705500)
	Provide adequate screening at all irrigation diversions.		CBFWA recommendation
Restore floodplain connectivity and function.	Reconnect floodplains to channels.	Entiat River - UPA - Lower Entiat River Off-Channel Restoration Project	Yakama Nation MOA (200843500)
	Reconnect side channels and off-channel habitats to stream channels.	Entiat River - UPA - Lower Entiat River Off-Channel Restoration Project	FCRPS BiOp Action/New Recommendation (200705500)
		Implement Ecosystem Diagnosis and Treatment (EDT) Alternative 5 related to side-channel options	Yakama Nation MOA (200841800)
	Remove dikes and levies.		
Restore channel structure and complexity.	Place stable wood and other large material in streambeds.	Design and build in-channel pool forming structures in main stem Entiat for juvenile rearing and spawning habitat.	Yakama Nation MOA (200840200)
		Design and build in-channel pool forming structures in main stem Entiat for juvenile rearing and spawning habitat.	Yakama Nation MOA (200840400)

Restore riparian condition and LWD recruitment	Restore natural riparian vegetative communities.	UPA Entiat Subbasin Riparian Enhancement Program	FCRPS BiOp Action/New Recommendation (200723100)
		UPA Entiat Subbasin Riparian Enhancement Program	Yakama Nation MOA (200844200)
Improve degraded water quality	Increase stream/lake productivity to near historic levels to increase growth and survival of juvenile salmonids.	Continue hatchery carcass out planting and/or use of nutrient analogs in mid- and lower Entiat main stem	Yakama Nation MOA (200840500)
Restore natural hydrograph to provide sufficient flow during critical periods.	Obtain additional instream water rights.		CBFWA recommendation
	Improve irrigation conveyance and efficiency.	Entiat River - UPA - Knapp-Wham Hanan Detwiler Irrigation System Consolidation Project.	FCRPS BiOp Action/New Recommendation (200731800)
	Enhance hyporheic flows and spring inputs.		CBFWA recommendation
Improve hatchery practices	Reduce or eliminate presence of out of subbasin stock on spawning grounds		CBFWA recommendation
Monitor status and trends of focal species and populations	Establish or use preexisting index sites to gather baseline, trend, and comparative data.		CBFWA recommendation
Monitor and evaluate effectiveness of actions taken to implement Recommendations.	Develop methods to monitor biological response to habitat improvement.		CBFWA recommendation
	Monitor effectiveness of hatchery and natural production Recommendations.		CBFWA recommendation

Methow River Subbasin

Strategy	Recommended Measure		Source of Measure
Protect and conserve natural ecological processes	Continue existing protections, and increase protection of high quality habitats through acquisition, conservation easements, and cooperative agreements.	Assess potential temperature refugia, (using FLIR and temperature profiles) to identify important summer/winter juvenile rearing areas for future protection and restoration actions.	Yakama Nation MOA (200841500)
		Protect cottonwood forests, and replant unused riparian agricultural areas where feasible in lower Methow River reaches	Yakama Nation MOA (200841600)
		Protect Riparian and Floodplain in Middle Methow River with general emphasis from Carlton to Weeman Bridge.	Yakama Nation MOA (200841700)
		Riparian Floodplain Habitat Protection Program with an emphasis in lower reaches of Methow River.	Yakama Nation MOA (200842700)
		Identify, Protect and Restore areas providing thermal refugia in the lower Methow reaches.	Yakama Nation MOA (200843800)
		Riparian Floodplain Habitat Protection Program with an emphasis in upper reaches/tributaries of Methow River.	Yakama Nation MOA (200844100)
Restore passage and connectivity to habitats blocked or impaired by artificial barriers.	Remove or replace culverts and other passage barriers per priorities described in the recovery plan.	UPA Project - MVID West Canal Diversion and Headworks	FCRPS BiOp Action/New Recommendation (200717200)
		UPA Project - Fender Mill Floodplain Restoration - Phase 1	FCRPS BiOp Action/New Recommendation (200721400)
		UPA Project - Methow Valley Irrigation District East Diversion Dam Replacement	FCRPS BiOp Action/New Recommendation (200725100)
	Provide adequate screening at all irrigation diversions.		CBFWA recommendation
Restore floodplain connectivity and function.	Reconnect floodplains to channels.	UPA Project - Fender Mill Floodplain Restoration - Phase 1	FCRPS BiOp Action/New Recommendation (200721400)
		UPA Project - Methow Valley Irrigation District East Diversion Dam Replacement	FCRPS BiOp Action/New Recommendation

			(200726400)
		UPA Project - Programmatic Habitat Complexity Projects in the Methow River Subbasin	FCRPS BiOp Action/New Recommendation (200725100)
		BOR Reach Complex riparian reconnection / floodplain function - side channel improvements for the Methow River with an emphasis on reaches between Carlton to Weeman Bridge.	Yakama Nation MOA (200840800)
		Assess and inventory mill ponds in Middle Methow River reaches (and others) in relationship to providing additional main stem spawning and rearing habitat (acclimation, off-channel habitat, etc)	Yakama Nation MOA (200841300)
	Reconnect side channels and off-channel habitats to stream channels.	EXP UPA Mcpherson Side Channel	FCRPS BiOp Action/New Recommendation (200501000)
		UPA Project - Fender Mill Floodplain Restoration - Phase 1	FCRPS BiOp Action/New Recommendation (200721400)
		UPA Project - Elbow Coulee Floodplain Restoration	FCRPS BiOp Action/New Recommendation (200723700)
		UPA Project - Methow Valley Irrigation District East Diversion Dam Replacement	FCRPS BiOp Action/New Recommendation (200725100)
		UPA Project - Methow Valley Irrigation District East Diversion Dam Replacement	FCRPS BiOp Action/New Recommendation (200726400)
		BOR Reach Complex Side channel reconnection, LWD recruitment, levee removal, riparian restoration with an emphasis in the lower Twisp River	Yakama Nation MOA (200840100)
		BOR Reach Complex riparian reconnection / floodplain function - side channel improvements for the Methow River with an emphasis on reaches between Carlton to Weeman Bridge.	Yakama Nation MOA (200840800)
		BOR Reach complexity and side channel development, Early Winters fan to Gate Creek	Yakama Nation MOA (200840900)

		BOR Reach Complex - Restore Primarily side channel and increase habitat complexity in the Chewuch River.	Yakama Nation MOA (200841100)
		BOR Reach Complex - Modify levees, riparian restoration, LWD recruitment and side channel reconnection with an emphasis in the upper Twisp River Watershed.	Yakama Nation MOA (200841400)
		UPA Project - Programmatic Implementation of Habitat Complexity Projects in the Methow River Subbasin in areas not already identified.	Yakama Nation MOA (200842900)
	Remove dikes and levies.	UPA Project - Fender Mill Floodplain Restoration - Phase 1	FCRPS BiOp Action/New Recommendation (200721400)
		UPA Project - Elbow Coulee Floodplain Restoration	FCRPS BiOp Action/New Recommendation (200723700)
		UPA Project - Methow Valley Irrigation District East Diversion Dam Replacement	FCRPS BiOp Action/New Recommendation (200725100)
		UPA Project - Methow Valley Irrigation District East Diversion Dam Replacement	FCRPS BiOp Action/New Recommendation (200726400)
		BOR Reach Complex Side channel reconnection, LWD recruitment, levee removal, riparian restoration with an emphasis in the lower Twisp River	Yakama Nation MOA (200840100)
BOR Reach Complex - Modify levees, riparian restoration, LWD recruitment and side channel reconnection with an emphasis in the upper Twisp River Watershed.	Yakama Nation MOA (200841400)		
Restore channel structure and complexity.	Place stable wood and other large material in streambeds.	Add log and rock complexes to identified small tributary channels at key stream locations to reactivate floodplain where appropriate	Yakama Nation MOA (200840600)
		UPA Project - Programmatic Implementation of Habitat Complexity Projects in the Methow River Subbasin in areas not already identified.	Yakama Nation MOA (200842900)
		Design and implement Engineered Log Jams in the Upper Methow, Early Winters Creek and Lost River; identify areas, to increase and diversify key spawning and rearing habitat.	Yakama Nation MOA (200843300)

		Assess, design and implement Instream structures in various smaller tributary streams	Yakama Nation MOA (200843400)
Restore riparian condition and LWD recruitment	Restore natural riparian vegetative communities.	UPA Project - Methow Basin Riparian Enhancement	FCRPS BiOp Action/New Recommendation (200703500)
		UPA Project - Fender Mill Floodplain Restoration - Phase 1	FCRPS BiOp Action/New Recommendation (200721400)
		UPA Project - Elbow Coulee Floodplain Restoration	FCRPS BiOp Action/New Recommendation (200723700)
		UPA Project - Methow Valley Irrigation District East Diversion Dam Replacement	FCRPS BiOp Action/New Recommendation (200725100)
		BOR Reach Complex Side channel reconnection, LWD recruitment, levee removal, riparian restoration with an emphasis in the lower Twisp River	Yakama Nation MOA (200840100)
		BOR Reach Complex riparian reconnection / floodplain function - side channel improvements for the Methow River with an emphasis on reaches between Carlton to Weeman Bridge.	Yakama Nation MOA (200840800)
		BOR Reach Complex - Modify levees, riparian restoration, LWD recruitment and side channel reconnection with an emphasis in the upper Twisp River Watershed.	Yakama Nation MOA (200841400)
		Protect cottonwood forests, and replant unused riparian agricultural areas where feasible in lower Methow River reaches	Yakama Nation MOA (200841600)
		UPA Project - Programmatic Methow Basin Riparian Enhancement and re-establishment with an emphasis in key tributary streams.	Yakama Nation MOA (200842800)
		Restoration 30%+ of lineal stream area - Upper Methow tributaries with emphasis on Wolf Creek and Hancock Springs.	Yakama Nation MOA (200844400)

Restore natural hydrograph to provide sufficient flow during critical periods.	Obtain additional instream water rights.		CBFWA recommendation
	Improve irrigation conveyance and efficiency.		CBFWA recommendation
	Enhance hyporheic flows and spring inputs.		CBFWA recommendation
Improve degraded water quality	Reduce sediment recruitment by improving road maintenance.		CBFWA recommendation
	Reduce high water temperatures by restoring natural functions and processes through Recommendations identified to address physical habitat quality/quantity limitations.	BOR Reach Complex riparian reconnection / floodplain function - side channel improvements for the Methow River with an emphasis on reaches between Carlton to Weeman Bridge.	Yakama Nation MOA (200840800)
		Protect cottonwood forests, and replant unused riparian agricultural areas where feasible in lower Methow River reaches	Yakama Nation MOA (200841600)
		UPA Project - Programmatic Methow Basin Riparian Enhancement and re-establishment with an emphasis in key tributary streams.	Yakama Nation MOA (200842800)
Improve hatchery practices	Reduce or eliminate presence of out of subbasin stock on spawning grounds	Methow steelhead - reprogram Winthrop for release of 100k smolts in upper watershed	Yakama Nation MOA (200845300)
		Methow steelhead - Methow, Twisp, Chewuch acclimation	Yakama Nation MOA (200846000)
		Methow steelhead - Methow, Twisp, Chewuch acclimation - operate facilities	Yakama Nation MOA (200846000)
Monitor status and trends of focal species and populations	Establish or use preexisting index sites to gather baseline, trend, and comparative data.	Assess potential temperature refugia, (using FLIR and temperature profiles) to identify important summer/winter juvenile rearing areas for future protection and restoration actions.	Yakama Nation MOA (200841500)

Monitor and evaluate effectiveness of actions taken to implement Recommendations.	Develop methods to monitor biological response to habitat improvement.		CBFWA recommendation
	Monitor effectiveness of hatchery and natural production Recommendations.	UPA Project - MVID West Canal Diversion and Headworks	FCRPS BiOp Action/New Recommendation (200717200)
		Methow River Steelhead Relative Reproductive Success Study	FCRPS BiOp Action/New Recommendation (200872200)

Okanogan River Subbasin

Strategy	Recommended Measure		Source of Measure
Protect and conserve natural ecological processes	Continue existing protections, and increase protection of high quality habitats through acquisition, conservation easements, and cooperative agreements.	Implementation of the Okanogan Subbasin Plan. Initiate a Programmatic and Sequenced set of Key Habitat Restoration and Protection Actions	Colville Tribe MOA (200722400)
		Land and Water Acquisition	Colville Tribe MOA (200810400)
		ESA F&W Law Enforcement	Colville Tribe MOA (200810600)
		Okanogan-Similkameen Habitat Protection Project - Fish and wildlife habitat protection through fee simple and conservation easement purchases.	WDFW Comment (200723200*)
Restore passage and connectivity to habitats blocked or impaired by artificial barriers.	Remove or replace culverts and other passage barriers per priorities described in the recovery plan.	Restore and Enhance Anadromous Fish Populations and Habitat in Salmon Creek	Colville Tribe MOA (199604200)
		Anadromous Fish Habitat & Pass	Colville Tribe MOA (200000100)
	Provide adequate screening at all irrigation diversions.		CBFWA recommendation
Restore floodplain connectivity and function.	Reconnect floodplains to channels.		CBFWA recommendation
	Reconnect side channels and off-channel habitats to stream channels.	Okanogan Habitat	Colville Tribe MOA (200810200)
	Remove dikes and levies.		CBFWA recommendation
Restore riparian condition and LWD recruitment	Restore natural riparian vegetative communities.	Restore and Enhance Anadromous Fish Populations and Habitat in Salmon Creek	Colville Tribe MOA (199604200)
		Anadromous Fish Habitat & Pass	Colville Tribe MOA (200000100)
		Okanogan Habitat	Colville Tribe MOA (200810200)

		Okanogan Livestock and Water	FCRPS BiOp Action/New Recommendation (200714500)
Restore natural hydrograph to provide sufficient flow during critical periods.	Obtain additional instream water rights.	Restore and Enhance Anadromous Fish Populations and Habitat in Salmon Creek	Colville Tribe MOA (199604200)
		Okanogan River Water Acquisition (Commitment to allocate some water transactions project funding to Okanogan)	Colville Tribe MOA (200201301)
		Land and Water Acquisition	Colville Tribe MOA (200810400)
	Improve irrigation conveyance and efficiency.		CBFWA recommendation
	Enhance hyporheic flows and spring inputs.	Restore and Enhance Anadromous Fish Populations and Habitat in Salmon Creek	Colville Tribe MOA (199604200)
Improve degraded water quality	Reduce sediment recruitment by improving road maintenance.		CBFWA recommendation
	Reduce high water temperatures by restoring natural functions and processes through Recommendations identified to address physical habitat quality/quantity limitations.	Restore and Enhance Anadromous Fish Populations and Habitat in Salmon Creek	Colville Tribe MOA (199604200)
		Anadromous Fish Habitat & Pass	Colville Tribe MOA (200000100)
		Okanogan Habitat	Colville Tribe MOA (200810200)
Improve hatchery practices	Reduce or eliminate presence of out of subbasin stock on spawning grounds	Chief Joseph Hatchery Program	Colville Tribe MOA (200302300)
		Develop a locally-adapted summer steelhead program to supplement natural production throughout the Okanogan River basin	Colville Tribe MOA (200721200)

Monitor status and trends of focal species and populations	Establish or use preexisting index sites to gather baseline, trend, and comparative data.	Restore and Enhance Anadromous Fish Populations and Habitat in Salmon Creek	Colville Tribe MOA (199604200)
		Okanogan Basin Monitoring and Evaluation Project (OBMEP)	Colville Tribe MOA (200302200)
Monitor and evaluate effectiveness of actions taken to implement Recommendations.	Develop methods to monitor biological response to habitat improvement.		CBFWA recommendation
	Monitor effectiveness of hatchery and natural production Recommendations.	Anadromous Fish Habitat & Pass	Colville Tribe MOA (200000100)
		Okanogan Basin Monitoring and Evaluation Project (OBMEP)	Colville Tribe MOA (200302200)

Columbia Upper Middle Subbasin

Recommended Measure	Source of Measure
Recondition Upper Columbia kelt steelhead	FCRPS BiOp Action/New Recommendation (200871400)
Columbia Cascade Pump Screen Correction	FCRPS BiOp (200703400)
Steelhead Spawning Ground Surveys, Flow, and Temperature Monitoring of Small Tributaries of the Upper Middle Mainstem Columbia River.	WDFW Comment (200704600*)
Riparian Acquisitions and Subsequent O&M -- ESA Salmon habitat	WDFW Comment
Selective Harvest Evaluation and Sampling (recreational)/ Fishery Conservation Effectiveness Program Monitoring, Region 2.	WDFW Comment
Habitat Permitting and Compliance	WDFW Comment
Adult and Juvenile Abundance Monitoring-Region 2 (PRD steelhead)	WDFW Comment
Adult and Juvenile Abundance Monitoring-Region 2 (UCR steelhead)	WDFW Comment
Watershed Projects - Region 2	WDFW Comment
Status and Trend	Yakama Nation MOA (200844700)
Project Development / Mgt	Yakama Nation MOA (200844800)
RME Existing (Regional RM&E Coordination - Monitoring)	Yakama Nation MOA (200844900)
Upper Columbia Spring Chinook - Nutrient Supplementation	Yakama Nation MOA (200845600)
Upper Columbia Steelhead - Nutrient Supplementation	Yakama Nation MOA (200845700)
Upper Columbia Steelhead Kelt Reconditioning	Yakama Nation MOA (200845800)

Blue Mountain Province

Asotin Creek Subbasin

Strategy	Recommended Measure		Source of Measure
Protect and conserve natural ecological processes	Continue existing protections, and increase protection of high quality habitats through acquisition, conservation easements, and cooperative agreements.		CBFWA recommendation
Restore floodplain connectivity and function.	Reconnect floodplains to channels.		CBFWA recommendation
	Reconnect side channels and off-channel habitats to stream channels.		CBFWA recommendation
	Remove dikes and levies.		CBFWA recommendation
Restore riparian condition and LWD recruitment	Restore natural riparian vegetative communities.	Continued Implementation of Prioritized Asotin Creek Watershed Habitat Projects	FCRPS BiOp Action/New Recommendation (199401805)
		Continued Riparian Buffer Projects on Couse/Tenmile and other Salmonid Bearing Streams in Asotin County.	FCRPS BiOp Action/New Recommendation (200205000)
		Protect and Restore the Asotin Creek Watershed	Nez Perce Tribe Recommendation (200205400*)
	Install and maintain riparian fencing.	Continued Implementation of Prioritized Asotin Creek Watershed Habitat Projects	FCRPS BiOp Action/New Recommendation (199401805)
	Continued Riparian Buffer Projects on Couse/Tenmile and other	FCRPS BiOp Action/New	

		Salmonid Bearing Streams in Asotin County.	Recommendation (200205000)
Restore floodplain connectivity and function.	Reconnect floodplains to channels.	Protect and Restore the Asotin Creek Watershed	Nez Perce Tribe Recommendation (200205400*)
	Reconnect side channels and off-channel habitats to stream channels.	Protect and Restore the Asotin Creek Watershed	Nez Perce Tribe Recommendation (200205400*)
	Remove dikes and levies.		CBFWA recommendation
Restore natural hydrograph to provide sufficient flow during critical periods.	Install water control structures in fields, draws, ditches, etc.		CBFWA recommendation
Improve degraded water quality	Reduce sediment recruitment by improving road and ditch maintenance.	Continued Implementation of Prioritized Asotin Creek Watershed Habitat Projects	FCRPS BiOp Action/New Recommendation (199401805)
		Continued Riparian Buffer Projects on Couse/Tenmile and other Salmonid Bearing Streams in Asotin County.	FCRPS BiOp Action/New Recommendation (200205000)
		Protect and Restore the Asotin Creek Watershed	Nez Perce Tribe Recommendation (200205400*)
	Relocate roads where feasible.	Protect and Restore the Asotin Creek Watershed	Nez Perce Tribe Recommendation (200205400*)
Mitigate for impeded and blocked passage	Implement a mix of artificial propagation Recommendations, habitat restoration actions, improved mainstem passage and	Asotin Spring Chinook reintroduction	Nez Perce Tribe Recommendation

	survival in an integrated approach to improve anadromous fish returns to the Asotin Subbasin and to achieve objectives.		
Increase hatchery effectiveness for restoration and mitigation	Explore and implement innovative hatchery actions to achieve both restoration and mitigation objectives.	Asotin Spring Chinook reintroduction	Nez Perce Tribe Recommendation
Monitor status and trends of focal species and populations	Establish or use preexisting index sites to gather baseline, trend, and comparative data.	Assess Salmonids in Asotin Creek Watershed	FCRPS BiOp Action/WDFW Comment (200205300)
Monitor and evaluate effectiveness of actions taken to implement Recommendations.	Develop methods to monitor biological response to habitat improvement.		CBFWA recommendation
	Monitor effectiveness of hatchery and natural production Recommendations.	Continued Implementation of Prioritized Asotin Creek Watershed Habitat Projects	FCRPS BiOp Action/New Recommendation (199401805)
	Gather and analyze harvest data to aid in run reconstruction to evaluate status and action effectiveness.		CBFWA recommendation

Grande Ronde River Subbasin

Strategy	Recommended Measure		Source of Measure
Protect and conserve natural ecological processes	Continue existing protections, and increase protection of high quality habitats through acquisition, conservation easements, and cooperative agreements.	CTUIR Grande Ronde Subbasin Restoration Project	Umatilla Tribe MOA (199608300)
		CTUIR Ceded Area Priority Stream Corridor Convservation and Protection (capital acquisition) (Formerly: Expanded CTUIR Ceded Area Priority Stream Corridor Protection- Conservation Easements and Acquisition (upper Grande Ronde a priority area)).	Umatilla Tribe MOA (200820700)
		Grand Ronde Model Watershed Program Habitat Restoration - Planning, Coordination and Implementation	ODFW Recommendation (199202601)
		Protecting & Restoring the Wallowa River Watershed	Nez Perce Tribe Recommendation (200710500*)
		NPT Protect and Restore NE OR	FCRPS BiOp Action/Nez Perce Tribe Recommendation (200739300)
Restore channel structure and complexity.	Restore natural channel form.	CTUIR Grande Ronde Subbasin Restoration Project	Umatilla Tribe MOA (199608300)
		Grand Ronde Model Watershed Program Habitat Restoration - Planning, Coordination and Implementation	ODFW Recommendation (199202601)
		ODFW Blue Mountain Oregon Fish Habitat Improvement	FCRPS BiOp Action/ODFW Recommendation (198402500)
	Place stable wood and other large organic debris in streambeds.	Grand Ronde Model Watershed Program Habitat Restoration - Planning, Coordination and Implementation	ODFW Recommendation (199202601)
		Protecting & Restoring the Wallowa River Watershed	Nez Perce Tribe Recommendation (200710500*)
		ODFW Blue Mountain Oregon Fish Habitat Improvement	FCRPS BiOp Action/ODFW Recommendation (198402500)

	Stabilize and protect stream banks.	CTUIR Grande Ronde Subbasin Restoration Project	Umatilla Tribe MOA (199608300)
		Grand Ronde Model Watershed Program Habitat Restoration - Planning, Coordination and Implementation	ODFW Recommendation (199202601)
		Protecting & Restoring the Wallowa River Watershed	Nez Perce Tribe Recommendation (200710500*)
		ODFW Blue Mountain Oregon Fish Habitat Improvement	FCRPS BiOp Action/ODFW Recommendation (198402500)
Restore riparian condition and LWD recruitment	Restore natural riparian vegetative communities.	CTUIR Grande Ronde Subbasin Restoration Project	Umatilla Tribe MOA (199608300)
		Grand Ronde Model Watershed Program Habitat Restoration - Planning, Coordination and Implementation	ODFW Recommendation (199202601)
		Protecting & Restoring the Wallowa River Watershed	Nez Perce Tribe Recommendation (200710500*)
		ODFW Blue Mountain Oregon Fish Habitat Improvement	FCRPS BiOp Action/ODFW Recommendation (198402500)
	Implement grazing strategies that promote riparian recovery.	ODFW Blue Mountain Oregon Fish Habitat Improvement	FCRPS BiOp Action/ODFW Recommendation (198402500)
	Develop riparian buffers and setbacks.		CBFWA recommendation
	Install riparian enclosure fencing.	CTUIR Grande Ronde Subbasin Restoration Project	Umatilla Tribe MOA (199608300)
		Grand Ronde Model Watershed Program Habitat Restoration - Planning, Coordination and Implementation	ODFW Recommendation (199202601)
		Protecting & Restoring the Wallowa River Watershed	Nez Perce Tribe Recommendation (200710500*)

Restore natural hydrograph to provide sufficient flow during critical periods.	Obtain additional instream water rights.		CBFWA recommendation
	Improve irrigation conveyance and efficiency.	Protecting & Restoring the Wallowa River Watershed	Nez Perce Tribe Recommendation (200710500*)
		ODFW Blue Mountain Oregon Fish Habitat Improvement	FCRPS BiOp Action/ODFW Recommendation (198402500)
	Enhance hyporheic flows and spring inputs	Grand Ronde Model Watershed Program Habitat Restoration - Planning, Coordination and Implementation	ODFW Recommendation (199202601)
		ODFW Blue Mountain Oregon Fish Habitat Improvement	FCRPS BiOp Action/ODFW Recommendation (198402500)
	Improve degraded water quality	Increase riparian shading.	CTUIR Grande Ronde Subbasin Restoration Project
Grand Ronde Model Watershed Program Habitat Restoration - Planning, Coordination and Implementation			ODFW Recommendation (199202601)
Protecting & Restoring the Wallowa River Watershed			Nez Perce Tribe Recommendation (200710500*)
Reduce sediment recruitment by restoring natural functions and processes through Recommendations identified to address physical habitat quality/quantity limitations.		CTUIR Grande Ronde Subbasin Restoration Project	Umatilla Tribe MOA (199608300)
		Grand Ronde Model Watershed Program Habitat Restoration - Planning, Coordination and Implementation	ODFW Recommendation (199202601)
		Protecting & Restoring the Wallowa River Watershed	Nez Perce Tribe Recommendation (200710500*)
		ODFW Blue Mountain Oregon Fish Habitat Improvement	FCRPS BiOp Action/ODFW Recommendation (198402500)

Mitigate for impeded and blocked passage	Implement a mix of artificial propagation Recommendations, habitat restoration actions, improved mainstem passage and survival in an integrated approach to improve anadromous fish returns to the Grande Ronde subbasin and to achieve objectives.	Protecting & Restoring the Wallowa River Watershed	Nez Perce Tribe Recommendation (200710500*)
		Grande Ronde Coho Reintroduction	Nez Perce Tribe Recommendation
Increase hatchery effectiveness for restoration and mitigation.	Explore and implement innovative hatchery actions to achieve both restoration and mitigation objectives.	Grande Ronde Supplementation Operations and Maintenance	Umatilla Tribe MOA (19980070)
		Snake River Safety Net Program - UGR and CC	Umatilla Tribe MOA (200820800)
		Snake River fall Chinook - modify ponds at Lyons Ferry to improve adult holding	Umatilla Tribe MOA (200821000)
		Grande Ronde/Imnaha Endemic Spring Chinook Supplementation – Northeast Oregon Hatchery	FCRPS BiOp Action/Nez Perce Tribe Recommendation (198805301)
		Grande Ronde Supp Lostine O&M/M&E	FCRPS BiOp Action/Nez Perce Tribe Recommendation (199800702)
		Grande Ronde Coho Reintroduction	Nez Perce Tribe Recommendation
		Fall Chinook Cottonwood Pond	Nez Perce Tribe Recommendation
		Wallowa Lake Sockeye	Nez Perce Tribe Recommendation
		Northeast Oregon (NEOH) Outplanting Facilities Master Plan	ODFW Recommendation (198805305)
		Grande Ronde Basin Endemic Spring Chinook Supplementation Project: Northeast Oregon hatcheries implementation-ODFW	FCRPS BiOp Action/ODFW Recommendation (199800704)
		Grande Ronde Captive Brood O&M	FCRPS BiOp Action/ODFW Recommendation

			(199801001)
		OR Snake River Spring/Summer Chinook Salmon Captive Propagation	FCRPS BiOp Action/ODFW Recommendation (200740400)
Monitor status and trends of focal species and populations	Establish or use preexisting index sites to gather baseline, trend, and comparative data.	CTUIR Grande Ronde Subbasin Restoration Project	Umatilla Tribe MOA (199608300)
		Grande Ronde Cooperative Salmonid Monitoring and Evaluation Project	Umatilla Tribe MOA (200708300)
		Joseph Creek Steelhead Abundance	Nez Perce Tribe Recommendation
		ODFW Blue Mountain Oregon Fish Habitat Improvement	FCRPS BiOp Action/ODFW Recommendation (198402500)
		Investigate Life History Of Spring Chinook Salmon and Summer Steelhead in the Grande Ronde River Subbasin	FCRPS BiOp Action/ODFW Recommendation (199202604)
		Oregon Plan Monitoring of Steelhead Status, Trend, and Habitat in the Grande Ronde River Subbasin.	ODFW Recommendation (200733700*)
Monitor and evaluate effectiveness of actions taken to implement Recommendations.	Develop methods to monitor biological response to habitat improvement.	Grande Ronde Cooperative Salmonid Monitoring and Evaluation Project	Umatilla Tribe MOA (200708300)
		Oregon Plan Monitoring of Steelhead Status, Trend, and Habitat in the Grande Ronde River Subbasin.	ODFW Recommendation (200733700*)
	Monitor effectiveness of hatchery and natural production Recommendations.	Grande Ronde Cooperative Salmonid Monitoring and Evaluation Project	Umatilla Tribe MOA (200708300)
		Grande Ronde Supp Lostine O&M/M&E	199800702 FCRPS BiOp Action/Nez Perce Tribe Recommendation (199800702)
		Captive Broodstock Artificial Propagation	FCRPS BiOp Action/Nez Perce Tribe Recommendation (199801006)
		NEOH Monitoring & Evaluation Implementation	Nez Perce Tribe Recommendation (200713200*)

		Investigate Life History Of Spring Chinook Salmon and Summer Steelhead in the Grande Ronde River Subbasin	FCRPS BiOp Action/ODFW Recommendation (199202604)
	Gather and analyze harvest data to aid in run reconstruction to evaluate status and action effectiveness.	Grande Ronde Cooperative Salmonid Monitoring and Evaluation Project	Umatilla Tribe MOA (200708300)

Innaha River Subbasin

Strategy	Recommended Measure		Source of Measure
Protect and conserve natural ecological processes	Continue existing protections, and increase protection of high quality habitats through acquisition, conservation easements, and cooperative agreements.		CBFWA recommendation
Restore channel structure and complexity.	Restore natural channel form.		CBFWA recommendation
	Place stable wood and other large organic debris in streambeds.		CBFWA recommendation
	Stabilize and protect stream banks.		CBFWA recommendation
Restore riparian condition and LWD recruitment	Restore natural riparian vegetative communities.		CBFWA recommendation
	Implement grazing strategies that promote riparian recovery.		CBFWA recommendation
	Develop riparian buffers and setbacks.		CBFWA recommendation
	Install riparian enclosure fencing.		CBFWA recommendation
Restore natural hydrograph to provide sufficient flow during critical periods.	Obtain additional instream water rights.		CBFWA recommendation
	Improve irrigation conveyance and efficiency.		CBFWA recommendation

	Enhance hyporheic flows and spring inputs.		CBFWA recommendation
Improve degraded water quality	Increase riparian shading.		CBFWA recommendation
Mitigate for impeded and blocked passage	Implement a mix of artificial propagation Recommendations, habitat restoration actions, improved mainstem passage and survival in an integrated approach to improve anadromous fish returns to the Imnaha Subbasin and to achieve objectives.		CBFWA recommendation
Increase hatchery effectiveness for restoration and mitigation.	Explore and implement innovative hatchery actions to achieve both restoration and mitigation objectives.		CBFWA recommendation
Monitor status and trends of focal species and populations	Establish or use preexisting index sites to gather baseline, trend, and comparative data.	Imnaha River Smolt to Adult Return Rate and Smolt Monitoring Project	Nez Perce Tribe Recommendation/ODFW Recommendation (199701501)
		Adult Steelhead Escapement Monitoring - Imnaha River Subbasin	Nez Perce Tribe Recommendation (200205600*)
	Gather and analyze harvest data to aid in run reconstruction to evaluate status and action effectiveness		CBFWA recommendation

Monitor and evaluate effectiveness of actions taken to implement Recommendations.	Develop methods to monitor biological response to habitat improvement.		CBFWA recommendation
	Monitor effectiveness of hatchery and natural production Recommendations.	Imnaha River Smolt to Adult Return Rate and Smolt Monitoring Project	Nez Perce Tribe Recommendation/ODFW Recommendation (199701501)
	Gather and analyze harvest data to aid in run reconstruction to evaluate status and action effectiveness.		CBFWA recommendation

Snake Hells Canyon Subbasin

Strategy	Recommended Measure		Source of Measure
Protect and conserve natural ecological processes	Continue existing protections, and increase protection of high quality habitats through acquisition, conservation easements, and cooperative agreements.		CBFWA recommendation
Restore channel structure and complexity.	Restore natural channel form.		CBFWA recommendation
	Place stable wood and other large organic debris in streambeds.		CBFWA recommendation
	Stabilize and protect stream banks.		CBFWA recommendation
Restore riparian condition and LWD recruitment	Restore natural riparian vegetative communities.		CBFWA recommendation
	Implement grazing strategies that promote riparian recovery.		CBFWA recommendation
	Develop riparian buffers and setbacks.		CBFWA recommendation
	Install riparian enclosure fencing.		CBFWA recommendation
Restore normative hydrograph to provide sufficient flow during critical periods.	Obtain additional instream water rights.		CBFWA recommendation
	Improve irrigation conveyance and efficiency.		CBFWA recommendation
	Enhance hyporheic flows and spring inputs.		CBFWA recommendation
Improve degraded water quality	Increase riparian shading.		CBFWA recommendation

Mitigate for impeded and blocked passage	Implement a mix of artificial propagation Recommendations, habitat restoration actions, improved mainstem passage and survival in an integrated approach to improve anadromous fish returns to the Snake Hells Canyon Subbasin and to achieve objectives.	Kelt Recondition/Repro Success	CRITFC MOA (200740100)
Increase hatchery effectiveness for restoration and mitigation	Explore and implement innovative hatchery actions to achieve both restoration and mitigation objectives.	Spawning distribution of Snake River Fall Chinook salmon	FCRPS BiOp Action/New Recommendation (198801003)
Monitor status and trends of focal species and populations	Establish or use preexisting index sites to gather baseline, trend, and comparative data.		CBFWA recommendation
	Gather and analyze harvest data to aid in run reconstruction to evaluate status and action effectiveness		CBFWA recommendation

Monitor and evaluate effectiveness of actions taken to implement Recommendations.	Develop methods to monitor biological response to habitat improvement.		CBFWA recommendation
	Monitor effectiveness of hatchery and natural production Recommendations.		CBFWA recommendation
	Gather and analyze harvest data to aid in run reconstruction to evaluate status and action effectiveness.		CBFWA recommendation

Mountain Snake Province

Clearwater River Subbasin

Strategy	Recommended Measure		Source of Measure
Protect and conserve natural ecological processes	Continue existing protections, and increase protection of high quality habitats through acquisition, conservation easements, and cooperative agreements.	Protect and Restore Waw'aalamnime to 'Imnamatnoon Creek Analysis Area	FCRPS BiOp Action/Nez Perce Tribe Recommendation (199607703)
		Protect & Restore the Big Canyon Creek Watershed	FCRPS BiOp Action/Nez Perce Tribe Recommendation (199901600)
		Protect and Restore Lapwai Creek Watershed	FCRPS BiOp Action/Nez Perce Tribe Recommendation (199901700)
		Rehabilitate Newsome Creek	FCRPS BiOp Action/Nez Perce Tribe Recommendation (200003500)
		Protect And Restore Mill Creek	FCRPS BiOp Action/Nez Perce Tribe Recommendation (200003600)
		Protect & Restore Red River Watershed	FCRPS BiOp Action/Nez Perce Tribe Recommendation (200207200)
		Protect and Restore Crooked Fork to Colt Killed Analysis Area	FCRPS BiOp Action/Nez Perce Tribe Recommendation (200207400)
		Restore and Protect Crooked River Watershed	Nez Perce Tribe Recommendation (200713400*)
		Restore and Protect American River Watershed	Nez Perce Tribe Recommendation (200714200*)
		Protect and Restore the Middle Lochsa	FCRPS BiOp Action/Nez Perce Tribe Recommendation (200725500)
		Protect and Restore the Upper Lochsa Watershed	FCRPS BiOp Action/Nez

			Perce Tribe Recommendation (200739500)
		Potlatch River Basin	Nez Perce Tribe Recommendation
		Protect and Restore the Lower Lochsa	Nez Perce Tribe Recommendation
		Restore Selway River Watershed	Nez Perce Tribe Recommendation
Restore passage and connectivity to habitats blocked or impaired by artificial barriers.	Remove or replace culverts and other passage barriers in the Lochsa River watershed per priorities described in the recovery plan.	Protect and Restore Waw'aalamnime to 'Imnamatnoon Creek Analysis Area	FCRPS BiOp Action/Nez Perce Tribe Recommendation (199607703)
		Protect and Restore the Middle Lochsa	FCRPS BiOp Action/Nez Perce Tribe Recommendation (200725500)
		Protect and Restore the Upper Lochsa Watershed	FCRPS BiOp Action/Nez Perce Tribe Recommendation (200739500)
		Protect and Restore the Lower Lochsa	Nez Perce Tribe Recommendation
Restore floodplain connectivity and function.	Reduce road-related impacts through relocation, reconstruction, or decommissioning, and return road surfaces, cuts, and fills to productivity.	Protect and Restore Lolo Creek Watershed	FCRPS BiOp Action/Nez Perce Tribe Recommendation (199607702)
		Restore McComas Meadows/ Meadow Creek Watershed	FCRPS BiOp Action/Nez Perce Tribe Recommendation (199607705)
		Protect & Restore the Big Canyon Creek Watershed	FCRPS BiOp Action/Nez Perce Tribe Recommendation (199901600)
		Protect and Restore Lapwai Creek Watershed	FCRPS BiOp Action/Nez Perce Tribe Recommendation (199901700)
		Rehabilitate Newsome Creek	FCRPS BiOp Action/Nez Perce Tribe Recommendation (200003500)
		Protect & Restore Red River Watershed	FCRPS BiOp Action/Nez Perce Tribe Recommendation (200207200)

		Protect and Restore Crooked Fork to Colt Killed Analysis Area	FCRPS BiOp Action/Nez Perce Tribe Recommendation (200207400)
		Restore and Protect Crooked River Watershed	Nez Perce Tribe Recommendation (200713400*)
		Restore and Protect American River Watershed	Nez Perce Tribe Recommendation (200714200*)
		Protect and Restore the Middle Lochsa	FCRPS BiOp Action/Nez Perce Tribe Recommendation (200725500)
		Protect and Restore the Upper Lochsa Watershed	FCRPS BiOp Action/Nez Perce Tribe Recommendation (200739500)
		Potlatch River Basin	Nez Perce Tribe Recommendation
		Protect and Restore the Lower Lochsa	Nez Perce Tribe Recommendation
		Restore Selway River Watershed	Nez Perce Tribe Recommendation
	Restore channel integrity.	Protect and Restore Lolo Creek Watershed	FCRPS BiOp Action/Nez Perce Tribe Recommendation (199607702)
		Protect & Restore the Big Canyon Creek Watershed	FCRPS BiOp Action/Nez Perce Tribe Recommendation (199901600)
		Big Canyon Fish Habitat	IDFG Recommendation (199901500)
		Protect and Restore Lapwai Creek Watershed	FCRPS BiOp Action/Nez Perce Tribe Recommendation (199901700)
		Lapwai Cr Anadromous Habitat	FCRPS BiOp Action/IDFG Recommendation (200207000)
		Rehabilitate Newsome Creek	FCRPS BiOp Action/Nez Perce Tribe Recommendation

			(200003500)
		Protect & Restore Red River Watershed	FCRPS BiOp Action/Nez Perce Tribe Recommendation (200207200)
		Protect and Restore Crooked Fork to Colt Killed Analysis Area	FCRPS BiOp Action/Nez Perce Tribe Recommendation (200207400)
		Restore Access to Upper Musselshell Creek (200711900)	Nez Perce Tribe Recommendation (200711900*)
		Restore and Protect Crooked River Watershed (200713400)	Nez Perce Tribe Recommendation (200713400*)
		Restore and Protect American River Watershed (200714200)	Nez Perce Tribe Recommendation (200714200*)
		Protect and Restore the Middle Lochsa (200725500)	FCRPS BiOp Action/Nez Perce Tribe Recommendation (200725500)
		Protect and Restore the Upper Lochsa Watershed (200739500)	FCRPS BiOp Action/Nez Perce Tribe Recommendation (200739500)
		Potlatch River Basin	Nez Perce Tribe Recommendation
		Protect and Restore the Lower Lochsa	Nez Perce Tribe Recommendation
		Restore Selway River Watershed	Nez Perce Tribe Recommendation
		Restore Potlatch R Watershed	FCRPS BiOp Action/IDFG Recommendation (200206100)
Restore riparian condition and LWD recruitment	Establish riparian vegetation to provide cover, stabilize streambanks, reduce stream temperatures, and	Protect and Restore Lolo Creek Watershed	FCRPS BiOp Action/Nez Perce Tribe Recommendation (199607702)
		Protect and Restore Waw'aalamnime to 'Imnamatnoon Creek Analysis Area	FCRPS BiOp Action/Nez Perce Tribe Recommendation

	provide LWD.		(199607703)
		Protect & Restore the Big Canyon Creek Watershed	FCRPS BiOp Action/Nez Perce Tribe Recommendation (199901600)
		Big Canyon Fish Habitat	IDFG Recommendation (199901500)
		Protect and Restore Lapwai Creek Watershed	FCRPS BiOp Action/Nez Perce Tribe Recommendation (199901700)
		Lapwai Cr Anadromous Habitat	FCRPS BiOp Action/IDFG Recommendation (200207000)
		Rehabilitate Newsome Creek	FCRPS BiOp Action/Nez Perce Tribe Recommendation (200003500)
		Protect And Restore Mill Creek	FCRPS BiOp Action/Nez Perce Tribe Recommendation (200003600)
		Protect & Restore Red River Watershed	FCRPS BiOp Action/Nez Perce Tribe Recommendation (200207200)
		Protect and Restore Crooked Fork to Colt Killed Analysis Area	FCRPS BiOp Action/Nez Perce Tribe Recommendation (200207400)
		Restore Access to Upper Musselshell Creek	Nez Perce Tribe Recommendation (200711900*)
		Restore and Protect Crooked River Watershed	Nez Perce Tribe Recommendation (200713400*)
		Restore and Protect American River Watershed	Nez Perce Tribe Recommendation (200714200*)
		Protect and Restore the Middle Lochsa	FCRPS BiOp Action/Nez Perce Tribe Recommendation (200725500)
		Protect and Restore the Upper Lochsa Watershed	FCRPS BiOp Action/Nez

			Perce Tribe Recommendation (200739500)
		Potlatch River Basin	Nez Perce Tribe Recommendation
		Protect and Restore the Lower Lochsa	Nez Perce Tribe Recommendation
		Restore Selway River Watershed	Nez Perce Tribe Recommendation
		Restore Potlatch R Watershed	FCRPS BiOp Action/IDFG Recommendation (200206100)
Improve degraded water quality	Reduce sediment recruitment by modifying roads and trails.	Protect and Restore Lolo Creek Watershed	FCRPS BiOp Action/Nez Perce Tribe Recommendation (199607702)
		Protect and Restore Waw'aalamnime to 'Imnamatnoon Creek Analysis Area	FCRPS BiOp Action/Nez Perce Tribe Recommendation (199607703)
		Restore McComas Meadows/ Meadow Creek Watershed	FCRPS BiOp Action/Nez Perce Tribe Recommendation (199607705)
		Protect & Restore the Big Canyon Creek Watershed	FCRPS BiOp Action/Nez Perce Tribe Recommendation (199901600)
		Protect and Restore Lapwai Creek Watershed	FCRPS BiOp Action/Nez Perce Tribe Recommendation (199901700)
		Rehabilitate Newsome Creek	FCRPS BiOp Action/Nez Perce Tribe Recommendation (200003500)
		Protect & Restore Red River Watershed	FCRPS BiOp Action/Nez Perce Tribe Recommendation (200207200)
		Protect and Restore Crooked Fork to Colt Killed Analysis Area	FCRPS BiOp Action/Nez Perce Tribe Recommendation (200207400)
		Restore and Protect Crooked River Watershed	Nez Perce Tribe

			Recommendation (200713400*)
		Restore and Protect American River Watershed	Nez Perce Tribe Recommendation (200714200*)
		Protect and Restore the Middle Lochsa	FCRPS BiOp Action/Nez Perce Tribe Recommendation (200725500)
		Protect and Restore the Upper Lochsa Watershed	FCRPS BiOp Action/Nez Perce Tribe Recommendation (200739500)
		Potlatch River Basin	Nez Perce Tribe Recommendation
		Protect and Restore the Lower Lochsa	Nez Perce Tribe Recommendation
		Restore Selway River Watershed	Nez Perce Tribe Recommendation
	Establish riparian vegetation to provide cover, stabilize streambanks, and reduce stream temperatures.	Big Canyon Fish Habitat	IDFG Recommendation (199901500)
		Lapwai Cr Anadromous Habitat	FCRPS BiOp Action/IDFG Recommendation (200207000)
		Restore Potlatch R Watershed	FCRPS BiOp Action/IDFG Recommendation (200206100)
	Reduce high water temperatures by restoring natural functions and processes through Recommendations identified to address physical habitat quality/quantity limitations.	Protect and Restore Lolo Creek Watershed	FCRPS BiOp Action/Nez Perce Tribe Recommendation (199607702)
		Protect and Restore Waw'aalamnime to 'Imnamatnoon Creek Analysis Area	FCRPS BiOp Action/Nez Perce Tribe Recommendation (199607703)
		Restore McComas Meadows/ Meadow Creek Watershed	FCRPS BiOp Action/Nez Perce Tribe Recommendation (199607705)
		Protect & Restore the Big Canyon Creek Watershed	FCRPS BiOp Action/Nez Perce Tribe Recommendation

		(199901600)
	Big Canyon Fish Habitat	IDFG Recommendation (199901500)
	Protect and Restore Lapwai Creek Watershed	FCRPS BiOp Action/Nez Perce Tribe Recommendation (199901700)
	Lapwai Cr Anadromous Habitat	FCRPS BiOp Action/IDFG Recommendation (200207000)
	Rehabilitate Newsome Creek	FCRPS BiOp Action/Nez Perce Tribe Recommendation (200003500)
	Protect And Restore Mill Creek	FCRPS BiOp Action/Nez Perce Tribe Recommendation (200003600)
	Protect & Restore Red River Watershed	FCRPS BiOp Action/Nez Perce Tribe Recommendation (200207200)
	Protect and Restore Crooked Fork to Colt Killed Analysis Area	FCRPS BiOp Action/Nez Perce Tribe Recommendation (200207400)
	Restore and Protect Crooked River Watershed	Nez Perce Tribe Recommendation (200713400*)
	Restore and Protect American River Watershed	Nez Perce Tribe Recommendation (200714200*)
	Protect and Restore the Middle Lochsa	FCRPS BiOp Action/Nez Perce Tribe Recommendation (200725500)
	Protect and Restore the Upper Lochsa Watershed	FCRPS BiOp Action/Nez Perce Tribe Recommendation (200739500)
	Potlatch River Basin	Nez Perce Tribe Recommendation
	Protect and Restore the Lower Lochsa	Nez Perce Tribe Recommendation

		Restore Selway River Watershed	Nez Perce Tribe Recommendation
		Restore Potlatch R Watershed	FCRPS BiOp Action/IDFG Recommendation (200206100)
Mitigate for impeded and blocked passage	Implement a mix of artificial propagation Recommendations, habitat restoration actions, improved mainstem passage and survival in an integrated approach to improve anadromous fish returns to the Clearwater River and to achieve objectives.	Nutrient Enhancement Project	IDFG MOA (200860700)
		Lower Clearwater River/Potlatch River Watershed Management Plan Implementation	IDFG MOA (200860400)
		Clearwater Focus Program, Idaho SCC	IDFG Recommendation (199608600)
		Coho Restoration O&M	Nez Perce Tribe Recommendation
	Continue implementation of existing Resident Fish Substitution actions to partially mitigate for the blocked area behind Dworshak Dam.		CBFWA recommendation
	Explore and implement additional Resident Fish Substitution actions towards mitigation for the Dworshak blocked area.		CBFWA recommendation
Increase hatchery effectiveness for restoration and mitigation.	Explore and implement innovative hatchery actions to achieve both restoration and mitigation objectives.	Nez Perce Tribal Hatchery Operations & Maintenance	Nez Perce Tribe Recommendation (198335003)
		Clearwater River Spring Chinook smolt production at NPTH	Nez Perce Tribe Recommendation
		Kooskia Fish Hatchery improvements - Clear Creek Spring Chinook	Nez Perce Tribe Recommendation
		South Fork Clearwater steelhead supplementation	Nez Perce Tribe

			Recommendation
		Snake River fall chinook supplementation-Fall Chinook Acclimation Project (FCAP)	FCRPS BiOp Action/Nez Perce Tribe Recommendation (199801005)
Monitor status and trends of focal species and populations	Establish or use preexisting index sites to gather baseline, trend, and comparative data.	Idaho Steelhead Monitoring and Evaluation Studies	IDFG MOA (199005500)
		Idaho Natural Production Monitoring and Evaluation	FCRPS BiOp Action/IDFG Recommendation (199107300)
		Distribution and Abundance Monitoring of <i>Oncorhynchus mykiss</i> within the Lower Clearwater Subbasin	Nez Perce Tribe Recommendation (200723300)
		Natural-origin Snake River Steelhead MPG Abundance via radio tagging and Genetic Stock Indexing (GSI) at Lower Granite Dam, with special attention to B-run	Nez Perce Tribe Recommendation
		Idaho Supplementation Studies	FCRPS BiOp Action/IDFG Recommendation (198909800)
	Gather and analyze harvest data to aid in run reconstruction to evaluate status and action effectiveness.	Idaho Steelhead Monitoring and Evaluation Studies	IDFG MOA (199005500)
		Snake River steelhead annual run-reconstruction of hatchery returns, harvest, and escapement to known and unknown population areas	Nez Perce Tribe Recommendation
		Idaho Supplementation Studies	FCRPS BiOp Action/IDFG Recommendation (198909800)
	Monitor and evaluate effectiveness of actions taken to implement Recommendations.	Develop methods to monitor biological response to habitat improvement.	Idaho Steelhead Monitoring and Evaluation Studies
Idaho Natural Production Monitoring and Evaluation			FCRPS BiOp Action/IDFG Recommendation (199107300)
Distribution and Abundance Monitoring of <i>Oncorhynchus mykiss</i> within the Lower Clearwater Subbasin			Nez Perce Tribe Recommendation (200723300)

		Natural-origin Snake River Steelhead MPG Abundance via radio tagging and Genetic Stock Indexing (GSI) at Lower Granite Dam, with special attention to B-run	Nez Perce Tribe Recommendation
		Evaluating Stream Habitat Using the Nez Perce Tribe - DFRM Watershed Monitoring Plan	Nez Perce Tribe Recommendation
Monitor effectiveness of hatchery and natural production Recommendations.		Idaho Steelhead Monitoring and Evaluation Studies	IDFG MOA (199005500)
		Idaho Natural Production Monitoring and Evaluation	FCRPS BiOp Action/IDFG Recommendation (199107300)
		Nez Perce Tribal Hatchery M&E	Nez Perce Tribe Recommendation (198335003)
		B-run steelhead supplementation effectiveness research in Lolo Creek and South Fork Clearwater	Nez Perce Tribe Recommendation
		Snake River steelhead annual run-reconstruction of hatchery returns, harvest, and escapement to known and unknown population areas	Nez Perce Tribe Recommendation
		Idaho Supplementation Studies	FCRPS BiOp Action/IDFG Recommendation (198909800)
Gather and analyze harvest data to aid in run reconstruction to evaluate status and action effectiveness.		Idaho Steelhead Monitoring and Evaluation Studies	IDFG MOA (199005500)
		Snake River steelhead annual run-reconstruction of hatchery returns, harvest, and escapement to known and unknown population areas	Nez Perce Tribe Recommendation

Salmon River Subbasin

Strategy	Recommended Measure		Source of Measure
Protect and conserve natural ecological processes	Continue existing protections, and increase protection of high quality habitats through acquisition, conservation easements, and cooperative agreements.	Upper Lemhi River Acquisition and Habitat Restoration: Acquisition	IDFG MOA (200860100)
		Lower Lemhi River Habitat Restoration Project: Easements	IDFG MOA (200860500)
		Upper Salmon Basin Watershed Project (USBWP) provides technical and administrative support with project implementation guidance to landowners to implement fish habitat projects on private lands	FCRPS BiOp Action/New Recommendation (199202603)
		Idaho Watershed Habitat Restoration Lemhi County	FCRPS BiOp Action/Nez Perce Tribe Recommendation (200739400)
		Snake River Sockeye Salmon Habitat and Limnological Monitoring	FCRPS BiOp Action/IDFG Recommendation (200740200)
Restore passage and connectivity to habitats blocked or impaired by artificial barriers.	Remove or replace culverts and other passage barriers per priorities described in the recovery plan.	Idaho Watershed Habitat Restoration Project via Custer Soil and Water Conservation District	FCRPS BiOp Action/IDFG Recommendation (200726800)
		Idaho Fish Screening and Passage Improvements	FCRPS BiOp Action/IDFG Recommendation (199401500)
		Upper Salmon Screen Tributary Passage	FCRPS BiOp Action/IDFG Recommendation (200739900)
		Upper Salmon Basin Watershed Project (USBWP) provides technical and administrative support with project implementation guidance to landowners to implement fish habitat projects on private lands	FCRPS BiOp Action/New Recommendation (199202603)
		Idaho Watershed Habitat Restoration Lemhi County	FCRPS BiOp Action/Nez Perce Tribe Recommendation (200739400)
		Coordinate and implement tributary habitat restoration in the Little Salmon River and lower Salmon River Idaho	FCRPS BiOp RPA/New Recommendation

			(200706500*)
		Big Creek Habitat and Passage	FCRPS BiOp RPA/New Recommendation
		ESA Habitat Restoration	Shoshone Bannock Tribe MOA
	Reintroduce native salmon species in areas where they have been extirpated by human activities.		CBFWA recommendation
Restore floodplain connectivity and function.	Reduce road-related impacts through relocation, reconstruction, or decommissioning, and return road surfaces, cuts, and fills to productivity.	Restore Salmon River (Challis, Idaho)	FCRPS BiOp Action/IDFG Recommendation (199901900)
		Idaho Watershed Habitat Restoration Project via Custer Soil and Water Conservation District	FCRPS BiOp Action/IDFG Recommendation (200726800)
		Upper Lemhi River Acquisition and Habitat Restoration: Restoration Activities	IDFG MOA (200860200)
		Pahsimeroi River Habitat Project	IDFG MOA (200860300)
		Protect and Restore Slate Creek	FCRPS BiOp Action/Nez Perce Tribe Recommendation (200706400)
Reconnect side channels and off-channel habitats to stream channels		Restore Salmon River (Challis, Idaho)	FCRPS BiOp Action/IDFG Recommendation (199901900)
		Idaho Watershed Habitat Restoration Project via Custer Soil and Water Conservation District	FCRPS BiOp Action/IDFG Recommendation (200726800)
		Idaho Fish Screening and Passage Improvements	FCRPS BiOp Action/IDFG Recommendation (199401500)
		Upper Salmon Screen Tributary Passage	FCRPS BiOp Action/IDFG Recommendation (200739900)

		Upper Lemhi River Acquisition and Habitat Restoration: Restoration Activities	IDFG MOA (200860200)
		Pahsimeroi River Habitat Project	IDFG MOA (200860300)
		Upper Salmon Basin Watershed Project (USBWP) provides technical and administrative support with project implementation guidance to landowners to implement fish habitat projects on private lands	FCRPS BiOp Action/New Recommendation (199202603)
		Idaho Watershed Habitat Restoration Lemhi County	FCRPS BiOp Action/Nez Perce Tribe Recommendation (200739400)
		Protect and Restore Slate Creek	FCRPS BiOp Action/Nez Perce Tribe Recommendation (200706400)
		Protect and Restore the Little Salmon Watershed	Nez Perce Tribe Recommendation (200712800*)
		Protect and restore Big Creek	Nez Perce Tribe Recommendation
		Big Creek Habitat and Passage	FCRPS BiOp RPA/New Recommendation
		Yankee Fork Salmon River Dredge Tailings Restoration Project	FCRPS BiOp /New Recommendation (200205900)
		ESA Habitat Restoration	Shoshone Bannock Tribe MOA
	Reconnect tributaries and ponds to river.	Restore Salmon River (Challis, Idaho)	FCRPS BiOp Action/IDFG Recommendation (199901900)
		Idaho Watershed Habitat Restoration Project via Custer Soil and Water Conservation District	FCRPS BiOp Action/IDFG Recommendation (200726800)
		Idaho Fish Screening and Passage Improvements	FCRPS BiOp Action/IDFG

			Recommendation (199401500)
		Upper Salmon Screen Tributary Passage	FCRPS BiOp Action/IDFG Recommendation (200739900)
		Upper Salmon Basin Watershed Project (USBWP) provides technical and administrative support with project implementation guidance to landowners to implement fish habitat projects on private lands	FCRPS BiOp Action/New Recommendation (199202603)
		Idaho Watershed Habitat Restoration Lemhi County	FCRPS BiOp Action/Nez Perce Tribe Recommendation (200739400)
		Protect and Restore Slate Creek	FCRPS BiOp Action/Nez Perce Tribe Recommendation (200706400)
		Reestablish Connectivity and Restore Fish Habitat in the East Fork of the South Fork Salmon River Watershed	FCRPS BiOp Action/Nez Perce Tribe Recommendation (200712700)
		Protect and Restore the Little Salmon Watershed	Nez Perce Tribe Recommendation (200712800*)
		Protect and restore Big Creek	Nez Perce Tribe Recommendation
		Big Creek Habitat and Passage	FCRPS BiOp RPA/New Recommendation
		Yankee Fork Salmon River Dredge Tailings Restoration Project	FCRPS BiOp /New Recommendation (200205900)
		ESA Habitat Restoration	Shoshone Bannock Tribe MOA

Restore riparian condition and LWD recruitment	Establish riparian vegetation to provide cover, stabilize streambanks, reduce stream temperatures, and provide LWD.	Restore Salmon River (Challis, Idaho)	FCRPS BiOp Action/IDFG Recommendation (199901900)
		Idaho Watershed Habitat Restoration Project via Custer Soil and Water Conservation District	FCRPS BiOp Action/IDFG Recommendation (200726800)
		Upper Lemhi River Acquisition and Habitat Restoration: Restoration Activities	IDFG MOA (200860200)
		Pahsimeroi River Habitat Project	IDFG MOA (200860300)
		Upper Salmon Basin Watershed Project (USBWP) provides technical and administrative support with project implementation guidance to landowners to implement fish habitat projects on private lands	FCRPS BiOp Action/New Recommendation (199202603)
		Idaho Watershed Habitat Restoration Lemhi County	FCRPS BiOp Action/Nez Perce Tribe Recommendation (200739400)
		Protect and Restore Slate Creek	FCRPS BiOp Action/Nez Perce Tribe Recommendation (200706400)
		Reestablish Connectivity and Restore Fish Habitat in the East Fork of the South Fork Salmon River Watershed	FCRPS BiOp Action/Nez Perce Tribe Recommendation (200712700)
		Protect and Restore the Little Salmon Watershed	Nez Perce Tribe Recommendation (200712800*)
		Protect and restore Big Creek	Nez Perce Tribe Recommendation
		Coordinate and implement tributary habitat restoration in the Little Salmon River and lower Salmon River Idaho	FCRPS BiOp RPA/New Recommendation (200706500*)
Big Creek Habitat and Passage	FCRPS BiOp RPA/New Recommendation		
Salmon River Habitat Enhancement	FCRPS BiOp /New		

			Recommendation (199405000)
		ESA Habitat Restoration	Shoshone Bannock Tribe MOA
	Reduce road densities.	Protect and Restore Slate Creek	FCRPS BiOp Action/Nez Perce Tribe Recommendation (200706400)
Improve degraded water quality	Reduce road densities.	Protect and Restore Slate Creek	FCRPS BiOp Action/Nez Perce Tribe Recommendation (200706400)
	Reduce sediment recruitment by modifying roads and trails.	Upper Lemhi River Acquisition and Habitat Restoration: Restoration Activities	IDFG MOA (200860200)
		Pahsimeroi River Habitat Project	IDFG MOA (200860300)
		Idaho Watershed Habitat Restoration Project via Custer Soil and Water Conservation District	FCRPS BiOp Action/IDFG Recommendation (200726800)
		Protect and Restore Slate Creek	FCRPS BiOp Action/Nez Perce Tribe Recommendation (200706400)
		Reestablish Connectivity and Restore Fish Habitat in the East Fork of the South Fork Salmon River Watershed	FCRPS BiOp Action/Nez Perce Tribe Recommendation (200712700)
	Rehabilitate abandoned mine sites.	Reestablish Connectivity and Restore Fish Habitat in the East Fork of the South Fork Salmon River Watershed	FCRPS BiOp Action/Nez Perce Tribe Recommendation (200712700)

	Reduce sediment and metals recruitment by rehabilitating abandoned mine sites in the Big Creek, Bear Valley Creek, and Yankee Fork watersheds.	Salmon River Habitat Enhancement	FCRPS BiOp /New Recommendation (199405000)
		Yankee Fork Salmon River Dredge Tailings Restoration Project	FCRPS BiOp /New Recommendation (200205900)
	Reduce high water temperatures by restoring natural functions and processes through Recommendations identified to address physical habitat quality/quantity limitations.	Restore Salmon River (Challis, Idaho)	FCRPS BiOp Action/IDFG Recommendation (199901900)
		Idaho Watershed Habitat Restoration Project via Custer Soil and Water Conservation District	FCRPS BiOp Action/IDFG Recommendation (200726800)
		Upper Lemhi River Acquisition and Habitat Restoration: Restoration Activities	IDFG MOA (200860200)
		Pahsimeroi River Habitat Project	IDFG MOA (200860300)
		Lower Lemhi River Habitat Restoration Project: Habitat restoration	IDFG MOA (200860600)
		Upper Salmon Basin Watershed Project (USBWP) provides technical and administrative support with project implementation guidance to landowners to implement fish habitat projects on private lands	FCRPS BiOp Action/New Recommendation (199202603)
		Idaho Watershed Habitat Restoration Lemhi County	FCRPS BiOp Action/Nez Perce Tribe Recommendation (200739400)
		Protect and Restore Slate Creek	FCRPS BiOp Action/Nez Perce Tribe Recommendation (200706400)
		Reestablish Connectivity and Restore Fish Habitat in the East Fork of the South Fork Salmon River Watershed	FCRPS BiOp Action/Nez Perce Tribe Recommendation (200712700)
		Protect and Restore the Little Salmon Watershed	Nez Perce Tribe Recommendation

			(200712800*)
		Protect and restore Big Creek	Nez Perce Tribe Recommendation
		Big Creek Habitat and Passage	FCRPS BiOp RPA/New Recommendation
		Salmon River Habitat Enhancement	FCRPS BiOp /New Recommendation (199405000)
		ESA Habitat Restoration	Shoshone Bannock Tribe MOA
	Increase stream/lake productivity to near historic levels to increase growth and survival of juvenile salmonids.	Nutrient Enhancement Project	IDFG MOA (200860700)
		Nutrient Supplementation for ESA	Shoshone Bannock Tribe MOA
Restore natural hydrograph to provide sufficient flow during critical periods.	Identify opportunities to restore streamflows in the Camas Creek and Yankee Fork watersheds.		CBFWA recommendation
	Improve irrigation efficiencies.	Idaho Fish Screening and Passage Improvements	FCRPS BiOp Action/IDFG Recommendation (199401500)
		Upper Salmon Basin Watershed Project (USBWP) provides technical and administrative support with project implementation guidance to landowners to implement fish habitat projects on private lands	FCRPS BiOp Action/New Recommendation (199202603)
		Idaho Watershed Habitat Restoration Lemhi County	FCRPS BiOp Action/Nez Perce Tribe Recommendation (200739400)
		Coordinate and implement tributary habitat restoration in the Little Salmon River and lower Salmon River Idaho	FCRPS BiOp RPA/New Recommendation (200706500*)

	Sequence diversion operations.	Idaho Fish Screening and Passage Improvements	FCRPS BiOp Action/IDFG Recommendation (199401500)
		Upper Salmon Basin Watershed Project (USBWP) provides technical and administrative support with project implementation guidance to landowners to implement fish habitat projects on private lands	FCRPS BiOp Action/New Recommendation (199202603)
		Idaho Watershed Habitat Restoration Lemhi County	FCRPS BiOp Action/Nez Perce Tribe Recommendation (200739400)
	Reconnect mainstem tributaries.		CBFWA recommendation
Mitigate for impeded and blocked passage	Implement a mix of artificial propagation Recommendations, habitat restoration actions, improved mainstem passage and survival in an integrated approach to improve anadromous fish returns to the Salmon River subbasin and to achieve objectives.	Redfish Lake Sockeye Salmon Captive Broodstock Rearing and Research	FCRPS BiOp Action/IDFG Recommendation (199204000)
		Idaho Supplementation Studies	FCRPS BiOp Action/IDFG Recommendation (198909800)
		Redfish Lake Sockeye Salmon Captive Broodstock Program	FCRPS BiOp Action/IDFG Recommendation (199107200)
		Idaho Chinook Salmon Captive Propagation	FCRPS BiOp Action/IDFG Recommendation (199700100)
		Snake River Salmon Sockeye Captive Propagation (Construction)	IDFG MOA (200740200)
		Snake River Salmon Sockeye Captive Propagation (Planning)	IDFG MOA (200740200)
		Snake River Salmon Sockeye Captive Propagation (O&M)	IDFG MOA (200740200)
		Snake River Salmon Sockeye Captive Propagation (Purchase)	IDFG MOA (200740200)
		ID Snake River Spr/Summer Chinook Salmon Captive Propagation	FCRPS BiOp Action/IDFG Recommendation (200740300)
		Increased Snake River Sockeye Production – Planning and Design	IDFG MOA (200799000)
	Idaho Supplementation Studies	FCRPS BiOp Action/Nez	

			Perce Tribe Recommendation (198909802)
		Johnson Creek Artificial Propagation Enhancement Project	FCRPS BiOp Action/Nez Perce Tribe Recommendation (199604300)
		Lemhi Spring Chinook supplementation	Nez Perce Tribe Recommendation
		Broodstock Management Plan for Sawtooth, Pahsimeroi, McCall Hatcheries-Snake R spring/summer chinook (post ISS)	Nez Perce Tribe Recommendation
		Idaho Supplementation Studies	FCRPS BiOp Action/IDFG Recommendation (198909800)
		Supplementation Projects	Shoshone Bannock Tribe MOA
Increase hatchery effectiveness for restoration and mitigation	Explore and implement innovative hatchery actions to achieve both restoration and mitigation objectives.	Redfish Lake Sockeye Salmon Captive Broodstock Rearing and Research	FCRPS BiOp Action/IDFG Recommendation (199204000)
		Idaho Supplementation Studies	FCRPS BiOp Action/IDFG Recommendation (198909800)
		Redfish Lake Sockeye Salmon Captive Broodstock Program	FCRPS BiOp Action/IDFG Recommendation (199107200)
		Idaho Chinook Salmon Captive Propagation	FCRPS BiOp Action/IDFG Recommendation (199700100)
		Snake River Salmon Sockeye Captive Propagation (Construction)	IDFG MOA (200740200)
		Snake River Salmon Sockeye Captive Propagation (Planning)	IDFG MOA (200740200)
		Snake River Salmon Sockeye Captive Propagation (O&M)	IDFG MOA (200740200)
		Snake River Salmon Sockeye Captive Propagation (Purchase)	IDFG MOA (200740200)
		ID Snake River Spr/Summer Chinook Salmon Captive Propagation	FCRPS BiOp Action/IDFG Recommendation (200740300)

		Increased Snake River Sockeye Production – Planning and Design	IDFG MOA (200799000)
		OR Snake River Spring/Summer Chinook Salmon Captive Propagation; Manchester Spring Chinook Captive Broodstock Project	FCRPS BiOp Action/New Recommendation (199606700)
		Idaho Supplementation Studies	FCRPS BiOp Action/Nez Perce Tribe Recommendation (198909802)
		Johnson Creek Artificial Propagation Enhancement Project	FCRPS BiOp Action/Nez Perce Tribe Recommendation (199604300)
		Chinook Salmon Adult Abundance Monitoring [Formerly - Listed Stock Adult Escapement]	FCRPS BiOp Action/Nez Perce Tribe Recommendation (199703000)
		Lemhi Spring Chinook supplementation	Nez Perce Tribe Recommendation
		Broodstock Management Plan for Sawtooth, Pahsimeroi, McCall Hatcheries-Snake R spring/summer Chinook (post ISS)	Nez Perce Tribe Recommendation
		Idaho Supplementation Studies	FCRPS BiOp Action/IDFG Recommendation (198909800)
		Supplementation Projects	Shoshone Bannock Tribe MOA

Monitor status and trends of focal species and populations	Establish or use preexisting index sites to gather baseline, trend, and comparative data.	Idaho Natural Production Monitoring	FCRPS BiOp Action/IDFG Recommendation (199107300)
		Pit Tagging Wild Chinook	FCRPS BiOp Action/New Recommendation (199102800)
		Integrated Status and Effectiveness Monitoring Program (ISEMP)	FCRPS BiOp Action/New Recommendation (2000301700)
		Snake River Sockeye Salmon Habitat and Limnological Monitoring	FCRPS BiOp Action/IDFG Recommendation (200740200)
Monitor and evaluate effectiveness of actions taken to implement Recommendations.	Develop methods to monitor biological response to habitat improvement.	Idaho Natural Production Monitoring	FCRPS BiOp Action/IDFG Recommendation (199107300)
		Pit Tagging Wild Chinook	FCRPS BiOp Action/New Recommendation (199102800)
		Integrated Status and Effectiveness Monitoring Program (ISEMP)	FCRPS BiOp Action/New Recommendation (2000301700)
		Chinook Salmon Adult Abundance Monitoring [Formerly - Listed Stock Adult Escapement]	FCRPS BiOp Action/Nez Perce Tribe Recommendation (199703000)
		Snake River Sockeye Salmon Habitat and Limnological Monitoring	FCRPS BiOp Action/IDFG Recommendation (200740200)
	Monitor effectiveness of hatchery and natural production Recommendations.	Idaho Natural Production Monitoring	FCRPS BiOp Action/IDFG Recommendation (199107300)
Chinook Salmon Adult Abundance Monitoring [Formerly - Listed Stock Adult Escapement]		FCRPS BiOp Action/Nez Perce Tribe Recommendation (199703000)	

		Snake River Sockeye Salmon Habitat and Limnological Monitoring	FCRPS BiOp Action/IDFG Recommendation (200740200)
		Little Salmon River Spring/Summer Chinook Salmon Genetic Characterization	Nez Perce Tribe Recommendation
	Gather and analyze harvest data to aid in run reconstruction to evaluate status and action effectiveness.		CBFWA recommendation

Middle Snake Province

Malheur River Subbasin

Strategy	Recommended Measure		Source of Measure
Restore passage and connectivity to habitats blocked or impaired by artificial barriers.	Reintroduce native salmon species in areas where they have been extirpated by human activities.	Inventory and assess habitat status and needs for anadromous reintroductions in Eastern Oregon tributaries above Hells Canyon Dam	Umatilla Tribe MOA (200820400)
Restore floodplain connectivity and function.	Reduce road-related impacts through relocation, reconstruction, or decommissioning, and return road surfaces, cuts, and fills to productivity.		
	Reconnect side channels and off-channel habitats to stream channels.		
	Reconnect tributaries and ponds to river.		
Restore channel structure and complexity.	Restore natural channel form.		
	Increase role and abundance of wood and large organic debris in streambeds.		
	Stabilize and protect streambanks.		

Restore riparian condition and LWD recruitment	Establish riparian vegetation to provide cover, stabilize streambanks, reduce stream temperatures, and provide LWD.		
	Reduce road densities.		
Restore natural hydrograph to provide sufficient flow during critical periods.	Improve irrigation conveyance and efficiency.		
	Sequence diversion operations.		
	Reconnect mainstem tributaries.		
Improve degraded water quality	Reduce high water temperatures by restoring natural functions and processes through Recommendations identified to address physical habitat quality/quantity limitations.		
Mitigate for impeded and blocked passage	Implement a mix of artificial propagation Recommendations, habitat restoration actions, improved mainstem passage and survival in an integrated approach to restore anadromous fish returns to the Malheur River subbasin and to achieve objectives.		

Monitor and evaluate effectiveness of actions taken to implement Recommendations.	Conduct feasibility studies to asses and plan the reintroduction of anadromous fish to the Malheur River subbasin.	Inventory and assess habitat status and needs for anadromous reintroductions in Eastern Oregon tributaries above Hells Canyon Dam	Umatilla Tribe MOA (200820400)
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Pacific Lamprey

Strategy	Recommended Measure		Source of Measure
Improve adult and juvenile Pacific lamprey passage survival and reduce delays in migration.	Develop and implement aids to passage at known and suspected lamprey passage obstacles.	Pacific Lamprey Research and Restoration Project (Umatilla Subbasin)	Umatilla Tribe MOA (199402600)
		Lamprey Mainstem passage design assistance	CRITFC MOA (200852400)
	Identify additional specific structures or operations that delay, obstruct, or kill migrating lamprey.	Pacific Lamprey Research and Restoration Project (Umatilla Subbasin)	Umatilla Tribe MOA (199402600)
		Lamprey Mainstem passage design assistance	CRITFC MOA (200852400)
	Monitor lamprey passage to evaluate passage improvement actions and to identify additional passage problem areas.	Pacific Lamprey Research and Restoration Project (Umatilla Subbasin)	Umatilla Tribe MOA (199402600)
		Lamprey Mainstem passage design assistance	CRITFC MOA (200852400)
	Assess passage efficiency, direct mortality, and/or other metrics that relate to migratory success.	Pacific Lamprey Research and Restoration Project (Umatilla Subbasin)	Umatilla Tribe MOA (199402600)
		Willamette Falls lamprey escapement and population status study	Warm Springs Tribe MOA (200830800)
		Lamprey Mainstem passage design assistance	CRITFC MOA (200852400)
Continue restoring freshwater spawning and rearing habitat for anadromous lampreys	Develop, implement, and evaluate lamprey-specific restoration projects (restoring natural processes in the absence of information on limiting factors).		CBFWA recommendation
	Identify ongoing habitat restoration and safety-net activities and evaluate their effects on		CBFWA recommendation

	lamprey.		
Reintroduce and restore lamprey production to suitable habitats where they no longer occur, and monitor results.	Develop, implement, and monitor restoration actions.	Pacific Lamprey Research and Restoration Project (Umatilla Subbasin)	Umatilla Tribe MOA (199402600)
		Adult Lamprey Translocation and other data compilation and database	Nez Perce Tribe Recommendation
Develop a collaborative lamprey conservation, restoration, and management plan.	Improve our understanding and documentation of critical uncertainties by updating the Columbia River Basin Lamprey Technical Workgroup Critical Uncertainties document as part of a Columbia Basin lamprey conservation plan.		CBFWA recommendation
	Support development of a Columbia Basin lamprey management plan. The plan should include: (1) abundance targets Recommendation at mainstem dams and tributaries, and (2) adult and juvenile passage efficiency targets and performance standards for mainstem dams.		CBFWA recommendation
	Identify research and analyses that address critical uncertainties regarding lamprey habitat, status,		CBFWA recommendation

	distribution, and genetic structure.		
	Develop and maintain a regional Pacific lamprey data base for housing and accessing historic, current and new literature on distribution, life history, ecology, status, restoration, and cultural values.		CBFWA recommendation
Better understand lamprey status	Compile and evaluate current and historical information on Pacific lamprey distribution, abundance and status within the Columbia Basin.	Determine Status and Limiting Factors of Pacific Lamprey in Fifteenmile Subbasin, Oregon	Warm Springs Tribe MOA (200700700)
		Evaluate the Status of Pacific Lamprey in the Lower Deschutes River Subbasin, Oregon	Warm Springs Tribe MOA (200201600)
		Pacific Lamprey status assessment (Tucannon Subbasin)	WDFW Comment
		Pacific Lamprey Research and Restoration Project (Umatilla Subbasin)	Umatilla Tribe MOA (199402600)
		Ammocoete densities (Yakima Subbasin)	Yakama Nation MOA (200845000)
		Lamprey presence /absence and other baseline in Upper Columbia and Yakima	Yakama Nation MOA (200846000)
		Willamette Falls lamprey escapement and population status study	Warm Springs Tribe MOA (200830800)
		Snake River Lamprey data collection	Nez Perce Tribe Recommendation
		Ammocoete data collection	Nez Perce Tribe Recommendation
		Relative abundance, distribution, and population structure of lampreys in the Columbia River Basin	New Recommendation (200716500*)
		Pacific Lamprey Status Assessment in Washington	WDFW Comment
		Adult Lamprey Translocation and other data compilation and database	Nez Perce Tribe Recommendation
			Develop methods to differentiate among

	species at all life stages (field-based).		
	Develop standardized sampling protocols and conduct systematic basin-wide surveys to assess adult and juvenile abundance and distribution.	Determine Status and Limiting Factors of Pacific Lamprey in Fifteenmile Subbasin, Oregon	Warm Springs Tribe MOA (200700700)
		Evaluate the Status of Pacific Lamprey in the Lower Deschutes River Subbasin, Oregon	Warm Springs Tribe MOA (200201600)
		Pacific Lamprey status assessment (Tucannon Subbasin)	WDFW Comment
		Ammocoete densities (Yakima Subbasin)	Yakama Nation MOA (200845000)
		Lamprey presence /absence and other baseline in Upper Columbia and Yakima	Yakama Nation MOA (200846000)
	Define, improve, and continue historic distribution and abundance indices (e.g., dam counts, tribal harvest records, smolt trap collections, etc).	Determine Status and Limiting Factors of Pacific Lamprey in Fifteenmile Subbasin, Oregon	Warm Springs Tribe MOA (200700700)
		Evaluate the Status of Pacific Lamprey in the Lower Deschutes River Subbasin, Oregon	Warm Springs Tribe MOA (200201600)
		Pacific Lamprey status assessment (Tucannon Subbasin)	WDFW Comment
		Pacific Lamprey Research and Restoration Project (Umatilla Subbasin)	Umatilla Tribe MOA (199402600)
		Willamette Falls lamprey escapement and population status study	Warm Springs Tribe MOA (200830800)
Coordinate information exchange with existing and future projects not targeting lamprey specifically.		CBFWA recommendation	
Determine anadromous lamprey population structure	Supplement existing libraries of genetic markers for lamprey (e.g., microsatellites, single nucleotide polymorphisms).	Relative abundance, distribution, and population structure of lampreys in the Columbia River Basin	New Recommendation (200716500)
	Collect and maintain lamprey tissue samples from the Columbia	Relative abundance, distribution, and population structure of lampreys in the Columbia River Basin	New Recommendation (200716500*)

	River Basin and neighboring basins.		
	Investigate and determine population characteristics.	Relative abundance, distribution, and population structure of lampreys in the Columbia River Basin	New Recommendation (200716500*)
Determine anadromous lamprey limiting factors	Document habitat preferences and habitat availability for all life stages of anadromous lamprey.	Evaluate the Status of Pacific Lamprey in the Lower Deschutes River Subbasin, Oregon	Warm Springs Tribe MOA (200201600)
		Determine Status and Limiting Factors of Pacific Lamprey in Fifteenmile Subbasin, Oregon	Warm Springs Tribe MOA (200700700)
	Evaluate the physiological and behavioral responses of lamprey to a variety of environmental stressors.		CBFWA recommendation
	Assess trophic relationships.		CBFWA recommendation
	Assess the potential magnitude and effect of predation on lamprey productivity.		CBFWA recommendation
Describe anadromous lamprey biology and ecology	Describe the ecological function of anadromous lamprey.		CBFWA recommendation
	Describe the biology of anadromous lamprey.		CBFWA recommendation
	Develop methodology for gender identification in the field and laboratory.		CBFWA recommendation
	Develop aging techniques.		CBFWA recommendation
	Assess life history characteristics of freshwater and ocean-		CBFWA recommendation

	phase anadromous lamprey.		
Describe anadromous lamprey population dynamics	Estimate demographic rate parameters capable of changing the size of populations such as birth, death, immigration, and emigration rates.		CBFWA recommendation

Attachment 2c:
Resident Fish Provisions

Strategies and Measures for Lower Columbia/Estuary White Sturgeon

Strategy	Recommended Measure		Source of Measure
Restore upstream and downstream movement of white sturgeon in the lower Columbia River	Fund annual juvenile white sturgeon transplant activities from below Bonneville Dam and/or from Bonneville Reservoir to John Day and The Dalles reservoirs	White Sturgeon Mitigation and Restoration in the Columbia and Snake River Upstream from Bonneville Dam	ODFW (Recommendation) (198605000)
	Manage marine mammals to reduce predation of white sturgeon downstream of Bonneville Dam		CBFWA (Recommendation)
	Monitor and evaluate, a) mitigative white sturgeon restoration actions, and b) population responses to environmental conditions		CBFWA (Recommendation)
	Conduct research that addresses critical white sturgeon uncertainties		CBFWA (Recommendation)
Ensure water quality and contaminant loads in river substrates meet existing guidelines and regulations	Monitor and evaluate, a) mitigative white sturgeon restoration actions, and b) population responses to environmental conditions		CBFWA (Recommendation)
	Conduct research that addresses critical white sturgeon uncertainties		CBFWA (Recommendation)
Conduct non-lethal hazing actions on the Columbia River to deter Steller and California sea lions from feeding on white sturgeon	Manage marine mammals to reduce predation of white sturgeon downstream of Bonneville Dam		CBFWA (Recommendation)
	Monitor and evaluate, a) mitigative white sturgeon restoration actions, and b) population responses to environmental conditions		CBFWA (Recommendation)
	Conduct research that addresses critical white sturgeon uncertainties		CBFWA (Recommendation)
Investigate the need and potential	Operate the FCRPS to provide flows consistent with aggressive non-breach hydrosystem operations		CBFWA (Recommendation)

measures for minimizing egg and larval white sturgeon piscivory	Monitor and evaluate, a) mitigative white sturgeon restoration actions, and b) population responses to environmental conditions		CBFWA (Recommendation)
	Conduct research that addresses critical white sturgeon uncertainties		CBFWA (Recommendation)
Obtain consistent annual spawning and recruitment of white sturgeon in the lower Columbia River	Operate the FCRPS to provide flows consistent with aggressive non-breach hydrosystem operations		CBFWA (Recommendation)
	Fund annual juvenile white sturgeon transplant activities from below Bonneville Dam and/or from Bonneville Reservoir to John Day and The Dalles reservoirs		CBFWA (Recommendation)
	Monitor and evaluate, a) mitigative white sturgeon restoration actions, and b) population responses to environmental conditions		CBFWA (Recommendation)
	Conduct research that addresses critical white sturgeon uncertainties		CBFWA (Recommendation)
Set harvest guidelines to ensure adequate escapement of harvestable-size fish to broodstock	In consultation with the appropriate management agencies fund intensive sustainable white sturgeon fishery management		CBFWA (Recommendation)
	Monitor and evaluate, a) mitigative white sturgeon restoration actions, and b) population responses to environmental conditions		CBFWA (Recommendation) WDFW Comment
	Conduct research that addresses critical white sturgeon uncertainties		CBFWA (Recommendation)
Create habitat conditions that will aid survival and development of white sturgeon eggs and larvae	Operate the FCRPS to provide flows consistent with aggressive non-breach hydrosystem operations		CBFWA (Recommendation)
	Monitor and evaluate, a) mitigative white sturgeon restoration actions, and b) population responses to environmental conditions		CBFWA (Recommendation)
	Conduct research that addresses critical white sturgeon uncertainties		CBFWA (Recommendation)
Obtain consistent annual spawning and recruitment of	Operate the FCRPS to provide flows consistent with aggressive non-breach hydrosystem operations		CBFWA (Recommendation)
	Monitor and evaluate, a) mitigative white sturgeon		CBFWA

white sturgeon in the lower Columbia River	restoration actions, and b) population responses to environmental conditions		(Recommendation)
	Conduct research that addresses critical white sturgeon uncertainties		CBFWA (Recommendation)
Achieve habitat conditions that will aid survival and development of white sturgeon eggs and larvae	Operate the FCRPS to provide flows consistent with aggressive non-breach hydrosystem operations		CBFWA (Recommendation)
	Monitor and evaluate, a) mitigative white sturgeon restoration actions, and b) population responses to environmental conditions		CBFWA (Recommendation)
	Conduct research that addresses critical white sturgeon uncertainties		CBFWA (Recommendation)
Investigate scope and impact of direct white sturgeon mortality due to dredging activities	Operate the FCRPS to provide flows consistent with aggressive non-breach hydrosystem operations		CBFWA (Recommendation)
	Conduct dredging operations to minimize operation related mortality on white sturgeon in the free-flowing river below Bonneville Dam		CBFWA (Recommendation)
	Monitor and evaluate, a) mitigative white sturgeon restoration actions, and b) population responses to environmental conditions		CBFWA (Recommendation)
	Conduct research that addresses critical white sturgeon uncertainties		CBFWA (Recommendation)
Characterize white sturgeon interactions with introduced species	Monitor and evaluate, a) mitigative white sturgeon restoration actions, and b) population responses to environmental conditions		CBFWA (Recommendation)
	Conduct research that addresses critical white sturgeon uncertainties		CBFWA (Recommendation)

Operate the hydrosystem to reduce mortality on white sturgeon	Block access to turbine draft tubes during turbine dewatering and other maintenance operations to minimize white sturgeon entrainment and mortality		CBFWA (Recommendation)
	Monitor and evaluate, a) mitigative white sturgeon restoration actions, and b) population responses to environmental conditions		CBFWA (Recommendation)
	Conduct research that addresses critical white sturgeon uncertainties		CBFWA (Recommendation)

Strategies and Measures for Lower Columbia/Estuary Green Sturgeon

Strategy	Recommended Measure		Source of Measure
Quantify green sturgeon abundances in the lower Columbia River to better inform management decisions	Develop and conduct studies to quantify green sturgeon abundances and associated spatio-temporal variability		CBFWA (Recommendation)
	Monitor harvest levels and the effectiveness of current fishery regulations		CBFWA (Recommendation)
Evaluate green sturgeon interactions with non-native species and remove potentially detrimental non-native prey	Study the impacts of diet shifts on the transfer of energy and materials from prey to green sturgeon		CBFWA (Recommendation)
	Potentially remove detrimental non-native prey		CBFWA (Recommendation)
Evaluate significance of pinniped predation on green sturgeon	Manage marine mammals to reduce predation of green sturgeon		CBFWA (Recommendation)

Characterize diets of green sturgeon and consider limiting dike construction and filling activities	Asses the importance of macro-detritus and wetland associated macro-benthos in the diets of green sturgeon		CBFWA (Recommendation)
	Regulate diking and filling activities that may limit green sturgeon access to wetland derived production		CBFWA (Recommendation)
Ensure water quality and contaminant loads in river substrates meet appropriate guidelines and regulations	Conduct research that quantifies and addresses the affects of specific contaminants and water quality requirements on green sturgeon		CBFWA (Recommendation)

Strategies and Measures for Kalama Coastal Cutthroat Trout

Strategy	Recommended Measure		Source of Measure
Create population database	Implement biological surveys to evaluate population density and composition		CBFWA (Recommendation)
	Identify migration patterns through telemetry studies		CBFWA (Recommendation)
	Implement mark-recapture studies to estimate population size		CBFWA (Recommendation)

Strategies and Measures for Lewis Coastal Cutthroat Trout

Strategy	Recommended Measure		Source of Measure
Create population database	Implement biological surveys to evaluate population density and composition		CBFWA (Recommendation)
	Identify migration patterns through telemetry studies		CBFWA (Recommendation)
	Implement mark-recapture studies to estimate population size		CBFWA (Recommendation)

Strategies and Measures for Washougal Coastal Cutthroat Trout

Strategy	Recommended Measure		Source of Measure
Create population database	Implement biological surveys to evaluate population density and composition		CBFWA (Recommendation)
	Identify migration patterns through telemetry studies		CBFWA (Recommendation)
	Implement mark-recapture studies to estimate population size		CBFWA (Recommendation)

Strategies and Measures for Willamette Bull Trout

Strategy	Recommended Measure		Source of Measure
Improve habitat to sustain populations of bull trout in at least four tributaries of the Willamette River (McKenzie, Middle Fork Willamette, Clackamas, North Santiam rivers)	Protect, restore, and enhance bull trout habitat, and implement Specific Measure (Project Reference)s to restore instream structure and complexity by adding large woody debris, side channels and spawning gravels		CBFWA (Recommendation)
Restore connectivity in migratory corridor	Correct manmade barriers that impede bull trout access to suitable habitat by developing upstream and downstream passage at dams that block access to former and present bull trout populations		CBFWA (Recommendation)
Reestablish bull trout in unoccupied historical habitats in the Willamette Basin	Assess the feasibility of reestablishing bull trout in former habitat by compiling existing data on potential bull trout spawning and rearing habitat and gathering new data where there are gaps in the information		CBFWA (Recommendation)
	Determine potential sources of bull trout in the		CBFWA

	Willamette Basin including all known populations (Anderson Creek, Roaring River, Sweetwater Creek and the McKenzie above Trail Bridge Reservoir)		(Recommendation)
	If determined feasible and advisable, relocate bull trout for a minimum of seven years (one bull trout generation)		CBFWA (Recommendation)
Develop a genetic management plan for bull trout in the Upper Willamette River core area providing for multiple, genetically healthy populations	Collect tissue samples from bull trout for genetic characterization, characterize the genetic structure among local populations by determining frequencies of alleles		CBFWA (Recommendation)
	Draft a genetic management plan that specifies the rate and directions of artificial gene flow necessary to minimize the risk of inbreeding depression and genetic drift while maintaining population structure		CBFWA (Recommendation)
	Implement the genetic management plan until intact migratory corridors among all local populations in the Willamette Recovery Unit provide opportunities for natural gene flow		CBFWA (Recommendation)
Eliminate or significantly reduce brook trout populations in habitats that contain bull trout populations	Determine brook trout distribution		CBFWA (Recommendation)
	Develop/implement test methods of reducing brook trout in bull trout watersheds		CBFWA (Recommendation)
Production of juvenile salmon in waters with bull trout	Re-establish populations of Chinook salmon in bull trout habitats above dams in the Willamette Basin		CBFWA (Recommendation)

Strategies and Measures for Willamette Coastal Cutthroat Trout

Strategy	Recommended Measure		Source of Measure
Protect and conserve natural ecological processes that support the viability of populations	Protect /restore: 1) riparian condition and large woody debris, 2) floodplain connectivity and function, 3) stream channel structure and complexity via collaborative efforts with landowners, watershed councils, municipalities, and other public and private entities		CBFWA (Recommendation)
	Develop financial incentive and educational programs to increase participation		CBFWA (Recommendation)
	Employ regulatory mechanisms as necessary		CBFWA (Recommendation)

Strategies and Measures for Willamette Oregon Chub

Strategy	Recommended Measure		Source of Measure
Modify flood control operations and reduce channelization	Reconnect floodplain habitats, remove revetments, restore wetland habitats, restrict development in floodplains, provide stream and wetland buffers in agricultural lands		CBFWA (Recommendation)
Restrict movement of non-native fishes and remove non-native fishes when feasible	Limit stocking of non-native fishes to secure areas where there is no emigration and/or movement during flooding		CBFWA (Recommendation)
	Remove non-native fishes where they threatened nearby Oregon chub populations		CBFWA (Recommendation)
	Restore off-channel and side channel habitats		CBFWA (Recommendation)

Strategies and Measures for Columbia Gorge White Sturgeon

Strategy	Recommended Measure		Source of Measure
Restore upstream and downstream movement of white sturgeon impounded in Columbia River reservoirs	Develop a regionally accepted White Sturgeon Conservation and Management Plan	White Sturgeon Mitigation and Restoration in the Columbia and Snake River Upstream from Bonneville Dam	ODFW (Recommendation) (198605000)
		Develop a Master Plan for a rearing Facility to Enhance Selected Populations of White Sturgeon in the Columbia River Basin	CRITFC (Recommendation) (200715500)
	Implement annual juvenile white sturgeon transplant activities from below Bonneville Dam and/or from Bonneville Reservoir to John Day and The Dalles reservoirs	White Sturgeon Mitigation and Restoration in the Columbia and Snake River Upstream from Bonneville Dam	ODFW (Recommendation) (198605000)
	Identify and quantify regional white sturgeon hatchery augmentation needs and immediately implement Master Plan processes	Develop a Master Plan for a rearing Facility to Enhance Selected Populations of White Sturgeon in the Columbia River Basin	CRITFC (Recommendation) (200715500)
	Monitor and evaluate, a) mitigative white sturgeon restoration actions, and b) population responses to environmental conditions	White Sturgeon Mitigation and Restoration in the Columbia and Snake River Upstream from Bonneville Dam	ODFW (Recommendation) (198605000)
	Conduct research that addresses critical white sturgeon uncertainties	White Sturgeon Mitigation and Restoration in the Columbia and Snake River Upstream from Bonneville Dam	ODFW (Recommendation) (198605000)
Ensure water quality and contaminant loads in river substrates meet existing guidelines and regulations	Development a regionally accepted White Sturgeon Conservation and Management Plan	Develop a Master Plan for a rearing Facility to Enhance Selected Populations of White Sturgeon in the Columbia River Basin	CRITFC (Recommendation) (200715500)
		White Sturgeon Mitigation and Restoration in the Columbia and Snake River Upstream from Bonneville Dam	ODFW (Recommendation) (198605000)
	Monitor and evaluate, a) mitigative white sturgeon restoration actions, and b) population responses to environmental conditions		CBFWA (Recommendation)
	Conduct research that addresses critical white sturgeon uncertainties		CBFWA (Recommendation)

Obtain consistent annual spawning and recruitment of white sturgeon in Bonneville Reservoir	Operate the FCRPS to provide flows consistent with aggressive non-breach hydrosystem operations		CBFWA (Recommendation)
	In consultation with the appropriate state agencies and tribes, implement intensive sustainable white sturgeon fishery management	White Sturgeon Mitigation and Restoration in the Columbia and Snake River Upstream from Bonneville Dam	ODFW (Recommendation) (198605000)
	Develop a regionally accepted White Sturgeon Conservation and Management Plan	White Sturgeon Mitigation and Restoration in the Columbia and Snake River Upstream from Bonneville Dam	ODFW (Recommendation) (198605000)
		Develop a Master Plan for a rearing Facility to Enhance Selected Populations of White Sturgeon in the Columbia River Basin	CRITFC (Recommendation) (200715500)
	Implement annual juvenile white sturgeon transplant activities from below Bonneville Dam and/or from Bonneville Reservoir to John Day and The Dalles reservoirs	White Sturgeon Mitigation and Restoration in the Columbia and Snake River Upstream from Bonneville Dam	ODFW (Recommendation) (198605000)
	Identify and quantify regional white sturgeon hatchery augmentation needs and immediately implement Master Plan processes	Develop a Master Plan for a rearing Facility to Enhance Selected Populations of White Sturgeon in the Columbia River Basin	CRITFC (Recommendation) (200715500)
	Monitor and evaluate, a) mitigative white sturgeon restoration actions, and b) population responses to environmental conditions	White Sturgeon Mitigation and Restoration in the Columbia and Snake River Upstream from Bonneville Dam	ODFW (Recommendation) (198605000)
	Conduct research that addresses critical white sturgeon uncertainties	White Sturgeon Mitigation and Restoration in the Columbia and Snake River Upstream from Bonneville Dam	ODFW (Recommendation) (198605000)
Set harvest guidelines to ensure adequate escapement of harvestable-size fish to broodstock	In consultation with the appropriate state agencies and tribes, fund intensive sustainable white sturgeon fishery management	White Sturgeon Mitigation and Restoration in the Columbia and Snake River Upstream from Bonneville Dam	ODFW (Recommendation) (198605000)
	Develop a regionally accepted White Sturgeon Conservation and Management Plan	White Sturgeon Mitigation and Restoration in the Columbia and Snake River Upstream from Bonneville Dam	ODFW (Recommendation) (198605000)
		Develop a Master Plan for a rearing Facility to Enhance Selected Populations of White Sturgeon in the Columbia River Basin	CRITFC (Recommendation) (200715500)

	Implement annual juvenile white sturgeon transplant activities from below Bonneville Dam and/or from Bonneville Reservoir to John Day and The Dalles reservoirs	White Sturgeon Mitigation and Restoration in the Columbia and Snake River Upstream from Bonneville Dam	ODFW (Recommendation) (198605000)
	Identify and quantify regional white sturgeon hatchery augmentation needs and immediately implement Master Plan processes	Develop a Master Plan for a rearing Facility to Enhance Selected Populations of White Sturgeon in the Columbia River Basin	CRITFC (Recommendation) (200715500)
	Monitor and evaluate, a) mitigative white sturgeon restoration actions, and b) population responses to environmental conditions	White Sturgeon Mitigation and Restoration in the Columbia and Snake River Upstream from Bonneville Dam	ODFW (Recommendation) (198605000)
	Conduct research that addresses critical white sturgeon uncertainties	White Sturgeon Mitigation and Restoration in the Columbia and Snake River Upstream from Bonneville Dam	ODFW (Recommendation) (198605000)
Investigate the need and potential measures for minimizing egg and juvenile white sturgeon predation by native and introduced resident fishes	Operate the FCRPS to provide flows consistent with aggressive non-breach hydrosystem operations		CBFWA (Recommendation)
	Develop a regionally accepted White Sturgeon Conservation and Management Plan	Develop a Master Plan for a rearing Facility to Enhance Selected Populations of White Sturgeon in the Columbia River Basin	CRITFC (Recommendation) (200715500)
		White Sturgeon Mitigation and Restoration in the Columbia and Snake River Upstream from Bonneville Dam	ODFW (Recommendation) (198605000)
	Implement annual juvenile white sturgeon transplant activities from below Bonneville Dam and/or from Bonneville Reservoir to John Day and The Dalles reservoirs		CBFWA (Recommendation)
	Identify and quantify regional white sturgeon hatchery augmentation needs and immediately implement Master Plan processes	Develop a Master Plan for a rearing Facility to Enhance Selected Populations of White Sturgeon in the Columbia River Basin	CRITFC (Recommendation) (200715500)
	Monitor and evaluate, a) mitigative white sturgeon restoration actions, and b) population responses to environmental conditions		CBFWA (Recommendation)
	Conduct research that addresses critical white sturgeon uncertainties		CBFWA (Recommendation)

Achieve habitat conditions that will aid survival and development of white sturgeon eggs and larvae	Operate the FCRPS to provide flows consistent with aggressive non-breach hydrosystem operations		CBFWA (Recommendation)
	Develop a regionally accepted White Sturgeon Conservation and Management Plan	White Sturgeon Mitigation and Restoration in the Columbia and Snake River Upstream from Bonneville Dam	ODFW (Recommendation) (198605000)
		Develop a Master Plan for a rearing Facility to Enhance Selected Populations of White Sturgeon in the Columbia River Basin	CRITFC (200715500)
	Implement annual juvenile white sturgeon transplant activities from below Bonneville Dam and/or from Bonneville Reservoir to John Day and The Dalles reservoirs		CBFWA (Recommendation)
	Identify and quantify regional white sturgeon hatchery augmentation needs and immediately implement Master Plan processes		CBFWA (Recommendation)
	Monitor and evaluate, a) mitigative white sturgeon restoration actions, and b) population responses to environmental conditions		CBFWA (Recommendation)
	Conduct research that addresses critical white sturgeon uncertainties		CBFWA (Recommendation)
Increase habitat connectivity	Operate the FCRPS to provide flows consistent with aggressive non-breach hydrosystem operations		CBFWA (Recommendation)
	Develop a regionally accepted White Sturgeon Conservation and Management Plan	White Sturgeon Mitigation and Restoration in the Columbia and Snake River Upstream from Bonneville Dam	ODFW (Recommendation) (198605000)
		Develop a Master Plan for a rearing Facility to Enhance Selected Populations of White Sturgeon in the Columbia River Basin	CRITFC (Recommendation) (200715500)
	Implement annual juvenile white sturgeon transplant activities from below Bonneville Dam and/or from Bonneville Reservoir to John Day and The Dalles reservoirs	White Sturgeon Mitigation and Restoration in the Columbia and Snake River Upstream from Bonneville Dam	ODFW (Recommendation) (198605000)
	Identify and quantify regional white sturgeon hatchery	White Sturgeon Mitigation and Restoration in the	ODFW

	augmentation needs and immediately implement Master Plan processes	Columbia and Snake River Upstream from Bonneville Dam	(Recommendation) (198605000)
	Monitor and evaluate, a) mitigative white sturgeon restoration actions, and b) population responses to environmental conditions		CBFWA (Recommendation)
	Conduct research that addresses critical white sturgeon uncertainties		CBFWA (Recommendation)
Characterize white sturgeon interactions with introduced species	Develop a regionally accepted White Sturgeon Conservation and Management Plan		CBFWA (Recommendation)
		White Sturgeon Mitigation and Restoration in the Columbia and Snake River Upstream from Bonneville Dam	ODFW (Recommendation) (198605000)
	Monitor and evaluate, a) mitigative white sturgeon restoration actions, and b) population responses to environmental conditions		CBFWA (Recommendation)
	Conduct research that addresses critical white sturgeon uncertainties		CBFWA (Recommendation)

Strategies and Measures for Small Oregon Tributary Rainbow Trout

Strategy	Recommended Measure		Source of Measure
Protect and restore existing instream and riparian habitat (reduce reservoir inundation)	Implement habitat restoration and protection measures described in the Lower Columbia River Recovery Plan		CBFWA (Recommendation)
Restore unimpeded access that has been blocked by anthropogenic factors	Implement habitat restoration and protection measures described in the Lower Columbia River Recovery Plan		CBFWA (Recommendation)

Strategies and Measures for Fifteenmile Coastal Cutthroat Trout

Strategy	Recommended Measure		Source of Measure
Protect and restore aquatic and riparian habitats	Encourage land owners and managers to utilize best management practices that both protect and restore aquatic habitat		CBFWA (Recommendation)
	Implement conservation strategies developed in Mid-Columbia Steelhead Recovery Plan and other planning documents		CBFWA (Recommendation)
Reduce stream temperatures	Encourage land owners and managers to utilize best management practices that do not increase temperatures, and cause point source pollution issues		CBFWA (Recommendation)
	Implement conservation strategies developed in Mid-Columbia Steelhead Recovery Plan		CBFWA (Recommendation)
Restore natural hydrograph	Implement water conservation and efficiency programs that reduce stream water withdrawals, and upland conservation measures designed to effect runoff		CBFWA (Recommendation)
	Implement of water conservation strategies developed in Mid-Columbia Steelhead Recovery Plan and other planning documents		CBFWA (Recommendation)

Strategies and Measures for Fifteenmile Rainbow Trout

Strategy	Recommended Measure		Source of Measure
Protect and restore aquatic and riparian habitats	Encourage land owners and managers to utilize best management practices that both protect and restore aquatic habitat		CBFWA (Recommendation)
	Implement conservation strategies developed in		CBFWA

	Mid-Columbia Steelhead Recovery Plan and other planning documents		(Recommendation)
Reduce stream temperatures	Encourage land owners and managers to utilize best management practices that do not increase temperatures, and cause point source pollution issues		CBFWA (Recommendation)
	Implement conservation strategies developed in Mid-Columbia Steelhead Recovery Plan		CBFWA (Recommendation)
Restore natural hydrograph	Implement water conservation and efficiency programs that reduce stream water withdrawals, and upland conservation measures designed to effect runoff		CBFWA (Recommendation)
	Implement of water conservation strategies developed in Mid-Columbia Steelhead Recovery Plan and other planning documents		CBFWA (Recommendation)

Strategies and Measures for Hood River Bull Trout

Strategy	Recommended Measure		Source of Measure
Restore natural hydrograph	Implement water conservations measures described in the Lower Columbia River Recovery Plan, Hood River Subbasin/ Management Plans, and other planning documents to reduce water diversion	Hood River Habitat Program	CTWSRO MOA (199802100)
Restore natural hydrograph	Implement water conservations measures described in the Lower Columbia River Recovery Plan, Hood River Subbasin/ anagement Plans, and other planning documents to reduce water diversion	Hood River Habitat Program	CTWSRO MOA (199802100)
Restore access to all historic habitats	Implement measures described in the Lower Columbia River Recovery Plan, Hood River Subbasin/Management Plans, and other planning documents	Migratory patterns, Structure, Abundance, and Status of Bull Trout Populations in Subbasins of the Columbia Gorge, Columbia Plateau, and Blue Mountain Provinces	ODFW (Recommendation) (199405400)
		Hood River Habitat Program	CTWSRO MOA

			(199802100)
Protect and restore instream and riparian habitat	Implement measures described in Lower Columbia River Recovery Plan, Hood River Subbasin/Management Plans, and other planning documents	Migratory patterns, Structure, Abundance, and Status of Bull Trout Populations in Subbasins of the Columbia Gorge, Columbia Plateau, and Blue Mountain Provinces	ODFW (199405400)
		Hood River Habitat Program	CTWSRO MOA (199802100)

Strategies and Measures for Hood Coastal Cutthroat Trout

Strategy	Recommended Measure		Source of Measure
Restore natural hydrograph	Implement water conservations measures described in the Lower Columbia River Recovery Plan, Hood River Subbasin/ Management Plans, and other planning documents to reduce water diversion	Hood River Habitat Program	CTWSRO MOA (199802100)
Restore natural hydrograph	Implement water conservations measures described in Lower Columbia River Recovery Plan, Hood River Subbasin/ Management Plans, and other planning documents to reduce water diversion	Hood River Habitat Program	CTWSRO MOA (199802100)
Restore access to all historic habitats	Implement measures described in Lower Columbia River Recovery Plan, Hood River Subbasin/Management Plans, and other planning documents	Hood River Habitat Program	CTWSRO MOA (199802100)
Protect and restore instream and riparian habitat	Implement measures described in Lower Columbia River Recovery Plan, Hood River Subbasin/Management Plans, and other planning documents	Hood River Habitat Program	CTWSRO MOA (199802100)

Strategies and Measures for Klickitat Bull Trout

Strategy	Recommended Measure		Source of Measure
Create population database	Implement biological surveys to evaluate population density and composition		CBFWA (Recommendation)
	Identify migration patterns through telemetry studies		CBFWA (Recommendation)
	Implement mark-recapture studies to estimate population size		CBFWA (Recommendation)

Strategies and Measures for Columbia Lower Middle White Sturgeon

Strategy	Recommended Measure		Source of Measure
Restore upstream and downstream movement	Develop a regionally accepted White Sturgeon Conservation and Management Plan	White Sturgeon Mitigation and Restoration in the Columbia and Snake River Upstream from Bonneville Dam	ODFW (Recommendation) (198605000)
		Develop a Master Plan for a rearing Facility to Enhance Selected Populations of White Sturgeon in the Columbia River Basin	CRITFC (Recommendation) (200715500)
	Conduct annual juvenile white sturgeon transplant activities from below Bonneville Dam and/or from Bonneville Reservoir to John Day and The Dalles reservoirs to compensate for years when operations of the FCRPS contributes to recruitment failures in either of these reservoirs	White Sturgeon Mitigation and Restoration in the Columbia and Snake River Upstream from Bonneville Dam	ODFW (Recommendation) (198605000)
	Consistent with existing and any future regional conservation and management plans, and in consultation with the appropriate state agencies and tribes, quantify regional hatchery augmentation needs and describe a flexible, adaptive approach to phasing in hatchery production to augment natural production of depressed populations in the impounded portions of the Columbia and Snake	Develop a Master Plan for a rearing Facility to Enhance Selected Populations of White Sturgeon in the Columbia River Basin	CRITFC (Recommendation) (200715500)

	rivers Begin commensurate Hatchery Master Planning processes required for the construction, operation and maintenance of hatchery production facilities		
	Monitor and evaluate a) restoration actions designed to mitigate for lost white sturgeon production due to the construction and operation of the FCRPS and b) population responses to environmental conditions	White Sturgeon Mitigation and Restoration in the Columbia and Snake River Upstream from Bonneville Dam	ODFW (Recommendation) (198605000)
	Conduct assessments of the status of white sturgeon populations (eg, abundance, size distribution, length-weight relationship, etc) in Bonneville, The Dalles, or John Day Reservoirs every three (3) years and McNary, Ice Harbor, Lower Monumental and Little Goose reservoirs every five (5) years	White Sturgeon Mitigation and Restoration in the Columbia and Snake River Upstream from Bonneville Dam	ODFW (Recommendation) (198605000)
Ensure water quality and contaminant loads in river substrates meet existing guidelines and regulations	Development of a regionally accepted White Sturgeon Conservation and Management Plan	White Sturgeon Mitigation and Restoration in the Columbia and Snake River Upstream from Bonneville Dam	ODFW (Recommendation) (198605000)
		Develop a Master Plan for a rearing Facility to Enhance Selected Populations of White Sturgeon in the Columbia River Basin	CRITFC (Recommendation) (200715500)
	Monitor and evaluate a) restoration actions designed to mitigate for lost white sturgeon production due to the construction and operation of the FCRPS and b) population responses to environmental conditions		CBFWA (Recommendation)
	Conducting assessments of the status of white sturgeon populations (eg, abundance, size distribution, length-weight relationship, etc) in Bonneville, The Dalles, or John Day Reservoirs every three (3) years and McNary, Ice Harbor, Lower Monumental and Little Goose reservoirs every five (5) years		CBFWA (Recommendation)
	Identify annual sustainable recreational and commercial harvest levels through population simulation that accounts for variable natural production, growth rate, and abundance;		CBFWA (Recommendation)
	Conduct annual recreational creel surveys that		CBFWA

	enable active in-season management to attain pre-determined sustainable harvest levels		(Recommendation)
	Conduct annual tribal commercial and subsistence fishery monitoring that enables active in-season management to attain annual pre-determined sustainable harvest levels		CBFWA (Recommendation)
	Develop of a regionally accepted White Sturgeon Conservation and Management Plan	White Sturgeon Mitigation and Restoration in the Columbia and Snake River Upstream from Bonneville Dam	ODFW (Recommendation) (198605000)
		Develop a Master Plan for a rearing Facility to Enhance Selected Populations of White Sturgeon in the Columbia River Basin	CRITFC (Recommendation) (200715500)
	Monitor and evaluate a) restoration actions designed to mitigate for lost white sturgeon production due to the construction and operation of the FCRPS and b) population responses to environmental conditions by: Conducting assessments of the status of white sturgeon populations (eg, abundance, size distribution, length-weight relationship, etc) in Bonneville, The Dalles, or John Day Reservoirs every three (3) years and McNary, Ice Harbor, Lower Monumental and Little Goose reservoirs every five (5) years		CBFWA (Recommendation)
	Indexing annual levels of, and variation in, white sturgeon recruitment in the free-flowing Columbia River downstream of Bonneville Dam, Bonneville, The Dalles, John Day, and McNary reservoirs in the Columbia River, and in Ice Harbor, Lower Monumental, Little Goose, and Lower Granite reservoirs in the Snake River		CBFWA (Recommendation)
	Conduct research that addresses critical uncertainties identified in existing and future regional white sturgeon conservation and management plans pertaining to Bio-energetic modeling of Bonneville Reservoir white sturgeon removal scenarios and their effects upon overall		CBFWA (Recommendation)

	white sturgeon productivity due to the construction and operation of the FCRPS		
Minimize egg and juvenile white sturgeon predation by native and introduced resident fishes	Operate the Federal Columbia River Power System (FCRPS) to provide white sturgeon spawning habitat in Bonneville, The Dalles and John Day reservoirs by providing a minimum average April through July flow of 250 KCFS at McNary Dam	White Sturgeon Mitigation and Restoration in the Columbia and Snake River Upstream from Bonneville Dam	ODFW (Recommendation) (198605000)
Characterize white sturgeon interactions with introduced species	Develop of a regionally accepted White Sturgeon Conservation and Management Plan	White Sturgeon Mitigation and Restoration in the Columbia and Snake River Upstream from Bonneville Dam	ODFW (Recommendation) (198605000)
Document the usage of available prey species, including introduced species, and the food value of these species in comparison with native species they have replaced		Develop a Master Plan for a rearing Facility to Enhance Selected Populations of White Sturgeon in the Columbia River Basin	CRITFC (Recommendation) (200715500)
	Implement annual juvenile white sturgeon transplant activities from below Bonneville Dam and/or from Bonneville Reservoir to John Day and The Dalles reservoirs to compensate for years when operations of the FCRPS contributes to recruitment failures in either of these reservoirs		CBFWA (Recommendation)
	Consistent with existing and any future regional conservation and management plans, and in consultation with the appropriate state agencies and tribes, quantify regional hatchery augmentation needs and describe a flexible, adaptive approach to phasing in hatchery production to augment natural production of depressed populations in the impounded portions of the Columbia and Snake rivers Begin commensurate Hatchery Master Planning processes required for the construction, operation and maintenance of hatchery production facilities		CBFWA (Recommendation)
	Monitor and evaluate a) restoration actions designed to mitigate for lost white sturgeon production due to the construction and operation of the FCRPS and b)		CBFWA (Recommendation)

	population responses to environmental conditions by indexing annual levels of, and variation in, white sturgeon recruitment in Bonneville Dam, Bonneville, The Dalles, John Day, and McNary reservoirs in the Columbia River, and in Ice Harbor, Lower Monumental, Little Goose, and Lower Granite reservoirs in the Snake River		
	Conduct research that addresses critical uncertainties identified in existing and future regional white sturgeon conservation and management plans related to loss of white sturgeon productivity due to the construction and operation of the FCRPS		CBFWA (Recommendation)
Obtain consistent annual spawning and recruitment	Operate the Federal Columbia River Power System (FCRPS) to provide white sturgeon spawning habitat in Bonneville, The Dalles and John Day reservoirs by providing a minimum average April through July flow of 250 KCFS at McNary Dam	White Sturgeon Mitigation and Restoration in the Columbia and Snake River Upstream from Bonneville Dam	ODFW (Recommendation) (198605000)
Create habitat conditions that will aid survival and development of white sturgeon eggs and larvae	In consultation with the appropriate state agencies and tribes, fund intensive white sturgeon fishery management	White Sturgeon Mitigation and Restoration in the Columbia and Snake River Upstream from Bonneville Dam	ODFW (Recommendation) (198605000)
Obtain consistent annual spawning and recruitment of white sturgeon in Bonneville Reservoir	Identify annual sustainable recreational and commercial harvest levels through population simulation that accounts for variable natural production, growth rate, and abundance	White Sturgeon Mitigation and Restoration in the Columbia and Snake River Upstream from Bonneville Dam	ODFW (Recommendation) (198605000)
	Conduct annual recreational creel surveys that enable active in-season management to attain pre-determined sustainable harvest levels	White Sturgeon Mitigation and Restoration in the Columbia and Snake River Upstream from Bonneville Dam	ODFW (Recommendation) (198605000)
	Conduct annual tribal commercial and subsistence fishery monitoring that enables active in-season management to attain annual pre-determined sustainable harvest levels	White Sturgeon Mitigation and Restoration in the Columbia and Snake River Upstream from Bonneville Dam	ODFW (Recommendation) (198605000)
	Develop a regionally accepted White Sturgeon	White Sturgeon Mitigation and Restoration in the	ODFW

	<p>Conservation and Management Plan II Implement annual juvenile white sturgeon transplant activities from below Bonneville Dam and/or from Bonneville Reservoir to John Day and The Dalles reservoirs to compensate for years when operations of the FCRPS contributes to recruitment failures in either of these reservoirs</p>	<p>Columbia and Snake River Upstream from Bonneville Dam</p>	<p>(Recommendation) (198605000)</p>
		<p>Develop a Master Plan for a rearing Facility to Enhance Selected Populations of White Sturgeon in the Columbia River Basin</p>	<p>CRITFC (Recommendation) (200715500)</p>
	<p>Consistent with existing and any future regional conservation and management plans, and in consultation with the appropriate state agencies and tribes, quantify regional hatchery augmentation needs and describe a flexible, adaptive approach to phasing in hatchery production to augment natural production of depressed populations in the impounded portions of the Columbia and Snake rivers Begin commensurate Hatchery Master Planning processes required for the construction, operation and maintenance of hatchery production facilities</p>	<p>Develop a Master Plan for a rearing Facility to Enhance Selected Populations of White Sturgeon in the Columbia River Basin</p>	<p>CRITFC (Recommendation) (200715500)</p>
	<p>Monitor and evaluate a) restoration actions designed to mitigate for lost white sturgeon production due to the construction and operation of the FCRPS and b) population responses to environmental conditions by indexing annual levels of, and variation in, white sturgeon recruitment in Bonneville Dam, Bonneville, The Dalles, John Day, and McNary reservoirs in the Columbia River, and in Ice Harbor, Lower Monumental, Little Goose, and Lower Granite reservoirs in the Snake River</p>	<p>White Sturgeon Mitigation and Restoration in the Columbia and Snake River Upstream from Bonneville Dam</p>	<p>ODFW (Recommendation) (198605000)</p>
	<p>Conduct research that addresses critical uncertainties identified in existing and future regional white sturgeon conservation and</p>	<p>Sturgeon Genetics</p>	<p>LRT (Recommendation) (200850400)</p>

	<p>management plans related to loss of white sturgeon productivity due to the construction and operation of the FCRPS These studies shall include (but are not limited to):</p> <ul style="list-style-type: none"> - White sturgeon maturation work (in conjunction with and support of white sturgeon recovery in the Kootenai and upper Columbia rivers) <p>Assessment of white sturgeon broodstock contribution to recruitment via genetic analysis</p>		
	<p>Conduct research that addresses critical uncertainties identified in existing and future regional white sturgeon conservation and management plans related to loss of white sturgeon productivity due to the construction and operation of the FCRPS</p>	<p>Develop a regionally accepted White Sturgeon Conservation and Management Plan</p>	<p>CRITFC (Recommendation) (200715500)</p>
	<p>Monitor and evaluate a) restoration actions designed to mitigate for lost white sturgeon production due to the construction and operation of the FCRPS and b) population responses to environmental conditions by indexing annual levels of, and variation in, white sturgeon recruitment in Bonneville Dam, Bonneville, The Dalles, John Day, and McNary reservoirs in the Columbia River, and in Ice Harbor, Lower Monumental, Little Goose, and Lower Granite reservoirs in the Snake River</p>	<p>Develop a regionally accepted White Sturgeon Conservation and Management Plan</p>	<p>CRITFC (Recommendation) (200715500)</p>
	<p>Conduct annual juvenile white sturgeon transplant activities from below Bonneville Dam and/or from Bonneville Reservoir to John Day and The Dalles reservoirs to compensate for years when operations of the FCRPS contributes to recruitment failures in either of these reservoirs</p>	<p>Develop a regionally accepted White Sturgeon Conservation and Management Plan</p>	<p>CRITFC (Recommendation) (200715500)</p>
	<p>Develop a regionally accepted White Sturgeon Conservation and Management Plan</p>	<p>Develop a regionally accepted White Sturgeon Conservation and Management Plan</p>	<p>CRITFC (Recommendation) (200715500)</p>
	<p>Assessment of white sturgeon broodstock</p>	<p>Sturgeon Genetics</p>	<p>LRT</p>

	contribution to recruitment via genetic analysis		(Recommendation) (200850400)
	Determination of minimum spawning flows for successful white sturgeon recruitment throughout the Columbia River Basin in areas where they are not currently defined		CBFWA (Recommendation)
Achieve habitat conditions that will aid survival and development of white sturgeon eggs and larvae	Operate the Federal Columbia River Power System (FCRPS) to provide white sturgeon spawning habitat in Bonneville, The Dalles and John Day reservoirs by providing a minimum average April through July flow of 250 KCFS at McNary Dam	White Sturgeon Mitigation and Restoration in the Columbia and Snake River Upstream from Bonneville Dam	ODFW (Recommendation) (198605000)
	Identify annual sustainable recreational and commercial harvest levels through population simulation that accounts for variable natural production, growth rate, and abundance		CBFWA (Recommendation)
	Conduct annual recreational creel surveys that enable active in-season management to attain pre-determined sustainable harvest levels		CBFWA (Recommendation)
	Conduct annual tribal commercial and subsistence fishery monitoring that enables active in-season management to attain annual pre-determined sustainable harvest levels		CBFWA (Recommendation)
	Develop of a regionally accepted White Sturgeon Conservation and Management Plan	White Sturgeon Mitigation and Restoration in the Columbia and Snake River Upstream from Bonneville Dam	ODFW (Recommendation) (198605000)
		Develop a regionally accepted White Sturgeon Conservation and Management Plan	CRITFC (Recommendation) (200715500)
	Conduct annual juvenile white sturgeon transplant activities from below Bonneville Dam and/or from Bonneville Reservoir to John Day and The Dalles reservoirs to compensate for years when operations of the FCRPS contributes to recruitment failures in either of these reservoirs		CBFWA (Recommendation)
	Consistent with existing and any future regional		CBFWA

	conservation and management plans, and in consultation with the appropriate state agencies and tribes, quantify regional hatchery augmentation needs and describe a flexible, adaptive approach to phasing in hatchery production to augment natural production of depressed populations in the impounded portions of the Columbia and Snake rivers Begin commensurate Hatchery Master Planning processes required for the construction, operation and maintenance of hatchery production facilities		(Recommendation)
	Monitor and evaluate a) restoration actions designed to mitigate for lost white sturgeon production due to the construction and operation of the FCRPS and b) population responses to environmental conditions by indexing annual levels of, and variation in, white sturgeon recruitment in Bonneville Dam, Bonneville, The Dalles, John Day, and McNary reservoirs in the Columbia River, and in Ice Harbor, Lower Monumental, Little Goose, and Lower Granite reservoirs in the Snake River		CBFWA (Recommendation)
	Conduct research that addresses critical uncertainties identified in existing and future regional white sturgeon conservation and management plans pertaining to quantification of contaminant accumulation in waters and sediments upstream of Bonneville Dam and their effects upon overall white sturgeon productivity		CBFWA (Recommendation)

Strategies and Measures for Crab Kokanee

Strategy	Recommended Measure		Source of Measure
Enhance population to compensate for lost	Stock up to 5 million fingerlings or 3 million 15		CBFWA (Recommendation)

natural spawning opportunity and entrainment losses	year olds		
	Identify productivity peaks spatially and temporally		CBFWA (Recommendation)
	Provide additional hatchery space or net pens to increase size/condition of released fish		CBFWA (Recommendation)
	Install barrier nets at outlet structures to avoid entraining recruited fish		CBFWA (Recommendation)
Remove whitefish, especially broodstock	Liberalize harvest regulations		CBFWA (Recommendation)
	Educate anglers regarding the opportunity and methods to harvest over		CBFWA (Recommendation)
	Implement wholesale capture (nets, traps, electrofish, etc) of over		CBFWA (Recommendation)
Control predator populations	Monitor predator population size and composition		CBFWA (Recommendation)
	Liberalize harvest regulations on walleye and smallmouth bass populations as appropriate		CBFWA (Recommendation)
	Educate anglers regarding the opportunity and methods for predator harvest		CBFWA (Recommendation)
	Stock larger kokanee Wholesale capture (nets, traps, electrofish, etc) of walleye and smallmouth bass populations during concentrations on spawning grounds if necessary		CBFWA (Recommendation)
	Use non-lethal means to harass cormorants to spread impacts evenly over all waters or direct impacts to waters capable of sustaining the predation		CBFWA (Recommendation)
	Work with federal and state authorities to define management goals for cormorant populations		CBFWA (Recommendation)

Strategies and Measures for Crab Largemouth Bass, Smallmouth Bass, Bluegill, Yellow Perch, Walleye, and Crappie

Strategy	Recommended Measure		Source of Measure
Control predators ^{1,2}	Monitor species' condition, relative densities, and harvest rates ^{1,2,5}		CBFWA (Recommendation)
	Use harvest regulations to adjust population densities ¹		CBFWA (Recommendation)
	Educate anglers regarding the opportunity and methods to harvest over-abundant species ¹		CBFWA (Recommendation)
	Wholesale capture (nets, traps, electrofish, etc) of over-abundant species during concentrations on spawning grounds if necessary ^{1,2,5}		CBFWA (Recommendation)
	Use non-lethal means to harass cormorants to spread impacts evenly over all waters or direct impacts to waters capable of sustaining the predation ^{1,2,5}		CBFWA (Recommendation)
	Work with federal and state authorities to define management goals for cormorant populations ^{1,2,5}		CBFWA (Recommendation)
Maintain balanced mixed species populations ^{1,2,3,4,6}	Monitor species' condition, relative densities, and harvest rates ^{1,2,3,4,6}		CBFWA (Recommendation)
	Monitor system secondary productivity ^{1,2,3,4,6}		CBFWA (Recommendation)
	Use harvest regulations to adjust population densities ^{1,3,4,6}		CBFWA (Recommendation)
	Educate anglers regarding the opportunity and methods to harvest over-abundant species ^{1,2,3,4,6}		CBFWA (Recommendation)
	Wholesale capture (nets, traps, electrofish, etc) of over-abundant species during concentrations on spawning grounds if necessary ^{1,2,3,4,6}		CBFWA (Recommendation)

Control size of walleye, and smallmouth bass populations as appropriate ^{1,3,4,6}	Monitor predator population size and composition ^{1,3,4,6}		CBFWA (Recommendation)
	Liberalize harvest regulations as appropriate ^{1,3,4,6}		CBFWA (Recommendation)
	Educate anglers regarding the opportunity and methods for predator harvest ^{1,3,4,6}		CBFWA (Recommendation)
	Wholesale capture (nets, traps, electrofish, etc) of predators during concentrations on spawning grounds if necessary ^{1,3,4,6}		CBFWA (Recommendation)
Protect critical spawning and rearing habitats ^{1,4}	Promote carp harvest through angler education ^{1,4,6}		CBFWA (Recommendation)
	Wholesale capture (nets, traps, electrofish, etc) of carp during concentrations on spawning grounds if necessary ^{1,4,6}		CBFWA (Recommendation)
	Isolate spawning and rearing habitats from carp intrusion where feasible through use of fish barriers ^{1,4,6}		CBFWA (Recommendation)
	Work with state and local shoreline management authorities to limit development impacts ^{1,4,6}		CBFWA (Recommendation)
	Install barrier nets at outlet structures to avoid entraining recruited fish ^{1,4,6}		CBFWA (Recommendation)
	Monitor species' condition, relative densities, and harvest rates ⁴		CBFWA (Recommendation)
	Monitor system second productivity ⁴		CBFWA (Recommendation)
Control size of smallmouth bass population ²	Monitor predator population size and composition ²		CBFWA (Recommendation)
	Liberalize harvest regulations as appropriate ²		CBFWA (Recommendation)
	Educate anglers regarding the opportunity and methods for predator harvest ²		CBFWA (Recommendation)
	Wholesale capture (nets, traps, electrofish, etc) of		CBFWA

	predators during concentrations on spawning grounds if necessary ²		(Recommendation)
Control size of walleye population ⁵	Monitor predator population size and composition ⁵		CBFWA (Recommendation)
	Liberalize harvest regulations as appropriate ⁵		CBFWA (Recommendation)
	Educate anglers regarding the opportunity and methods for predator harvest ⁵		CBFWA (Recommendation)
	Wholesale capture (nets, traps, electrofish, etc) of predators during concentrations on spawning grounds if necessary ⁵		CBFWA (Recommendation)

¹Largemouth bass, ²Smallmouth bass, ³Bluegill, ⁴Yellow perch, ⁵Walleye, ⁶Crappie

Strategies and Measures for Crab Crappie

Strategy	Recommended Measure		Source of Measure
Stock rainbow to compensate for lack of natural spawning opportunity and entrainment losses	Stock up to 100,000 fingerlings where feasible and 4-500,000 1+ yolds		CBFWA (Recommendation)
	Provide additional hatchery space or net pens to increase size/condition of released fish		CBFWA (Recommendation)
Adjust stocking size and timing to take advantage of available productivity and minimize entrainment	Install barrier nets at outlet structures to avoid entraining recruited fish		CBFWA (Recommendation)
	Identify productivity peaks spatially and temporally		CBFWA (Recommendation)
Increase the size of stocked rainbow	Monitor predator population size and composition		CBFWA (Recommendation)
	Liberalize harvest regulations on walleye and smallmouth bass populations as appropriate		CBFWA (Recommendation)
Control size of walleye and smallmouth bass	Educate anglers regarding the opportunity and		CBFWA

populations as appropriate Limit concentrated feeding by cormorants	methods for predator harvest		(Recommendation)
	Stock larger rainbow		CBFWA (Recommendation)
	Wholesale capture (nets, traps, electrofish, etc) of walleye and smallmouth bass populations during concentrations on spawning grounds if necessary		CBFWA (Recommendation)
	Use non-lethal means to harass cormorants to spread impacts evenly over all waters or direct impacts to waters capable of sustaining the predation		CBFWA (Recommendation)
	Work with federal and state authorities to define management goals for cormorant populations		CBFWA (Recommendation)
Maintain balanced mixed species populations	Monitor species' condition, relative densities, and harvest rates		CBFWA (Recommendation)
	Monitor system secondary productivity		CBFWA (Recommendation)
	Use harvest regulations to adjust population densities		CBFWA (Recommendation)
	Educate anglers regarding the opportunity and methods to harvest over-abundant species		CBFWA (Recommendation)
	Wholesale capture (nets, traps, electrofish, etc) of over-abundant species during concentrations on spawning grounds if necessary		CBFWA (Recommendation)

Strategies and Measures for Deschutes Bull Trout

Strategy	Recommended Measure		Source of Measure
See Water Quality/Quantity	See Water Quality/Quantity		CBFWA (Recommendation)
Screen water diversions	Work with Landowners, OWRD, Watershed Council and OWRD to screen diversions		CBFWA (Recommendation)
Maintain current management strategies	Monitor population genetic parameters	Bull Trout Status and Abundance Monitoring in the Waters Bordering the Warm Springs Reservation, Oregon	CTWSRO (Recommendation)

			(200715700)
	Develop/implement additional population abundance index measures	Bull Trout Status and Abundance Monitoring in the Waters Bordering the Warm Springs Reservation, Oregon	CTWSRO (Recommendation) (200715700)
	Conduct five year update/review on genetic characteristics of population	Bull Trout Status and Abundance Monitoring in the Waters Bordering the Warm Springs Reservation, Oregon	CTWSRO (Recommendation) (200715700)
Remove or decrease number of non-native predators	Actively remove through snorkeling or electro-fishing		CBFWA (Recommendation)
Enforce groundwater protection measures (Oregon State Water Resources)	Monitor stream/spring flows, Legislative or OWRD groundwater rules in place that adequately preserve the spring flows in the Metolius Basin		CBFWA (Recommendation)
Enforce groundwater protection measures (Oregon State Water Resources)	Monitor stream/spring flows, Legislative or OWRD groundwater rules in place that adequately preserve spring/surface flows in the Metolius Basin		CBFWA (Recommendation)

Strategies and Measures for Deschutes Redband Trout

Strategy	Recommended Measure		Source of Measure
Prevent further introduction and spread of introduced species	Ensure compliance with state and federal policies on introduced species		CBFWA (Recommendation)
Reduce the incidence of stray hatchery steelhead escaping into the Deschutes and reduce residualism of hatchery steelhead released into the Deschutes	Adhere to state and federal hatchery protocols described in the Round Butte Hatchery HGMP		CBFWA (Recommendation)
	Investigate magnitude, cause, effects of out of basin stray hatchery steelhead		CBFWA (Recommendation)

Protect and restore aquatic and riparian habitats	Encourage land owners and managers to utilize best management practices that both protect and restore aquatic habitat		CBFWA (Recommendation)
	Implement conservation strategies developed in Mid-C steelhead recovery plan and other planning documents	Deschutes River Restoration Program	CTWSRO MOA (200830100)
Reduce stream temperatures, and the influence of pollutants	Encourage land owners and managers to utilize best management practices that do not increase temperatures, and cause point source pollution issues	Deschutes River Restoration Program	CTWSRO MOA (200830100)
Replicate natural hydrograph	Implement water conservation and efficiency programs that reduce stream water withdrawals, and upland conservation measures designed to replicate the natural hydrograph		CBFWA (Recommendation)
	Implement water conservation strategies developed in Mid-Columbia Steelhead Recovery Plan and other planning documents		CBFWA (Recommendation)
Return fish to their historic habitats	Implement measures identified in the Mid-Columbia Steelhead Recovery Plan, and other planning documents designed to return fish to previous utilized habitats	Deschutes River Restoration Program Steelhead Management and Monitoring	CTWSRO MOA (200830100, 200830500)

Strategies and Measures for John Day Bull Trout

Strategy	Recommended Measure		Source of Measure
Restore habitat	Increase amounts of large wood	Forrest Conservation Area Program/ Oxbow Conservation Area Program/ John Day Watershed Restoration Program	CTWSRO MOA (200104101, 200001500, 199801800)
	Effectively manage grazing by livestock within riparian areas		CBFWA (Recommendation)
	Reduce width to depth ratios	Forrest Conservation Area Program/ Oxbow Conservation Area Program/ John Day Watershed Restoration Program	CTWSRO MOA (200104101, 200001500, 199801800)
	Restore floodplain function and connectivity	Forrest Conservation Area Program/ Oxbow Conservation Area Program/ John Day Watershed Restoration Program	CTWSRO MOA (200104101, 200001500, 199801800)
	Increase the amount of canopy cover and shade	Forrest Conservation Area Program/ Oxbow Conservation Area Program/ John Day Watershed Restoration Program	CTWSRO MOA (200104101, 200001500, 199801800)
	Increase habitat diversity	Forrest Conservation Area Program/ Oxbow Conservation Area Program/ John Day Watershed Restoration Program	CTWSRO MOA (200104101, 200001500, 199801800)
	Reintroduce beaver where they are absent and habitat conditions will support them		CBFWA (Recommendation)
Protect existing high quality habitat	Acquire through either fee title or through conservation easements critical high quality habitats		CBFWA (Recommendation)
	Sign cooperative management agreements with private landowners who voluntarily want to protect high quality habitats		CBFWA (Recommendation)
	Implement special management designations on		CBFWA

	public lands		(Recommendation)
Restore passage at non-natural barriers	Replace culverts that do not meet fish passage criteria	Forrest Conservation area program/ Oxbow Conservation area Program/ John day watershed restoration program	CTWSRO MOA (200104101, 200001500, 199801800)
	Replace irrigation push up dams with permanent structures that meet fish passage criteria	John day watershed restoration program	CTWSRO MOA (199801800)
	Restore streamflow in streams that flow intermittently because of water withdrawals	John day watershed restoration program	CTWSRO MOA (199801800)
Reduce water temperatures during summer months	Increase shading of streams	Forrest Conservation area program/ Oxbow Conservation area Program/ John day watershed restoration program	CTWSRO moa (200104101, 200001500, 199801800)
	Lease water rights from willing sellers		CBFWA (Recommendation)
	Implement more efficient irrigation systems	John day watershed restoration program	CTWSRO MOA (199801800)
	Reduce the amount of irrigation water that returns overland to the river	John day watershed restoration program	CTWSRO MOA (199801800)
Restore stream flows during low flow periods	Lease water rights from willing sellers		CBFWA (Recommendation)
	Convert flood irrigation systems to more efficient methods	John day watershed restoration program	CTWSRO MOA (199801800)
	Require measurement of water use		CBFWA (Recommendation)
	Investigate feasibility and effectiveness of floodplain aquifer recharge Specific Measure (Project Reference)s		CBFWA (Recommendation)
	Improve hydrologic connectivity of springs to streams where poorly designed roads, small impoundments and other disturbances have redirected spring flows away from drainages		CBFWA (Recommendation)
	Determine feasibility of off-stream storage,		CBFWA

	including ecological effects		(Recommendation)
Increase abundance of juvenile and adult steelhead and Chinook	Implement habitat restoration program	Forrest Conservation area program/ Oxbow Conservation area Program/ John day watershed restoration program	CTWSRO MOA (200104101, 200001500, 199801800)
	Improve water quality, restore streamflows, and same as habitat restoration above	Forrest Conservation area program/ Oxbow Conservation area Program/ John day watershed restoration program	CTWSRO MOA (200104101, 200001500, 199801800)
Remove brook trout	Prohibit stocking of brook trout in drainages where bull trout are present		CBFWA (Recommendation)
	Investigate effective methods of brook trout removal		CBFWA (Recommendation)
	Stock bull trout from select donor populations into areas with suitable habitat above naturally occurring barriers		CBFWA (Recommendation)

¹Redband trout and ²Westslope cutthroat trout

Strategies and Measures for John Day Redband Trout and Westslope Cutthroat Trout

Strategy	Recommended Measure		Source of Measure
Restore habitat ^{1,2}	Increase amounts of large wood ^{1,2}	Forrest Conservation area program/ Oxbow Conservation area Program/ John day watershed restoration program	CTWSRO MOA (200104101, 200001500, 199801800)
	Effectively manage grazing by livestock within riparian areas ^{1,2}		CBFWA (Recommendation)
	Reduce width to depth ratios ^{1,2}	Forrest Conservation area program/ Oxbow Conservation area Program/ John day watershed restoration program	CTWSRO MOA (200104101, 200001500, 199801800)
	Restore floodplain function and connectivity ^{1,2}	Forrest Conservation area program/ Oxbow Conservation area Program/ John day watershed restoration program	CTWSRO MOA (200104101, 200001500,

			199801800)
	Increase the amount of canopy cover and shade ^{1,2}	Forrest Conservation area program/ Oxbow Conservation area Program/ John day watershed restoration program	CTWSRO MOA (200104101, 200001500, 199801800)
	Increase habitat diversity ^{1,2}	Forrest Conservation area program/ Oxbow Conservation area Program/ John day watershed restoration program	CTWSRO MOA (200104101, 200001500, 199801800)
	Reintroduce beaver where they are absent and habitat conditions will support them ^{1,2}		CBFWA (Recommendation)
Protect existing high quality habitat ^{1,2}	Acquire through either fee title or through conservation easements critical high quality habitats ^{1,2}		CBFWA (Recommendation)
	Sign cooperative management agreements with private landowners who voluntarily want to protect high quality habitats ^{1,2}		CBFWA (Recommendation)
	Implement special management designations on public lands ^{1,2}		CBFWA (Recommendation)
]Restore passage at non-natural barriers ^{1,2}	Replace culverts that do not meet fish passage criteria ^{1,2}	Forrest Conservation area program/ Oxbow Conservation area Program/ John day watershed restoration program	CTWSRO MOA (200104101, 200001500, 199801800)
	Replace irrigation push up dams with permanent structures that meet fish passage criteria ^{1,2}	John day watershed restoration program	CTWSRO MOA (199801800)
	Restore streamflow in streams that flow intermittently because of water withdrawals ^{1,2}	John day watershed restoration program	CTWSRO MOA (199801800)
Reduce water temperatures during summer months ^{1,2}	Increase shading of streams ^{1,2}	Forrest Conservation area program/ Oxbow Conservation area Program/ John day watershed restoration program	CTWSRO MOA (200104101, 200001500, 199801800)
	Lease water rights from willing sellers ^{1,2}		CBFWA (Recommendation)

	Implement more efficient irrigation systems ^{1,2}	John day watershed restoration program	CTWSRO MOA (199801800)
	Reduce the amount of irrigation water that returns overland to the river ^{1,2}	John day watershed restoration program	CTWSRO MOA (199801800)
Restore stream flows during low flow periods ^{1,2}	Lease water rights from willing sellers ^{1,2}		CBFWA (Recommendation)
	Convert flood irrigation systems to more efficient methods ^{1,2}	John day watershed restoration program	CTWSRO MOA (199801800)
	Require measurement of water use ^{1,2}		CBFWA (Recommendation)
	Investigate feasibility and effectiveness of floodplain aquifer recharge Specific Measure (Project Reference)s ^{1,2}		CBFWA (Recommendation)
	Improve hydrologic connectivity of springs to streams where poorly designed roads, small impoundments and other disturbances have redirected spring flows away from drainages ^{1,2}		CBFWA (Recommendation)
	Determine feasibility of off-stream storage, including ecological effects ^{1,2}		CBFWA (Recommendation)
Remove brook trout ²	Prohibit stocking of brook and rainbow trout in drainages where cutthroat trout are present ²		CBFWA (Recommendation)
	Investigate effective methods of brook trout removal where their distribution overlaps with cutthroat trout ²		CBFWA (Recommendation)
Determine origin of hybridization ²	Investigate options to minimize hybridization ²		CBFWA (Recommendation)

Strategies and Measures for Snake Lower White Sturgeon

Strategy	Recommended Measure		Source of Measure
Provide suitable spawning and rearing habitat	Operate the Federal Columbia River Power System (FCRPS) to provide suitable white sturgeon spawning and rearing habitat in Priest Rapids, Wanapum, Rock Island, Rocky Reach, and Wells reservoirs by providing a minimum average April through July flow that translates to 250 KCFS at McNary Dam		CBFWA (Recommendation)
Develop a regionally-accepted white sturgeon management plan framework	Develop a regionally accepted White Sturgeon Conservation and Management Plan	Develop a regionally accepted White Sturgeon Conservation and Management Plan	CRITFC (Recommendation) (200715500) WDFW Comment
		White Sturgeon Mitigation and Restoration in the Columbia and Snake River Upstream from Bonneville Dam	ODFW (Recommendation) (198605000)
Evaluate the need for and monitor the success of restoration efforts	Monitor and evaluate a) restoration actions designed to mitigate for lost white sturgeon production due to the construction and operation of the FCRPS and b) population responses to environmental conditions by: conducting assessments of the status of white sturgeon populations (eg, abundance, size distribution, length-weight relationship, etc) in McNary, Ice Harbor, Lower Monumental and Little Goose reservoirs every five (5) years	White Sturgeon Mitigation and Restoration in the Columbia and Snake River Upstream from Bonneville Dam	ODFW (Recommendation) (198605000)
	Indexing annual levels of, and variation in, white sturgeon recruitment in McNary reservoirs in the Columbia River, and in Ice Harbor, Lower Monumental, and Little Goose reservoirs in the Snake River	White Sturgeon Mitigation and Restoration in the Columbia and Snake River Upstream from Bonneville Dam	ODFW (Recommendation) (198605000)

<p>Identify and quantify the level of hatchery augmentation that will restore and enhance sturgeon populations and implement the Master Planning process to initiate the construction, operation and maintenance of regional facility(ies)</p>	<p>Consistent with existing and any future regional conservation and management plans, and in consultation with the appropriate state agencies and tribes, identify and quantify regional hatchery augmentation needs and immediately implement Master Plan processes necessary to construct, operate and maintain hatchery production facilities to augment natural production of depressed white sturgeon populations in the impounded portions of the Columbia and Snake rivers</p>	<p>Develop a regionally accepted White Sturgeon Conservation and Management Plan</p>	<p>CRITFC (Recommendation) (200715500)</p>
<p>Address critical uncertainties</p>	<p>Conduct research that addresses critical uncertainties identified in existing and future regional white sturgeon conservation and management plans related to loss of white sturgeon productivity due to the construction and operation of the FCRPS. These studies shall include determination of minimum spawning flows for successful white sturgeon recruitment throughout the Columbia River Basin in areas where they are not currently defined</p>		<p>CBFWA (Recommendation)</p>
	<p>Assessment of white sturgeon broodstock contribution to recruitment via genetic analysis</p>	<p>Sturgeon Genetics</p>	<p>LRT (Recommendation) (200850400)</p>
	<p>Quantification of contaminant accumulation in waters and sediments upstream of McNary Dam and their effects upon white sturgeon productivity</p>		<p>CBFWA (Recommendation)</p>

Identify and maintain sustainable harvest levels to ensure adequate escapement of fish to broodstock	Consistent with existing and any future regional conservation and management plans, and in consultation with the appropriate state agencies, and tribes, fund white sturgeon fishery management including	White Sturgeon Mitigation and Restoration in the Columbia and Snake River Upstream from Bonneville Dam	ODFW (Recommendation) (198605000)
	Identify sustainable recreational and Tribal harvest levels through population simulation that accounts for variable natural production, growth rate, and abundance	White Sturgeon Mitigation and Restoration in the Columbia and Snake River Upstream from Bonneville Dam	ODFW (Recommendation) (198605000)
	Conduct recreational creel surveys that enable active in-season management to attain pre-determined sustainable harvest levels	White Sturgeon Mitigation and Restoration in the Columbia and Snake River Upstream from Bonneville Dam	ODFW (Recommendation) (198605000)
	Conduct Tribal commercial and subsistence fishery monitoring that enables active in-season management to attain pre-determined sustainable harvest levels	White Sturgeon Mitigation and Restoration in the Columbia and Snake River Upstream from Bonneville Dam	ODFW (Recommendation) (198605000)

Strategies and Measures for Tucannon Bull Trout

Strategy	Recommended Measure		Source of Measure
Restore habitat	Improve stream flows in reaches partially dewatered for irrigation		CBFWA (Recommendation)
	Increase sinuosity		CBFWA (Recommendation)
	Restore large wood in the system		CBFWA (Recommendation)
	Protect, or restore riparian zones		CBFWA (Recommendation)
	Increase protective status of priority habitats in landuse regulations		CBFWA (Recommendation)
	Modify channel and increase flood-plain function		CBFWA (Recommendation)
	Increase habitat diversity		CBFWA

			(Recommendation)
Restore passage at non-natural barriers	Restore stream flows in reaches dewatered for irrigation use		CBFWA (Recommendation)
	Replace culverts or bridges not meeting fish passage guidelines		CBFWA (Recommendation)
	Screen irrigation diversions, maintain passage efficiency through ongoing O&M or additional activities, implement irrigation efficiency Specific Measure (Project Reference)s, and replace irrigation diversion structures with improved structures meeting fish passage standards		CBFWA (Recommendation)
	Continue to monitor and remove dams and barriers made by recreationists		CBFWA (Recommendation)
Reduce water temperatures during summer months	Restore priority restoration and protection reach attributes to improve downstream conditions		CBFWA (Recommendation)
	Modify channel and increase flood-plain function		CBFWA (Recommendation)
	Modify detrimental land use activities		CBFWA (Recommendation)
Restore stream flows during low flow periods	Increase water conservation and irrigation efficiency, and purchase or lease water rights from willing landowners		CBFWA (Recommendation)
Increase nutrients	Increase spring Chinook returns		CBFWA (Recommendation)
	Outplant hatchery spring chinook carcasses or fish cubes		CBFWA (Recommendation)
Identify population parameters	Conduct population estimates and evaluate distribution and genetic structure		CBFWA (Recommendation)
Curtail poaching	Continue and enhance WDFW, USFS and USFWS enforcement to prevent illegal harvest/harassment of bull trout		CBFWA (Recommendation)
Monitoring Population Identification genetic	Conduct DNA analysis to identify populations and set recovery goals		CBFWA (Recommendation)
	Continue, and expand, spawning surveys to		CBFWA

structure, abundance, movements and general distribution are not well understood Population status and trend information is needed to appropriately set criteria for recovery and to determine recovery status	determine relative spawning abundance and distribution		(Recommendation)
	Expand Electrofishing or snorkeling to determine		CBFWA (Recommendation)
	Determine habitat conditions and trends		CBFWA (Recommendation)
	Complete the draft recovery plan		CBFWA (Recommendation)

Strategies and Measures for Umatilla Bull Trout

Strategy	Recommended Measure		Source of Measure
Restore habitat	Restore stream flows in reaches dewatered for irrigation		CBFWA (Recommendation)
	Restore large wood in the system		CBFWA (Recommendation)
	Fence and plant riparian zones		CBFWA (Recommendation)
	Increase protective status of priority habitats		CBFWA (Recommendation)
	Modify channel and flood-plain function, and increase habitat diversity		CBFWA (Recommendation)
Restore passage at non-natural barriers	Maintain Phase I and II and implement Phase III of the Umatilla Basin Specific Measure (Project Reference), restore stream flows in reaches dewatered for irrigation use, replace culverts not meeting fish passage guidelines, screen irrigation diversions, maintain passage efficiency through ongoing O&M activities, implement irrigation efficiency Specific Measure (Project Reference)s, and replace temporary irrigation diversion dams		CBFWA (Recommendation)

	with structures that meet fish passage standards		
Reduce water temperatures during summer months	Restore headwater attributes to improve downstream conditions, modify channel and flood-plain function, and modify detrimental land use activities		CBFWA (Recommendation)
Restore stream flows during low flow periods	Maintain Phase I and II and implement Phase III of the Umatilla Basin Specific Measure (Project Reference), increase water conservation and irrigation efficiency, and purchase or lease water rights from willing landowners		

Strategies and Measures for Umatilla Mussels

Strategy	Recommended Measure		Source of Measure
Determine and restore preferred habitat	Conduct field studies and re-location efforts to identify preferred physical habitat of all three genera, determine optimal stream flows, especially in reaches dewatered for irrigation, determine habitat preferences through re-location experiments; increase habitat diversity	Freshwater Mussel Research and Restoration Project	CTUIR (Recommendation) (200203700)
Determine if existing water quality in Umatilla will maintain viable and self-sustaining mussel populations	Conduct physiological and condition experiments to determine lethal limits for mussels in regards to summer temperatures, dislodging flows, food availability and composition, and overall water quality requirements	Freshwater Mussel Research and Restoration Project	CTUIR (Recommendation) (200203700)
Determine host fish and minimum host fish population levels needed to maintain self-sustaining mussel populations	Determine host fish through laboratory experiments, culture juvenile mussels in hatchery setting for possible re-introduction trials, determine optimal habitats for both fish hosts and mussel species	Freshwater Mussel Research and Restoration Project	CTUIR (Recommendation) (200203700)
Determine which	Determine genetically which genera of <i>Anodonta</i>	Freshwater Mussel Research and Restoration Project	CTUIR

genera and species occur in Umatilla drainage, and which stocks of the western pearlshell may be best suited for reintroduction efforts	occur in the Umatilla River (a recent new genus has been discovered)		(Recommendation) (200203700)
	Determine where stocks of western pearlshell can be obtained that are best suited for reintroduction efforts	Freshwater Mussel Research and Restoration Project	CTUIR (Recommendation) (200203700)
	Match existing genetic makeup of Umatilla populations of western ridge mussel and <i>Anodonta</i> spp with extant populations in nearby drainages to find most suitable candidates for re-introduction efforts	Freshwater Mussel Research and Restoration Project	CTUIR (Recommendation) (200203700)

Strategies and Measures for Umatilla Redband Trout

Strategy	Recommended Measure		Source of Measure
Restore degraded habitat	Restore stream flows in reaches dewatered for irrigation		CBFWA (Recommendation)
	Restore large wood in the system, fence and plant riparian zones		CBFWA (Recommendation)
	Increase protective status of priority habitats		CBFWA (Recommendation)
	Restore floodplain function and channel complexity, and increase habitat diversity		CBFWA (Recommendation)
Restore passage at non-natural barriers	Maintain Phase I and II and implement Phase III of the Umatilla Basin Specific Measure (Project Reference)		CBFWA (Recommendation)
	Restore stream flows in reaches dewatered for irrigation use		CBFWA (Recommendation)
	Replace culverts not meeting fish passage guidelines		CBFWA (Recommendation)
	Screen irrigation diversions		CBFWA

			(Recommendation)
	Maintain passage efficiency through ongoing O&M activities		CBFWA (Recommendation)
	Implement irrigation efficiency Specific Measure (Project Reference)s		CBFWA (Recommendation)
	Replace temporary irrigation diversion dams with structures that meet fish passage standards		CBFWA (Recommendation)
Reduce water temperatures during summer months	Restore headwater attributes to improve downstream conditions		CBFWA (Recommendation)
	Modify channel and flood-plain function		CBFWA (Recommendation)
	Modify detrimental land use activities		CBFWA (Recommendation)
Restore stream flows during low flow periods	Maintain Phase I and II and implement Phase III of the Umatilla Basin Specific Measure (Project Reference)		CBFWA (Recommendation)
	Increase water conservation and irrigation efficiency		CBFWA (Recommendation)
	Purchase or lease water rights from willing landowners		CBFWA (Recommendation)

Strategies and Measures for Walla Walla Bull Trout

Strategy	Recommended Measure		Source of Measure
Restore passage at non-natural barriers	Restore stream flows in reaches dewatered for irrigation use		CBFWA (Recommendation)
	Replace culverts not meeting fish passage guidelines		CBFWA (Recommendation)
	Screen irrigation diversions		CBFWA (Recommendation)
	Monitor fish passage improvement Specific Measure		CBFWA

	(Project Reference)s		(Recommendation)
	Implement irrigation efficiency Specific Measure (Project Reference)s		CBFWA (Recommendation)
	Replace temporary irrigation diversion dams with structures meeting fish passage standards		CBFWA (Recommendation)
Restore degraded habitat	Restore stream flows in reaches dewatered for irrigation		CBFWA (Recommendation)
	Restore large wood in the system		CBFWA (Recommendation)
	Reduce grazing impacts		CBFWA (Recommendation)
	Restore floodplain function and channel complexity, and increase habitat diversity		CBFWA (Recommendation)
Reduce water temperatures during summer months	Increase stream flows		CBFWA (Recommendation)
	Lease water rights from willing sellers		CBFWA (Recommendation)
	Implement more efficient irrigation systems, and improve watershed function		CBFWA (Recommendation)
Restore stream flows during low flow periods	Implement irrigation efficiency Specific Measure (Project Reference)		CBFWA (Recommendation)
	Evaluate shallow aquifer recharge Specific Measure (Project Reference)s		CBFWA (Recommendation)
	Lease or purchase water rights		CBFWA (Recommendation)
	Initiate point of diversion transfers		CBFWA (Recommendation)

Strategies and Measures for Walla Walla Bull Trout

Strategy	Recommended Measure		Source of Measure
Restore passage at non-natural barriers	Restore stream flows in reaches dewatered for irrigation use		CBFWA (Recommendation)
	Replace irrigation diversion structures with improved structures meeting fish passage standards		CBFWA (Recommendation)
	Replace culverts not meeting fish passage guidelines		CBFWA (Recommendation)
	Screen irrigation diversions, maintain passage efficiency through on-going O&M or additional activities		CBFWA (Recommendation)
	Monitor effectiveness of fish passage improvement Specific Measure (Project Reference)s		CBFWA (Recommendation)
	Implement irrigation efficiency Specific Measure (Project Reference)s		CBFWA (Recommendation)
	Replace temporary irrigation diversion dams with structures meeting fish passage standards		CBFWA (Recommendation)
	Continue to monitor and remove dams and barriers made by recreationists		CBFWA (Recommendation)
Restore degraded habitat	Improve stream flows in reaches partially or completely dewatered for irrigation		CBFWA (Recommendation)
	Increase sinuosity		CBFWA (Recommendation)
	Restore large wood in the system		CBFWA (Recommendation)
	Protect, or restore riparian zones		CBFWA (Recommendation)
	Increase protective status of priority habitats in landuse regulations		CBFWA (Recommendation)

	Restore floodplain function and channel complexity, and increase habitat diversity		CBFWA (Recommendation)
Reduce water temperatures during summer months	Increase stream flows		CBFWA (Recommendation)
	Restore priority restoration and protection reach attributes to improve downstream conditions		CBFWA (Recommendation)
	Modify channel and increase floodplain functions		CBFWA (Recommendation)
	Reduce detrimental land use activities		CBFWA (Recommendation)
	Lease water rights from willing sellers		CBFWA (Recommendation)
	Implement more efficient irrigation systems, and improve watershed function		CBFWA (Recommendation)
Restore stream flows during low flow periods	Implement irrigation efficiency Specific Measure (Project Reference)s		CBFWA (Recommendation)
	Initiate point of diversion transfers		CBFWA (Recommendation)
	Evaluate shallow aquifer recharge Specific Measure (Project Reference)s		CBFWA (Recommendation)
	Increase water conservation and irrigation efficiency, and purchase or lease water rights from willing landowner		CBFWA (Recommendation)
Increase nutrients	Increase spring chinook returns		CBFWA (Recommendation)
	Outplant hatchery spring chinook carcasses or fish cubes		CBFWA (Recommendation)
Curtail Poaching and fishery impacts	Continue and enhance WFDW, CTUIR, and USFWS enforcement		CBFWA (Recommendation)
Decrease predators and exotic species	Increase stream flows		CBFWA (Recommendation)
	Restore priority restoration and protection reach		CBFWA

	attributes to improve downstream conditions		(Recommendation)
	Modify channel and increase floodplain functions		CBFWA (Recommendation)
	Reduce detrimental land use activities		CBFWA (Recommendation)
	Lease water rights from willing sellers		CBFWA (Recommendation)
	Implement more efficient irrigation systems, and improve watershed function		CBFWA (Recommendation)
	Decrease water temperatures		CBFWA (Recommendation)
	Evaluate shallow aquifer recharge Specific Measure (Project Reference)s		CBFWA (Recommendation)
	Increase water conservation and irrigation efficiency, and purchase or lease water rights from willing landowners		CBFWA (Recommendation)
	Liberalize fishing regulations on exotic species		CBFWA (Recommendation)
Monitoring Populations identification, genetic structure, abundance, movements and general distribution are not well understood Population status and trend information is needed to appropriately set criteria for recovery and to determine recovery status	Conduct DNA analysis to identify populations and set recovery goals		CBFWA (Recommendation)
	Continue, and expand, spawning surveys to determine relative spawning abundance and distribution	Migratory patterns, Structure, Abundance, and Status of Bull Trout Populations in Subbasins of the Columbia Gorge, Columbia Plateau, and Blue Mountain Provinces	ODFW (Recommendation) (199405400)
	Expand electrofishing or snorkeling to determine distribution		CBFWA (Recommendation)
	Determine habitat conditions and trends		CBFWA (Recommendation)
	Complete the draft recovery plan		CBFWA (Recommendation)

Strategies and Measures for Walla Walla Redband Trout

Strategy	Recommended Measure		Source of Measure
Restore passage at non-natural barriers	Restore stream flows in reaches dewatered for irrigation use		CBFWA (Recommendation)
	Replace culverts not meeting fish passage guidelines		CBFWA (Recommendation)
	Screen irrigation diversions		CBFWA (Recommendation)
	Monitor fish passage improvement Specific Measure (Project Reference)s		CBFWA (Recommendation)
	Implement irrigation efficiency Specific Measure (Project Reference)s		CBFWA (Recommendation)
	Replace temporary irrigation diversion dams with structures meeting fish passage standards		CBFWA (Recommendation)
Restore habitat	Restore stream flows in reaches dewatered for irrigation		CBFWA (Recommendation)
	Restore large wood in the system		CBFWA (Recommendation)
	Reduce grazing impacts		CBFWA (Recommendation)
	Restore floodplain function and channel complexity		CBFWA (Recommendation)
	Increase habitat diversity		CBFWA (Recommendation)
Reduce water temperatures during summer months	Increase stream flows		CBFWA (Recommendation)
	Lease water rights from willing sellers		CBFWA (Recommendation)
	Implement more efficient irrigation systems		CBFWA (Recommendation)
	Improve watershed function		CBFWA (Recommendation)

Restore stream flows during low flow periods	Implement irrigation efficiency Specific Measure (Project Reference)s		CBFWA (Recommendation)
	Transfer point(s) of diversion		CBFWA (Recommendation)
	Evaluate shallow aquifer recharge Specific Measure (Project Reference)s		CBFWA (Recommendation)
	Lease or purchase water rights		CBFWA (Recommendation)

Strategies and Measures for Yakima Bull Trout

Strategy	Recommended Measure		Source of Measure
Protect properly functioning habitat	Utilize conservation agreements and/or fee simple acquisition opportunistically to protect local bull trout population habitat that meets the definition of “properly functioning condition”		CBFWA (Recommendation)
	Negotiate provisions in the USFS – Naches Ranger District lease renewal for the SF Tieton River grazing allotment to reduce or prevent livestock damage in bull trout spawning areas		CBFWA (Recommendation)
	Negotiate with the USFS – Naches Ranger District for the permanent abandonment of FS Rd 1800 west of the Deep Cr culvert crossing for motorized vehicle traffic		CBFWA (Recommendation)
	Remove the culverts, restore the creek bed and provide a suitable ford for horses and non-motorized recreational use (hiking, mountain biking) of the road west of Deep Creek		CBFWA (Recommendation)

Modify reservoir and flow regime	Use the ESA Section 7 consultation process between the USFWS and the Bureau of Reclamation (Reclamation) to develop a new Biological Assessment (BA) with proposed actions that substantively address specific reservoir and flow regime problems that adversely impact local bull trout populations		CBFWA (Recommendation)
	USFWS shall issue a Biological Opinion (BiOp) that obligates Reclamation to implement negotiated proposed actions to recover bull trout local populations with certainty and in a timely manner		CBFWA (Recommendation)
	Improve irrigation and other water user efficiency that moves flow toward normative conditions		CBFWA (Recommendation)
	Return flow regimes to more normative conditions through increased natural and artificial storage		CBFWA (Recommendation)
	Modify or eliminate the annual “Flip-flop” flow operation		CBFWA (Recommendation)
Provide effective fish passage to restore connectivity between the sixteen local bull trout populations and restore anadromous fish runs to boost ecosystem productivity	Participate in and support Reclamation’s efforts to develop technically feasible and economically viable engineering designs for upstream and downstream fish passage facilities at Cle Elum Dam, Bumping Lake Dam and Clear Lake Dam (and other storage dams in future years)		CBFWA (Recommendation)
	Assist BOR in securing funding from Congress, NPCC/BPA and other federal, state and local partners for passage facility construction, operation and maintenance		CBFWA (Recommendation)
	The fish co-managers, WDFW and Yakama Nation, shall implement an anadromous fish re-introduction plan using hatchery supplementation to accelerate restoration of salmon populations upstream of Reclamation storage dams equipped with fish passage		CBFWA (Recommendation)

	Investigate the potential of a pilot bull trout hatchery supplementation Specific Measure (Project Reference) (or capture and redistribution of adult bull trout spawners from “healthy” local populations to “critical” populations (SaSI definitions)), to accelerate restoration of critical and depressed local populations		CBFWA (Recommendation)
	Work with the USFS (Naches and Cle Elum RD’s) and DNR (Ahtanum Cr basin) to educate the public about the threat to bull trout populations caused by constructing numerous low rock dams in spawning tributaries during the summer months immediately prior to spawning migrations		CBFWA (Recommendation)
	WDFW and USFS monitor spawning tributaries adjacent to campgrounds and other areas of high recreation use during the summer and de-construct recreational dams to restore upstream passage for adult bull trout		CBFWA (Recommendation)
	Monitor passage conditions at the mouths of Reclamation storage reservoir bull trout spawning tributaries (Gold Cr, Box Canyon Cr, Indian Cr, SF Tieton R) and take measures to concentrate flow and assure passage across the reservoir lakebed during summer drawdown		CBFWA (Recommendation)
	Coordinate with Reclamation to fund the deployment of labor and materials to accomplish this measure		CBFWA (Recommendation)
Improve compliance with conservation-oriented fishing regulations that close bull trout spawning/rearing areas in tributaries to fishing	Continue and enhance WDFW and USFWS enforcement to prevent illegal harvest/harassment of bull trout		CBFWA (Recommendation)
	Close the regulatory “loophole” unique to the Yakima Basin adfluvial populations (Deep Cr, SF Tieton R, Indian Cr, NF Tieton R, Gold Cr, Box Canyon Cr, Kachess R) that some fishermen have		CBFWA (Recommendation)

year-round	exploited Extend the “closed water” rule downstream in these tributaries to include those portions of the creek flowing across the dry lakebed during irrigation season reservoir drawdown		
	Continue to publish the “bull trout vs brook trout” identification illustration in WDFW’s annual sport fishing rules pamphlet		CBFWA (Recommendation)
	Continue to produce and post the bull trout vs brook trout identification sign prominently in areas where bull trout and brook co-exist		CBFWA (Recommendation)

Strategies and Measures for Columbia Upper Middle Bull Trout

Strategy	Recommended Measure		Source of Measure
Evaluate passage at hydro-facilities	Conduct telemetry studies to determine migration patterns and potential problems at hydro-facilities		CBFWA (Recommendation)
Identify status and distribution	Conduct surveys to determine population density, composition, and distribution		CBFWA (Recommendation)

Strategies and Measures for Columbia Upper Middle White Sturgeon

Strategy	Recommended Measure		Source of Measure
Provide suitable spawning and rearing habitat	Operate the Federal Columbia River Power System (FCRPS) to provide suitable white sturgeon spawning and rearing habitat in Priest Rapids, Wanapum, Rock Island, Rocky Reach, and Wells reservoirs by providing a minimum average April through July flow that translates to 250 KCFS at McNary Dam		CBFWA (Recommendation)

<p>Conduct research to addresses critical uncertainties</p>	<p>Conduct research that addresses critical uncertainties identified in existing and future regional white sturgeon conservation and management plans related to loss of white sturgeon productivity due to the construction and operation of the FCRPS. These studies shall include (but are not limited to) determination of minimum spawning flows for successful white sturgeon recruitment throughout the Columbia River Basin in areas where they are not currently defined.</p>		<p>CBFWA (Recommendation)</p>
<p>Implement hatchery based white sturgeon augmentation program(s)</p>	<p>Consistent with existing and any future regional conservation and management plans, and in consultation with the appropriate state agencies, tribes, and PUDs, implement regional hatchery augmentation to restore white sturgeon populations in the impounded portions of the Columbia River upstream of Priest Rapids Dam [Specific and detailed background, objectives and tasks are described in FERC Relicensing documents – Priest Rapids Specific Measure (Project Reference) Final 401 Certification, as amended, March 2008; Grant PUD FLA 2003, White Sturgeon Conservation Aquaculture Plan; Chelan PUD Rocky Reach Settlement Agreement, White Sturgeon Management Plan, 2005]</p>	<p>Develop a regionally accepted White Sturgeon Conservation and Management Plan</p>	<p>CRITFC (Recommendation) (200715500)</p>
<p>Evaluate and monitor white sturgeon population restoration efforts</p>	<p>Consistent with existing and any future regional conservation and management plans, and in consultation with the appropriate state agencies, tribes, and PUDs, monitor and evaluate a) restoration actions designed to mitigate for lost white sturgeon production due to the construction and operation of the FCRPS and b) population responses to environmental conditions by conducting periodic assessments of the status of white sturgeon populations (eg, abundance, size distribution, length-weight relationship, etc) in</p>		<p>CBFWA (Recommendation)</p>

	Priest Rapids, Wanapum, Rock Island, Rocky Reach, and Wells reservoirs [Detailed objectives and tasks are described in FERC Relicensing documents –]		
Develop a regionally-accepted white sturgeon management plan framework	Develop a regionally accepted White Sturgeon Conservation and Management Plan	Develop a regionally accepted White Sturgeon Conservation and Management Plan	CRITFC (Recommendation) (200715500)
Identify and maintain sustainable harvest levels to ensure adequate escapement of fish to broodstock	Consistent with existing and any future regional conservation and management plans, and in consultation with the appropriate state agencies, tribes, and PUDs, fund white sturgeon fishery management including		CBFWA (Recommendation)
	Identify sustainable recreational and Tribal harvest levels through population simulation that accounts for variable natural production, growth rate, and abundance		CBFWA (Recommendation)
	Conduct recreational creel surveys that enable active in-season management to attain pre-determined sustainable harvest levels		CBFWA (Recommendation)
	Conduct Tribal subsistence fishery monitoring that enables active in-season management to attain pre-determined sustainable harvest levels		CBFWA (Recommendation)

Strategies and Measures for Entiat Bull Trout

Strategy	Recommended Measure		Source of Measure
Reduce non-natives	Remove brook trout through harvest or other means (eg, chemical and trapping)		CBFWA (Recommendation)
	Increase agency presence through creel surveys and enforcement		CBFWA (Recommendation)
Reduce non-natives	Remove brook trout through harvest or other means (eg, chemical and trapping)		CBFWA (Recommendation)

	Increase agency presence through creel surveys and enforcement		CBFWA (Recommendation)
Evaluate habitat and current use	Quantify habitat needs and implement restoration measures		CBFWA (Recommendation)
Curtail poaching activities	Evaluate and control harvest activities		CBFWA (Recommendation)

Strategies and Measures for Entiat Westslope Cutthroat Trout

Strategy	Recommended Measure		Source of Measure
Reduce non-native species	Reduce rainbow trout population through harvest or other means (eg, chemical and trapping)		CBFWA (Recommendation)
	Increase agency presence through creel surveys and enforcement		CBFWA (Recommendation)
Evaluate habitat and current use	Quantify habitat needs and implement restoration measures		CBFWA (Recommendation)

Strategies and Measures for Entiat Rainbow Trout

Strategy	Recommended Measure		Source of Measure
Improve population structure (ie, age and growth)	Conduct biological and creel surveys		CBFWA (Recommendation)
	Implement regulation changes to reduce rainbow trout population or limit harvest of larger fish		CBFWA (Recommendation)
	Determine best options in relation to westslope cutthroat trout objectives		CBFWA (Recommendation)

Strategies and Measures for Lake Chelan Bull Trout

Strategy	Recommended Measure		Source of Measure
Seek/create a refuge population	Survey for remnant populations in Stehekin		CBFWA (Recommendation)
	Identify reason for population crash or extirpation		CBFWA (Recommendation)
	Identify stock for reintroduction to Stehekin refuge population		CBFWA (Recommendation)
Reduce predator populations	Reduce lake trout populations through harvest or other means where feasible		CBFWA (Recommendation)
	Evaluate regulation modifications		CBFWA (Recommendation)

Strategies and Measures for Lake Chelan Westslope Cutthroat Trout

Strategy	Recommended Measure		Source of Measure
Enhance numbers of broodstock and age-0 fish	Obtain better estimate of production, especially for Stehekin		CBFWA (Recommendation)
	Stock 100,000 catchable-sized fish annually or use net pen rearing to attain desirable size		CBFWA (Recommendation)
	Deploy remote site incubators and/or fry stocking in tributaries		CBFWA (Recommendation)
Reduce introduced species	Reduce predator populations through harvest or other means where feasible		CBFWA (Recommendation)
	Regulation evaluation and consider closing tributary sections		CBFWA (Recommendation)

Enhance access to tributaries	Modify current hydro-operations to preserve access to spawning/rearing tributaries		CBFWA (Recommendation)
	Remove alluvial barriers		CBFWA (Recommendation)

Strategies and Measures for Lake Chelan Kokanee

Strategy	Recommended Measure		Source of Measure
Develop a management plan	Conduct population surveys to better estimate natural production and adjust stocking for proper harvest size and catch per unit effort		CBFWA (Recommendation)
	Conduct genetic surveys to identify the best broodstock source for culture purposes		CBFWA (Recommendation)
Reduce introduced species	Reduce introduced species (ie, mysis shrimp, lake trout, and rainbow trout) through harvest or other means where feasible		CBFWA (Recommendation)

Strategies and Measures for Lake Chelan Burbot

Strategy	Recommended Measure		Source of Measure
Develop a management plan	Conduct extensive surveys to obtain baseline population data, habitat use information, and pathology data		CBFWA (Recommendation)

Strategies and Measures for Methow Bull Trout

Strategy	Recommended Measure		Source of Measure
Reduce competitive species populations	Evaluate species interactions and status		CBFWA (Recommendation)
	Remove brook trout through harvest or other means (eg chemical, trapping)		CBFWA (Recommendation)
	Increase agency presence through creel surveys and enforcement		CBFWA (Recommendation)
	Evaluate regulation effectiveness		CBFWA (Recommendation)
Reduce hybridizing species populations	Evaluate species interactions and status		CBFWA (Recommendation)
	Remove brook trout through harvest or other means (eg chemical, trapping)		CBFWA (Recommendation)
	Increase agency presence through creel surveys and enforcement		CBFWA (Recommendation)
	Evaluate regulation effectiveness		CBFWA (Recommendation)
Improve spawning and rearing conditions	Survey current habitat, quantify needs, and evaluate current uses		CBFWA (Recommendation)
	Implement appropriate restoration actions		CBFWA (Recommendation)
Estimate impact of harvest	Conduct yearly surveys to determine population health		CBFWA (Recommendation)
	Develop a population estimate to management purposes		CBFWA (Recommendation)
	Work with federal biologists to develop a database for the Lost River population		CBFWA (Recommendation)

Strategies and Measures for Methow Westslope Cutthroat Trout

Strategy	Recommended Measure		Source of Measure
Reduce competitive species populations	Reduce rainbow trout populations through harvest or other means (eg, chemical and trapping)		CBFWA (Recommendation)
	Investigate re-introduction to increase distribution		CBFWA (Recommendation)
Reduce hybridizing species populations	Reduce rainbow trout populations through harvest or other means (eg, chemical and trapping) and investigate re-introduction to increase distribution		CBFWA (Recommendation)
Control harvest practices	Evaluate harvest practices through increased agency presence using creel surveys and law enforcement		CBFWA (Recommendation)
Improve spawning and rearing conditions	Survey current habitat, quantify needs, and evaluate current uses		CBFWA (Recommendation)
	Implement appropriate restoration actions		CBFWA (Recommendation)

Strategies and Measures for Okanogan Rainbow Trout

Strategy	Recommended Measure		Source of Measure
Address population and reservoir-specific data gaps to better inform decision making processes	Implement a feminized triploid rainbow trout stocking and creel survey program for Lake Rufus Woods	Lake Rufus Woods Subbasin Area Stock Assessment, Habitat Assessment, and Fisheries Evaluation Program	CCT (Recommendation) (20072700)
	Monitor fishery to determine angler catch rates, optimal number and size of fish to be released	Lake Rufus Woods Subbasin Area Stock Assessment, Habitat Assessment, and Fisheries Evaluation Program	CCT (Recommendation) (20072700)
	Determine origin of fish caught with marking identification, stomach content analysis, and radio isotope studies	Lake Rufus Woods Subbasin Area Stock Assessment, Habitat Assessment, and Fisheries Evaluation Program	CCT (Recommendation) (20072700)
	Determine primary factors affecting the quality of the Rufus Woods fishery including the study of the	Lake Rufus Woods Subbasin Area Stock Assessment, Habitat Assessment, and Fisheries Evaluation Program	CCT (Recommendation)

	primary productivity of the reservoir		(20072700)
Modify actions associated with current land-use activities	Work with local ranchers to develop cost share Specific Measure (Project Reference)s with Natural Resource and Conservation Service (NRCS) that will stabilize streams and stream banks		CBFWA (Recommendation)
	Re-establish riparian vegetation, and exclude cattle from riparian zones		CBFWA (Recommendation)
	Work with Colville Tribes integrated review process and land use board to reduce impacts from proposed timber harvest, range plans and Specific Measure (Project Reference)s, and road construction Specific Measure (Project Reference)s to reduce road densities and water quality impacts from proposed Specific Measure (Project Reference)s and land uses		CBFWA (Recommendation)
Protect and enhance in-stream flows	Work with Colville Tribes integrated review process and land use board to reduce impacts from proposed timber harvest, range plans and Specific Measure (Project Reference)s, and road construction Specific Measure (Project Reference)s to reduce road densities and water quality impacts from proposed Specific Measure (Project Reference)s and land uses		CBFWA (Recommendation)
	Work with Colville Tribal Council to purchase water rights and protect and enhance in-stream flows		CBFWA (Recommendation)

Strategies and Measures for Okanogan Lahotan Cutthroat Trout

Strategy	Recommended Measure		Source of Measure
Improve flows to provide access to spawning habitat	Coordinate the participation, planning, and implementation of proposed timber harvest, range plans and Specific Measure (Project Reference)s, and road construction Specific Measure (Project		CBFWA (Recommendation)

	Reference)s to reduce road densities and hydrological impacts from proposed Specific Measure (Project Reference)s and land uses		
	Purchase property, water rights, and conservation agreements, for the protection and enhancement of in-stream flows		CBFWA (Recommendation)
	Continue collection of brood stock and harvest of fertile eggs to be raised in the hatchery and planted into Omak Lake annually and monitor harvest	Colville Hatchery	CCT (Recommendation) (198503800)
Enhance Omak Lake population	Continue collection of brood stock and harvest of fertile eggs to be raised in the hatchery and planted into Omak Lake annually	Colville Hatchery	CCT (Recommendation) (198503800)
	Monitor harvest	Colville Hatchery	CCT (Recommendation) (198503800)

Strategies and Measures for Okanogan Kokanee

Strategy	Recommended Measure		Source of Measure
Address reservoir-specific population data gaps to better inform decision making processes	Continue monitoring Nespelem River and develop sampling and monitoring plan for entire reservoir addressing key factors such as limnology, primary productivity, secondary productivity, and fish productivity	Chief Joseph Kokanee Enhancement	CCT (Recommendation) (199501100)
Identify magnitude of predatory impacts on natural origin kokanee	Investigate predators effects on kokanee in Lake Rufus Woods	Chief Joseph Kokanee Enhancement	CCT (Recommendation) (199501100)
Assess entrainment at Chief Joseph Dam determine corrective measures	Develop and implement an assessment addressing entrainment at Chief Joseph Dam	Chief Joseph Kokanee Enhancement	CCT (Recommendation) (199501100)
Modify current land-use practice	Work with local ranchers to develop cost share Specific Measure (Project Reference)s with Natural	Chief Joseph Kokanee Enhancement	CCT (Recommendation)

	Resource Conservation Service (NRCS) that will stabilize streams and stream banks, re-establish riparian vegetation, and exclude cattle from riparian zones		(199501100)
	Work with Colville Tribes integrated review process and land use board to reduce impacts from proposed timber harvest, range plans and Specific Measure (Project Reference)s, and road construction Specific Measure (Project Reference)s to reduce road densities and water quality impacts from proposed Specific Measure (Project Reference)s and land uses		CBFWA (Recommendation)
Improve habitat conditions	Work with Colville Tribal Council and NRCS to identify conservation actions that protect and enhance in stream habitat Determine the feasibility of constructing spawning channels in the Nespelem sub basin and other areas	Chief Joseph Kokanee Enhancement	CCT (Recommendation) (199501100)
	Coordinate the participation, planning, and implementation of proposed timber harvest, range plans and Specific Measure (Project Reference)s, and road construction Specific Measure (Project Reference)s to reduce road densities and hydrological impacts from proposed Specific Measure (Project Reference)s and land uses Purchase property, water rights, and conservation agreements and easements, for the protection and enhancement of in-stream habitat		CBFWA (Recommendation)

Strategies and Measures for Wenatchee Bull Trout

Strategy	Recommended Measure		Source of Measure
Reduce competitive species populations	Evaluate species interactions and status		CBFWA (Recommendation)
	Remove brook trout through harvest or other means		CBFWA

	(eg chemical, trapping)		(Recommendation)
Increase/improve spawning and rearing habitat	Quantify habitat needs		CBFWA (Recommendation)
	Identify habitat currently being used		CBFWA (Recommendation)
	Implement restoration measures		CBFWA (Recommendation)
Reduce hybridizing species populations	Evaluate species interactions and status		CBFWA (Recommendation)
	Conduct biological surveys (population estimates) in Lake Wenatchee, the Wenatchee River and its tributaries		CBFWA (Recommendation)
	Remove brook trout through harvest or other means (eg chemical, trapping)		CBFWA (Recommendation)
Reduce poaching activities	Evaluate harvest practices through creel surveys and the presence of law enforcement		CBFWA (Recommendation)
	Evaluate regulation effectiveness and modify if warranted		CBFWA (Recommendation)

Strategies and Measures for Wenatchee Westslope Cutthroat Trout

Strategy	Recommended Measure		Source of Measure
Reduce competitive species populations	Reduce rainbow trout populations through harvest or other means (eg, chemical and trapping)		CBFWA (Recommendation)
	Investigate re-introduction to increase distribution		CBFWA (Recommendation)
Reduce hybridizing species populations	Reduce rainbow trout populations through harvest or other means (eg, chemical and trapping)		CBFWA (Recommendation)
	Investigate re-introduction to increase distribution		CBFWA (Recommendation)
Control harvest	Evaluate harvest practices through increased agency		CBFWA

practices	presence using creel surveys and law enforcement		(Recommendation)
Improve spawning and rearing conditions	Survey current habitat, quantify needs, and evaluate current uses		CBFWA (Recommendation)
	Implement appropriate restoration actions		CBFWA (Recommendation)

Strategies and Measures for Wenatchee Westslope Cutthroat Trout

Strategy	Recommended Measure		Source of Measure
Reduce competitive species populations	Perform population surveys		CBFWA (Recommendation)
	Reduce cutthroat trout populations through harvest or other means (eg, chemical and trapping)		CBFWA (Recommendation)
	Reduce or eliminate high lakes stocking program		CBFWA (Recommendation)
Reduce hybridizing species populations	Perform population and genetic surveys		CBFWA (Recommendation)

Strategies and Measures for Coeur d’Alene Bull Trout

Strategy	Recommended Measure		Source of Measure
Reduce impacts from past mining operations and development along river and stream corridors and reduce sediment delivery to the stream network	Work with the Idaho Department of Fish and Game, Coeur d’Alene Tribe, Forest Service, other agencies, private developers and landowners, county planners and interested angling groups to make protection of fisheries habitat a primary concern in land use decisions		CBFWA (Recommendation)
	Incorporate evaluations of existing habitat into Specific Measure (Project Reference) plans whenever possible		CBFWA (Recommendation)

	Develop a database to demonstrate the magnitude of habitat loss and more effectively influence land use decisions		CBFWA (Recommendation)
	Work with the Idaho Department of Fish and Game, Coeur d'Alene Tribe, Forest Service, Department of Transportation, Silver Valley Natural Resource Trustees, Environmental Protection Agency, Department of Lands, Department of Environmental Quality, and others to insure mitigation of habitat loss or restoration of habitat whenever possible		CBFWA (Recommendation)
	Promote lessons learned from past research to improve habitat critical to bull trout survival		CBFWA (Recommendation)
Reduce impacts from introduced species	Set liberal regulations on northern pike, smallmouth bass and brook trout to reduce their numbers and limit their spread		CBFWA (Recommendation)
	Develop informational programs to educate anglers and the public to risks of random introductions of exotic species		CBFWA (Recommendation)
	Through planning, use enforcement efforts to curtail illegal introductions		CBFWA (Recommendation)
	Work with anglers to reach a balance between exotic species and bull trout		CBFWA (Recommendation)
Reduce heavy metal concentrations Restore functional riparian habitat	Work with Idaho Fish and Game, Coeur d'Alene Tribe, Forest Service, Department of Environmental Quality, Environmental Protection Agency, US Fish and Wildlife Service, Bureau of Land Management and other agencies in reducing heavy metal loading into the Coeur d'Alene River watershed Monitor the fish populations to show benefits from reductions in heavy metal concentrations and water temperatures		CBFWA (Recommendation)

Restore connectivity to important spawning, rearing and refugia habitat	Work with the Idaho Fish and Game, Coeur d'Alene Tribe, Forest Service, Idaho Department of Lands, other agencies, private developers and landowners, county planners and interested angling groups to make protection of fisheries habitat a primary concern in land-use decisions Incorporate evaluations of roads, railroads and dikes in survey Specific Measure (Project Reference)s to assess where access to important habitat has been lost		CBFWA (Recommendation)
	Develop a data base to demonstrate the magnitude of habitat loss and more effectively influence land use decisions		CBFWA (Recommendation)
	Work with the Idaho Department of Fish and Game, Coeur d'Alene Tribe, Forest Service, Department of Transportation, Silver Valley Natural Resource Trustees, Environmental Protection Agency, Department of Lands, Department of Environmental Quality and others to insure mitigation of habitat loss or to restore access whenever possible		CBFWA (Recommendation)

Strategies and Measures for Coeur d'Alene Kokanee

Strategy	Recommended Measure		Source of Measure
Reduce impacts from introduced species	Set liberal regulations on smallmouth bass to reduce their numbers and limit their spread		CBFWA (Recommendation)
	Determine habitat use, movement and feeding habits of smallmouth bass to assess impacts on kokanee and other desired game fishes		CBFWA (Recommendation)
	Evaluate chinook survival and recruitment to the fishery by monitoring chinook derbies and conducting redd count surveys		CBFWA (Recommendation)
	Adjust chinook stocking as necessary to meet		CBFWA

	kokanee goals		(Recommendation)
Modify angler harvest to meet kokanee abundance and size goals	Evaluate angler harvest of kokanee through creel surveys		CBFWA (Recommendation)
	Continue to evaluate kokanee abundance and size through trawling and/or hydroacoustics	Lake Pend Oreille Fishery Recovery Project: Purpose to Restore Fisheries Impacted by the Federal Hydropower System within the Idaho Portion of the Pend Oreille Drainage	IDFG (Recommendation) (199404700)
	Seek public input on whether anglers desire to harvest more kokanee of smaller size or fewer kokanee of a larger size		CBFWA (Recommendation)
	Develop a model that uses kokanee exploitation, Chinook abundance and the number and size of spawning kokanee to predict the expected number and size of mature kokanee three years later This model could be used to help adjust angler harvest of kokanee and introductions of Chinook salmon to maintain the desired size and number of mature kokanee		CBFWA (Recommendation)
Minimize impacts to lake fisheries due to lakeshore encroachment, pollution and nutrient loading	Work with Idaho Department of Fish and Game, Coeur d'Alene Tribe, county planners and Department of Lands to make protection of fish habitat and water quality a primary concern in land use decisions		CBFWA (Recommendation)

Strategies and Measures for Coeur d'Alene Westslope Cutthroat Trout

Strategy	Recommended Measure		Source of Measure
Reduce impacts from development along river and stream corridors and reduce sediment delivery to	Collaboratively work with all agencies (including Forest Service, Coeur d'Alene Tribe and Idaho Fish and Game), private developers and landowners, county planners and interested angling groups to make protection of fisheries habitat a primary	Coeur d'Alene Reservation Habitat Enhancement	CDAT (Recommendation) (1990004400)

the stream network	concern in land use decisions		
	Incorporate evaluations of existing habitat into Specific Measure (Project Reference) plans whenever possible	Coeur d'Alene Reservation Habitat Enhancement	CDAT (Recommendation) (1990004400)
	Develop a database to demonstrate the magnitude of habitat loss and more effectively influence land use decisions	Coeur d'Alene Reservation Habitat Enhancement	CDAT (Recommendation) (1990004400)
	Work with the Forest Service, Department of Transportation, Silver Valley Natural Resource Trustees, Environmental Protection Agency, Department of Lands, Department of Environmental Quality, Coeur d'Alene Tribe, Idaho Department of Fish and Game and others to insure mitigation of habitat loss or restoration of habitat whenever possible	Coeur d'Alene Reservation Habitat Enhancement	CDAT (Recommendation) (1990004400)
	Promote lessons learned from cutthroat trout research in the Coeur d'Alene Subbasin to improve habitat critical to cutthroat trout survival	Coeur d'Alene Reservation Habitat Enhancement	CDAT (Recommendation) (1990004400)
Reduce impacts from introduced species	Set liberal regulations on northern pike, smallmouth bass, brook trout and rainbow trout to reduce their numbers and limit their spread	Coeur d'Alene Reservation Habitat Enhancement	CDAT (Recommendation) (1990004400)
	Develop informational programs to educate anglers and the public to risks of random introductions of exotic species	Coeur d'Alene Reservation Habitat Enhancement	CDAT (Recommendation) (1990004400)
	Evaluate potential impacts that high kokanee densities may have on restoration of adfluvial cutthroat trout	Coeur d'Alene Reservation Habitat Enhancement	CDAT (Recommendation) (1990004400)
	Through planning, use enforcement efforts to curtail illegal introductions	Coeur d'Alene Reservation Habitat Enhancement	CDAT (Recommendation) (1990004400)
	Work with anglers to reach a balance between exotic species and cutthroat trout	Coeur d'Alene Reservation Habitat Enhancement	CDAT (Recommendation)

			(1990004400)
Reduce illegal harvest	Work with the Idaho Fish and Game, Coeur d'Alene Tribe, Forest Service, Idaho Department of Lands, other agencies, private developers and landowners, county planners and interested angling groups to make protection of fisheries habitat a primary concern in land use decisions	Coeur d'Alene Reservation Habitat Enhancement	CDAT (Recommendation) (1990004400)
	Incorporate evaluations of roads, railroads and dikes into survey Specific Measure (Project Reference)s to assess where access to important habitat has been lost	Coeur d'Alene Reservation Habitat Enhancement	CDAT (Recommendation) (1990004400)
	Develop a database to demonstrate the magnitude of habitat loss and more effectively influence land use decisions	Coeur d'Alene Reservation Habitat Enhancement	CDAT (Recommendation) (1990004400)
	Work with the Idaho Fish and Game, Coeur d'Alene Tribe, Forest Service, Department of Transportation, Silver Valley Natural Resource Trustees, Environmental Protection Agency, Department of Lands, Department of Environmental Quality, and others to insure mitigation of habitat loss or to restore access whenever possible	Coeur d'Alene Reservation Habitat Enhancement	CDAT (Recommendation) (1990004400)
Reduce heavy metal concentrations	Work with the Idaho Department of Fish and Game, Coeur d'Alene Tribe, Department of Environmental Quality, Environmental Protection Agency, US Fish and Wildlife Service, Bureau of Land Management and other agencies in reducing heavy metal loading into the Coeur d'Alene River watershed	Coeur d'Alene Reservation Habitat Enhancement	CDAT (Recommendation) (1990004400)
Reduce in-stream water temperatures during the warm summer months	Work to restore functional riparian areas in order to facilitate lower summer temperatures with higher mean flows	Coeur d'Alene Reservation Habitat Enhancement	CDAT (Recommendation) (1990004400)
	Monitor the fish populations to show benefits to reductions in heavy metal concentrations and water temperatures	Coeur d'Alene Reservation Habitat Enhancement	CDAT (Recommendation) (1990004400)

Strategies and Measures for Columbia Upper Redband Trout/Rainbow Trout, Kokanee, Burbot, Westslope Cutthroat Trout, and White Sturgeon

Strategy	Recommended Measure		Source of Measure
Modify hydro-operations ^{1,2,3,5}	Determine rates of entrainment under different hydro-operation scenarios and negotiate hydro-operations and facility operations ^{1,2,3}	Chief Joseph Kokanee Enhancement	CCT (Recommendation) (199501100)
		Lake Roosevelt Fisheries Evaluation Program	STOI (Recommendation) (199404300)
	Quantify levels of primary, secondary and benthic macroinvertebrate production in near-shore habitats under various hydro-operation scenarios, and identify critical areas for habitat protection, enhancement, and restoration ^{1,2,3,5}	Lake Roosevelt Fisheries Evaluation Program	STOI (Recommendation) (199404300)
	Experiment with release strategies to maximize recruitment to fishery ^{1,2,5}	Chief Joseph Kokanee Enhancement	CCT (Recommendation) (199501100)
		Lake Roosevelt Fisheries Evaluation Program	STOI (Recommendation) (199404300)
	Maximize water retention times to increase rearing capacity and maintain high water elevation ²	Chief Joseph Kokanee Enhancement	CCT (Recommendation) (199501100)
		Lake Roosevelt Fisheries Evaluation Program	STOI (Recommendation) (199404300)
	Conduct research to examine the relationships between spring and summer discharge and recruitment (in relation to increase mean daily discharge at the international border in the spring and summer) ⁵	Chief Joseph Kokanee Enhancement	CCT (Recommendation) (199501100)
		Lake Roosevelt Fisheries Evaluation Program	STOI (Recommendation) (199404300)
	Conduct research to determine if delayed reservoir	Chief Joseph Kokanee Enhancement	CCT

	refill results in more riverine habitat and/or recruitment ⁵		(Recommendation) (199501100)
		Lake Roosevelt Fisheries Evaluation Program	STOI (Recommendation) (199404300)
Maintain and improve in-stream and riparian habitat ^{1,2,3,4,5}	Identify critical areas for habitat protection, enhancement, and restoration, purchase lands, easements or conservation agreements to protect and enhance existing habitat ^{1,2,3,4,5}	Chief Joseph Kokanee Enhancement	CCT (Recommendation) (199501100)
	Enhance and restore physical in-stream and riparian habitat ^{1,2,3,4,5}	Chief Joseph Kokanee Enhancement	CCT (Recommendation) (199501100)
Increase available habitat ²	Develop a habitat improvement plan that identifies specific sites, action, and prioritization for each action ²	Chief Joseph Kokanee Enhancement	CCT (Recommendation) (199501100)
		Lake Roosevelt White Sturgeon Recovery Project	STOI (Recommendation) (199502700)
	Develop a community outreach plan ²		CBFWA (Recommendation)
Ensure adequate water for all life stages ^{1,2,3}	Establish minimum in-stream flow rules for tributaries and all life stages ^{1,2,3}		CBFWA (Recommendation)
	Purchase water rights ³		CBFWA (Recommendation)
	Develop water conservation program and public outreach and education about water conservation ³		CBFWA (Recommendation)
	Maintain current hydrograph with a peak during the freshet to cue spawning ⁵	Lake Roosevelt Fisheries Evaluation Program	STOI 9recommendation) (199404300)
Modify hydro-operations to ensure adequate water temperatures and dissolved oxygen levels throughout Lake	Determine water temperature and dissolved oxygen conditions under different hydro-operation scenarios ^{1,2,3,5}	Lake Rufus Woods Subbasin Area Stock Assessment, Habitat Assessment, and Fisheries Evaluation Program	CCT (Recommendation) (20072700)
		Banks Lake Fishery Evaluation Program	WDFW (Recommendation) (200102800)

Roosevelt ^{1,2,3,5}	Experiment with release strategies to maximize recruitment to fishery ^{1,2,5}	Lake Roosevelt Fisheries Evaluation Program	STOI (Recommendation) (199404300)
		Banks Lake Fishery Evaluation Program	WDFW (Recommendation) (200102800)
	Negotiate hydro-operations and facility improvements ^{1,2,3,5}	Chief Joseph Kokanee Enhancement	CCT (Recommendation) (199501100)
		Lake Roosevelt Fisheries Evaluation Program	STOI (Recommendation) (199404300)
Increase dissolved oxygen levels ⁴	Identify lakes with hypolimnetic anoxia ⁴		CBFWA (Recommendation)
	Develop strategies to address dissolved oxygen limitation ⁴	Lake Rufus Woods Subbasin Area Stock Assessment, Habitat Assessment, and Fisheries Evaluation Program	CCT (Recommendation) (20072700)
Increase nutrients ^{1,2,3,5}	Identify streams and populations that would benefit from nutrient enhancement ^{1,2,3}		CBFWA (Recommendation)
	Implement a nutrient addition program ^{1,2,3}		CBFWA (Recommendation)
	Modify hydro-operations to increase retention times to allow for nutrient assimilation and increased primary and secondary production ^{1,2,3}		CBFWA (Recommendation)
	Develop a nutrient enhancement program including levels needed, application strategy, monitoring and evaluation, and public outreach and education ^{1,2,3,5}		CBFWA (Recommendation)
	Quantify impacts of hydro-operations on primary and secondary production related to retention times ^{1,2,3,5}	Lake Roosevelt Fisheries Evaluation Program	STOI (Recommendation) (199404300)
	Negotiate hydro-operations ^{1,2,3,5}	Lake Roosevelt Fisheries Evaluation Program	STOI (Recommendation) (199404300)
Reduce nutrient	Identify sources of point and non-point nutrient		CBFWA

loading ^{1,2}	addition ^{1,2,3}		(Recommendation)
	Develop strategies and programs to reduce nutrient additions ^{1,2,3}		CBFWA (Recommendation)
Remove point and non-point sources of contaminants ^{1,2,3,4,5}	Determine types, extent, and impacts of all potential contaminants, and develop cleanup strategies for pollution sources ^{1,2,3,4,5}		CBFWA (Recommendation)
Reduce or eliminate non-native predators ^{1,2,3,4,5}	Quantify rates of predation/competition by non-native predators ^{1,2,3,4,5}	Lake Rufus Woods Subbasin Area Stock Assessment, Habitat Assessment, and Fisheries Evaluation Program	CCT (Recommendation) (20072700)
		Banks Lake Fishery Evaluation Program	WDFW (Recommendation) (200102800)
	Develop fishing regulation changes ^{1,2,3,5}	Lake Roosevelt Fisheries Evaluation Program	STOI (Recommendation) (199404300)
	Experiment with release strategies to maximize recruitment to fishery ^{1,2,5}	Lake Roosevelt Fisheries Evaluation Program	STOI (Recommendation) (199404300)
		Banks Lake Fishery Evaluation Program	WDFW (Recommendation) (200102800)
	Establish a removal/ reduction program ^{1,3,4,5}	Lake Roosevelt Fisheries Evaluation Program	STOI (Recommendation) (199404300)
	Increase removal efficiency by liberalizing bag limits for non-native species (walleye and smallmouth bass) ²		CBFWA (Recommendation)
Maintain wild-type genetic diversity and minimize hybridization ^{1,2}	Utilize triploid/sterile hatchery fish for stocking programs ^{1,2}	Lake Rufus Woods Subbasin Area Stock Assessment, Habitat Assessment, and Fisheries Evaluation Program	CCT (Recommendation) (20072700)
		Lake Roosevelt Rainbow Trout Net Pens	LRDA (Recommendation) (199500900)
	Maximize harvest of hatchery fish ^{1,2}	Colville Hatchery	CCT

			(Recommendation) (198503800)
Use marking methods to differentiate hatchery and wild fish for regulation of angler harvest ^{1,2}	Colville Hatchery		CCT (Recommendation) (198503800)
	Spokane Tribal Hatchery		STOI (Recommendation) (199104600)
	Lake Rufus Woods Subbasin Area Stock Assessment, Habitat Assessment, and Fisheries Evaluation Program		CCT (Recommendation) (20072700)
	Lake Roosevelt Fisheries Evaluation Program		STOI (Recommendation) (199404300)
	Sherman Creek Hatchery		WDFW (Recommendation) (199104700)
	Lake Roosevelt Rainbow Trout Net Pens		LRDA (Recommendation) (199500900)
	Develop a breeding program to ensure only pure native stocks are used ^{1,2}	Colville Hatchery	
Lake Roosevelt Fisheries Evaluation Program			STOI (Recommendation) (199404300)
Lake Roosevelt White Sturgeon Recovery Project			STOI (Recommendation) (199502700)
Lake Roosevelt White Sturgeon Conservation Hatchery Project			STOI (Recommendation) (200737200)
Ford Hatchery and Operations			WDFW (Recommendation) (200102900)

Modify stocking strategy ⁴	Experiment with release strategies to maximize recruitment to fishery ⁴	Lake Roosevelt Fisheries Evaluation Program	STOI (Recommendation) (199404300)
		Banks Lake Fishery Evaluation Program	WDFW (Recommendation) (200102800)
Reduce harvest on sensitive stocks ^{1,2,5}	Quantify angling impacts on wild stocks ^{1,2,5}	Colville Hatchery	CCT (Recommendation) (198503800)
	Develop fishing regulation changes ^{1,2,5}	Chief Joseph Kokanee Enhancement	CCT (Recommendation) (199501100)
	Increase enforcement to prevent poaching, and Increase public outreach and education ^{1,2,5}	Lake Roosevelt White Sturgeon Recovery Project	STOI (Recommendation) (199502700)
		Intermountain Province Resident Fish Conference and E-Library	LRF (Recommendation) (200103100)
	Decrease bag limit from 2 to 0 (natural origin) in Lake Roosevelt ²		CBFWA (Recommendation)
Restore fish passage for all life stages to all habitats ^{1,2}	Identify critical areas for tributary access / passage protection, enhancement, and restoration ^{1,2}	Chief Joseph Kokanee Enhancement	CCT (Recommendation) (199501100)
	Identify barriers preventing access to tributaries under different hydro-operation scenarios ^{1,2}	Chief Joseph Kokanee Enhancement	CCT (Recommendation) (199501100)
	Enhance or restore access as appropriate ^{1,2}	Chief Joseph Kokanee Enhancement	CCT (Recommendation) (199501100)
	Identify barriers preventing access to habitat ^{1,2}	Chief Joseph Kokanee Enhancement	CCT (Recommendation) (199501100)
	Negotiate hydro-operations ¹	Chief Joseph Kokanee Enhancement	CCT (Recommendation) (199501100)

¹Redband/rainbow trout, ²Kokanee, ³Burbot, ⁴Westslope cutthroat trout, ⁵White sturgeon

Strategies and Measures for Pend Oreille Bull Trout

Strategy	Recommended Measure		Source of Measure
Remove non-native predators (lake trout and rainbow trout)	Continue program of removing lake trout by trap netting and gillnetting	Lake Pend Oreille Fishery Recovery Project: Purpose to Restore Fisheries Impacted by the Federal Hydropower System within the Idaho Portion of the Pend Oreille Drainage	IDFG (Recommendation) (199404700)
	Locate concentrations of lake trout by sonic telemetry to improve harvest	Lake Pend Oreille Fishery Recovery Project: Purpose to Restore Fisheries Impacted by the Federal Hydropower System within the Idaho Portion of the Pend Oreille Drainage	IDFG (Recommendation) (199404700)
	Keep liberal regulations for the sport fishery on lake and rainbow trout (no harvest limits, no season, and no size limits)		CBFWA (Recommendation)
	Pay anglers to harvest lake trout and rainbow trout to increase harvest		CBFWA (Recommendation)
	Allow harvest of rainbow trout in tributary streams where rainbow trout spawn		CBFWA (Recommendation)
	Evaluate removal program through an adaptive management approach and change methodology as needed	Lake Pend Oreille Fishery Recovery Project: Purpose to Restore Fisheries Impacted by the Federal Hydropower System within the Idaho Portion of the Pend Oreille Drainage	IDFG (Recommendation) (199404700)
	Research the potential for lake level changes to impact lake trout spawning		CBFWA (Recommendation)
	Monitor predator and kokanee populations in the lake to determine if measures are working	Lake Pend Oreille Fishery Recovery Project: Purpose to Restore Fisheries Impacted by the Federal Hydropower System within the Idaho Portion of the Pend Oreille Drainage	IDFG (Recommendation) (199404700)
	Research and implement other alternatives for lake trout and rainbow trout management as they are developed in an attempt to reduce the forage demand of predators	Lake Pend Oreille Fishery Recovery Project: Purpose to Restore Fisheries Impacted by the Federal Hydropower System within the Idaho Portion of the Pend Oreille Drainage	IDFG (Recommendation) (199404700)

Provide passage	The US Army Corps of Engineers, the State of Idaho, Bonneville Power Administration, and US Fish and Wildlife Service shall work cooperatively to evaluate, develop and implement a method to allow bull trout passage at Albeni Falls Dam	Restoration of Bull Trout Passage at Albeni Falls Dam using a Trap-and Haul Approach in Conjunction with Investigations to Assess Effectiveness of Rapid Genetic Analysis in Assigning Natal Tributary	KT (Recommendation) (200724600)
	At Cabinet Gorge Dam, Avista Corps, the State of Idaho, and US Fish and Wildlife Service should continue its efforts for the evaluation and implementation of bull trout passage		CBFWA (Recommendation)

Strategies and Measures for Pend Oreille Bull Trout (Northeast Washington)

Strategy	Recommended Measure		Source of Measure
Modify hydro-operations	Determine rates of entrainment under different hydro-operation scenarios and negotiate hydro-operations and facility operations		CBFWA (Recommendation)
	Quantify levels of primary, secondary and benthic macroinvertebrate production in near-shore habitats under various hydro-operation scenarios, and identify critical areas for habitat protection, enhancement, and restoration		CBFWA (Recommendation)
	Experiment with release strategies to maximize recruitment to fishery		CBFWA (Recommendation)
Provide adequate water temperatures and dissolved oxygen levels	Identify critical areas for habitat protection, enhancement, and restoration, purchase lands, easements or conservation agreements to protect and enhance existing habitat	Kalispel Tribe Resident Fish Project	KT (Recommendation) (199500100)
		Resident Fish Stock Status Above Chief Joseph and Grand Coulee Dams	KT (Recommendation) (199700400)
	Enhance and restore physical in-stream and riparian habitat	Kalispel Tribe Resident Fish Project	KT (Recommendation) (199500100)
		Resident Fish Stock Status Above Chief Joseph and Grand	KT

		Coulee Dams	(Recommendation) (199700400)
Modify hydro-operations to ensure adequate water temperatures and dissolved oxygen levels throughout Pend Oreille River	Determine water temperature and dissolved oxygen conditions under different hydro-operation scenarios		CBFWA (Recommendation)
	Experiment with release strategies to maximize recruitment to fishery		CBFWA (Recommendation)
	Negotiate hydro-operations and facility improvements		CBFWA (Recommendation)
Reduce nutrient loading	Identify sources of point and non-point nutrient addition		CBFWA (Recommendation)
	Develop strategies and programs to reduce nutrient additions		CBFWA (Recommendation)
Remove point and non-point sources of contaminants	Determine types, extent, and impacts of all potential contaminants		CBFWA (Recommendation)
	Develop cleanup strategies for pollution sources		CBFWA (Recommendation)
Reduce non-native predator densities	Quantify rates of predation/competition by non-native predators	Kalispel Tribe Resident Fish Project	KT (Recommendation) (199500100)
	Develop fishing regulation changes		CBFWA (Recommendation)
	Experiment with release strategies to maximize recruitment to fishery		CBFWA (Recommendation)
	Establish a removal/ reduction program	Kalispel Tribe Resident Fish Project	KT (Recommendation) (199500100)
		Pend Oreille Nonnative Fish Suppression Project	KT (Recommendation) (200714900)
Minimize hybridization	Maximize harvest of hatchery fish		CBFWA (Recommendation)
	Modify stocking strategies to reduce potential		CBFWA (Recommendation)

	genetic interaction		
	Limit non-native species expansion	Kalispel Tribe Resident Fish Project	KT (Recommendation) (199500100)
Reduce take on sensitive stocks	Quantify angling impacts on wild stocks		CBFWA (Recommendation)
	Increase enforcement to stop poaching		CBFWA (Recommendation)
	Increase public outreach and education		CBFWA (Recommendation)
Restore fish passage and habitat connectivity for all life history stages	Identify barriers preventing access to tributaries under different hydro-operations	Kalispel Tribe Resident Fish Project	KT (Recommendation) (199500100)
		Resident Fish Stock Status Above Chief Joseph and Grand Coulee Dams	KT (Recommendation) (199700400)
	Where appropriate install fish passage at hydropower Specific Measure (Project Reference)s to provide access to tributaries to allow for expression of all life histories	Kalispel Tribe Resident Fish Project	KT (Recommendation) (199500100)
		Resident Fish Stock Status Above Chief Joseph and Grand Coulee Dams	KT (Recommendation) (199700400)
	Implement fish passage program where appropriate	Kalispel Tribe Resident Fish Project	KT (Recommendation) (199500100)
		Resident Fish Stock Status Above Chief Joseph and Grand Coulee Dams	KT (Recommendation) (199700400)
	Negotiate hydro-operations	Kalispel Tribe Resident Fish Project	KT (Recommendation) (199500100)

Strategies and Measures for Pend Oreille Kokanee (Lake Pend Oreille)

Strategy	Recommended Measure		Source of Measure
Reduce predation on kokanee by non-native predators until kokanee recover	Continue the program of removing lake trout by trap netting and gillnetting	Lake Pend Oreille Fishery Recovery Project: Purpose to Restore Fisheries Impacted by the Federal Hydropower System within the Idaho Portion of the Pend Oreille Drainage	IDFG (Recommendation) (199404700)
	Locate concentrations of lake trout by sonic telemetry to improve harvest	Lake Pend Oreille Fishery Recovery Project: Purpose to Restore Fisheries Impacted by the Federal Hydropower System within the Idaho Portion of the Pend Oreille Drainage	IDFG (Recommendation) (199404700)
	Maintain liberal regulations for the sport fishery for predatory fish (no harvest, no season, and no size limits)		CBFWA (Recommendation)
	Pay anglers to harvest lake trout and rainbow trout	Lake Pend Oreille Fishery Recovery Project: Purpose to Restore Fisheries Impacted by the Federal Hydropower System within the Idaho Portion of the Pend Oreille Drainage	IDFG (Recommendation) (199404700)
	Allow harvest of rainbow trout in tributary streams where rainbow trout spawn		CBFWA (Recommendation)
	Monitor the abundance of lake trout, rainbow trout, bull trout and kokanee to determine the effectiveness of the recovery efforts	Lake Pend Oreille Fishery Recovery Project: Purpose to Restore Fisheries Impacted by the Federal Hydropower System within the Idaho Portion of the Pend Oreille Drainage	IDFG (Recommendation) (199404700)
	Evaluate removal program through an adaptive management approach and change methodology as needed Investigate establishing a commercial lake whitefish fishery and increasing by-catch of lake trout as one additional way to suppress lake trout abundance and predation on kokanee	Lake Pend Oreille Fishery Recovery Project: Purpose to Restore Fisheries Impacted by the Federal Hydropower System within the Idaho Portion of the Pend Oreille Drainage	IDFG (Recommendation) (199404700)
	Research the potential for lake level changes to impact lake trout spawning	Lake Pend Oreille Fishery Recovery Project: Purpose to Restore Fisheries Impacted by the Federal Hydropower System within the Idaho Portion of the Pend Oreille Drainage	IDFG (Recommendation) (199404700)

	Assess potential benefits of fertilizing a section of the lake to: 1) increase kokanee growth to help them avoid predation, and 2) change their distribution in the lake and avoid the north end where lake trout are more numerous		CBFWA (Recommendation)
	Implement a fertilization Specific Measure (Project Reference) if the evaluation shows potential benefits and acceptable risks		CBFWA (Recommendation)
	Research kokanee stocking strategies for methods to improve kokanee recovery		CBFWA (Recommendation)
Modify hydro-operations	In some years, lower the winter elevation of the lake to the minimum pool level to allow wave action to clean and re-sort shoreline gravel Then in subsequent years, hold the lake 4 feet higher to allow kokanee to spawn in the previously cleaned gravel In any given year consideration should be given to adult kokanee abundance, precipitation forecast, the success of chum salmon spawning during the previous year, and previous frequency of draw downs in deciding on a winter lake level		CBFWA (Recommendation)
	Annually, during August or September, the IDFG, USACE, BPA, USFWS, NOAA, and the Lakes Commission should meet to decide on winter lake elevations that benefit both kokanee and chum salmon below Bonneville Dam A decision tree has been developed to assist in the selection of a pool level To assist in the selection of a lake level, the abundance of kokanee spawners should be estimated annually		CBFWA (Recommendation)

	Examine kokanee spawning habitat annually by core sampling to determine if lake level changes are having the desired effect of improving habitat quality		CBFWA (Recommendation)
Protect and improve shoreline spawning habitat	Work with regulatory agencies to ensure kokanee spawning areas are protected by the established regulatory process		CBFWA (Recommendation)
	Establish a fund for purchasing land or obtaining conservation easements to kokanee spawning areas that occur on private property, and to do habitat work on the shoreline to protect nearby spawning areas		CBFWA (Recommendation)

Strategies and Measures for Pend Oreille Kokanee (Washington portion)

Strategy	Recommended Measure		Source of Measure
Modify hydro-operations	Determine rates of entrainment under different hydro-operation scenarios and negotiate hydro-operations and facility operations		CBFWA (Recommendation)
	Quantify levels of primary, secondary and benthic macroinvertebrate production in near-shore habitats under various hydro-operation scenarios, and identify critical areas for habitat protection, enhancement, and restoration		CBFWA (Recommendation)
	Experiment with release strategies to maximize recruitment to fishery		CBFWA (Recommendation)
Provide adequate water temperatures and dissolved oxygen levels	Identify critical areas for habitat protection, enhancement, and restoration, purchase lands, easements or conservation agreements to protect and enhance existing habitat		CBFWA (Recommendation)
	Enhance and restore physical in-stream and riparian		CBFWA

	habitat		(Recommendation)
Modify hydro-operations to ensure adequate water temperatures and dissolved oxygen levels throughout Pend Oreille River Drainage	Determine water temperature and dissolved oxygen conditions under different hydro-operation scenarios		CBFWA (Recommendation)
	Experiment with release strategies to maximize recruitment to fishery		CBFWA (Recommendation)
	Negotiate hydro-operations and facility improvements		CBFWA (Recommendation)
Reduce nutrient loading	Identify sources of point and non-point nutrient addition		CBFWA (Recommendation)
	Develop strategies and programs to reduce nutrient additions		CBFWA (Recommendation)
Remove point and non-point sources of contaminants	Determine types, extent, and impacts of all potential contaminants		CBFWA (Recommendation)
	Develop cleanup strategies for pollution sources		CBFWA (Recommendation)
Reduce non-native predator densities	Quantify rates of predation/competition by non-native predators		CBFWA (Recommendation)
	Develop fishing regulation changes		CBFWA (Recommendation)
	Experiment with release strategies to maximize recruitment to fishery		CBFWA (Recommendation)
	Establish a removal/ reduction program	Pend Oreille Nonnative Fish Suppression Project	KT (Recommendation) (200714900)
Minimize hybridization	Maximize harvest of hatchery fish		CBFWA (Recommendation)
	Modify stocking strategies to reduce potential genetic interaction		CBFWA (Recommendation)
	Limit non-native species expansion		CBFWA (Recommendation)

Reduce take on sensitive stocks	Quantify angling impacts on wild stocks		CBFWA (Recommendation)
	Increase enforcement to stop poaching		CBFWA (Recommendation)
	Increase public outreach and education		CBFWA (Recommendation)
Restore fish passage and habitat connectivity for all life history stages	Identify barriers preventing access to tributaries under different hydro-operations		CBFWA (Recommendation)
	Where appropriate install fish passage at hydropower Specific Measure (Project Reference)s to provide access to tributaries to allow for expression of all life histories		CBFWA (Recommendation)
	Implement fish passage program where appropriate		CBFWA (Recommendation)
	Negotiate hydro-operations		CBFWA (Recommendation)

Strategies and Measures for Pend Oreille Whitefish (Idaho)

Strategy	Recommended Measure		Source of Measure
Improve passage	Prioritize streams with habitat access problems and implement Specific Measure (Project Reference)s to remove the barrier		CBFWA (Recommendation)
Improve the habitat in tributary streams	Prioritize streams where the most benefit for mountain whitefish and other native species can be obtained		CBFWA (Recommendation)
	Conduct stream improvement Specific Measure (Project Reference)s to repair damaged habitat		CBFWA (Recommendation)

Strategies and Measures for Pend Oreille Whitefish (Washington)

Strategy	Recommended Measure		Source of Measure
Modify hydro-operations	Identify critical areas for habitat protection, enhancement, and restoration		CBFWA (Recommendation)
	Negotiate hydro-operations		CBFWA (Recommendation)
Maintain and improve in-stream and riparian habitat	Identify critical areas for habitat protection, enhancement, and restoration, purchase lands, easements or conservation agreements to protect and enhance existing habitat	Resident Fish Stock Status Above Chief Joseph and Grand Coulee Dams	KT (Recommendation) (199700400)
	Enhance and restore physical in-stream and riparian habitat		CBFWA (Recommendation)
Ensure adequate water for all life stages	Establish minimum in-stream flow rules for tributaries and all life stages		CBFWA (Recommendation)
	Purchase water rights		CBFWA (Recommendation)
	Develop water conservation program, and public outreach and education about water conservation		CBFWA (Recommendation)
Modify hydro-operations to ensure adequate water temperatures and dissolved oxygen levels	Determine water temperature and dissolved oxygen conditions under different hydro-operation scenarios		CBFWA (Recommendation)
	Negotiate hydro-operations and facility improvements		CBFWA (Recommendation)
Increase dissolved oxygen in lakes	Identify lakes with hypolimnetic anoxia and develop strategies to address dissolved oxygen limitation		CBFWA (Recommendation)
Reduce nutrient loading	Identify sources of point and non-point nutrient addition		CBFWA (Recommendation)
	Develop strategies and programs to reduce nutrient additions		CBFWA (Recommendation)

Remove point and non-point sources of contaminants	Determine types, extent, and impacts of all potential contaminants, and develop cleanup strategies for pollution sources		CBFWA (Recommendation)
Reduce non-native predator densities	Quantify rates of predation/competition by non-native predators		CBFWA (Recommendation)
	Develop fishing regulation changes		CBFWA (Recommendation)
	Establish a removal/ reduction program		CBFWA (Recommendation)
Reduce harvest on sensitive stocks	Quantify angling impacts on wild stocks		CBFWA (Recommendation)
	Develop fishing regulation changes		CBFWA (Recommendation)
	Increase enforcement to prevent poaching		CBFWA (Recommendation)
	Increase public outreach and education		CBFWA (Recommendation)
Restore fish passage for all life stages to all habitats	Identify critical areas for tributary access/passagage protection, enhancement, and restoration	Resident Fish Stock Status Above Chief Joseph and Grand Coulee Dams	KT (Recommendation) (199700400)
	Identify barriers preventing access to tributaries under different hydro-operation scenarios, and enhance or restore access as appropriate, identify barriers preventing access to habitat	Resident Fish Stock Status Above Chief Joseph and Grand Coulee Dams	KT (Recommendation) (199700400)
	Negotiate hydro-operations		CBFWA (Recommendation)
	Implement fish passage restoration programs where appropriate		CBFWA (Recommendation)
	Where appropriate, install volitional fish passage facilities at all hydropower Specific Measure (Project Reference)s to provide access to tributaries to allow for expression of all life histories		CBFWA (Recommendation)

Strategies and Measures for Pend Oreille Westslope Cutthroat Trout (Idaho)

Strategy	Recommended Measure		Source of Measure
Reduce the abundance of lake trout in Lake Pend Oreille	Continue the program of removing lake trout by trap netting and gillnetting	Lake Pend Oreille Fishery Recovery Project: Purpose to Restore Fisheries Impacted by the Federal Hydropower System within the Idaho Portion of the Pend Oreille Drainage	IDFG (Recommendation) (199404700)
	Locate concentrations of lake trout by sonic telemetry to improve harvest	Lake Pend Oreille Fishery Recovery Project: Purpose to Restore Fisheries Impacted by the Federal Hydropower System within the Idaho Portion of the Pend Oreille Drainage	IDFG (Recommendation) (199404700)
	Maintain liberal regulations for the sport fishery on lake trout (no harvest, no season, and no size limits)		CBFWA (Recommendation)
	Pay anglers to harvest lake trout		CBFWA (Recommendation)
	Monitor the abundance of lake trout to evaluate the removal program through an adaptive management approach and change methodologies as needed	Lake Pend Oreille Fishery Recovery Project: Purpose to Restore Fisheries Impacted by the Federal Hydropower System within the Idaho Portion of the Pend Oreille Drainage	IDFG (Recommendation) (199404700)
	Investigate establishing a commercial lake whitefish fishery and increasing by-catch of lake trout as one additional way to suppress lake trout abundance and predation on cutthroat		CBFWA (Recommendation)
	Research the potential for lake level changes to impact lake trout spawning		CBFWA (Recommendation)
Identify/correct barriers	Inventory migration barriers on cutthroat spawning streams, and prioritize their importance to improve stream and population connectivity	Preserving/Enhancing Bull Trout and Westslope Cutthroat Trout within the Upper Pend Oreille Basin	KT (Recommendation) (200703800)
Address habitat limitations where feasible	Inventory cutthroat habitat throughout the subbasin	Preserving/Enhancing Bull Trout and Westslope Cutthroat Trout within the Upper Pend Oreille Basin	KT (Recommendation) (200703800)
	Develop a prioritized list of habitat improvement Specific Measure (Project Reference)s that gives	Preserving/Enhancing Bull Trout and Westslope Cutthroat Trout within the Upper Pend Oreille Basin	KT (Recommendation)

	priority to genetically pure populations and economically feasible solutions to habitat problems		(200703800)
	Implement habitat Specific Measure (Project Reference)s and evaluate cutthroat population response to habitat improvement efforts	Preserving/Enhancing Bull Trout and Westslope Cutthroat Trout within the Upper Pend Oreille Basin	KT (Recommendation) (200703800)
Identify pure westslope cutthroat trout populations and implement measures to protect the genetic integrity of remaining pure populations	Conduct a drainage-wide inventory to evaluate the distribution, population status and genetic purity of westslope cutthroat trout populations	Preserving/Enhancing Bull Trout and Westslope Cutthroat Trout within the Upper Pend Oreille Basin	KT (Recommendation) (200703800)
	Implement a program to expand genetically pure populations in cutthroat trout in key spawning tributaries and monitor the effectiveness of these efforts		CBFWA (Recommendation)

Strategies and Measures for Pend Oreille Westslope Cutthroat Trout (Washington)

Strategy	Recommended Measure		Source of Measure
Modify hydro-operations	Determine rates of entrainment under different hydro-operation scenarios and negotiate hydro-operations and facility operations		CBFWA (Recommendation)
	Quantify impacts of hydro-operations on primary and secondary production related to retention times (Boundary Reservoir)		CBFWA (Recommendation)
	Identify critical areas for habitat protection, enhancement, and restoration	Resident Fish Stock Status Above Chief Joseph and Grand Coulee Dams	KT (Recommendation) (199700400)
	Experiment with release strategies to maximize recruitment to fishery		CBFWA (Recommendation)
	Negotiate hydro-operations		CBFWA (Recommendation)

Maintain and improve in-stream and riparian habitat	Identify critical areas for habitat protection, enhancement, and restoration, purchase lands, easements or conservation agreements to protect and enhance existing habitat	Preserving/Enhancing Bull Trout and Westslope Cutthroat Trout within the Upper Pend Oreille Basin	KT (Recommendation) (200703800)
		Resident Fish Stock Status Above Chief Joseph and Grand Coulee Dams	KT (Recommendation) (199700400)
	Enhance and restore physical in-stream and riparian habitat	Preserving/Enhancing Bull Trout and Westslope Cutthroat Trout within the Upper Pend Oreille Basin	KT (Recommendation) (200703800)
		Resident Fish Stock Status Above Chief Joseph and Grand Coulee Dams	KT (Recommendation) (199700400)
Ensure adequate water for all life stages	Establish minimum in-stream flow rules for tributaries and all life stages		CBFWA (Recommendation)
	Purchase water rights		CBFWA (Recommendation)
	Develop water conservation program, and public outreach and education about water conservation		CBFWA (Recommendation)
Modify hydro-operations to ensure adequate water temperatures and dissolved oxygen levels	Determine water temperature and dissolved oxygen conditions under different hydro-operation scenarios		CBFWA (Recommendation)
	Experiment with release strategies to maximize recruitment to fishery		CBFWA (Recommendation)
	Negotiate hydro-operations and facility improvements		CBFWA (Recommendation)
Increase dissolved oxygen in lakes	Identify lakes with hypolimnetic anoxia and develop strategies to address dissolved oxygen limitation		CBFWA (Recommendation)

Reduce nutrient loading	Identify sources of point and non-point nutrient addition		CBFWA (Recommendation)
	Develop strategies and programs to reduce nutrient additions		CBFWA (Recommendation)
Remove point and non-point sources of contaminants	Determine types, extent, and impacts of all potential contaminants, and develop cleanup strategies for pollution sources		CBFWA (Recommendation)
Reduce non-native predator densities	Quantify rates of predation/ competition by non-native predators		CBFWA (Recommendation)
	Develop fishing regulation changes		CBFWA (Recommendation)
	Experiment with release strategies to maximize recruitment to fishery		CBFWA (Recommendation)
	Establish a removal/ reduction program	Kalispel Tribe Resident Fish Project	KT (Recommendation) (199500100)
		Pend Oreille Nonnative Fish Suppression Project	KT (Recommendation) (200714900)
Restore fish passage for all life stages to all habitats	Identify critical areas for tributary access/passage protection, enhancement, and restoration	Preserving/Enhancing Bull Trout and Westslope Cutthroat Trout within the Upper Pend Oreille Basin	KT (Recommendation) (200703800)
		Kalispel Tribe Resident Fish Project	KT (Recommendation) (199500100)
		Resident Fish Stock Status Above Chief Joseph and Grand Coulee Dams	KT (Recommendation) (199700400)
	Identify barriers preventing access to tributaries under different hydro-operation scenarios, and enhance or restore access as appropriate	Preserving/Enhancing Bull Trout and Westslope Cutthroat Trout within the Upper Pend Oreille Basin	KT (Recommendation) (200703800)
		Kalispel Tribe Resident Fish Project	KT (Recommendation) (199500100)

	Identify barriers preventing access to habitat	Preserving/Enhancing Bull Trout and Westslope Cutthroat Trout within the Upper Pend Oreille Basin	KT (Recommendation) (200703800)
		Kalispel Tribe Resident Fish Project	KT (Recommendation) (199500100)
		Resident Fish Stock Status Above Chief Joseph and Grand Coulee Dams	KT (Recommendation) (199700400)
	Negotiate hydro-operations		CBFWA (Recommendation)
	Implement fish passage restoration programs where appropriate	Preserving/Enhancing Bull Trout and Westslope Cutthroat Trout within the Upper Pend Oreille Basin	KT (Recommendations) (200703800)
		Kalispel Tribe Resident Fish Project	KT (Recommendation) (199500100)
	Where appropriate, install volitional fish passage facilities at all hydropower Specific Measure (Project Reference)s to provide access to tributaries to allow for expression of all life histories		CBFWA (Recommendation)
Minimize hybridization	Utilize triploid/sterile hatchery fish for stocking programs		CBFWA (Recommendation)
	Maximize harvest of hatchery fish		CBFWA (Recommendation)
	Modify stocking strategies to reduce potential genetic interaction		CBFWA (Recommendation)
	Limit non-native species expansion		CBFWA (Recommendation)
	Use marking methods to differentiate hatchery and wild fish for regulation of angler harvest		CBFWA (Recommendation)
	Develop a breeding program to ensure only pure native stocks used, and establish an active removal/reduction program		CBFWA (Recommendation)

Reduce harvest on sensitive stocks	Quantify angling impacts on wild stocks		CBFWA (Recommendation)
	Develop fishing regulation changes		CBFWA (Recommendation)
	Increase enforcement to prevent poaching		CBFWA (Recommendation)
	Increase public outreach and education		CBFWA (Recommendation)

Strategies and Measures for Pend Oreille Gerrard Trout (Idaho)

Strategy	Recommended Measure		Source of Measure	
Implement a short-term reduction of the rainbow trout population such that age 1-2 kokanee survival is over 50% by 2010 Continue efforts to reduce the predation of kokanee by lake trout to reduce lake trout-rainbow trout competition	Reduction efforts include maintaining liberalized fishing regulations for rainbow trout on the lake and in the tributaries Investigate and implement other means of population control (tributary weiring, redd removal) if a sport fishery is not successful at reducing rainbow trout abundance		CBFWA (Recommendation)	
	Annually estimate the kokanee abundance within Lake Pend Oreille and calculate survival rates, production, and yield from the previous year as well as periodically estimating the abundance of lake trout and rainbow trout to see if efforts to reduce predacious fish are having the desired effect	Lake Pend Oreille Fishery Recovery Project: Purpose to Restore Fisheries Impacted by the Federal Hydropower System within the Idaho Portion of the Pend Oreille Drainage		IDFG (Recommendation) (199404700)
	Once kokanee are recovered, implement management strategies to restore the trophy rainbow trout fishery in Lake Pend Oreille Strategies may include special rules on harvest, re-stocking with pure strain Gerrard rainbow trout, or other means necessary to meet stated objectives			CBFWA (Recommendation)

The strategy is to not improve spawning habitat for rainbow trout until kokanee recover	Following kokanee recovery, improve connectivity and condition of Gerrard rainbow trout spawning habitat		CBFWA (Recommendation)
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Strategies and Measures for Pend Oreille Burbot (Washington)

Strategy	Recommended Measure		Source of Measure
Modify hydro-operations	Determine rates of entrainment under different hydro-operation scenarios and negotiate hydro-operations and facility operations		CBFWA (Recommendation)
	Quantify levels of primary, secondary and benthic acroinvertebrate production in near-shore habitats under various hydro-operation scenarios		CBFWA (Recommendation)
	Identify critical areas for habitat protection, enhancement, and restoration	Resident Fish Stock Status Above Chief Joseph and Grand Coulee Dams	KT (Recommendation) (199700400)
	Negotiate hydro-operations		CBFWA (Recommendation)
Maintain and improve in-stream and riparian habitat	Identify critical areas for habitat protection, enhancement, and restoration, purchase lands, easements or conservation agreements to protect and enhance existing habitat	Resident Fish Stock Status Above Chief Joseph and Grand Coulee Dams	KT (199700400)
	Enhance and restore physical in-stream and riparian habitat		CBFWA (Recommendation)
Maintain dissolved oxygen levels	Develop strategies to address potential future dissolved oxygen limitation due to increased development and land use		CBFWA (Recommendation)
Increase nutrients in Lake Sullivan	Develop a nutrient enhancement program including levels needed, application strategy, monitoring and evaluation, and public outreach and education		CBFWA (Recommendation)

	Quantify impacts of hydro-operations on primary and secondary production related to retention times, negotiate hydro-operations		CBFWA (Recommendation)
Reduce nutrient loading	Identify sources of point and non-point nutrient addition		CBFWA (Recommendation)
	Develop strategies and programs to reduce nutrient additions		CBFWA (Recommendation)
Remove point and non-point sources of contaminants	Determine types, extent, and impacts of all potential contaminants, and develop cleanup strategies for pollution sources		CBFWA (Recommendation)
Reduce non-native predator densities	Quantify rates of predation/competition by non-native predators		CBFWA (Recommendation)
	Develop fishing regulation changes		CBFWA (Recommendation)
	Establish a removal/ reduction program		CBFWA (Recommendation)
Reduce harvest on sensitive stocks	Quantify angling impacts on wild stocks		CBFWA (Recommendation)
	Develop fishing regulation changes		CBFWA (Recommendation)
	Increase enforcement to prevent poaching		CBFWA (Recommendation)
	Increase public outreach and education		CBFWA (Recommendation)

Strategies and Measures for Pend Oreille Pygmy Whitefish (Washington)

Strategy	Recommended Measure		Source of Measure
Modify hydro-operations	Determine rates of entrainment under different hydro-operation scenarios and negotiate hydro-operations and facility operations		CBFWA (Recommendation)
	Quantify levels of primary, secondary and benthic		CBFWA

	acroinvertebrate production in near-shore habitats under various hydro-operation scenarios		(Recommendation)
	Identify critical areas for habitat protection, enhancement, and restoration	Resident Fish Stock Status Above Chief Joseph and Grand Coulee Dams	KT (Recommendation) (199700400)
	Negotiate hydro-operations		CBFWA (Recommendation)
Maintain and improve in-stream and riparian habitat	Identify critical areas for habitat protection, enhancement, and restoration, purchase lands, easements or conservation agreements to protect and enhance existing habitat	Resident Fish Stock Status Above Chief Joseph and Grand Coulee Dams	KT (Recommendation) (199700400)
	Enhance and restore physical in-stream and riparian habitat	Resident Fish Stock Status Above Chief Joseph and Grand Coulee Dams	KT (Recommendation) (199700400)
Maintain dissolved oxygen levels in laes	Develop strategies to address potential future dissolved oxygen limitation due to increased development and land use		CBFWA (Recommendation)
Increase nutrients in Lake Sullivan	Develop a nutrient enhancement program including levels needed, application strategy, monitoring and evaluation, and public outreach and education		CBFWA (Recommendation)
	Quantify impacts of hydro-operations on primary and secondary production related to retention times, negotiate hydro-operations		CBFWA (Recommendation)
Reduce nutrient loading	Identify sources of point and non-point nutrient addition		CBFWA (Recommendation)
	Develop strategies and programs to reduce nutrient additions		CBFWA (Recommendation)
Remove point and non-point sources of contaminants	Determine types, extent, and impacts of all potential contaminants, and develop cleanup strategies for pollution sources		CBFWA (Recommendation)
Reduce non-native predator densities	Quantify rates of predation/competition by non-native predators		CBFWA (Recommendation)

	Develop fishing regulation changes		CBFWA (Recommendation)
	Establish a removal/ reduction program		CBFWA (Recommendation)
Reduce incidental impact	Increase public outreach and education		CBFWA (Recommendation)

Strategies and Measures for Sanpoil Kokanee

Strategy	Recommended Measure		Source of Measure
Increase available habitat	Develop habitat improvement strategy that identifies specific sites and actions and prioritization of each action	Lake Roosevelt Rainbow Trout Habitat/Passage Improvement Program	CCT (Recommendation) (199001800)
	Restore fish passage at all major barriers (ie, dams, dikes, weirs, etc) and culvert crossing	Lake Roosevelt Rainbow Trout Habitat/Passage Improvement Program	CCT (Recommendation) (199001800)
	Restore habitat complexity (in-stream and riparian),relocate, obliterate, or reconstruct road segments, restore flow	Lake Roosevelt Rainbow Trout Habitat/Passage Improvement Program	CCT (Recommendation) (199001800)
	Develop community outreach plan with the primary purpose of educating land owners on land use practices		CBFWA (Recommendation)
Reduce non-native population	Increase removal efficiency by liberalizing bag limits for non-native species (walleye and smallmouth bass)		CBFWA (Recommendation)
Modify hydro-operations	Maximize water retention times to increase rearing capacity		CBFWA (Recommendation)
	Maintain higher water elevation		CBFWA (Recommendation)
Reduce angler harvest	Decrease bag limit from 2 to 0 kokanee/day (natural origin kokanee only) in Lake Roosevelt		CBFWA (Recommendation)

Strategies and Measures for Spokane Redband Trout, Mountain Whitefish, Kokanee, and Largemouth Bass

Strategy	Recommended Measure		Source of Measure
Modify hydro-operations ^{1,2,3,4}	Determine rates of entrainment under different hydro-operation scenarios and negotiate hydro-operations and facility operations ^{1,2,3}		CBFWA (Recommendation)
	Identify critical areas for habitat protection, enhancement and restoration ^{1,2,3}		CBFWA (Recommendation)
	Experiment with release strategies to maximize recruitment to fishery ^{1,2,3}		CBFWA (Recommendation)
	Negotiate hydropower operations at Post Falls HED to provide optimal discharge for spawning and emergence ^{1,2}		CBFWA (Recommendation)
	Quantify levels of primary, secondary, and benthic macroinvertebrate production in near-shore habitats under various hydro-operation scenarios ⁴		CBFWA (Recommendation)
Maintain and improve in-stream and riparian habitat ^{1,2,3}	Identify critical areas for habitat protection, enhancement, and restoration, purchase lands, easements or conservation agreements to protect and enhance existing habitat ^{1,2,3}	Coeur d'Alene Fisheries Enhancement, Hangman Creek	CDAT (Recommendation) (200103200)
	Enhance and restore physical in-stream and riparian habitat ^{1,2,3}	Coeur d'Alene Fisheries Enhancement, Hangman Creek	CDAT (Recommendation) (200103200)
Ensure adequate water for all life stages ^{1,2,3}	Establish minimum in-stream flow rules for tributaries and all life stages ^{1,2,3}		CBFWA (Recommendation)
	Purchase water rights ^{1,2,3}		CBFWA (Recommendation)
	Develop water conservation program, and public outreach and education about water conservation ^{1,2,3}	Coeur d'Alene Fisheries Enhancement, Hangman Creek	CDAT (Recommendation) (200103200)

Modify hydro-operations to ensure adequate water temperatures and dissolved oxygen levels in the mainstem Spokane River ^{1,2,3}	Determine water temperature and dissolved oxygen conditions under different hydro-operation scenarios ^{1,2,3}		CBFWA (Recommendation)
	Experiment with release strategies to maximize recruitment to fishery ^{1,2,3}		CBFWA (Recommendation)
	Negotiate hydro-operations and facility improvements ^{1,2,3}		CBFWA (Recommendation)
Implement TMDL ^{1,2,3}	Work with DOE to develop and implement TMDL for temperature, dissolved oxygen, and nutrients ^{1,2,3}		CBFWA (Recommendation)
Reduce nutrient loading ^{1,2,3}	Identify sources of point and non-point nutrient addition ^{1,2,3}		CBFWA (Recommendation)
	Develop strategies and programs to reduce nutrient additions ^{1,2,3}		CBFWA (Recommendation)
Remove point and non-point sources of contaminants ^{1,2,3,4}	Determine types, extent, and impacts of all potential contaminants, and develop cleanup strategies for pollution sources ^{1,2,3,4}		CBFWA (Recommendation)
Reduce non-native predator densities ^{1,2,3}	Quantify rates of predation/competition by non-native predators ^{1,2,3}		CBFWA (Recommendation)
	Develop fishing regulation changes ^{1,2,3}		CBFWA (Recommendation)
	Experiment with release strategies to maximize recruitment to fishery ^{1,2,3}		CBFWA (Recommendation)
	Establish a removal/ reduction program ^{1,2,3}		CBFWA (Recommendation)
Restore fish passage for all life stages to all habitats ^{1,2,3}	Identify critical areas for tributary access / passage protection, enhancement, and restoration ^{1,2,3}	Coeur d'Alene Fisheries Enhancement, Hangman Creek	CDAT (Recommendation) (200103200)
	Identify barriers preventing access to tributaries under different hydro-operation scenarios, and enhance or restore access as appropriate ^{1,2,3}	Coeur d'Alene Fisheries Enhancement, Hangman Creek	CDAT (Recommendation) (200103200)
	Identify barriers preventing access to habitat ^{1,2,3}	Coeur d'Alene Fisheries Enhancement, Hangman Creek	CDAT

			(Recommendation) (200103200)
	Negotiate hydro-operations, and implement fish passage restoration programs where appropriate ^{1,2,3}		CBFWA (Recommendation)
	Implement fish passage restoration programs where appropriate ³	Coeur d'Alene Fisheries Enhancement, Hangman Creek	CDAT (Recommendation) (200103200)
Reduce harvest on sensitive stocks ^{1,2,3}	Quantify angling impacts on wild stocks ^{1,2,3}		CBFWA (Recommendation)
	Develop fishing regulation changes ^{1,2,3}		CBFWA (Recommendation)
	Increase enforcement to prevent poaching ^{1,2,3}		CBFWA (Recommendation)
	Increase public outreach and education ^{1,2,3}	Coeur d'Alene Fisheries Enhancement, Hangman Creek	CDAT (Recommendation) (200103200)
Minimize hybridization ^{1,3}	Utilize triploid/sterile hatchery fish for stocking programs ¹		CBFWA (Recommendation)
	Maximize harvest of hatchery fish ¹		CBFWA (Recommendation)
	Modify stocking strategies to reduce potential genetic interaction ^{1,3}		CBFWA (Recommendation)
	Limit non-native species expansion, use marking methods to differentiate hatchery and wild fish for regulation of angler harvest ¹		CBFWA (Recommendation)
Maintain wild-type genetic diversity and population structure ¹	Develop a breeding program that ensures wild-type genetic structure and diversity of the target population are fully represented ¹		CBFWA (Recommendation)

¹Redband, ²Mountain whitefish, ³Kokanee, ⁴Largemouth bass

Strategies and Measures for Flathead Bull Trout

Strategy	Recommended Measure		Source of Measure
Restore natural hydrologic conditions (ie flow, timing and duration); operate Hungry Horse Dam to minimize negative impacts	Implement integrated rule curves (IRC's) at Hungry Horse Dam	Hungry Horse Mitigation Program	MFWP (Recommendation) (199101903)
		Evaluation of the Biological Effects of the Northwest Power and Conservation Council's Mainstem Amendment on Fisheries Upstream and Downstream of Hungry Horse and Libby Dams, MT	MFWP (Recommendations) (200600800)
	Adopt flood control provisions of the IRC's (VAR-Q) approach	Hungry Horse Mitigation Program	MFWP (Recommendation) (199101903)
		Evaluation of the Biological Effects of the Northwest Power and Conservation Council's Mainstem Amendment on Fisheries Upstream and Downstream of Hungry Horse and Libby Dams, MT	MFWP (Recommendation) (200600800)
Reduce reservoir operational impacts	Reduce reservoir drawdown and reduce frequency of Hungry Horse refill failure to within five feet of full pool	Hungry Horse Mitigation Program	MFWP (Recommendation) (199101903)
		Evaluation of the Biological Effects of the Northwest Power and Conservation Council's Mainstem Amendment on Fisheries Upstream and Downstream of Hungry Horse and Libby Dams, MT	MFWP (Recommendation) (200600800)
	Maintain or exceed recommended instream flows in the South Fork Flathead River	Hungry Horse Mitigation Program	MFWP (Recommendation) (199101903)
		Evaluation of the Biological Effects of the Northwest Power and Conservation Council's Mainstem Amendment on Fisheries Upstream and Downstream of Hungry Horse and Libby Dams, MT	MFWP (Recommendation) (200600800)
	Consider bull trout and westslope cutthroat trout when developing flood control release patterns	Hungry Horse Mitigation Program	MFWP (Recommendation)

			(199101903)	
		Evaluation of the Biological Effects of the Northwest Power and Conservation Council’s Mainstem Amendment on Fisheries Upstream and Downstream of Hungry Horse and Libby Dams, MT	MFWP (Recommendation) (200600800)	
Increase/Improve in-lake habitat	Revegetate top ten feet of varial zone	Hungry Horse Mitigation/Flathead Lake	CSKT (Recommendation) (199101901)	
		Montana Focus watershed Coordinator	CSKT Recommendation (199608701)	
		Secure and Restore Resident Fish Habitat	CSKT (Recommendation) (200200300)	
		Hungry Horse Mitigation Program	MFWP (Recommendation) (199101903)	
		Secure and Protect Fish Habitat in the Flathead Subbasin	MFWP (Recommendation) (200200300)	
		Montana Resident Fish Habitat Acquisition	MFWP (Recommendation) (200880000)	
		Place artificial habitat structures where they are likely to benefit native fish	Hungry Horse Mitigation/Flathead Lake	CSKT (Recommendation) (199101901)
			Montana Focus Watershed Coordinator	CSKT (Recommendation) (199608701)
			Secure and Restore Resident Fish Habitat	CSKT (Recommendation) (200200300)
			Hungry Horse Mitigation Program	MFWP (Recommendation) (199101903)

		Secure and Protect Fish Habitat in the Flathead Subbasin	MFWP (Recommendation) (200200300)
		Montana Resident Fish Habitat Acquisition	MFWP (Recommendation) (200880000)
Increase seasonal or in-seasonal reservoir retention time	Work with action agencies to adjust operations to increase retention time by five days relative to past	Hungry Horse Mitigation Program	MFWP (Recommendation) (199101903)
		Evaluation of the Biological Effects of the Northwest Power and Conservation Council’s Mainstem Amendment on Fisheries Upstream and Downstream of Hungry Horse and Libby Dams, MT	MFWP (Recommendation) (200600800)
Reduce the level of competition/ predation by non-native lake trout in Flathead Lake	Conduct public-involved lake trout removal efforts in Flathead Lake	Hungry Horse Mitigation/Flathead Lake	CSKT (Recommendation) (199101901)
		Hungry Horse Mitigation Program	MFWP (Recommendation) (199101903)
	Monitor lake trout status and harvest levels in Flathead Lake	Hungry Horse Mitigation/Flathead Lake	CSKT (Recommendation) (199101901)
		Hungry Horse Mitigation Program	MFWP (Recommendation) (199101903)
Identify status of newly discovered lake trout population in Swan Lake	Quantify lake trout population size and habitat utilization in Swan Lake	Hungry Horse Mitigation/Flathead Lake	CSKT (Recommendation) (199101901)
		Hungry Horse Mitigation Program	MFWP (Recommendation) (199101903)
	Develop and implement strategies to reduce or eliminate lake trout	Hungry Horse Mitigation/Flathead Lake	CSKT (Recommendation) (199101901)
		Hungry Horse Mitigation Program	MFWP (Recommendation)

			(199101903)
	Develop a management direction for bull trout protection in the Swan Drainage	Hungry Horse Mitigation/Flathead Lake	CSKT (Recommendation) (199101901)
		Hungry Horse Mitigation Program	MFWP (Recommendation) (199101903)
Reduce competition with brook trout	Implement liberal harvest regulations on brook trout Develop/Implement fish stocking policies	Hungry Horse Mitigation/Flathead Lake	CSKT (Recommendation) (199101901)
		Hungry Horse Mitigation Program	MFWP (Recommendation) (199101903)
	Suppress/eradicate brook trout where feasible	Hungry Horse Mitigation/Flathead Lake	CSKT (Recommendation) (199101901)
		Hungry Horse Mitigation Program	MFWP (Recommendation) (199101903)
Minimize risk of brook trout hybridization in critical bull trout spawning and rearing tributaries	Assess current status and hybridization in bull trout spawning and rearing tributaries	Hungry Horse Mitigation/Flathead Lake	CSKT (Recommendation) (199101901)
		Hungry Horse Mitigation Program	MFWP (Recommendation) (199101903)
	Determine the life history and habitat utilization of the hybrid fish	Hungry Horse Mitigation/Flathead Lake	CSKT (Recommendation) (199101901)
		Hungry Horse Mitigation Program	MFWP (Recommendation) (199101903)
	Maintain liberal angling regulations for brook trout	Hungry Horse Mitigation/Flathead Lake	CSKT (Recommendation) (199101901)
		Hungry Horse Mitigation Program	MFWP (Recommendation)

			(199101903)
	Increase educational efforts on proper fish identification	Hungry Horse Mitigation/Flathead Lake	CSKT (Recommendation) (199101901)
		Hungry Horse Mitigation Program	MFWP (Recommendation) (199101903)
	Develop and enforce fish stocking policies and private fish pond licensing requirements	Hungry Horse Mitigation/Flathead Lake	CSKT (Recommendation) (199101901)
		Hungry Horse Mitigation Program	MFWP (Recommendation) (199101903)
	Suppress/eradicate brook trout where feasible	Hungry Horse Mitigation/Flathead Lake	CSKT (Recommendation) (199101901)
		Hungry Horse Mitigation Program	MFWP (Recommendation) (199101903)
Protect and maintain spawning and rearing habitat quality and the connectivity necessary for the migratory life history	Work with willing landowners to provide long-term habitat protection through acquisition or easement	Hungry Horse Mitigation/Flathead Lake	CSKT (Recommendation) (199101901)
		Secure and Protect Fish Habitat in the Flathead Subbasin	MFWP (Recommendation) (200200300)
		Montana Focus Watershed Coordinator	CSKT (Recommendation) (199608701)
		Montana Resident Fish Habitat Acquisition	MFWP (Recommendation) (200880000)
	Implement stream restoration/enhancement Specific Measure (Project Reference)s where feasible	Montana Focus Watershed Coordinator	CSKT (Recommendation) (199608701)
		Secure and Restore Resident Fish Habitat	CSKT (Recommendation)

		(200200300)
	Secure and Protect Fish Habitat in the Flathead Subbasin	MFWP (Recommendation) (200200300)
	Montana Resident Fish Habitat Acquisition	MFWP (Recommendation) (200880000)
Fulfill statutory obligations relative to streambed and bank protection	Hungry Horse Mitigation/Flathead Lake	CSKT (Recommendation) (199101901)
	Montana Focus Watershed Coordinator	CSKT (Recommendation) (199608701)
	Secure and Restore Resident Fish Habitat	CSKT (Recommendation) (200200300)
	Montana Resident Fish Habitat Acquisition	MFWP (Recommendation) (200880000)
Assure that rural residential development of private lands in alluvial valleys does not negatively impact migratory corridors connecting upstream spawning and rearing areas with the lake and river system	Hungry Horse Mitigation/Flathead Lake	CSKT (Recommendation) (199101901)
	Montana Focus Watershed Coordinator	CSKT (Recommendation) (199608701)
	Secure and Restore Resident Fish Habitat	CSKT (Recommendation) (200200300)
	Montana Resident Fish Habitat Acquisition	MFWP (Recommendation) (200880000)
Participate in the evaluation of forestry “best management practices” as stipulated by the legislature	Montana Focus Watershed Coordinator	CSKT (Recommendation) (199608701)
	Secure and Restore Resident Fish Habitat	CSKT (Recommendation)

			(200200300)
		Montana Resident Fish Habitat Acquisition	MFWP (Recommendation) (200880000)
Mitigate for the 1258 km of habitat inundated by the construction of Hungry Horse Dam	Acquire and restore the equivalent amount of habitat lost by acquiring fee title and/or conservation easements at fair market value	Montana Resident Fish Habitat Acquisition	MFWP (Recommendation) (200880000)
		Secure and Protect Fish Habitat in the Flathead Subbasin	MFWP (Recommendation) (200200300)
Mitigate for the loss of over 40% of the spawning habitat blocked by Hungry Horse Dam	Acquire and restore the equivalent amount of habitat lost by acquiring fee title and/or conservation easements at fair market value	Montana Resident Fish Habitat Acquisition	MFWP (Recommendation) (200880000)
		Secure and Protect Fish Habitat in the Flathead Subbasin	MFWP (Recommendation) (200200300)

Strategies and Measures for Flathead Westslope Cutthroat Trout

Strategy	Recommended Measure		Source of Measure
Restore and maintain natural hydrologic conditions (ie, flow, timing, and duration), and operate the dam to minimize negative impacts	Implement integrated rule curves (IRCs) for operation of Hungry Horse Dam and pursue adoption of the flood control provisions of the IRCs (VAR-Q approach)	Hungry Horse Mitigation Program	MFWP (Recommendation) (199101903)
		Evaluation of the Biological Effects of the Northwest Power and Conservation Council’s Mainstem Amendment on Fisheries Upstream and Downstream of Hungry Horse and Libby Dams, MT	MFWP (Recommendation) (200600800)

Reduce reservoir operational impacts	Reduce reservoir drawdown and reduce frequency of Hungry Horse refill failure to within five feet of full pool	Hungry Horse Mitigation Program	MFWP (Recommendation) (199101903)
		Evaluation of the Biological Effects of the Northwest Power and Conservation Council’s Mainstem Amendment on Fisheries Upstream and Downstream of Hungry Horse and Libby Dams, MT	MFWP (Recommendation) (200600800)
	Maintain or exceed recommended instream flows in the South Fork Flathead River	Hungry Horse Mitigation Program	MFWP (Recommendation) (199101903)
		Evaluation of the Biological Effects of the Northwest Power and Conservation Council’s Mainstem Amendment on Fisheries Upstream and Downstream of Hungry Horse and Libby Dams, MT	MFWP (Recommendation) (200600800)
	Consider bull trout and westslope cutthroat trout when developing flood control release patterns	Hungry Horse Mitigation Program	MFWP (Recommendation) (199101903)
		Evaluation of the Biological Effects of the Northwest Power and Conservation Council’s Mainstem Amendment on Fisheries Upstream and Downstream of Hungry Horse and Libby Dams, MT	MFWP (Recommendation) (200600800)
Increase seasonal or in-season reservoir retention time	Work with action agencies to adjust operations to increase retention time by five days relative to past	Hungry Horse Mitigation Program	MFWP (Recommendation) (199101903)
		Evaluation of the Biological Effects of the Northwest Power and Conservation Council’s Mainstem Amendment on Fisheries Upstream and Downstream of Hungry Horse and Libby Dams, MT	MFWP (Recommendation) (200600800)
Increase/Improve in-lake habitat	Revegetate top ten feet of varial zone; improve shoreline habitat in Flathead Lake by implementing Kerr Specific Measure (Project Reference) FWIS	Hungry Horse Mitigation/Flathead Lake	CSKT (Recommendation) (199101901)
		Montana Focus Watershed Coordinator	CSKT (Recommendation) (199608701)

		Secure and Restore Resident Fish Habitat	CSKT (Recommendation) (200200300)
		Hungry Horse Mitigation Program	MFWP (Recommendation) (199101903)
		Secure and Protect Fish Habitat in the Flathead Subbasin	MFWP (Recommendation) (200200300)
		Montana Resident Fish Habitat Acquisition	MFWP (Recommendation) (200880000)
	Place artificial habitat structures where they are likely to benefit native fish	Hungry Horse Mitigation/Flathead Lake	CSKT (Recommendation) (199101901)
		Montana Focus Watershed Coordinator	CSKT (Recommendation) (199608701)
		Secure and Restore Resident Fish Habitat	CSKT (Recommendation) (200200300)
		Hungry Horse Mitigation Program	MFWP (Recommendation) (199101903)
		Secure and Protect Fish Habitat in the Flathead Subbasin	MFWP (Recommendation) (200200300)
		Montana Resident Fish Habitat Acquisition	MFWP (Recommendation) (200880000)
Reduce the level of predation by non-native lake trout in Flathead Lake and mainstem Flathead	Conduct public-involved lake trout removal efforts in Flathead Lake	Hungry Horse Mitigation/Flathead Lake	CSKT (Recommendation) (199101901)
		Hungry Horse Mitigation Program	MFWP (Recommendation) (199101903)

River	Monitor lake trout status and harvest levels in Flathead Lake	Hungry Horse Mitigation/Flathead Lake	CSKT (Recommendation) (199101901)	
		Hungry Horse Mitigation Program	MFWP (Recommendation) (199101903)	
Reduce competition with rainbow & brook trout	Implement liberal harvest regulations on rainbow trout and brook	Hungry Horse Mitigation/Flathead Lake	CSKT (Recommendation) (199101901)	
		Hungry Horse Mitigation Program	MFWP (Recommendation) (199101903)	
	Develop/Implement fish stocking policies	Hungry Horse Mitigation/Flathead Lake	CSKT (Recommendation) (199101901)	
		Hungry Horse Mitigation Program	MFWP (Recommendation) (199101903)	
	Suppress/eradicate rainbow trout where feasible	Hungry Horse Mitigation/Flathead Lake	CSKT (Recommendation) (199101901)	
		Hungry Horse Mitigation Program	MFWP (Recommendation) (199101903)	
	Assess current status of competition with brook trout in westslope cutthroat spawning and rearing tributaries	Hungry Horse Mitigation/Flathead Lake	CSKT (Recommendation) (199101901)	
		Hungry Horse Mitigation Program	MFWP (Recommendation) (199101903)	
	Increase educational efforts on proper fish identification	Hungry Horse Mitigation/Flathead Lake	CSKT (Recommendation) (199101901)	
		Hungry Horse Mitigation Program	MFWP (Recommendation) (199101903)	

Protect existing genetically pure populations of westslope cutthroat trout in the South Fork Drainage	Remove all of the exotic trout from lakes and their associated streams where possible	Hungry Horse Mitigation Program	MFWP (Recommendation) (199101903)
	Rely on genetically pure fish stocked in the headwater lakes to repopulate the stream systems and move them towards a genetically pure state	Hungry Horse Mitigation Program	MFWP (Recommendation) (199101903)
	Increase educational and enforcement activities to discourage illegal fish introduction	Hungry Horse Mitigation Program	MFWP (Recommendation) (199101903)
	Characterize, conserve and monitor genetic diversity and gene flow among local populations	Hungry Horse Mitigation Program	MFWP (Recommendation) (199101903)
	Conduct genetic inventory to understand the genetic baseline and monitor genetic strategies	Hungry Horse Mitigation Program	MFWP (Recommendation) (199101903)
	Establish conservation refuge areas for stronghold species assemblages	Hungry Horse Mitigation Program	MFWP (Recommendation) (199101903)
	Incorporate conservation of genetic and behavioral attributes of westslope cutthroat trout into recovery and management plans	Hungry Horse Mitigation Program	MFWP (Recommendation) (199101903)
	Manage local populations to maintain long-term viability	Hungry Horse Mitigation Program	MFWP (Recommendation) (199101903)

Strategies and Measures for Kootenai Bull Trout

Strategy (SBP Obj)	Recommended Measure		Source of Measure
<p>Physical Habitat Restoration</p> <p>To improve the altered hydrograph:</p>	Operate Libby Dam and the downstream hydropower system in ways that restore normative river functions in the lower Kootenai River, including hydrograph cycles that promote and maintain habitat diversity, and floodplain		CBFWA (Recommendation)

Bring Libby Dam

<p>operations 50% closer to normative conditions during summer and spring while providing flood control (M1a)</p> <p>Determine opportunities for hydro operations to remove delta blockages from tributary streams (M1b, T7b)</p> <p>Improve hydrographs to meet QHA-generated high/low flow habitat restoration scores of reference streams (T7a)</p>	connectivity		
	Evaluate alternatives for Libby Dam operations to provide more appropriate water temperatures and increased flexibility in flow management, especially during winter and spring		CBFWA (Recommendation)
	Develop, evaluate, and implement more normative seasonal flow windows and flow ramping rates		CBFWA (Recommendation)
<p>To improve the altered thermograph:</p> <p>Modify the mainstem thermal regime to be more normative, within current thermal limitations imposed by Libby Dam and Koocanusa Reservoir, to be more within the tolerance range of all life stages of various aquatic and focal fish species (M4a)</p> <p>Research, develop, and</p>	Use models to evaluate responses of habitat and fish populations to alternative dam operating strategies		CBFWA (Recommendation)
	Monitor temperatures within the reservoir and downstream sites during flow augmentation and normative flow operations		CBFWA (Recommendation)
	Develop multi-year experimental discharge agreements for Libby Dam operations to evaluate the effectiveness of restoring more natural thermographs for natural spawning, development, and recruitment for white sturgeon, burbot, bull trout and other important species and ecological functions		CBFWA (Recommendation)

<p>test new operational strategies for Libby Dam that could expand its role in more effectively providing a more normative downstream thermograph (M4b)</p> <p>Protect and revegetate riparian areas to maintain shading and cool water temperatures (T5a)</p> <p>Improve the thermograph to a level equivalent to the QHA-generated thermograph scores of reference and Class 1 streams (T5b)</p>			
<p>To improve channel stability:</p> <p>Improve channel stability to a level equivalent to the QHA-generated, channel stability habitat-restoration scores of reference streams (M6)</p> <p>Improve channel stability to a level equivalent to the QHA-generated</p>	<p>See details of the 11 associated measures (listed as strategies) on Page 28 of the Management Plan section of the Kootenai River Subbasin Plan</p>	<p>Reconnect Kootenai River with the Historic Floodplain</p>	<p>KTI (Recommendation) (200200800)</p>
		<p>Libby Mitigation Project</p>	<p>MFWP (Recommendation) (199500400)</p>
		<p>Kootenai River White Sturgeon Inventory</p>	<p>IDFG (Recommendation) (198806500)</p>

channel stability scores of reference and Class 1 streams (T4)			
<p>To improve connectivity:</p> <p>Restore, provide, and maintain passage to migratory fish by removing potential man-caused barriers, ie impassable culverts, hydraulic headcuts, water diversion blockages, landslides, and impassable deltas (T8)</p>	<p>Identify, monitor, and maintain existing barriers necessary to keep introduced species at bay install new barriers where necessary to prevent invasion of introduced species</p>	Reconnect Kootenai River with the Historic Floodplain	KTI (Recommendation) (200200800)
		Kootenai River White Sturgeon Inventory	IDFG (Recommendation) (198806500)
		Libby Mitigation Project	MFWP (Recommendation) (199500400)
	<p>Identify barriers or sites of entrainment for focal species, and implement tasks to provide passage and eliminate entrainment</p>	Reconnect Kootenai River with the Historic Floodplain	KTI (Recommendation) (200200800)
		Kootenai River White Sturgeon Inventory	IDFG (Recommendation) (198806500)
		Libby Mitigation Project	MFWP (Recommendation) (199500400)
	<p>Eliminate entrainment in diversions and provide fish passage around diversions</p>	Reconnect Kootenai River with the Historic Floodplain	KTI (Recommendation) (200200800)
		Kootenai River White Sturgeon Inventory	IDFG (Recommendation) (198806500)
		Libby Mitigation Project	MFWP (Recommendation) (199500400)
	<p>Install appropriate fish passage structures around diversions and/or remove related migration barriers</p>	Reconnect Kootenai River with the Historic Floodplain	KTI (Recommendation) (200200800)
		Kootenai River White Sturgeon Inventory	IDFG (Recommendation) (198806500)

		Libby Mitigation Project	MFWP (Recommendation) (199500400)
	Eliminate culvert barriers Monitor road crossings for blockages to upstream passage and replace existing culverts that impede passage	Reconnect Kootenai River with the Historic Floodplain	KTI (Recommendation) (200200800)
		Kootenai River White Sturgeon Inventory	IDFG (Recommendation) (198806500)
		Libby Mitigation Project	MFWP (Recommendation) (199500400)
To increase habitat diversity: Improve habitat diversity to levels equivalent to the QHA-generated habitat diversity habitat restoration scores, and habitat diversity conditions based on ecological primary literature and possible references rivers (M5) Protect habitat diversity in Class 1 streams and reaches (T6a) Improve habitat diversity to a level equivalent to the QHA-generated habitat diversity scores of reference streams	Periodically alter Kootenai River hydrograph to restore hydraulic energy needed to create increase habitat diversity		CBFWA (Recommendation)
	Design and implement re-connection of side channel, slough, backwater and, in-river habitats	Reconnect Kootenai River with the Historic Floodplain	KTI (Recommendation) (200200800)
		Kootenai River White Sturgeon Inventory	IDFG (Recommendation) (198806500)
		Libby Mitigation Project	MFWP (Recommendation) (199500400)

(T6b)			
To restore the hydraulic regime: Reduce reservoir drawdown and reduce the frequency of Koocanusa Reservoir refill failure to within five feet of full pool as compared to previous post-dam operation (R1)	Work with action agencies to improve reservoir refill probability and reduce maximum drawdown and increase seasonal and in-seasonal reservoir retention time by at least five days relative to past operations during similar water years	Kootenai River White Sturgeon Inventory	IDFG (Recommendation) (198806500)
		Libby Mitigation Project	MFWP (Recommendation) (199500400)
To improve shoreline condition: Revegetate the varial zone using best available techniques (R2)	Plan, coordinate, implement cost-effective means of revegetating the river and reservoir varial zones with appropriate techniques, agencies, and organizations	Kootenai River White Sturgeon Inventory	IDFG (Recommendation) (198806500)
		Libby Mitigation Project	MFWP (Recommendation) (199500400)
To improve riparian habitat condition: Improve riparian function and complexity of mainstem riparian habitat to support or contribute to sustainable population levels of focal species that function naturally and may be capable of supporting appropriate forms of human use (M2)	Develop a consolidated riparian and wetland habitat map for the Kootenai Subbasin	Kootenai River White Sturgeon Inventory	IDFG (Recommendation) (198806500)
		Libby Mitigation Project	MFWP (Recommendation) (199500400)
	Investigate and analyze historic losses of riparian and wetland habitats in the Kootenai Subbasin	Kootenai River White Sturgeon Inventory	IDFG (Recommendation) (198806500)
		Libby Mitigation Project	MFWP (Recommendation) (199500400)
	Identify associated losses in biological functions and performance (eg riparian dependent fish, animals, birds)	Kootenai River White Sturgeon Inventory	IDFG (Recommendation) (198806500)
		Libby Mitigation Project	MFWP

Restore riparian habitats to levels equivalent to the QHA-generated riparian condition habitat restoration scores of reference streams (T2)			(Recommendation) (199500400)
	Coordinate efforts with natural resource managers to develop a comprehensive riparian and wetland habitat protection, rehabilitation, and enhancement plan for the Kootenai River mainstem	Kootenai River White Sturgeon Inventory	IDFG (Recommendation) (198806500)
		Libby Mitigation Project	MFWP (Recommendation) (199500400)
<p>To address turbidity, fine sediments:</p> <p>Achieve turbidity levels in the mainstem that support sustainable population levels of focal species that function naturally and may be capable of supporting appropriate forms of human use (M3a)</p> <p>Reduce the delivery of fine sediments in the mainstem to support sustainable population levels of focal species that function naturally and may be capable of supporting appropriate forms of human use (M3b)</p> <p>Reduce the delivery of fine sediments to a level equivalent to the QHA-generated fine sediment habitat</p>	See details of the 19 associated measures (listed as strategies) on pages 23 and 24, and the 20 associated measures (listed as strategies) on pages 31-32 of the Management Plan section of the Kootenai River Subbasin Plan		

attribute scores of reference streams or reaches (T3)			
To improve reservoir volumetric turnover rate: Improve reservoir refill probability and reduce maximum drawdown to increase reservoir retention time by at least five days relative to past operations during similar water years (R1)	Work with action agencies to improve reservoir refill probability and reduce maximum drawdown and increase seasonal and in-seasonal reservoir retention time by at least five days relative to past operations during similar water years	Libby Mitigation Project	MFWP (Recommendation) (199500400)
		Kootenai River White Sturgeon Inventory	IDFG (Recommendation) (198806500)
To address number of local populations: Maintain or increase the total number of identified local populations and maintain the broad distribution of local populations across all four existing core areas (BT1)	See details of the 14 associated measures (listed as strategies) on pages 41-42 of the Management Plan section of the Kootenai River Subbasin Plan	Libby Mitigation Project	MFWP (Recommendation) (199500400)
		Kootenai River White Sturgeon Inventory	IDFG (Recommendation) (198806500)
To address small population size: Achieve at least 5 local populations (including British Columbia tributaries) with 100 adults in each of the	See details of the 13 measures (listed as strategies) on pages 43-44 of the Management Plan section of the Kootenai River Subbasin Plan	Kootenai River White Sturgeon Inventory	IDFG (Recommendation) (198806500)
		Libby Mitigation Project	MFWP (Recommendation) (199500400)

<p>primary Lake Koocanusa and Kootenai River/Kootenay Lake core areas, with each of these primary core areas containing at least 1,000 adult bull trout (BT2a)</p> <p>Achieve at least 1 local population of bull trout containing 100 or more adult fish in each of the Bull Lake and Sophie Lake secondary core areas (BT2b)</p>			
<p>To address population stability:</p> <p>Achieve an overall bull trout population trend in the Kootenai River Recovery Unit that is accepted, under contemporary standards, to be stable or increasing, based on at least 10 years of monitoring data (BT3)</p>	<p>See details of the 13 associated measures (listed as strategies) on pages 44-45 of the Management Plan section of the Kootenai River Subbasin Plan</p>	<p>Kootenai River White Sturgeon Inventory</p>	<p>IDFG (Recommendation) (198806500)</p>
<p>To address affects of non-native species introductions:</p> <p>Suppress and prevent expansion of populations of non-</p>	<p>Take actions necessary to suppress and prevent expansion of populations of non-native fish species</p>	<p>Libby Mitigation Project</p>	<p>MFWP (Recommendation) (199500400)</p>
		<p>Kootenai River White Sturgeon Inventory</p>	<p>IDFG (Recommendation) (198806500)</p>
		<p>Libby Mitigation Project</p>	<p>MFWP (Recommendation) (199500400)</p>

<p>native fish species beyond current levels in Kooconusa Reservoir (BT4a)</p> <p>Support and coordinate with suppression and removal activities for nonnative fish species in British Columbia waters of the Kootenai Subbasin to reduce relative and total abundance of non-native fishes in the Subbasin (BT4b)</p>			
<p>To address the effects of reduced nutrients/ system productivity: Restore system productivity (BT5)</p>	<p>Nutrient restoration in Kootenay Lake and Kootenai River</p>	<p>Kootenai River White Sturgeon Inventory</p>	<p>IDFG (Recommendation) (198806500)</p>
		<p>Kootenai River Ecosystem Improvements Project</p>	<p>KTI (Recommendation) (199404900)</p>
		<p>Libby Mitigation Program</p>	<p>MFWP (Recommendation) (199500400)</p>
	<p>Implement ongoing annual nutrient addition water quality monitoring program</p>	<p>Kootenai River White Sturgeon Inventory</p>	<p>IDFG (Recommendation) (198806500)</p>
		<p>Kootenai River Ecosystem Improvements Project</p>	<p>KTI (Recommendation) (199404900)</p>
		<p>Libby Mitigation Program</p>	<p>MFWP (Recommendation) (199500400)</p>
	<p>Implement ongoing Biomonitoring Program to measure water quality, algal accrual,</p>	<p>Kootenai River White Sturgeon Inventory</p>	<p>IDFG (Recommendation)</p>

	macroinvertebrate community condition		(198806500)
		Kootenai River Ecosystem Improvements Project	KTI (Recommendation) (199404900)
		Libby Mitigation Program	MFWP (Recommendation) (199500400)
	Implement annual fish survey	Kootenai River White Sturgeon Inventory	IDFG (Recommendation) (198806500)
		Libby Mitigation Project	MFWP (Recommendation) (199500400)
To mitigate for the 240 km of habitat inundated by the construction of Libby Dam	Acquire and restore the equivalent amount of habitat lost by acquiring fee title and/or conservation easements at fair market value	Secure and Protect Fish Habitat in the Kootenai Subbasin	MFWP MOA (Recommendation)
Address critical uncertainties	Conduct research needed to address critical uncertainties	Kootenai River White Sturgeon Inventory	IDFG (Recommendation) (198806500)
		Libby Mitigation Project	MFWP (Recommendation) (199500400)

Strategies and Measures for Kootenai Burbot

Strategy	Recommended Measure		Source of Measure
SAME FOR ALL FOCAL SPECIES (See physical habitat restorations strategies and measures for bull trout above)			
To address altered winter hydro and thermal regime: Develop and implement an	Document specific temperature and flow requirements	Kootenai River White Sturgeon Inventory	IDFG (Recommendation) (198806500)
	Investigate existing hydrological models to evaluate	Kootenai River White Sturgeon Inventory	IDFG (Recommendation)

experimental Kootenai River flow/water temperature operation	effects of operational alternatives life stages		(198806500)
	Evaluate use of selective withdrawal to affect thermograph	Kootenai River White Sturgeon Inventory	IDFG (Recommendation) (198806500)
	Develop and implement multi-year plan for experimental operations	Kootenai River White Sturgeon Inventory	IDFG (Recommendation) (198806500)
To improve reduced nutrients/system productivity: Restore system productivity (BUR1)	Nutrient restoration in Kootenay Lake and Kootenai River	Kootenai River White Sturgeon Inventory	IDFG (Recommendation) (198806500)
		Kootenai River Ecosystem Improvements Project	KTI (Recommendation) (199404900)
		Libby Mitigation Program	MFWP (Recommendation) (199500400)
	Implement ongoing annual nutrient addition water quality monitoring program	Kootenai River White Sturgeon Inventory	IDFG (Recommendation) (198806500)
		Kootenai River Ecosystem Improvements Project	KTI (Recommendation) (199404900)
		Libby Mitigation Program	MFWP (Recommendation) (199500400)
	Implement ongoing Biomonitoring Program to measure water quality, algal accrual, macroinvertebrate community condition	Kootenai River White Sturgeon Inventory	IDFG (Recommendation) (198806500)
		Kootenai River Ecosystem Improvements Project	KTI (Recommendation) (199404900)
		Implement annual fish survey	Kootenai River White Sturgeon Inventory
	To compensate for post-dam community	Develop, evaluate, implement, and monitor improvements to hydro operations, physical	Kootenai River White Sturgeon Inventory

composition shifts: Rehabilitate mainstem Kootenai River fish community structure and density to better approximate pre-Libby Dam ecological community characteristics (BUR2)	habitats, and ecological community components to restore ecological and environmental selection pressures to favor native assemblages of fish and wildlife taxa in the mainstem Kootenai River and associated and historical floodplain areas		(198806500)
		Secure and Protect Fish Habitat in the Kootenai Subbasin	MFWP MOA (Recommendation)
		Libby Mitigation Program	MFWP (Recommendation) (199500400)
	Restore lower winter water temperatures	Kootenai River White Sturgeon Inventory	IDFG (Recommendation) (198806500)
To address recruitment failure: Achieve consistent natural recruitment in at least three different spawning areas with net recruitment and juvenile population size sufficient to support desired adult population size (BUR3a) BUR3b Achieve stable size and age distributions as determined by an upward trend in a 6-year moving average of population abundance (BUR3b)	Restore natural recruitment and/or develop, refine, implement, and evaluate a conservation aquaculture program for burbot	Kootenai River White Sturgeon Inventory	IDFG (Recommendation) (198806500)
		Kootenai River Native Fish Restoration and Conservation Aquaculture	KTI (Recommendation) (198806400)
To address small population size: Achieve a minimum number of 2,500 adults in the burbot	Develop, refine, implement, and evaluate a conservation aquaculture program for burbot	Kootenai River White Sturgeon Inventory	IDFG (Recommendation) (198806500)
		Kootenai River Native Fish Restoration and Conservation Aquaculture	KTI (Recommendation) (198806400)

population (BUR4)			
To address the effects of contaminants (altered water quality: Evaluate lethal and sublethal effects of environmental contaminants (including reproductive and behavioral effects) on white sturgeon and burbot (BUR5a) Seek remedies for contaminant problems if warranted (BUR5b)	See details of the 5 associated measures (listed as strategies) on page 71 of the Management Plan section of the Kootenai River Subbasin Plan	Kootenai River White Sturgeon Inventory	IDFG (Recommendation) (198806500)
Address critical uncertainties	Conduct research needed to address critical uncertainties	Kootenai River White Sturgeon Inventory	IDFG (198806500)

Strategies and Measures for Kootenai Redband Trout

Strategy	Recommended Measure		Source of Measure
SAME FOR ALL FOCAL SPECIES (See physical habitat restorations strategies and measures for bull trout above)			
To address number of local populations: Maintain and/or increase the total number of genetically pure local populations (RBT1a)	Protect remaining redband populations by enacting conservation measures in sport angling regulations and fisheries management plans, guidelines, and policies to minimize unintentional mortality of redband trout in Kootenai River tributaries	Libby Mitigation Project	MFWP (Recommendation) (199500400)

		Development of Single Nucleotide Polymorphism (SNPs) genetic Markers Diagnostic between Coastal Rainbow Trout and Interior Redband Trout	IDFG (Recommendation) (200721800)
		Kootenai River White Sturgeon Inventory	IDFG (Recommendation) (198806500)
<p>To address small population size: Achieve a minimum of two genetically pure conservation populations, each containing at least 250 adult redband trout (including British Columbia tributaries) In Kootenai Subbasin redband trout populations that have subpopulations, subpopulations should contain at least 50 adult individuals to improve the probability of subpopulation persistence (RBT2)</p>	<p>Evaluate potential effects of introduced fishes on bull trout recovery, westslope cutthroat trout, redband trout, and kokanee conservation and implement tasks to minimize negative effects</p>	Libby Mitigation Project	MFWP (Recommendation) (199500400)
		Development of Single Nucleotide Polymorphism (SNPs) genetic Markers Diagnostic between Coastal Rainbow Trout and Interior Redband Trout	IDFG (Recommendation) (200721800)
		Kootenai River White Sturgeon Inventory	IDFG (Recommendation) (198806500)
	<p>Evaluate effects of existing and proposed sport harvest regulations on redband trout</p>	Libby Mitigation Project	MFWP (Recommendation) (199500400)
		Kootenai River White Sturgeon Inventory	IDFG (Recommendation) (198806500)
	<p>Characterize, conserve, and monitor genetic diversity in isolate populations</p>	Libby Mitigation Project	MFWP (Recommendation) (199500400)
		Development of Single Nucleotide Polymorphism (SNPs) genetic Markers Diagnostic between Coastal Rainbow Trout and Interior Redband Trout	IDFG (Recommendation) (200721800)
		Kootenai River White Sturgeon Inventory	IDFG (Recommendation) (198806500)
	<p>Incorporate conservation of genetic and behavioral attributes of redband trout into recovery and management plans</p>	Libby Mitigation Project	MFWP (Recommendation) (199500400)
		Development of Single Nucleotide Polymorphism (SNPs) genetic Markers Diagnostic between Coastal Rainbow Trout and Interior Redband Trout	IDFG (Recommendation) (200721800)

		Kootenai River White Sturgeon Inventory	IDFG (Recommendation) (198806500)
Maintain long-term viability of conservation populations (numbers and lifecycle strategies) and establish wild populations where native stocks have been extirpated		Libby Mitigation Project	MFWP (Recommendation) (199500400)
		Development of Single Nucleotide Polymorphism (SNPs) genetic Markers Diagnostic between Coastal Rainbow Trout and Interior Redband Trout	IDFG (Recommendation) (200721800)
		Kootenai River White Sturgeon Inventory	IDFG (Recommendation) (198806500)
Rear genetically pure redband trout in restored natural rearing habitat at the Libby Area Office		Libby Mitigation Project	MFWP (Recommendation) (199500400)
		Development of Single Nucleotide Polymorphism (SNPs) genetic Markers Diagnostic between Coastal Rainbow Trout and Interior Redband Trout	IDFG (Recommendation) (200721800)
Use F1 progeny for restoration Specific Measure (Project Reference)s within their historic range		Libby Mitigation Project	MFWP (Recommendation) (199500400)
		Development of Single Nucleotide Polymorphism (SNPs) genetic Markers Diagnostic between Coastal Rainbow Trout and Interior Redband Trout	IDFG (Recommendation) (200721800)
Evaluate effects of existing and proposed sport harvest regulations on redband trout populations		Libby Mitigation Project	MFWP (Recommendation) (199500400)
		Kootenai River White Sturgeon Inventory	IDFG (Recommendation) (198806500)
Maintain long-term viability of conservation populations		Libby Mitigation Project	MFWP (Recommendation) (199500400)
		Development of Single Nucleotide Polymorphism (SNPs) genetic Markers Diagnostic between Coastal Rainbow Trout and Interior Redband Trout	IDFG (Recommendation) (200721800)

	Where necessary, isolate pure populations to prevent invasion of nonnative species or genetically introgressed populations	Libby Mitigation Project	MFWP (Recommendation) (199500400)
		Development of Single Nucleotide Polymorphism (SNPs) genetic Markers Diagnostic between Coastal Rainbow Trout and Interior Redband Trout	IDFG (Recommendation) (200721800)
	Evaluate available over-winter rearing habitat for young redband trout and determine means of improving or optimizing available over winter rearing	Libby Mitigation Project	MFWP (Recommendation) (199500400)
		Kootenai River White Sturgeon Inventory	IDFG (Recommendation) (198806500)
To address affects of non-native species introductions: Suppress and prevent expansion of populations of non-native fish species (RBT3a) Support and coordinate with suppression and removal activities for nonnative fish species in British Columbia waters of the Kootenai Subbasin to reduce relative and total abundance of non-native fishes in the Subbasin (RBT3b)	Take actions necessary to suppress and prevent expansion of populations of non-native fish species	Libby Mitigation Project	MFWP (Recommendation) (199500400)
		Kootenai River White Sturgeon Inventory	IDFG (Recommendation) (198806500)
	Rehabilitate habitat to favor native species assemblages	Libby Mitigation Project	MFWP (Recommendation) (199500400)
To address the effects of reduced nutrients/ system productivity: Restore system	Nutrient restoration in Kootenay Lake and Kootenai River	Libby Mitigation Project	MFWP (Recommendation) (199500400)
		Kootenai River White Sturgeon Inventory	IDFG

productivity			(Recommendation) (198806500)	
		Kootenai River Ecosystem Improvements Project	KTI (Recommendation) (199404900)	
	Implement ongoing annual nutrient addition water quality monitoring program	Libby Mitigation Project	MFWP (Recommendation) (199500400)	
		Kootenai River White Sturgeon Inventory	IDFG (Recommendation) (198806500)	
		Kootenai River Ecosystem Improvements Project	KTI (Recommendation) (199404900)	
	Implement ongoing Biomonitoring Program to measure water quality, algal accrual, macroinvertebrate community condition	Libby Mitigation Project	MFWP (Recommendation) (199500400)	
		Kootenai River White Sturgeon Inventory	IDFG (Recommendation) (198806500)	
		Kootenai River Ecosystem Improvements Project	KTI (Recommendation) (199404900)	
	Implement annual fish survey	Libby Mitigation Project	MFWP (Recommendation) (199500400)	
		Kootenai River Ecosystem Improvements Project	KTI (Recommendation) (199404900)	
		Kootenai River White Sturgeon Inventory	IDFG (Recommendation) (198806500)	
	To mitigate for the 240 km of habitat inundated by the construction of Libby Dam	Acquire and restore the equivalent amount of habitat lost by acquiring fee title and/or conservation easements at fair market value	Libby Mitigation Project	MFWP (Recommendation) (199500400)
			Secure and Protect Fish habitat in the Kootenai Subbasin	MFWP

			(Recommendation)
Address critical uncertainties	Conduct research needed to address critical uncertainties	Libby Mitigation Project	MFWP (Recommendation) (199500400)
		Kootenai River White Sturgeon Inventory	IDFG (Recommendation) (198806500)

Strategies and Measures for Kootenai Kokanee

Strategy	Recommended Measure		Source of Measure
SAME FOR ALL FOCAL SPECIES (See physical habitat restorations strategies and measures for bull trout above)			
To address the effects of reduced nutrients/ system productivity: Restore system productivity (KOK1)	Nutrient restoration in Kootenay Lake and Kootenai River	Libby Mitigation Project	MFWP (Recommendation) (199500400)
		Kootenai River White Sturgeon Inventory	IDFG (Recommendation) (198806500)
		Kootenai River Ecosystem Improvements Project	KTI (Recommendation) (199404900)
	Implement ongoing annual nutrient addition water quality monitoring program	Libby Mitigation Project	MFWP (Recommendation) (199500400)
		Kootenai River White Sturgeon Inventory	IDFG (Recommendation) (198806500)
		Kootenai River Ecosystem Improvements Project	KTI (Recommendation) (199404900)
	Implement ongoing Biomonitoring Program to measure water quality, algal accrual, macroinvertebrate community condition	Libby Mitigation Project	MFWP (Recommendation) (199500400)
		Kootenai River White Sturgeon Inventory	IDFG

			(Recommendation) (198806500)
		Kootenai River Ecosystem Improvements Project	KTI (Recommendation) (199404900)
	Implement annual fish survey	Libby Mitigation Project	MFWP (Recommendation) (199500400)
		Kootenai River White Sturgeon Inventory	IDFG (Recommendation) (198806500)
To address the effects of community composition shifts: Rehabilitate tributary fish community structure and density to better approximate pre-Libby Dam ecological community characteristics (KOK2)	Develop, evaluate, implement, and monitor improvements to hydro operations, physical habitats, and ecological community components to restore ecological and environmental selection pressures to favor native assemblages of fish & wildlife in the mainstem Kootenai R and associated historical floodplain areas	Kootenai River Native Fish Restoration and Conservation Aquaculture	KTI (Recommendation) (198806400)
To address small population size: Document greater than 50 adult spawning kokanee in each tributary by 2007 Document greater than 100 adult spawning kokanee in each tributary by 2020 Develop a multi-year average of 250 adult spawning kokanee in	Implement a combination of nutrient addition, habitat restoration, and reintroduction efforts	Libby Mitigation Project	MFWP (Recommendation) (199500400)

each tributary by 2030 (KOK3)			
		Kootenai River White Sturgeon Inventory	IDFG (Recommendation) (198806500)
		Kootenai River Ecosystem Improvements Project	KTI (Recommendation) (199404900)
Address critical uncertainties	Conduct research needed to address critical uncertainties	Libby Mitigation Project	MFWP (Recommendation) (199500400)
		Kootenai River White Sturgeon Inventory	IDFG (Recommendation) (198806500)

Strategies and Measures for Kootenai Westslope Cutthroat Trout

Strategy	Recommended Measure		Source of Measure
SAME FOR ALL FOCAL SPECIES (See physical habitat restorations strategies and measures for bull trout above)			
To address number of local populations: Maintain or increase the total number of genetically pure local populations, and maintain the broad distribution of local populations in existing metapopulations (WCT1)	See details of the 12 associated measures (listed as strategies) on pages 52-53 of the Management Plan section of the Kootenai River Subbasin Plan	Libby Mitigation Project	MFWP (Recommendation) (199500400)
		Kootenai River White Sturgeon Inventory	IDFG (Recommendation) (198806500)
To address small population size:	See details of the 5 associated measures (listed as strategies) on page 54 of the Management Plan	Libby Mitigation Project	MFWP (Recommendation)

<p>Achieve at least five genetically pure conservation populations (including British Columbia tributaries) with 50 adults in each of the subpopulations in Lake Kootenusa, Kootenai River and Kootenay Lake, with each of these conservation populations containing at least 500 adult westslope cutthroat trout (WCT2)</p>	<p>section of the Kootenai River Subbasin Plan</p>	<p>Kootenai River White Sturgeon Inventory</p>	<p>(199500400) IDFG (Recommendation) (198806500)</p>
<p>To address the effects of non-native species introductions: Suppress and prevent expansion of populations of non-native fish species (WCT3a) Support and coordinate with suppression and removal activities for nonnative fish species in British Columbia waters of the Kootenai Subbasin to reduce relative and total abundance of non-</p>	<p>See details of the 10 associated measures (listed as strategies) on pages 54-55 of the Management Plan section of the Kootenai River Subbasin Plan</p>	<p>Libby Mitigation Project</p>	<p>MFWP (Recommendation) (199500400)</p>
		<p>Kootenai River White Sturgeon Inventory</p>	<p>IDFG (Recommendation) (198806500)</p>

native fishes in the Subbasin (WCT3b)			
To address the effects of reduced nutrients/ system productivity: Restore system productivity	Nutrient restoration in Kootenay Lake and Kootenai River	Libby Mitigation Project	MFWP (Recommendation) (199500400)
		Kootenai River White Sturgeon Inventory	IDFG (Recommendation) (198806500)
		Kootenai River Ecosystem Improvements Project	KTI (Recommendation) (199404900)
	Implement ongoing annual nutrient addition water quality monitoring program	Libby Mitigation Project	MFWP (Recommendation) (199500400)
		Kootenai River White Sturgeon Inventory	IDFG (Recommendation) (198806500)
		Kootenai River Ecosystem Improvements Project	KTI (Recommendation) (199404900)
	Implement ongoing Biomonitoring Program to measure water quality, algal accrual, macroinvertebrate community condition	Libby Mitigation Project	MFWP (Recommendation) (199500400)
		Kootenai River White Sturgeon Inventory	IDFG (Recommendation) (198806500)
		Kootenai River Ecosystem Improvements Project	KTI (Recommendation) (199404900)
	Implement annual fish survey	Libby Mitigation Project	MFWP (Recommendation) (199500400)
		Kootenai River White Sturgeon Inventory	IDFG (Recommendation) (198806500)

To mitigate for the 240 km of habitat inundated by the construction of Libby Dam	Acquire and restore the equivalent amount of habitat lost by acquiring fee title and/or conservation easements at fair market value	Secure and Protect Fish Habitat in Kootenai Subbasin	MFWP MOA (Recommendation)
Address critical uncertainties	Conduct research needed to address critical uncertainties	Libby Mitigation Project	MFWP (Recommendation) (199500400)
		Kootenai River White Sturgeon Inventory	IDFG (Recommendation) (198806500)

Strategies and Measures for Kootenai White Sturgeon

Strategy	Recommended Measure		Source of Measure
SAME FOR ALL FOCAL SPECIES (See physical habitat restorations strategies and measures for bull trout above)			
To address the effects of reduced nutrients/ system productivity: Restore system productivity (WST1)	Nutrient restoration in Kootenay Lake and Kootenai River	Libby Mitigation Project	MFWP (Recommendation) (199500400)
		Kootenai River White Sturgeon Inventory	IDFG (Recommendation) (198806500)
		Kootenai River Ecosystem Improvements Project	KTI (Recommendation) (199404900)
	Implement ongoing annual nutrient addition water quality monitoring program	Libby Mitigation Project	MFWP (Recommendation) (199500400)
		Kootenai River White Sturgeon Inventory	IDFG (Recommendation) (198806500)
		Kootenai River Ecosystem Improvements Project	KTI (Recommendation) (199404900)

	Implement ongoing Biomonitoring Program to measure water quality, algal accrual, macroinvertebrate community condition	Libby Mitigation Project	MFWP (Recommendation) (199500400)
		Kootenai River White Sturgeon Inventory	IDFG (Recommendation) (198806500)
		Kootenai River Ecosystem Improvements Project	KTI (Recommendation) (199404900)
	Implement annual fish survey	Libby Mitigation Project	MFWP (Recommendation) (199500400)
		Kootenai River White Sturgeon Inventory	IDFG (Recommendation) (198806500)
To address recruitment failure: Implement conservation aquaculture and habitat restoration efforts (WST2)	See details of the 27 associated measures (listed as strategies) on pages 730-732 of the Management Plan section of the Kootenai River Subbasin Plan	Reconnect Kootenai River with the Historic Floodplain	KTI (Recommendation) (200200800)
		Restore natural Recruitment of Kootenai River White Sturgeon	KTI (Recommendation) (200200200)
		Kootenai River Native Fish Restoration and Conservation Aquaculture	KTI (Recommendation) (198806400)
To address small population size: Achieve an estimated white sturgeon population that is stable or increasing with juveniles reared through a conservation aquaculture program available to be added to the wild population each year for a 10-year	Implement conservation aquaculture and habitat restoration efforts See details of the 5 associated measures (listed as strategies) on page 63 of the Management Plan section of the Kootenai River Subbasin Plan	Kootenai River Native Fish Restoration and Conservation Aquaculture	KTI (Recommendation) (198806400)

<p>period For this purpose, a year class will be represented by the equivalent of 1,000 one-year old fish from each of 6 to 12 families, i.e. 3 to 6 female parents Each of these year classes must be large enough to produce 24 to 120 white sturgeon surviving to sexual maturity (WST3a)</p> <p>Evaluate establishment of experimental non-essential white sturgeon population (WST3b)</p>			
<p>To address the effects of contaminants (altered water quality:</p> <p>Evaluate lethal and sublethal effects of environmental contaminants (including reproductive and behavioral effects) on white sturgeon and burbot (WST4a)</p> <p>Seek remedies for</p>	<p>See details of the 5 associated measures (listed as strategies) on page 64 of the Management Plan section of the Kootenai River Subbasin Plan</p>		<p>CBFWA (Recommendation)</p>

contaminant problems if warranted (WST4b)			
Address critical uncertainties	Conduct research needed to address critical uncertainties	Kootenai River White Sturgeon Inventory	IDFG (Recommendation) (198806500)

Strategies and Measures for Kootenai Mountain Whitefish

Strategy	Recommended Measure		Source of Measure
To address the effects of reduced nutrients/ system productivity: Restore system productivity	Nutrient restoration in Kootenay Lake and Kootenai River	Libby Mitigation Project	MFWP (Recommendation) (199500400)
		Kootenai River White Sturgeon Inventory	IDFG (Recommendation) (198806500)
		Kootenai River Ecosystem Improvements Project	KTI (Recommendation) (199404900)
	Implement ongoing annual nutrient addition water quality monitoring program	Libby Mitigation Project	MFWP (Recommendation) (199500400)
		Kootenai River White Sturgeon Inventory	IDFG (Recommendation) (198806500)
		Kootenai River Ecosystem Improvements Project	KTI (Recommendation) (199404900)
	Implement ongoing Biomonitoring Program to measure water quality, algal accrual, macroinvertebrate community condition	Libby Mitigation Project	MFWP (Recommendation) (199500400)
		Kootenai River White Sturgeon Inventory	IDFG (Recommendation) (198806500)
		Kootenai River Ecosystem Improvements Project	KTI (Recommendation)

			(199404900)
	Implement annual fish survey	Libby Mitigation Project	MFWP (Recommendation) (199500400)
		Kootenai River White Sturgeon Inventory	IDFG (Recommendation) (198806500)
Address critical uncertainties	Conduct research needed to address critical uncertainties	Kootenai River White Sturgeon Inventory	IDFG (Recommendation) (198806500)
		Libby Mitigation Project	MFWP (Recommendation) (199500400)

Strategies and Measures for Asotin Bull Trout

Strategy	Recommended Measure		Source of Measure
Identify populations, and assess abundance, distribution, genetic similarities, and populations status/tends	Conduct genetic analyses to map genetic similarities and differences within and among populations		CBFWA (Recommendation)
	Expand redd counts to better assess spawning distribution and relative abundance		CBFWA (Recommendation)
	Expand electrofishing and snorkeling to further define bull trout distribution and relative abundance		CBFWA (Recommendation)
	Complete the Draft Recovery Plan		CBFWA (Recommendation)
Restore stream flows during low flow periods	Increase water conservation and irrigation efficiency, and purchase or lease water rights from willing landowners		CBFWA (Recommendation)
	Implement irrigation efficiency Specific Measure (Project Reference)s		CBFWA (Recommendation)
Increase nutrients	Increase spring Chinook returns		CBFWA (Recommendation)

	Complete a spring chinook reintroduction plan		CBFWA (Recommendation)
Restore passage at non-natural barriers	Restore stream flows in reaches dewatered for irrigation use		CBFWA (Recommendation)
	Replace irrigation diversion structures with improved structures meeting fish passage standards		CBFWA (Recommendation)
	Replace culverts not meeting fish passage guidelines		CBFWA (Recommendation)
	Screen irrigation diversions, maintain passage efficiency through on-going O&M or additional activities,		CBFWA (Recommendation)
	Monitor effectiveness of fish passage improvement Specific Measure (Project Reference)s		CBFWA (Recommendation)
	Implement irrigation efficiency Specific Measure (Project Reference)s		CBFWA (Recommendation)
	Continue to monitor and remove dams and barriers made by recreationists		CBFWA (Recommendation)
Restore degraded habitat	Improve stream flows in reaches partially or completely dewatered for irrigation		CBFWA (Recommendation)
	Increase sinuosity		CBFWA (Recommendation)
	Restore large wood in the system		CBFWA (Recommendation)
	Protect, or restore riparian zones		CBFWA (Recommendation)
	Restore floodplain function and channel complexity, and increase habitat diversity		CBFWA (Recommendation)
	Increase protective status of priority habitats in landuse regulations		CBFWA (Recommendation)
Reduce water temperatures during summer months	Increase stream flows to decrease temperatures		CBFWA (Recommendation)
	Restore priority restoration and protection reach		CBFWA

	attributes to improve downstream conditions		(Recommendation)
	Modify channel and increase floodplain functions		CBFWA (Recommendation)
	Reduce detrimental land use activities		CBFWA (Recommendation)
	Lease water rights from willing sellers		CBFWA (Recommendation)
	Implement more efficient irrigation systems, and improve watershed function		CBFWA (Recommendation)
Increase nutrients	Increase spring chinook returns		CBFWA (Recommendation)
	Outplant hatchery spring chinook carcasses or fish cubes		CBFWA (Recommendation)
Monitoring Populations identification, genetic structure, abundance, movements and general distribution are not well understood Population status and trend information is needed to appropriately set criteria for recovery and to determine recovery status	Conduct DNA analysis to identify populations and set recovery goals		CBFWA (Recommendation)
	Continue, and expand, spawning surveys to determine relative spawning abundance and distribution		CBFWA (Recommendation)
	Expand Electrofishing or snorkeling to determine distribution		CBFWA (Recommendation)
	Determine habitat conditions and trends		CBFWA (Recommendation)
	Complete the draft recovery plan		CBFWA (Recommendation)

Strategies and Measures for Grande Ronde Bull Trout

Strategy	Recommended Measure		Source of Measure
Identify species distribution, genetic similarities, and status/trends	Conduct genetic analyses to map genetic similarities and differences within and among populations	Migratory Patterns, Structure, Abundance, and Status of Bull Trout Populations in Subbasins of the Columbia Gorge, Columbia Plateau, and Blue Mountain Provinces	ODFW (Recommendation) (199405400)
	Expand reed counts to better assess spawning distribution and relative abundance	Migratory Patterns, Structure, Abundance, and Status of Bull Trout Populations in Subbasins of the Columbia Gorge, Columbia Plateau, and Blue Mountain Provinces	ODFW (Recommendation) (199405400)
	Expand electrofishing and snorkeling to further define bull trout distribution and relative abundance	Migratory Patterns, Structure, Abundance, and Status of Bull Trout Populations in Subbasins of the Columbia Gorge, Columbia Plateau, and Blue Mountain Provinces	ODFW (Recommendation) (199405400)
	Complete the Draft Recovery Plan		CBFWA (Recommendation)
Increase nutrients	Increase spring Chinook returns		CBFWA (Recommendation)
	Outplant hatchery chinook carcasses		CBFWA (Recommendation)
Curtail poaching	Continue and enhance USFS and USFWS enforcement to prevent illegal harvest/harassment of bull trout		CBFWA (Recommendation)
Restore passage at non-natural barriers	Restore stream flows in reaches dewatered for irrigation use		CBFWA (Recommendation)
	Replace irrigation diversion structures with improved structures meeting fish passage standards		CBFWA (Recommendation)
	Replace culverts not meeting fish passage guidelines		CBFWA (Recommendation)
	Screen irrigation diversions, maintain passage efficiency through on-going O&M or additional activities,		CBFWA (Recommendation)

	Monitor effectiveness of fish passage improvement Specific Measure (Project Reference)s		CBFWA (Recommendation)
	Implement irrigation efficiency Specific Measure (Project Reference)s		CBFWA (Recommendation)
	Continue to monitor and remove dams and barriers made by recreationists		CBFWA (Recommendation)
Improve passage at road crossings	Improve passage conditions on Deer and Sage creeks at USFS Road crossings, and address passage issues in Catherine, Indian and Lookingglass (hatchery) creeks		CBFWA (Recommendation)
Restore degraded habitat	Improve stream flows in reaches partially or completely dewatered for irrigation		CBFWA (Recommendation)
	Increase sinuosity		CBFWA (Recommendation)
	Restore large wood in the system		CBFWA (Recommendation)
	Protect, or restore riparian zones		CBFWA (Recommendation)
	Restore floodplain function and channel complexity, and increase habitat diversity		CBFWA (Recommendation)
	Increase protective status of priority habitats in land use regulations		CBFWA (Recommendation)
Improve grazing management	Provide infrastructure and develop agreements to address grazing related issues on Catherine and Indian creeks and upper Grande Ronde River		CBFWA (Recommendation)
Reduce water temperatures during summer months	Increase stream flows		CBFWA (Recommendation)
	Restore priority restoration and protection reach attributes to improve downstream conditions		CBFWA (Recommendation)
	Modify channel and increase floodplain functions		CBFWA (Recommendation)

	Reduce detrimental land use activities		CBFWA (Recommendation)
	Lease water rights from willing sellers		CBFWA (Recommendation)
	Implement more efficient irrigation systems, and improve watershed function		CBFWA (Recommendation)
Improve grazing management	Protect existing good quality riparian and watershed areas, provide infrastructure and develop agreements to address grazing related issues on Catherine and Indian creeks and the upper Grande Ronde River		CBFWA (Recommendation)
Restore stream flows during low flow periods	Implement irrigation efficiency Specific Measure (Project Reference)s		CBFWA (Recommendation)
	Initiate point of diversion transfers		CBFWA (Recommendation)
	Evaluate shallow aquifer recharge Specific Measure (Project Reference)s		CBFWA (Recommendation)
	Increase water conservation and irrigation efficiency, and purchase or lease water rights from willing landowners		CBFWA (Recommendation)
	Water conservation or lease (Little Bear, Indian and Catherine creeks)		CBFWA (Recommendation)
Decrease predators and exotic species	Increase stream flows		CBFWA (Recommendation)
	Restore priority restoration and protection reach attributes to improve downstream conditions		CBFWA (Recommendation)
	Modify channel and increase floodplain functions		CBFWA (Recommendation)
	Reduce detrimental land use activities		CBFWA (Recommendation)
	Lease water rights from willing sellers		CBFWA (Recommendation)
	Implement more efficient irrigation systems, and		CBFWA (Recommendation)

	improve watershed function		
	Decrease water temperatures		CBFWA (Recommendation)
	Increase water conservation and irrigation efficiency, and purchase or lease water rights from willing landowners		CBFWA (Recommendation)
	Liberalize fishing regulations on exotic species		CBFWA (Recommendation)
Monitoring Populations identification, genetic structure, abundance, movements and general distribution are not well understood Population status and trend information is needed to appropriately set criteria for recovery and to determine recovery status	Conduct DNA analysis to identify populations and set recovery goals	Migratory Patterns, Structure, Abundance, and Status of Bull Trout Populations in Subbasins of the Columbia Gorge, Columbia Plateau, and Blue Mountain Provinces	ODFW (Recommendation) (199405400)
	Continue, and expand, spawning surveys to determine relative spawning abundance and distribution	Migratory Patterns, Structure, Abundance, and Status of Bull Trout Populations in Subbasins of the Columbia Gorge, Columbia Plateau, and Blue Mountain Provinces	ODFW (Recommendation) (199405400)
	Expand Electrofishing or snorkeling to determine distribution	Migratory Patterns, Structure, Abundance, and Status of Bull Trout Populations in Subbasins of the Columbia Gorge, Columbia Plateau, and Blue Mountain Provinces	ODFW (Recommendation) (199405400)
	Determine habitat conditions and trends	Migratory Patterns, Structure, Abundance, and Status of Bull Trout Populations in Subbasins of the Columbia Gorge, Columbia Plateau, and Blue Mountain Provinces	ODFW (Recommendation) (199405400)
	Complete the draft recovery plan		CBFWA (Recommendation)
Reduce incidence of brook trout	Focus harvest on brook trout, restrict stocking of brook trout, and manage brook trout introduction at Langdon Lake/Lookingglass Creek		CBFWA (Recommendation)

Strategies and Measures for Wallowa Lake Kokanee

Strategy	Recommended Measure		Source of Measure
Enforce land use regulations and ordinances	Work with County, State, and Federal regulators to assure that existing regulations are applied in a way that reduces potential for impact to aquatic resources in the river and lake		CBFWA (Recommendation)
Develop a comprehensive approach to address channel conditions in the river above the lake Evaluate effects of non-native species	Recruit a fluvial geomorphologist to design and implement a Specific Measure (Project Reference) to address channel and bedload problems in the Wallowa River above Wallowa Lake		CBFWA (Recommendation)
	Conduct annual monitoring of Mysid population in Wallowa Lake		CBFWA (Recommendation)
	Monitor abundance and species composition of zooplankton and conduct investigations of trophic dynamics in Wallowa Lake		CBFWA (Recommendation)
	Determine lake trout population dynamics, size and age structure, and kokanee consumption rates as part of investigation of Wallowa Lake trophic dynamics		CBFWA (Recommendation)
	Modify angling regulations, if necessary, to achieve management objectives for kokanee and lake trout		CBFWA (Recommendation)

Strategies and Measures for Grande Ronde Redband Trout

Note: Limiting factors, Threats and Measures for redband trout are the same as those for steelhead in the Grande Ronde

Strategies and Measures for Imnaha Bull Trout

Strategy	Measure		Source of Measure
Protection/ Restoration	Improve grazing management (Big Sheep/ Little Sheep system)		CBFWA (Recommendation)
	Restore channel complexity (Big Sheep system)		CBFWA (Recommendation)
Increase summer streamflow	Implement water conservation and water lease/purchases		CBFWA (Recommendation)

Strategies and Measures for Imnaha Redband Trout

Strategy and Measures: Same as Imnaha summer steelhead

Strategies and Measures for Snake Hells Canyon Bull Trout

Strategy	Recommended Measure		Source of Measure
Restore connectivity, food base, and nutrients to historic levels	Provide funding for on-the-ground actions to restore habitat connectivity Provide funding to determine the feasibility of using nutrients to improve food base		CBFWA (Recommendation)
Increase fish productivity and production, as well as life stage specific survival, through in-subbasin habitat improvement and protection	Provide funding for on-the-ground actions to restore habitat quality		CBFWA (Recommendation)

Improve water quality and quantity	Provide funding for on-the-ground actions to improve riparian conditions, improve stream flow and improve water quality		CBFWA (Recommendation)
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Strategies and Measures for Snake Hells Canyon Redband Trout (Idaho)

Strategy	Recommended Measure		Source of Measure
Restore upstream and downstream connectivity	Provide funding for on-the-ground actions to restore habitat connectivity		CBFWA (Recommendation)
Increase fish productivity and production, as well as life stage specific survival, through in-subbasin habitat improvement and protection	Provide for on-the-ground actions to restore habitat quality		CBFWA (Recommendation)
Improve water quality and quantity	Provide funding for on-the-ground actions to improve riparian conditions, improve stream flow and improve water quality		CBFWA (Recommendation)

Strategies and Measures for Snake Hells Canyon White Sturgeon

Strategy	Recommended Measure		Source of Measure
Improve flow regimes to provide adequate flows for spawning and proper conditions for eggs and juveniles, connectivity, and food base	Provide funding to restore habitat connectivity as well as to determine the feasibility of using nutrients to improve the food base		CBFWA (Recommendation)
Reduce sediment and nutrient delivery from irrigation return flows, aquaculture operations, and municipal discharge	Provide funding to identify sources of sedimentation and actions to mitigate Work with appropriate agencies and land owners to develop a strategy for reducing sedimentation		CBFWA (Recommendation)
Restore and manage demographic and genetic interchange among white sturgeon populations	Provide funding to determine the need to develop volitional passage facilities or the need for a periodic trap and transplant program to maintain population structure		CBFWA (Recommendation)
Increase abundance and size structure where necessary to maintain angling opportunity and promote natural spawning	Provide funding to determine the contribution of hatchery-reared fish and translocated wild fish to spawning populations Maintain no-harvest angling regulations		CBFWA (Recommendation)

<p>Quantify catch-and-release hooking mortality, illegal harvest, as well as direct tribal harvest levels</p>	<p>Provide funding to determine the magnitude of loss associated with catch-and-release fishing Provide funding to examine alternate sport gear types (hooks) Provide funding to collaborate with Washington and Oregon enforcement agencies and the Nez Perce Tribe to quantify levels of tribal harvest Provide funding to determine the magnitude of loss associated with illegal sturgeon harvest</p>		<p>CBFWA (Recommendation)</p>
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Strategies and Measures for Snake Hells Smallmouth Bass

Strategy	Recommended Measure		Source of Measure
<p>Quantify smallmouth predation on rainbow trout</p>	<p>Provide funding to assess smallmouth bass population status and distribution as well as to determine the level of predation on rainbow trout</p>		<p>CBFWA (Recommendation)</p>

Strategies and Measures for Clearwater (North Fork) Bull Trout, Westslope Cutthroat Trout, Kokanee, Redband Trout, and Mountain Whitefish

Strategy	Recommended Measure		Source of Measure
<p>Protect existing riparian habitat that is classified as properly functioning Enhance and rehabilitate riparian habitat that is currently classified as functioning at risk or not functioning Reduce sediment delivery to the stream</p>	<p>A Develop Specific Measure (Project Reference)s to address sedimentation issues, such as road obliteration/decommissioning, and historic mine cleanup^{1,2,4,5}</p>		<p>CBFWA (Recommendation)</p>
	<p>Work with grazing unit permit holders and the USFS to retire grazing permits in key tributaries within the Middle Fork¹</p>		<p>CBFWA (Recommendation)</p>
	<p>Work with the USFS, other state and federal agencies, private landowners, and sportsman’s groups to make protection of fisheries habitat a primary concern in land use decisions, and to</p>		<p>CBFWA (Recommendation)</p>

network by reducing impacts of land practices along river and stream corridors ¹	improve/restore riparian habitat ^{1,2,4,5}		
	Incorporate evaluations of existing habitat in survey Specific Measure (Project Reference)s whenever possible ^{2,4,5}		CBFWA (Recommendation)
Modify hydro-operations and facilities ³	Install strobe lights near the spillway and penstock intakes to Dworshak Dam to prevent kokanee entrainment ³		CBFWA (Recommendation)
	Work shall be a cooperative effort between BPA, Idaho Fosh and Game, the Army Corps of Engineers, and the Nez Perce Tribe ³		CBFWA (Recommendation)
	Selectively withdraw water from the reservoir at depths to avoid kokanee, while providing the appropriate temperature water for the river and hatchery downstream ³		CBFWA (Recommendation)
	Identify the depth of kiokanee during the day and night, throughout the year, and determine a profile of water temperatures The Corps of Engineers will then use this information to decide if water can be withdrawn at depths where kokanee entrainment would be minimized ³		CBFWA (Recommendation)
Reduce impacts from introduced species ¹	Develop informational programs to educate anglers and the public to risks of introductions of exotic species ¹		CBFWA (Recommendation)
	Develop methods to remove exotic populations ^{1,2,4}		CBFWA (Recommendation)
	Determine levels of hybridization and distribution of exotic species ^{1,2,4}		CBFWA (Recommendation)
	Set liberal regulations on brook trout to reduce their numbers and limit their spread ¹		CBFWA (Recommendation)
	Emphasize use of westslope cutthroat trout for stocking mountain lakes in the Clearwater drainage ²		CBFWA (Recommendation)
Reduce impacts of competition with invasive species ¹	Develop methods to remove exotic populations and to determine levels of hybridization and distribution of exotic species ^{1,2}		CBFWA (Recommendation)

Improve water quality ¹	Improve riparian cover and land use practices to reduce water temperatures ^{1,2,4,5}		CBFWA (Recommendation)
	Secure conservation easements in riparian and floodplain areas to protect vegetation and protect coldwater spring sources ^{1,2,4,5}		CBFWA (Recommendation)
	Work with the USFS, other state and federal agencies, private landowners, county planners, conservation groups, and sportsman’s groups ^{1,2,4,5}		CBFWA (Recommendation)
Restore connectivity, food base, and nutrients to historic levels ¹	Restore connectivity and develop fish passage ^{1,2,4,5}		CBFWA (Recommendation)
	Determine the feasibility of using nutrients to improve the food base ^{1,4}	Dworshak Dam Resident Fish Mitigation	IDFG (200700300)
Reduce illegal harvest ¹	Install easy to read roadside signs that will inform anglers of the fishing regulations ¹		CBFWA (Recommendation)
	Increase enforcement and education in areas where non-compliance with fishing regulations have been found to be a problem ¹		CBFWA (Recommendation)
	Simplify the fishing regulations ¹		CBFWA (Recommendation)
Improve habitat access ¹	Remove or modify culverts which have been identified as fish barriers ^{1,2,4,5}		CBFWA (Recommendation)
Improve water quality and increase zooplankton production ³	Enhance the nutrients in Dworshak reservoir Supplement and balance annual levels of base nutrients (nitrogen and phosphorous) ³	Dworshak Dam Resident Fish Mitigation	IDFG (Recommendation) (200700300)
	Water quality will be monitored so that the proper balance of nutrients can be maintained ³	Dworshak Dam Resident Fish Mitigation	IDFG (Recommendation) (200700300)
	Examine kokanee abundance, growth, and survival rates in an effort to evaluate the nutrient enhancement program ³	Dworshak Dam Resident Fish Mitigation	IDFG (Recommendation) (200700300)
Assess potential impacts of smallmouth bass on kokanee and define the magnitude of the problem ³	Document smallmouth bass food habits and a bioenergetic evaluation of the amount of gamefish that are eaten annually ³		CBFWA (Recommendation)
	Perform annual kokanee monitoring studies that determine the survival rate of kokanee to determine if it is below normal ³		CBFWA (Recommendation)

¹Bull trout, ²Westslope cutthroat trout, ³Kokanee, ⁴Redband trout, ⁵Mountain whitefish

Strategies and Measures for Clearwater (Selway) Bull trout, Westslope Cutthroat, Redband Trout, and Mountain Whitefish

Strategy	Recommended Measure		Source of Measure
Reduce impacts from introduced species ^{1,2,3}	Develop informational programs to educate anglers and the public to risks of introductions of exotic species ^{1,2,3}		CBFWA (Recommendation)
	Develop methods to remove exotic populations ^{1,2,3}		CBFWA (Recommendation)
	Determine levels of hybridization and distribution of exotic species ^{1,2,3}		CBFWA (Recommendation)
	Set liberal regulations on brook trout to reduce their numbers and limit their spread ^{1,2}		CBFWA (Recommendation)
	Emphasize use of westslope cutthroat trout for stocking mountain lakes in the Clearwater drainage ²		CBFWA (Recommendation)
Reduce impacts of competition with invasive species ^{1,2}	Develop methods to remove exotic populations and to determine levels of hybridization and distribution of exotic species ^{1,2}		CBFWA (Recommendation)
Reduce illegal harvest ¹	Install easy to read roadside signs that will inform anglers of the fishing regulations ¹		CBFWA (Recommendation)
	Increase enforcement and education in areas where non-compliance with fishing regulations have been found to be a problem ¹		CBFWA (Recommendation)
	Simplify the fishing regulations ¹		CBFWA (Recommendation)
Improve habitat access ^{1,2}	Remove or modify culverts which have been identified as fish barriers ^{1,2,4}		CBFWA (Recommendation)
Increase abundance of native forage	Determine the feasibility of using nutrients to improve food base ¹		CBFWA (Recommendation)

¹Bull trout, ²Westslope cutthroat trout, ³Redband trout, ⁴Mountain whitefish

Strategies and Measures for Clearwater (Potlatch) Redband Trout

Strategy	Recommended Measure		Source of Measure
Restore riparian habitat and function, and reduce sediment delivery to the stream network by reducing impacts of land use practices along the river and stream corridors	Develop Specific Measure (Project Reference)s to address sedimentation issues, such as road obliteration/decommissioning, and historic mine cleanup		CBFWA (Recommendation)
	Work with the USFS, other state and federal agencies, private landowners, and sportsman’s groups to make protection of fisheries habitat a primary concern in land use decisions, and to improve/restore riparian habitat		CBFWA (Recommendation)
	Incorporate evaluations of existing habitat in survey Specific Measure (Project Reference)s whenever possible		CBFWA (Recommendation)
Improve water quality and restore natural hydrograph	Improve riparian cover and land use practices to reduce water temperatures		CBFWA (Recommendation)
	Secure conservation easements in riparian and floodplain areas to protect vegetation and protect coldwater spring sources		CBFWA (Recommendation)
	Work with the USFS, other state and federal agencies, private landowners, county planners, conservation groups, and sportsman’s groups		CBFWA (Recommendation)
Improve habitat access	Remove or modify culverts which have been identified as fish barriers		CBFWA (Recommendation)

Strategies and Measures for Clearwater (South Fork) Bull Trout, Westslope Cutthroat Trout, Redband Trout, and Mountain Whitefish

Strategy	Recommended Measure		Source of Measure
Protect existing riparian habitat that is classified as properly functioning Enhance and rehabilitate	Develop Specific Measure (Project Reference)s to address sedimentation issues, such as road obliteration/decommissioning, and historic mine cleanup ^{1,2}		CBFWA (Recommendation)
	Work with the USFS, other state and federal		CBFWA

<p>riparian habitat that is currently classified as functioning at risk or not functioning Reduce sediment delivery to the stream network by reducing impacts of land practices along river and stream corridors^{1,2}</p>	<p>agencies, private landowners, and sportsman’s groups to make protection of fisheries habitat a primary concern in land use decisions, and to improve/restore riparian habitat^{1,2}</p>		<p>(Recommendation)</p>
<p>Reduce impacts from introduced species^{1,2,3,4}</p>	<p>Develop informational programs to educate anglers and the public to risks of introductions of exotic species^{1,2,3,4}</p>		<p>CBFWA (Recommendation)</p>
	<p>Develop methods to remove exotic populations^{1,2,3,4}</p>		<p>CBFWA (Recommendation)</p>
	<p>Determine levels of hybridization and distribution of exotic species^{1,2,3,4}</p>		<p>CBFWA (Recommendation)</p>
	<p>Set liberal regulations on brook trout to reduce their numbers and limit their spread^{1,2,3,4}</p>		<p>CBFWA (Recommendation)</p>
	<p>Emphasize use of westslope cutthroat trout for stocking mountain lakes in the Clearwater drainage²</p>		<p>CBFWA (Recommendation)</p>
<p>Reduce impacts of competition with invasive species^{1,2}</p>	<p>Develop methods to remove exotic populations and to determine levels of hybridization and distribution of exotic species^{1,2}</p>		<p>CBFWA (Recommendation)</p>
<p>Improve water quality^{1,2,3,4}</p>	<p>Improve riparian cover and land use practices to reduce water temperatures^{1,2,3,4}</p>		<p>CBFWA (Recommendation)</p>
	<p>Secure conservation easements in riparian and floodplain areas to protect vegetation and protect coldwater spring sources^{1,2,3,4}</p>		<p>CBFWA (Recommendation)</p>
	<p>Work with the USFS, other state and federal agencies, private landowners, county planners, conservation groups, and sportsman’s groups^{1,2,3,4}</p>		<p>CBFWA (Recommendation)</p>

Reduce illegal harvest ¹	Install easy to read roadside signs that will inform anglers of the fishing regulations ¹ Increase enforcement and education in areas where non-compliance with fishing regulations have been found to be a problem ¹		CBFWA (Recommendation)
	Simplify the fishing regulations ¹		CBFWA (Recommendation)
Improve habitat access ^{1,2,3,4}	Remove or modify culverts which have been identified as fish barriers ^{1,2,3,4}		CBFWA (Recommendation)

¹Bull trout, ²Westslope cutthroat trout, ³Redband trout, ⁴Mountain whitefish

Strategies and Measures for Clearwater (Lochsa) Bull Trout, Westslope Trout, Redband Trout, and Mountain Whitefish

Strategy	Recommended Measure	Source of Measure
Protect existing riparian habitat that is classified as properly functioning Enhance and rehabilitate riparian habitat that is currently classified as functioning at risk or not functioning Reduce sediment delivery to the stream network by reducing impacts of land practices along river and stream corridors ^{1,2}	Develop Specific Measure (Project Reference)s to address sedimentation issues, such as road obliteration/decommissioning, and historic mine cleanup ^{1,2}	CBFWA (Recommendation)
	Work with the USFS, other state and federal agencies, private landowners, and sportsman’s groups to make protection of fisheries habitat a primary concern in land use decisions, and to improve/restore riparian habitat ^{1,2}	CBFWA (Recommendation)
	Incorporate evaluations of existing habitat in survey Specific Measure (Project Reference)s whenever possible ¹	CBFWA (Recommendation)
Reduce impacts from introduced species ^{1,2,3,4}	Develop informational programs to educate anglers and the public to risks of introductions of exotic species ^{1,2,3,4}	CBFWA (Recommendation)
	Develop methods to remove exotic populations ^{1,2,3,4}	CBFWA (Recommendation)
	Determine levels of hybridization and distribution of	CBFWA

	exotic species ^{1,2,3,4}		(Recommendation)
	Set liberal regulations on brook trout to reduce their numbers and limit their spread ^{1,2,3,4}		CBFWA (Recommendation)
	Emphasize use of westslope cutthroat trout for stocking mountain lakes in the Clearwater drainage ²		CBFWA (Recommendation)
Reduce impacts of competition with invasive species ^{1,2}	Develop methods to remove exotic populations and to determine levels of hybridization and distribution of exotic species ^{1,2}		CBFWA (Recommendation)
Improve water quality ^{1,2,3,4}	Improve riparian cover and land use practices to reduce water temperatures ^{1,2,3,4}		CBFWA (Recommendation)
	Secure conservation easements in riparian and floodplain areas to protect vegetation and protect coldwater spring sources ^{1,2,3,4}		CBFWA (Recommendation)
	Work with the USFS, other state and federal agencies, private landowners, county planners, conservation groups, and sportsman’s groups ^{1,2,3,4}		CBFWA (Recommendation)
Reduce illegal harvest ¹	Install easy to read roadside signs that will inform anglers of the fishing regulations ¹ Increase enforcement and education in areas where non-compliance with fishing regulations have been found to be a problem ¹		CBFWA (Recommendation)
	Simplify the fishing regulations ¹		CBFWA (Recommendation)
Improve habitat access ^{1,2,3,4}	Remove or modify culverts which have been identified as fish barriers ^{1,2,3,4}		CBFWA (Recommendation)

¹Bull trout, ²Westslope cutthroat trout, ³Redband trout, ⁴Mountain whitefish

Strategies and Measures for Salmon (Lower Salmon River, mouth to Little Salmon River) Bull Trout, Westslope Cutthroat Trout, Redband trout, and White Sturgeon

Strategy	Recommended Measure	Source of Measure
Protect existing riparian habitat that is classified as properly functioning Enhance	Develop Specific Measure (Project Reference)s to address sedimentation issues, such as road obliteration/decommissioning, and historic mine cleanup ^{1,2,3}	CBFWA (Recommendation)

<p>and rehabilitate riparian habitat that is currently classified as functioning at risk or not functioning Reduce sediment delivery to the stream network by reducing impacts of land practices along river and stream corridors^{1,2}</p>	<p>Work with the USFS, other state and federal agencies, private landowners, and sportsman’s groups to make protection of fisheries habitat a primary concern in land use decisions, and to improve/restore riparian habitat^{1,2,3} Incorporate evaluations of existing habitat in survey Specific Measure (Project Reference)s whenever possible^{1,2,3}</p>		<p>CBFWA (Recommendation)</p>
<p>Increase abundance and size structure where necessary to maintain angling opportunity and promote natural spawning⁴</p>	<p>Determine the contribution of hatchery-reared fish and translocated wild fish to spawning populations⁴</p>		<p>CBFWA (Recommendation)</p>
	<p>Maintain no-harvest angling regulations⁴</p>		<p>CBFWA (Recommendation)</p>
<p>Reduce sediment and nutrient delivery from irrigation return flows, aquaculture operations and municipal discharge^{1,2,4}</p>	<p>Improve riparian cover and land use practices to reduce water temperatures^{1,2,3,4}</p>		<p>CBFWA (Recommendation)</p>
	<p>Work with the USFS, other state and federal agencies, private landowners, county planners, conservation groups, and sportsman’s groups^{1,2,3,4}</p>		<p>CBFWA (Recommendation)</p>
	<p>Identify sources of sedimentation and actions to mitigate^{1,2,3,4}</p>		<p>CBFWA (Recommendation)</p>
<p>Improve flow regimes to provide adequate flows for spawning and proper conditions for eggs and juveniles, and to restore connectivity, food base, and nutrients to historic levels⁴</p>	<p>Identify on-the-ground actions that could be implemented to optimize white sturgeon spawning success, incubation, and juvenile rearing conditions This is especially critical in core conservation areas where populations are supported entirely by natural recruitment⁴</p>		<p>CBFWA (Recommendation)</p>
	<p>Continue to provide technical support and input to state and federal regulatory agencies regarding land management, water quality, hydropower operations, and flow management⁴</p>		<p>CBFWA (Recommendation)</p>
	<p>Restore connectivity and food base⁴</p>		<p>CBFWA (Recommendation)</p>

Quantify catch-and-release hooking mortality, illegal harvest, as well as direct tribal harvest levels ⁴	Determine the magnitude of loss associated with catch-and-release fishing ⁴	CBFWA (Recommendation)
	Examine alternate sport gear types (hooks) ⁴	CBFWA (Recommendation)
	Collaborate with Washington and Oregon enforcement agencies and the Nez Perce Tribe to quantify levels of tribal harvest ⁴	CBFWA (Recommendation)
	Determine the magnitude of loss associated with illegal sturgeon harvest ⁴	CBFWA (Recommendation)
Improve habitat access ^{1,2,3}	Remove or modify culverts which have been identified as fish barriers ^{1,2,3}	CBFWA (Recommendation)

¹Bull trout, ²Westslope cutthroat trout, ³Redband trout, ⁴White sturgeon

Strategies and Measures for Salmon (Little Salmon to Middle Fork) Bull Trout, Westslope cutthroat Trout, and Redband Trout

Strategy	Recommended Measure	Source of Measure
Reduce impacts from development and construction along stream corridors and reduce sedimentation ^{1,2}	Identify sources of sedimentation ^{1,2}	CBFWA (Recommendation)
	Work with jurisdictional agencies to identify priority needs ^{1,2}	CBFWA (Recommendation)
	Work with federal agencies, state agencies, local city planners, developers, and landowners to make the protection of fisheries habitat a primary concern ^{1,2}	CBFWA (Recommendation)
	Promote the value and protection of functioning riparian zones and flood plains to reduce sedimentation, flood control, and solar heating ^{1,2}	CBFWA (Recommendation)
Reduce impacts from introduced species ¹	Identify where introduced species pose risks to populations of native species ¹	CBFWA (Recommendation)
	Where feasible, remove introduced species ¹	CBFWA (Recommendation)
	Develop informational programs to educate anglers and the public to risks of random introductions of	CBFWA (Recommendation)

	exotics ¹		
	Provide liberal regulations on brook trout ¹		CBFWA (Recommendation)
	Through planning, use enforcement efforts to curtail illegal introductions ¹		CBFWA (Recommendation)
Ensure connectivity is maintained from mainstem to all tributaries ^{1,2,3}	Identify manmade instream barriers that negatively impact stream connectivity ^{1,2,3}		CBFWA (Recommendation)
	Prioritize remedial actions ^{1,2,3}		CBFWA (Recommendation)
	Work with federal agencies, state agencies, local city planners, developers, and landowners to make the protection of fisheries habitat a primary concern ^{1,2,3}		CBFWA (Recommendation)

¹Bull trout, ²Westslope cutthroat trout, ³Redband trout,

Strategies and Measures for Salmon (Little Salmon to Middle Fork Salmon)

Measure	Recommended Measure		Source of Measure
Protect existing riparian habitat that is classified as properly functioning Enhance and rehabilitate riparian habitat that is currently classified as functioning at risk or not functioning Reduce sediment delivery to the stream network by reducing impacts of land practices along river and stream corridors ^{2,3,4}	Develop Specific Measure (Project Reference)s to address sedimentation issues, such as road obliteration/decommissioning, and historic mine cleanup ^{2,3,4}		CBFWA (Recommendation)
	Work with grazing unit permit holders and the USFS to retire grazing permits in key tributaries within the Middle Fork ^{2,3,4}		CBFWA (Recommendation)
	Work with the USFS, other state and federal agencies, private landowners, and sportsman’s groups to make protection of fisheries habitat a primary concern in land use decisions, and to improve/restore riparian habitat ^{2,3,4}		CBFWA (Recommendation)
	Incorporate evaluations of existing habitat in survey Specific Measure (Project Reference)s whenever possible ^{2,3,4}		CBFWA (Recommendation)

Reduce habitat fragmentation ^{1,2,3}	Remove or modify culverts which have been identified as fish barriers ^{1,2,3}		CBFWA (Recommendation)
	Provide passage at irrigation and hydroelectric diversions on tributaries to the Middle Fork ^{1,2,3}		CBFWA (Recommendation)
Reduce impacts from introduced species ¹	Develop informational programs to educate anglers and the public to risks of introductions of exotic species ¹		CBFWA (Recommendation)
	Develop methods to remove exotic populations ¹		CBFWA (Recommendation)
	Determine levels of hybridization and distribution of exotic species ¹		CBFWA (Recommendation)
	Set liberal regulations on brook trout to reduce their numbers and limit their spread ¹		CBFWA (Recommendation)
Reduce illegal harvest ^{1,2,3}	Install easy to read roadside signs that will inform anglers of the fishing regulations ^{1,2,3}		CBFWA (Recommendation)
	Increase enforcement and education in areas where non-compliance with fishing regulations have been found to be a problem ^{1,2,3}		CBFWA (Recommendation)
	Simplify the fishing regulations ^{1,2,3}		CBFWA (Recommendation)
	Provide river floaters with educational material regarding fish conservation needs ^{1,2,3}		CBFWA (Recommendation)
Reduce and/or eliminate entrainment treats at key locations ^{1,2,3,4}	Identify and screen high entrainment diversion locations in tributary areas ^{1,2,3,4}		CBFWA (Recommendation)
	Work with private landowners/irrigators ^{1,2,3,4}		CBFWA (Recommendation)
Improve habitat access	Remove or modify culverts which have been identified as fish barriers ⁴		CBFWA (Recommendation)
	Improve fish passage at irrigation and hydroelectric diversions on tributaries to the Middle Fork ⁴		CBFWA (Recommendation)

¹Bull trout, ²Westslope cutthroat trout, ³Redband trout, ⁴Mountain whitefish

Strategies and Measures for Salmon (Middle Fork Panther) Bull Trout, Westslope Cutthroat Trout, redband trout, and Mountain Whitefish

Strategy	Recommended Measure		Source of Measure
Improve habitat access by reconnecting strategic tributaries ^{1,2,3,4}	Reconnect strategic tributaries to the main-stem Salmon River ^{1,2,3,4}		CBFWA (Recommendation)
	Work with local landowners, irrigators, land management agencies, Lemhi County, and the highway administration to implement reconnects as manpower allows and as funding levels permit ^{1,2,3,4}		CBFWA (Recommendation)
	Improve water diversion and irrigation systems to conserve water for fish migration and passage ^{1,2,3,4}		CBFWA (Recommendation)
	Coordinate with land management agencies, Lemhi County, and the highway administration to ensure fish passage at road and highway crossings which may be fish barriers upon tributary stream reconnect ^{1,2,3,4}		CBFWA (Recommendation)
	Develop water conservation agreements with irrigation districts to reduce levels of stream diversion ^{1,2,3,4}		CBFWA (Recommendation)
Protect existing healthy, intact riparian habitat and enhance and rehabilitate riparian habitats that are currently degraded. Restore proper floodplain function ^{1,2,3,4}	Remove riprap, reopen isolated side channels and spring sources to provide flows to the historic floodplain ^{1,2,3,4}		CBFWA (Recommendation)
	Work with private landowners to protect and enhance riparian resources ^{1,2,3,4}		CBFWA (Recommendation)
	Improve grazing management, improve fencing, and purchase conservation easements ^{1,2,3,4}		CBFWA (Recommendation)
	Restore riparian vegetation via planting native vegetation in locations requiring shading, and bank stability ^{1,2,3,4}		CBFWA (Recommendation)
Improve water quality in the Panther Creek watershed ^{1,2,3,4}	Improve water quality in the Panther Creek watershed by reducing mine effluents into the watershed ^{1,2,3,4}		CBFWA (Recommendation)
	Habitat improvement work to replace lost resources within the watershed ^{1,2,3,4}		CBFWA (Recommendation)

Reduce and/or eliminate entrainment threats at key locations ^{1,2,3,4}	Identify and screen high entrainment diversion locations in tributary areas ^{1,2,3,4}		CBFWA (Recommendation)
	Work with private landowners / irrigators ^{1,2,3,4}		CBFWA (Recommendation)

¹Bull trout, ²Westslope cutthroat trout, ³Redband trout, ⁴Mountain whitefish

Strategies and Measures for Salmon (Lemhi) Bull Trout, Westslope Cutthroat Trout, Redband Trout, and Mountain Whitefish

Strategy	Recommended Measure	Source of Measure
Restore natural hydrographs in key tributaries to ensure adequate base flows are available for fish migration at all life stages ^{1,2,3,4}	Provide funding to reconnect strategic tributaries to the main-stem Lemhi River ^{1,2,3,4}	CBFWA (Recommendation)
	Work with local landowners, irrigators, land management agencies, and the highway administration to implement reconnects as manpower and funding levels permit ^{1,2,3,4}	CBFWA (Recommendation)
	Work with irrigators to improve water diversion and irrigation systems to conserve water for fish migration and passage ^{1,2,3,4}	CBFWA (Recommendation)
	Strategies such as dry year lease options, conveyance improvements, change in water application techniques, and water banking can be employed ^{1,2,3,4}	CBFWA (Recommendation)
	Coordinate with land management agencies, Lemhi County, and the highway administration to ensure fish passage at road and highway crossings which may be fish barriers upon reconnect ^{1,2,3,4}	CBFWA (Recommendation)
	Develop water conservation agreements with water districts to reduce levels of stream diversion ^{1,2,3,4}	CBFWA (Recommendation)
Protect existing healthy and intact riparian habitat and	Provide funding to complete improvements to irrigation diversions to provide stable diversion points and reduce erosion (stream	CBFWA (Recommendation)

enhance and rehabilitate riparian habitats that are currently degraded Reduce sediment delivery to the stream network by reducing impacts of land use practices along river and stream corridors ^{1,2,3,4}	sedimentation) ^{1,2,3,4}		CBFWA (Recommendation)
	Work with private landowners to protect and enhance riparian resources with grazing management strategies, fencing and/or conservation easements ^{1,2,3,4}		CBFWA (Recommendation)
Improve water quality and quantity to provide adequate flows to support spawning and rearing life history stages of in river and stream reaches that support these life history stages ^{1,2,3,4}	Provide funding to improve riparian cover and land use practices to improve flows and reduce water temperatures ^{1,2,3,4}		CBFWA (Recommendation)
	Fund improved water conveyance systems using pipelines and/or lined ditch systems ^{1,2,3,4}		CBFWA (Recommendation)
	Lease or acquire water rights to be dedicated in-stream ^{1,2,3,4}		CBFWA (Recommendation)
	Work with irrigators to develop water management plans that create the most efficient program based on crop needs and soil types to preserve water for in-stream needs ^{1,2,3,4}		CBFWA (Recommendation)
	Work with irrigation districts to ensure that diverted water is returned to the natural channel at the end of the irrigation season ^{1,2,3,4}		CBFWA (Recommendation)
	Work with private landowners/ irrigators ^{1,2,3,4}		CBFWA (Recommendation)
	Reduce and/or eliminate entrainment threats at key locations ^{1,2,3,4}	Provide funding to identify and screen high entrainment diversion locations in tributary areas ¹	
Work with private landowners / irrigators ^{1,2,3,4}			CBFWA (Recommendation)

¹Bull trout, ²Westslope cutthroat trout, ³Redband trout, ⁴Mountain whitefish

Strategies and Measures for Salmon (Pahsimeroi) Mountain Whitefish

Strategy	Recommended Measure		Source of Measure
Improve habitat access by reconnecting strategic tributaries ^{1,2,3,4}	Improve water diversion and irrigation systems to conserve water for fish migration and passage ^{1,2,3,4}		CBFWA (Recommendation)
	Remove or modify culverts at road and highway crossings which may be fish barriers upon reconnect ^{1,2,3,4}		CBFWA (Recommendation)
	Develop water conservation agreements to reduce levels of stream diversion ^{1,2,3,4}		CBFWA (Recommendation)
Improve water diversion and irrigation systems to conserve water and facilitate the connection of isolated river reaches Protect existing healthy riparian habitat and enhance and rehabilitate riparian habitats that are currently degraded Reduce sediment delivery to the stream network by reducing impacts of land use practices along river and stream corridors ^{1,2,3,4}	Improve water diversion and irrigation systems to conserve water and connect isolated river reaches ^{1,2,3,4}		CBFWA (Recommendation)

<p>Improve water quality and quantity to provide adequate flows to support spawning and rearing life history stages of in river and stream reaches that support these life history stages^{1,2,3,4}</p>			CBFWA (Recommendation)
			CBFWA (Recommendation)
	Strategies such as dry year lease options, conveyance improvements, change in application techniques, and water banking can be employed ^{1,2,3,4}		CBFWA (Recommendation)
	Protect and enhance riparian resources with grazing management strategies, fencing and/or conservation easements ^{1,2,3,4}		CBFWA (Recommendation)
	Work with water users to mimic or rehabilitate natural hydrographs in the main-stem to transport and recruit gravels to spawning and rearing habitats ^{1,2,3,4}		CBFWA (Recommendation)
	Complete improvements to irrigation diversions to provide stable diversion points and reduce erosion (stream sedimentation) ^{1,2,3,4}		CBFWA (Recommendation)
	Improve riparian cover and land use practices to improve flows and reduce water temperatures ^{1,2,3,4}		CBFWA (Recommendation)
	Improve of water conveyance systems ^{1,2,3,4}		CBFWA (Recommendation)
	Lease or acquire water rights to be dedicated in-stream ^{1,2,3,4}		CBFWA (Recommendation)
	Work with irrigators to develop water management plans that create the most efficient program based on crop needs and soil types to preserve water for in-stream needs ^{1,2,3,4}		CBFWA (Recommendation)
	Work with irrigation districts to ensure that diverted water is returned to the natural channel at the end of the irrigation season ^{1,2,3,4}		CBFWA (Recommendation)

Reduce and/or eliminate entrainment threats at key locations	Identify and screen high entrainment diversion locations in tributary areas ^{1,2,3,4}		CBFWA (Recommendation)
	Work with private landowners / irrigators ^{1,2,3,4}		CBFWA (Recommendation)

¹Bull trout, ²Westslope cutthroat trout, ³Redband trout, ⁴Mountain whitefish

Strategies and Measures for Salmon (Upper Salmon) Bull Trout, Westslope Cutthroat Trout, Westslope Cutthroat Trout, Redband Trout, and Mountain Whitefish

Strategy	Recommended Measure		Source of Measure
Improve habitat access by reconnecting strategic tributaries ^{1,2,3,4}	Reconnect strategic tributaries to the main-stem upper Salmon River ^{1,2,3,4}		CBFWA (Recommendation)
	Work with local landowners, irrigators, land management agencies, and the highway administration to implement reconnects as manpower and funding levels permit ^{1,2,3,4}		CBFWA (Recommendation)
	Work with irrigators to improve water diversion and irrigation systems to conserve water for fish migration and passage ^{1,2,3,4}		CBFWA (Recommendation)
	Strategies such as dry year lease options, conveyance improvements, change in water application techniques, and water banking can be employed ^{1,2,3,4}		CBFWA (Recommendation)
	Coordinate with land management agencies, Custer County, and the highway administration to ensure fish passage at road and highway crossings which may be fish barriers upon reconnect ^{1,2,3,4}		CBFWA (Recommendation)
	Develop water conservation agreements with water districts to reduce levels of stream diversion ^{1,2,3,4}		CBFWA (Recommendation)

Protect existing healthy and intact riparian habitat, and enhance and rehabilitate riparian habitats that are currently degraded Restore proper floodplain function ^{1,2,3,4}	Protect and enhance riparian resources with grazing management strategies, fencing and/or conservation easements ^{1,2,3,4}		CBFWA (Recommendation)
	Implement on-the-ground actions including: the reopening of isolated side channels and spring sources to provide flows to the historic floodplain, planting native vegetation in locations requiring shading and bank stability, and determining the feasibility and cost effectiveness of reclaiming and restoring habitats damaged by historic mining activities ^{1,2,3,4}		CBFWA (Recommendation)
Reduce summer water temperatures ^{1,2,3,4}	Improve riparian cover and land use practices to reduce water temperatures ^{1,2,3,4}		CBFWA (Recommendation)
	Secure conservation easements in riparian and floodplain areas to protect vegetation and protect coldwater spring sources ^{1,2,3,4}		CBFWA (Recommendation)
	Reconnect of tributary habitat to provide cold water refugia to fishes in the main-stem Salmon River ^{1,2,3,4}		CBFWA (Recommendation)
	Work with private landowners/ irrigators ^{1,2,3,4}		CBFWA (Recommendation)
Reduce and/or eliminate entrainment threats at key locations ^{1,2,3,4}	Identify and screen high entrainment diversion locations in tributary areas ^{1,2,3,4}		CBFWA (Recommendation)
	Work with private landowners / irrigators ^{1,2,3,4}		CBFWA (Recommendation)

¹Bull trout, ²Westslope cutthroat trout, ³Redband trout, ⁴Mountain whitefish

Strategies and Measures for Bruneau, Boise, Owyhee, Payette, Snake Upper Middle, Weiser Redband Trout

Strategy	Recommended Measure		Source of Measure
Reduce or eliminate impacts associated with surface water storage, diversion and adjacent land use along stream corridors	Assess entrainment losses at diversions and to describe population impacts		CBFWA (Recommendation)
	Prioritize and implement measures to reduce/eliminate entrainment loss		CBFWA (Recommendation)
	Work with Federal agencies, State agencies, irrigation districts and landowners to improve flow regimes where native redband trout occur		CBFWA (Recommendation)
	Promote efficient water use		CBFWA (Recommendation)
Reduce sedimentation impacts from road development and maintenance and construction along stream corridors	Identify sedimentation sources and work with jurisdictional agencies to mitigate		CBFWA (Recommendation)
	Restore riparian areas to control erosion and reduce solar heating	Shoshone-Paiute Tribes Habitat Enhancement	SPT (Recommendation) 199701100
	Implement TMDLs where appropriate		CBFWA (Recommendation)
	Work with Federal agencies, State agencies, local city planners, developers, and landowners to make the protection of fisheries habitat a primary concern	Shoshone-Paiute Tribes Habitat Enhancement	SPT (Recommendation) 199701100
Avoid or mitigate habitat impacts from development and land use along stream corridors	Conduct standard population and habitat surveys		CBFWA (Recommendation)
	Work with Federal agencies, State agencies, local city planners, developers, and landowners to make the protection of fisheries habitat a primary concern	Shoshone-Paiute Tribes Habitat Enhancement	SPT (Recommendation) 199701100
	Incorporate habitat assessment into standard population surveys		CBFWA (Recommendation)
Maintain or restore population	Identify and prioritize the removal of in stream barriers		CBFWA (Recommendation)

connectivity throughout mainstem reaches, between mainstem rivers and tributaries, and within tributaries			
Restore ecosystem productivity and redband trout abundance and resiliency by nutrient supplementation in key habitats	Refine methods and describe ecological benefits of nutrient supplementation to redband trout as well as other resident fish, aquatic, and terrestrial species		CBFWA (Recommendation)
	Develop and fund a marine nutrient mitigation program to benefit redband trout and other resident fish, riparian, and upland species		CBFWA (Recommendation)

Strategies and Measures for Bruneau, Boise, Owyhee, Payette, Snake Upper Middle, Weiser Mountain Whitefish

Strategy	Recommended Measure		Source of Measure
Reduce impacts from development and construction along stream corridors and reduce sedimentation	Conduct standard population and habitat surveys		CBFWA (Recommendation)
	Work with Federal agencies, State agencies, local city planners, developers, and landowners to implement protection and conservation of wetland, riparian, and instream habitats		CBFWA (Recommendation)
	Prevent the removal of woody debris critical to the development and maintenance of winter habitat (ie pools)		CBFWA (Recommendation)
	Preserve and restore side channel habitat		CBFWA (Recommendation)
	Incorporate habitat assessment into standard population surveys		CBFWA (Recommendation)

Reduce impacts from development and construction along stream corridors and reduce sedimentation	Identify sedimentation sources and work with jurisdictional agencies to mitigate		CBFWA (Recommendation)
Reduce impacts from development and surface water diversion along stream corridors			CBFWA (Recommendation)
	Work with Federal agencies, State agencies, local city planners, developers, and landowners to implement protection and conservation of wetland, riparian, and instream habitats		CBFWA (Recommendation)
	Promote the value, restoration and protection of functioning riparian zones, wetlands, and flood plains to reduce sedimentation, solar heating and increase flood control		CBFWA (Recommendation)
	Determine the extent of entrainment loss at major diversions and identify the level of population loss that is occurring		CBFWA (Recommendation)
	Work with Federal agencies, State agencies, local city planners, developers, irrigation districts and landowners to make the protection of fisheries habitat a primary concern		CBFWA (Recommendation)
	Promote efficient water use		CBFWA (Recommendation)

Strategies and Measures for Bruneau, Boise, Owyhee, Payette, Snake Upper Middle, Weiser White Sturgeon (Shoshone Falls to Hells Canyon Dam)

Strategy	Recommended Measure		Source of Measure
Improve flow regimes to provide adequate flows for spawning	Implement management actions that optimize white sturgeon spawning success, incubation, and juvenile rearing conditions, with emphasis on core		CBFWA (Recommendation)

and proper conditions for eggs and juveniles, connectivity, and food base	conservation populations supported entirely by natural recruitment		
Reduce sediment and nutrient delivery from irrigation return flows, aquaculture operations, and municipal discharge	Identify sources of sedimentation and actions to mitigate Work with appropriate agencies and land owners to develop a strategy for reducing sedimentation		CBFWA (Recommendation)
	Implement TMDL		CBFWA (Recommendation)
Restore and manage demographic and genetic interchange among white sturgeon populations	Determine the need to develop volitional passage facilities or the need for a periodic trap and transplant program to maintain population structure		CBFWA (Recommendation)
Increase abundance and size structure where necessary to maintain angling opportunity and promote natural spawning	Determine the contribution of hatchery-reared fish and translocated wild fish to spawning populations		CBFWA (Recommendation)
	Maintain no-harvest angling regulations		CBFWA (Recommendation)

Strategies and Measures for Bruneau, Boise, Owyhee, Payette, Snake Upper Middle, Weiser Wood River Sculpin

Strategy	Recommended Measure		Source of Measure
Prevent/reduce upstream expansion of brown trout	Determine the distribution and abundance of brown trout		CBFWA (Recommendation)
Reduce or eliminate impacts associated with surface water diversion and adjacent land use along stream	Evaluate entrainment loss at major diversions		CBFWA (Recommendation)

corridors			
Reduce impacts from development and construction along stream corridors and reduce sedimentation	Describe the magnitude of the problem and prioritize actions to correct		CBFWA (Recommendation)
	Work with jurisdictional agencies to mitigate		CBFWA (Recommendation)
	Work with Federal agencies, State agencies, irrigation districts and landowners to make the protection of fisheries habitat a primary concern		CBFWA (Recommendation)
	Promote efficient water use		CBFWA (Recommendation)
	Identify sources of sedimentation and work with jurisdictional agencies to mitigate		CBFWA (Recommendation)
	Work with Federal agencies, State agencies, local city planners, developers, irrigation districts and landowners to make the protection of fisheries habitat a primary concern		CBFWA (Recommendation)
	Promote the value and protection of functioning riparian zones and flood plains to reduce sedimentation, flood control, and solar heating		CBFWA (Recommendation)
Reduce impacts from development and land use along stream corridors and reduce sedimentation (ie embeddedness)	Conduct standard population and habitat surveys Work with Federal agencies, State agencies, local city planners, developers, and landowners to make the protection of fisheries habitat a primary concern Incorporate habitat assessment into standard population surveys Preserve existing side channel habitat		CBFWA (Recommendation)

Strategies and Measures for Malheur Bull Trout

Strategy	Recommended Measure		Source of Measure
Restore and protect riparian habitats	Improve instream habitat, incorporate bull trout recovery actions into The Oregon Plan for Salmon and Watersheds and the Northwest Power and Conservation Council Subbasin/Management Plans	Malheur Subbasin Habitat Restoration and Fish Enhancement – Logan Valley	BPT (Recommendation) (200712000)
		Malheur Subbasin Habitat Restoration and Fish Enhancement – Stinkingwater Project	BPT (Recommendation) (200712000)
		Acquisition and Maintenance of Habitat for Anadromous and Resident Fish	BPT (Recommendation)
	Identify site-specific threats that may be limiting bull trout in watersheds with historical bull trout habitat	Malheur Subbasin Habitat Restoration and Fish Enhancement – Logan Valley	BPT (Recommendation) (200717100)
		Malheur Subbasin Habitat Restoration and Fish Enhancement – Stinkingwater Project	BPT (Recommendation) (200712000)
		Acquisition and Maintenance of Habitat for Anadromous and Resident Fish	BPT (Recommendation)
	Identify and pursue opportunities to implement recovery strategies	Evaluate the Life History of Native Salmonids in the Malheur Subbasin	BPT (Recommendation) (199701900)
		Malheur Subbasin Habitat Restoration and Fish Enhancement – Logan Valley	BPT (Recommendation) (200712000)
		Malheur Subbasin Habitat Restoration and Fish Enhancement – Stinkingwater Project	BPT (Recommendation) (200712000)
		Acquisition and Maintenance of Habitat for Anadromous and Resident Fish	BPT (Recommendation)
	Restore shade and canopy, riparian cover, and native vegetation in all bull trout spawning areas	Malheur Subbasin Habitat Restoration and Fish Enhancement – Logan Valley	BPT (Recommendation) (200712000)
Malheur Subbasin Habitat Restoration and Fish Enhancement – Stinkingwater Project		BPT (Recommendation)	

		(200712000)
	Acquisition and Maintenance of Habitat for Anadromous and Resident Fish	BPT (Recommendation)
Reduce grazing impacts in all bull trout spawning areas	Malheur Subbasin Habitat Restoration and Fish Enhancement – Logan Valley	BPT (Recommendation) (200712000)
	Malheur Subbasin Habitat Restoration and Fish Enhancement – Stinkingwater Project	BPT (Recommendation) (200712000)
	Acquisition and Maintenance of Habitat for Anadromous and Resident Fish	BPT (Recommendation)
Identify and prioritize opportunities for channel restoration in Lake Creek	Malheur Subbasin Habitat Restoration and Fish Enhancement – Logan Valley	BPT (Recommendation) (200712000)
	Malheur Subbasin Habitat Restoration and Fish Enhancement – Stinkingwater Project	BPT (Recommendation) (200712000)
	Acquisition and Maintenance of Habitat for Anadromous and Resident Fish	BPT (Recommendation)
Determine life history requirements of resident and migratory bull trout local population in the Malheur Core Area	Evaluate the Life History of Native Salmonids in the Malheur Subbasin	BPT (Recommendation) (199701900)
Provide long-term habitat protection through land purchase or easements	Malheur Subbasin Habitat Restoration and Fish Enhancement – Logan Valley	BPT (Recommendation) (200712000)
	Malheur Subbasin Habitat Restoration and Fish Enhancement – Stinkingwater Project	BPT (Recommendation) (200712000)
	Acquisition and Maintenance of Habitat for Anadromous and Resident Fish	BPT (Recommendation)
Develop educational materials on bull trout and their habitat needs to provide to landowners and interested public parties	Evaluate the Life History of Native Salmonids in the Malheur Subbasin	BPT (Recommendation) (199701900)
Integrate watershed analyses and assessments and restoration activities on public and private lands	Malheur Subbasin Habitat Restoration and Fish Enhancement – Logan Valley	BPT (Recommendation)

		(200712000)
	Malheur Subbasin Habitat Restoration and Fish Enhancement – Stinkingwater Project	BPT (Recommendation) (200712000)
	Acquisition and Maintenance of Habitat for Anadromous and Resident Fish	BPT (Recommendation)
Coordinate bull trout recovery with recovery efforts, management plans, etc of other species such as redband trout	Evaluate the Life History of Native Salmonids in the Malheur Subbasin	BPT (Recommendation) (199701900)
	Malheur Subbasin Habitat Restoration and Fish Enhancement – Logan Valley	BPT (Recommendation) (200712000)
	Malheur Subbasin Habitat Restoration and Fish Enhancement – Stinkingwater Project	BPT (Recommendation) (200712000)
	Acquisition and Maintenance of Habitat for Anadromous and Resident Fish	BPT (Recommendation)
Improve and implement fisheries management guidelines and policies designed to protect native species	Evaluate the Life History of Native Salmonids in the Malheur Subbasin	BPT (Recommendation) (199701900)
Evaluate effectiveness of different habitat restoration techniques in restoring channel functions and local bull trout populations in the Malheur Core Area	Malheur Subbasin Habitat Restoration and Fish Enhancement – Logan Valley	BPT (Recommendation) (200712000)
	Malheur Subbasin Habitat Restoration and Fish Enhancement – Stinkingwater Project	BPT (Recommendation) (200712000)
	Acquisition and Maintenance of Habitat for Anadromous and Resident Fish	BPT (Recommendation)
Determine the movement and seasonality of use of different habitat types by adult and sub-adult migratory bull trout in multiple streams, with emphasis on reservoirs and mainstem rivers	Evaluate the Life History of Native Salmonids in the Malheur Subbasin	BPT (Recommendation) (199701900)
Acquisition and Maintenance of Habitat for Anadromous and Resident Fish Acquisition and Maintenance of Habitat for	Evaluate the Life History of Native Salmonids in the Malheur Subbasin	BPT (Recommendation) (199701900)

	Anadromous and Resident Fish Acquisition and Maintenance of Habitat for Anadromous and Resident Fish	Malheur Subbasin Habitat Restoration and Fish Enhancement – Logan Valley	BPT (Recommendation) (200712000)
		Malheur Subbasin Habitat Restoration and Fish Enhancement – Stinkingwater Project	BPT (Recommendation) (200712000)
	Acquisition and Maintenance of Habitat for Anadromous and Resident Fish	Acquisition and Maintenance of Habitat for Anadromous and Resident Fish	BPT (Recommendation)
	Conduct regular surveys in potential habitat in the Malheur Core Area where bull trout status is unknown or re-colonization is anticipated	Evaluate the Life History of Native Salmonids in the Malheur Subbasin	BPT (Recommendation) (199701900)
Re-establish historical connectivity and migratory corridors for all native fish species	Identify and implement opportunities for two-way passage at major dams		CBFWA (Recommendation)
	Install appropriate fish screen and passage structures around diversions and/or remove related migration barriers	Malheur Subbasin Habitat Restoration and Fish Enhancement – Logan Valley	BPT (Recommendation) (200712000)
		Malheur Subbasin Habitat Restoration and Fish Enhancement – Stinkingwater Project	BPT (Recommendation) (200712000)
		Acquisition and Maintenance of Habitat for Anadromous and Resident Fish	BPT (Recommendation)
	Provide passage at transportation/ road-related barriers	Malheur Subbasin Habitat Restoration and Fish Enhancement – Logan Valley	BPT (Recommendation) (200712000)
		Malheur Subbasin Habitat Restoration and Fish Enhancement – Stinkingwater Project	BPT (Recommendation) (200712000)
		Acquisition and Maintenance of Habitat for Anadromous and Resident Fish	BPT (Recommendation)
	Incorporate bull trout recovery actions into The Oregon Plan for Salmon and Watersheds and the Northwest Power and Conservation Council Subbasin/Management Plans	Evaluate the Life History of Native Salmonids in the Malheur Subbasin	BPT (Recommendation) (199701900)
		Malheur Subbasin Habitat Restoration and Fish Enhancement – Logan Valley	BPT (Recommendation) (200712000)
		Malheur Subbasin Habitat Restoration and Fish Enhancement – Logan Valley	BPT (Recommendation) (200712000)

		Enhancement – Stinkingwater Project	(Recommendation) (200712000)
		Acquisition and Maintenance of Habitat for Anadromous and Resident Fish	BPT (Recommendation)
	Review reservoir operational concerns and provide operating recommendation through Federal consultation or other means		
	Coordinate bull trout recovery with recovery efforts, management plans, etc of other species such as redband trout, work cooperatively with the Burns-Paiute tribal government to implement recovery actions, and periodically review progress towards recovery goals and assess recovery tasks	Evaluate the Life History of Native Salmonids in the Malheur Subbasin	BPT (Recommendation) (199701900)
		Malheur Subbasin Habitat Restoration and Fish Enhancement – Logan Valley	BPT (Recommendation) (200712000)
		Malheur Subbasin Habitat Restoration and Fish Enhancement – Stinkingwater Project	BPT (Recommendation) (200712000)
		Acquisition and Maintenance of Habitat for Anadromous and Resident Fish	BPT (Recommendation)
Genetic identification of populations Meet water quality standards set by the Malheur River DEQ TMDL's	Develop genetic management plan for bull trout population isolated by human made barriers	Evaluate the Life History of Native Salmonids in the Malheur Subbasin	BPT (Recommendation) (199701900)
	Determine consequences of genetic fragmentation/isolation due to human-made barriers, identify and pursue opportunities to implement recovery strategies	Evaluate the Life History of Native Salmonids in the Malheur Subbasin	BPT (Recommendation) (199701900)
	Assess sediment sources in Malheur Subbasin	Malheur Subbasin Habitat Restoration and Fish Enhancement – Logan Valley	BPT (Recommendation) (200712000)
		Malheur Subbasin Habitat Restoration and Fish Enhancement – Stinkingwater Project	BPT (Recommendation) (200712000)
		Acquisition and Maintenance of Habitat for Anadromous and Resident Fish	BPT (Recommendation)
	Stabilize roads, crossings, and other sources of sediment delivery	Malheur Subbasin Habitat Restoration and Fish Enhancement – Logan Valley	BPT (Recommendation) (200712000)

		Malheur Subbasin Habitat Restoration and Fish Enhancement – Stinkingwater Project	BPT (Recommendation) (200712000)
		Acquisition and Maintenance of Habitat for Anadromous and Resident Fish	BPT (Recommendation)
Incorporate bull trout recovery actions into The Oregon Plan for Salmon and Watersheds and the Northwest Power and Conservation Council Subbasin/Management Plans		Evaluate the Life History of Native Salmonids in the Malheur Subbasin	BPT (Recommendation) (200712000)
		Malheur Subbasin Habitat Restoration and Fish Enhancement – Logan Valley	BPT (Recommendation) (200712000)
		Malheur Subbasin Habitat Restoration and Fish Enhancement – Stinkingwater Project	BPT (Recommendation) (200712000)
		Acquisition and Maintenance of Habitat for Anadromous and Resident Fish	BPT (Recommendation)
Identify and pursue opportunities to implement recovery strategies, increase monitoring of sediment inputs on the Malheur National Forest		Malheur Subbasin Habitat Restoration and Fish Enhancement – Logan Valley	BPT (Recommendation) (200712000)
		Malheur Subbasin Habitat Restoration and Fish Enhancement – Stinkingwater Project	BPT (Recommendation) (200712000)
		Acquisition and Maintenance of Habitat for Anadromous and Resident Fish	BPT (Recommendation)
Coordinate bull trout recovery with recovery efforts, management plans, etc of other species such as redband trout, improve and implement fisheries management guidelines and policies designed to protect native species, work cooperatively with the Burns-Paiute tribal government to implement recovery actions, and periodically review progress towards recovery goals and assess recovery tasks		Evaluate the Life History of Native Salmonids in the Malheur Subbasin	BPT (199701900)
		Malheur Subbasin Habitat Restoration and Fish Enhancement – Logan Valley	BPT (Recommendation) (200712000)
		Malheur Subbasin Habitat Restoration and Fish Enhancement – Stinkingwater Project	BPT (Recommendation) (200712000)
		Acquisition and Maintenance of Habitat for Anadromous and Resident Fish	BPT (Recommendation)
Restore historical stream discharge	Assess current and historical effects of upland management on changes to the hydrograph in all	Malheur Subbasin Habitat Restoration and Fish Enhancement – Logan Valley	BPT (Recommendation)

hydrograph to mainstem and tributary habitats	spawning tributaries		(200712000)
		Malheur Subbasin Habitat Restoration and Fish Enhancement – Stinkingwater Project	BPT (Recommendation) (200712000)
		Acquisition and Maintenance of Habitat for Anadromous and Resident Fish	BPT (Recommendation)
Incorporate bull trout recovery actions into The Oregon Plan for Salmon and Watersheds and the Northwest Power and Conservation Council Subbasin/Management Plans		Evaluate the Life History of Native Salmonids in the Malheur Subbasin	BPT (Recommendation) (199701900)
		Malheur Subbasin Habitat Restoration and Fish Enhancement – Logan Valley	BPT (Recommendation) (200712000)
		Malheur Subbasin Habitat Restoration and Fish Enhancement – Stinkingwater Project	BPT (Recommendation) (200712000)
		Acquisition and Maintenance of Habitat for Anadromous and Resident Fish	BPT (Recommendation)
Identify and pursue opportunities to implement recovery strategies, establish/provide instream flows downstream from reservoirs and stabilize flow regimes		Malheur Subbasin Habitat Restoration and Fish Enhancement – Logan Valley	BPT (Recommendation) (200712000)
		Malheur Subbasin Habitat Restoration and Fish Enhancement – Stinkingwater Project	BPT (Recommendation) (200712000)
		Acquisition and Maintenance of Habitat for Anadromous and Resident Fish	BPT (Recommendation)
Restore connectivity and opportunities for migration by improving instream flows and/or water rights		Malheur Subbasin Habitat Restoration and Fish Enhancement – Logan Valley	BPT (Recommendation) (200712000)
		Malheur Subbasin Habitat Restoration and Fish Enhancement – Stinkingwater Project	BPT (Recommendation) (200712000)
		Acquisition and Maintenance of Habitat for Anadromous and Resident Fish	BPT (Recommendation)
Coordinate bull trout recovery with recovery efforts, management plans, etc of other species such as redband trout, improve and implement fisheries		Evaluate the Life History of Native Salmonids in the Malheur Subbasin	BPT (Recommendation) (199701900)

	management guidelines and policies designed to protect native species	Malheur Subbasin Habitat Restoration and Fish Enhancement – Logan Valley	BPT (Recommendation) (200712000)
		Malheur Subbasin Habitat Restoration and Fish Enhancement – Stinkingwater Project	BPT (Recommendation) (200712000)
		Acquisition and Maintenance of Habitat for Anadromous and Resident Fish	BPT (Recommendation)
	Work cooperatively with the Burns-Paiute tribal government to implement recovery actions, and periodically review progress towards recovery goals and assess recovery tasks	Evaluate the Life History of Native Salmonids in the Malheur Subbasin	BPT (Recommendation) (199701900)
		Malheur Subbasin Habitat Restoration and Fish Enhancement – Logan Valley	BPT (Recommendation) (200712000)
		Malheur Subbasin Habitat Restoration and Fish Enhancement – Stinkingwater Project	BPT (Recommendation) (200712000)
		Acquisition and Maintenance of Habitat for Anadromous and Resident Fish	BPT (Recommendation)
Identify non-point sources	Assess and mitigate effects on bull trout from non-point source pollution		CBFWA (Recommendation)
Remove or control non-native fish populations that impact native fish populations	Implement brook trout removal efforts	Evaluate the Life History of Native Salmonids in the Malheur Subbasin	BPT (Recommendation) (199701900)
	Incorporate bull trout recovery actions into The Oregon Plan for Salmon and Watersheds and the Northwest Power and Conservation Council Subbasin/Management Plans	Evaluate the Life History of Native Salmonids in the Malheur Subbasin	BPT (Recommendation) (199701900)
	Determine site-specific levels of competition and hybridization with introduced sport fish and assess impacts of those interactions	Evaluate the Life History of Native Salmonids in the Malheur Subbasin	BPT (Recommendation) (199701900)
	Identify and pursue opportunities to implement recovery strategies	Evaluate the Life History of Native Salmonids in the Malheur Subbasin	BPT 9Recommendation) (199701900)
	Develop and implant an educational effort to address problems and consequences of unauthorized fish	Evaluate the Life History of Native Salmonids in the Malheur Subbasin	BPT (Recommendation)

	introductions		(199701900)
	Increase information outreach to anglers	Evaluate the Life History of Native Salmonids in the Malheur Subbasin	BPT (Recommendation) (199701900)
	Improve and implement fisheries management guidelines and policies designed to protect native species	Evaluate the Life History of Native Salmonids in the Malheur Subbasin	BPT (Recommendation) (199701900)
	Determine the movement and seasonality of use of different habitat types by adult and sub-adult migratory bull trout in multiple streams, with emphasis on reservoirs and mainstem rivers	Evaluate the Life History of Native Salmonids in the Malheur Subbasin	BPT (Recommendation) (199701900)
	Work cooperatively with the Burns-Paiute tribal government to implement recovery actions, periodically review progress towards recovery goals and assess recovery tasks	Evaluate the Life History of Native Salmonids in the Malheur Subbasin	BPT (Recommendation) (199701900)
Restore nutrient cycle and prey base interactions	Investigate potential for restoring historic prey base by reintroducing anadromous species		CBFWA (Recommendation)
	Identify and pursue opportunities to implement recovery strategies		CBFWA (Recommendation)
	Develop an annual work plan to support implementation in the Malheur Recovery Unit		CBFWA (Recommendation)
	Review reservoir operational concerns and provide operating recommendation through Federal consultation or other means		CBFWA (Recommendation)
	Improve and implement fisheries management guidelines and policies designed to protect native species	Evaluate the Life History of Native Salmonids in the Malheur Subbasin	BPT (Recommendation) (199701900)
	Evaluate food web interactions in drainages most affected by introduced fishes, reservoir operations, loss of anadromous species (prey base/nutrients), etc,	Evaluate the Life History of Native Salmonids in the Malheur Subbasin	BPT (Recommendation) (199701900)
	Work cooperatively with the Burns-Paiute tribal government to implement recovery actions, and	Evaluate the Life History of Native Salmonids in the Malheur Subbasin	BPT (Recommendation)

	periodically review progress towards recovery goals and assess recovery tasks		(199701900)
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Strategies and Measures for Malheur Redband Trout

Strategy	Recommended Measure		Source of Measure
Restore and protect instream habitat and stream channel processes	Allow stream flow processes to maintain channels through restoration of natural flow regimes and floodplain connection	Acquisition and Maintenance of Habitat for Anadromous and Resident Fish	BPT (Recommendation)
		Malheur Subbasin Habitat Restoration and Fish Enhancement – Logan Valley	BPT (Recommendation) (200712000)
		Malheur Subbasin Habitat Restoration and Fish Enhancement – Stinkingwater Project	BPT (Recommendation) (200712000)
Improve instream channel habitat through placement of large woody debris and boulders, bank stabilization efforts and flow augmentation/improvements		Acquisition and Maintenance of Habitat for Anadromous and Resident Fish	BPT (Recommendation)
		Malheur Subbasin Habitat Restoration and Fish Enhancement – Logan Valley	BPT (Recommendation) (200712000)
		Malheur Subbasin Habitat Restoration and Fish Enhancement – Stinkingwater Project	BPT (Recommendation) (200712000)
Develop off-channel habitat		Acquisition and Maintenance of Habitat for Anadromous and Resident Fish	BPT (Recommendation)
		Malheur Subbasin Habitat Restoration and Fish Enhancement – Logan Valley	BPT (Recommendation) (200712000)
		Malheur Subbasin Habitat Restoration and Fish Enhancement – Stinkingwater Project	BPT (Recommendation) (200712000)
Remove or modify levies, berms, roads or dikes where appropriate		Acquisition and Maintenance of Habitat for Anadromous and Resident Fish	BPT (Recommendation)
		Malheur Subbasin Habitat Restoration and Fish Enhancement – Logan Valley	BPT (Recommendation)

		(200712000)
	Malheur Subbasin Habitat Restoration and Fish Enhancement – Stinkingwater Project	BPT (Recommendation) (200712000)
Re-configure modified channels through active restoration	Acquisition and Maintenance of Habitat for Anadromous and Resident Fish	BPT (Recommendation)
	Malheur Subbasin Habitat Restoration and Fish Enhancement – Logan Valley	BPT (Recommendation) (200712000)
	Malheur Subbasin Habitat Restoration and Fish Enhancement – Stinkingwater Project	BPT (Recommendation) (200712000)
Restore shade and canopy, riparian cover, and native vegetation in all redband trout spawning areas	Acquisition and Maintenance of Habitat for Anadromous and Resident Fish	BPT (Recommendation)
	Malheur Subbasin Habitat Restoration and Fish Enhancement – Logan Valley	BPT (Recommendation) (200712000)
	Malheur Subbasin Habitat Restoration and Fish Enhancement – Stinkingwater Project	BPT (Recommendation) (200712000)
Reduce grazing impacts in all redband trout spawning areas	Acquisition and Maintenance of Habitat for Anadromous and Resident Fish	BPT (Recommendation)
	Malheur Subbasin Habitat Restoration and Fish Enhancement – Logan Valley	BPT (Recommendation) (200712000)
	Malheur Subbasin Habitat Restoration and Fish Enhancement – Stinkingwater Project	BPT (Recommendation) (200712000)
Provide long-term habitat protection through land purchase or easements	Acquisition and Maintenance of Habitat for Anadromous and Resident Fish	BPT (Recommendation)
	Malheur Subbasin Habitat Restoration and Fish Enhancement – Logan Valley	BPT (Recommendation) (200712000)
	Malheur Subbasin Habitat Restoration and Fish Enhancement – Stinkingwater Project	BPT (Recommendation) (200712000)

	Evaluate effectiveness of different habitat restoration techniques	Acquisition and Maintenance of Habitat for Anadromous and Resident Fish	BPT (Recommendation)
		Malheur Subbasin Habitat Restoration and Fish Enhancement – Logan Valley	BPT (Recommendation) (200712000)
		Malheur Subbasin Habitat Restoration and Fish Enhancement – Stinkingwater Project	BPT (Recommendation) (200712000)
	Monitor habitat and water quality improvements by utilizing methodologies identified in the Malheur River Subbasin Native Salmonid Monitoring Plan	Acquisition and Maintenance of Habitat for Anadromous and Resident Fish	BPT (Recommendation)
		Malheur Subbasin Habitat Restoration and Fish Enhancement – Logan Valley	BPT (Recommendation) (200712000)
		Malheur Subbasin Habitat Restoration and Fish Enhancement – Stinkingwater Project	BPT (Recommendation) (200712000)
Improve habitat connectivity and fish passage	Create fish passage at dams and irrigation water diversion structures	Acquisition and Maintenance of Habitat for Anadromous and Resident Fish	BPT (Recommendation)
		Malheur Subbasin Habitat Restoration and Fish Enhancement – Logan Valley	BPT (Recommendation) (200712000)
		Malheur Subbasin Habitat Restoration and Fish Enhancement – Stinkingwater Project	BPT (Recommendation) (200712000)
	Remove unnecessary dam and diversion structures, remove barriers at roads	Acquisition and Maintenance of Habitat for Anadromous and Resident Fish	BPT (Recommendation)
		Malheur Subbasin Habitat Restoration and Fish Enhancement – Logan Valley	BPT (Recommendation) (200712000)
		Malheur Subbasin Habitat Restoration and Fish Enhancement – Stinkingwater Project	BPT (Recommendation) (200712000)
	Repair/improve culverts to allow fish passage, eliminate barriers created by dewatered reaches and poor water quality	Acquisition and Maintenance of Habitat for Anadromous and Resident Fish	BPT (Recommendation)
		Malheur Subbasin Habitat Restoration and Fish Enhancement – Logan Valley	BPT (Recommendation)

			(200712000)
		Malheur Subbasin Habitat Restoration and Fish Enhancement – Stinkingwater Project	BPT (Recommendation) (200712000)
Install approved fish screens at irrigation diversions		Acquisition and Maintenance of Habitat for Anadromous and Resident Fish	BPT (Recommendation)
		Malheur Subbasin Habitat Restoration and Fish Enhancement – Logan Valley	BPT (Recommendation) (200712000)
		Malheur Subbasin Habitat Restoration and Fish Enhancement – Stinkingwater Project	BPT (Recommendation) (200712000)
Identify and implement opportunities for two-way passage at major dams			CBFWA (Recommendation)
Determine consequences of genetic fragmentation/isolation due to human-made barriers		Evaluate the Life History of Native Salmonids in the Malheur Subbasin	BPT (Recommendation) (199701900)
Monitor habitat and water quality improvements by utilizing methodologies identified in the Malheur River Subbasin Native Salmonid Monitoring Plan		Acquisition and Maintenance of Habitat for Anadromous and Resident Fish	BPT (Recommendation)
		Malheur Subbasin Habitat Restoration and Fish Enhancement – Logan Valley	BPT (Recommendation) (200712000)
		Malheur Subbasin Habitat Restoration and Fish Enhancement – Stinkingwater Project	BPT (Recommendation) (200712000)
Improve riparian, floodplain and wetland habitats	Maintain/protect existing riparian, floodplain and wetland habitats	Acquisition and Maintenance of Habitat for Anadromous and Resident Fish	BPT (Recommendation)
		Malheur Subbasin Habitat Restoration and Fish Enhancement – Logan Valley	BPT (Recommendation) (200712000)
		Malheur Subbasin Habitat Restoration and Fish Enhancement – Stinkingwater Project	BPT (Recommendation) (200712000)
Restore and maintain connection of stream channels to their floodplains and restore floodplain function		Acquisition and Maintenance of Habitat for Anadromous and Resident Fish	BPT (Recommendation)
		Malheur Subbasin Habitat Restoration and Fish Enhancement – Stinkingwater Project	BPT

		Enhancement – Logan Valley	(Recommendation) (200712000)
		Malheur Subbasin Habitat Restoration and Fish Enhancement – Stinkingwater Project	BPT (Recommendation) (200712000)
Plant native vegetation, reestablish wetlands through easements, restoration and enhancement		Acquisition and Maintenance of Habitat for Anadromous and Resident Fish	BPT (Recommendation)
		Malheur Subbasin Habitat Restoration and Fish Enhancement – Logan Valley	BPT (Recommendation) (200712000)
		Malheur Subbasin Habitat Restoration and Fish Enhancement – Stinkingwater Project	BPT (Recommendation) (200712000)
Establish buffers to improve riparian areas through conservation easements, riparian fencing and implementation of setbacks, and implement proper grazing management		Acquisition and Maintenance of Habitat for Anadromous and Resident Fish	BPT (Recommendation)
		Malheur Subbasin Habitat Restoration and Fish Enhancement – Logan Valley	BPT (Recommendation) (200712000)
		Malheur Subbasin Habitat Restoration and Fish Enhancement – Stinkingwater Project	BPT (Recommendation) (200712000)
Monitor habitat and water quality improvements by utilizing methodologies identified in the Malheur River Subbasin Native Salmonid Monitoring Plan		Acquisition and Maintenance of Habitat for Anadromous and Resident Fish	BPT (Recommendation)
		Malheur Subbasin Habitat Restoration and Fish Enhancement – Logan Valley	BPT (Recommendation) (200712000)
		Malheur Subbasin Habitat Restoration and Fish Enhancement – Stinkingwater Project	BPT (Recommendation) (200712000)

Improve water quality	Maintain or create adequate vegetation in buffers to intercept overland and subsurface sources of pollution	Acquisition and Maintenance of Habitat for Anadromous and Resident Fish	BPT (Recommendation)
		Malheur Subbasin Habitat Restoration and Fish Enhancement – Logan Valley	BPT (Recommendation) (200712000)
		Malheur Subbasin Habitat Restoration and Fish Enhancement – Stinkingwater Project	BPT (Recommendation) (200712000)
	Appropriate application of herbicides and insecticides to protect water quality and aquatic resources	Acquisition and Maintenance of Habitat for Anadromous and Resident Fish	BPT (Recommendation)
		Malheur Subbasin Habitat Restoration and Fish Enhancement – Logan Valley	BPT (Recommendation) (200712000)
		Malheur Subbasin Habitat Restoration and Fish Enhancement – Stinkingwater Project	BPT (Recommendation) (200712000)
	Implement nutrient management	Acquisition and Maintenance of Habitat for Anadromous and Resident Fish	BPT (Recommendation)
		Malheur Subbasin Habitat Restoration and Fish Enhancement – Logan Valley	BPT (Recommendation) (200712000)
		Malheur Subbasin Habitat Restoration and Fish Enhancement – Stinkingwater Project	BPT (Recommendation) (200712000)
	Implement sewage and stormwater management	Acquisition and Maintenance of Habitat for Anadromous and Resident Fish	BPT (Recommendation)
		Malheur Subbasin Habitat Restoration and Fish Enhancement – Logan Valley	BPT (Recommendation) (200712000)
		Malheur Subbasin Habitat Restoration and Fish Enhancement – Stinkingwater Project	BPT (Recommendation) (200712000)
Increase monitoring of sediment inputs	Acquisition and Maintenance of Habitat for Anadromous and Resident Fish	BPT (Recommendation)	
	Malheur Subbasin Habitat Restoration and Fish Enhancement – Logan Valley	BPT (Recommendation)	

			(200712000)
		Malheur Subbasin Habitat Restoration and Fish Enhancement – Stinkingwater Project	BPT (Recommendation) (200712000)
	Assess and mitigate effects on redband trout from non-point source pollution	Acquisition and Maintenance of Habitat for Anadromous and Resident Fish	BPT (Recommendation)
		Malheur Subbasin Habitat Restoration and Fish Enhancement – Logan Valley	BPT (Recommendation) (200712000)
		Malheur Subbasin Habitat Restoration and Fish Enhancement – Stinkingwater Project	BPT (Recommendation) (200712000)
	Monitor habitat and water quality improvements by utilizing methodologies identified in the Malheur River Subbasin Native Salmonid Monitoring Plan	Acquisition and Maintenance of Habitat for Anadromous and Resident Fish	BPT (Recommendation)
		Malheur Subbasin Habitat Restoration and Fish Enhancement – Logan Valley	BPT (Recommendation) (200712000)
		Malheur Subbasin Habitat Restoration and Fish Enhancement – Stinkingwater Project	BPT (Recommendation) (200712000)
Reduce upland erosion and sedimentation	Assess sediment sources in Malheur Subbasin	Acquisition and Maintenance of Habitat for Anadromous and Resident Fish	BPT (Recommendation)
		Malheur Subbasin Habitat Restoration and Fish Enhancement – Logan Valley	BPT (Recommendation) (200712000)
		Malheur Subbasin Habitat Restoration and Fish Enhancement – Stinkingwater Project	BPT (Recommendation) (200712000)
	Stabilize roads, crossings, and other sources of sediment delivery	Acquisition and Maintenance of Habitat for Anadromous and Resident Fish	BPT (Recommendation)
		Malheur Subbasin Habitat Restoration and Fish Enhancement – Logan Valley	BPT (Recommendation) (200712000)
		Malheur Subbasin Habitat Restoration and Fish Enhancement – Stinkingwater Project	BPT (Recommendation) (200712000)

	Encourage improvements in grazing management	Acquisition and Maintenance of Habitat for Anadromous and Resident Fish	BPT (Recommendation)
		Malheur Subbasin Habitat Restoration and Fish Enhancement – Logan Valley	BPT (Recommendation) (200712000)
		Malheur Subbasin Habitat Restoration and Fish Enhancement – Stinkingwater Project	BPT (Recommendation) (200712000)
	Encourage improvements in timber management	Acquisition and Maintenance of Habitat for Anadromous and Resident Fish	BPT (Recommendation)
		Malheur Subbasin Habitat Restoration and Fish Enhancement – Logan Valley	BPT (Recommendation) (200712000)
		Malheur Subbasin Habitat Restoration and Fish Enhancement – Stinkingwater Project	BPT (Recommendation) (200712000)
	Encourage improvements in agricultural practices including methods such as no till farming or cover crops	Acquisition and Maintenance of Habitat for Anadromous and Resident Fish	BPT (Recommendation)
		Malheur Subbasin Habitat Restoration and Fish Enhancement – Logan Valley	BPT (Recommendation) (200712000)
		Malheur Subbasin Habitat Restoration and Fish Enhancement – Stinkingwater Project	BPT (Recommendation) (200712000)
	Monitor habitat and water quality improvements by utilizing methodologies identified in the Malheur River Subbasin Native Salmonid Monitoring Plan	Acquisition and Maintenance of Habitat for Anadromous and Resident Fish	BPT (Recommendation)
		Malheur Subbasin Habitat Restoration and Fish Enhancement – Logan Valley	BPT (Recommendation) (200712000)
		Malheur Subbasin Habitat Restoration and Fish Enhancement – Stinkingwater Project	BPT (Recommendation) (200712000)

Reduce out-of-stream water use through efficiency, conservation, lease or purchase	Assess current and historical effects of upland management on changes to the hydrograph in all spawning tributaries	Acquisition and Maintenance of Habitat for Anadromous and Resident Fish	BPT (Recommendation)
		Malheur Subbasin Habitat Restoration and Fish Enhancement – Logan Valley	BPT (Recommendation) (200712000)
	Establish/provide instream flows downstream from reservoirs and stabilize flow regimes	Malheur Subbasin Habitat Restoration and Fish Enhancement – Stinkingwater Project	BPT (Recommendation) (200712000)
			CBFWA (Recommendation)
	Improve irrigation efficiency and water management to increase instream flows (may include lease and purchase of water where necessary and available)	Acquisition and Maintenance of Habitat for Anadromous and Resident Fish	BPT (Recommendation)
		Malheur Subbasin Habitat Restoration and Fish Enhancement – Logan Valley	BPT (Recommendation) (200712000)
		Malheur Subbasin Habitat Restoration and Fish Enhancement – Stinkingwater Project	BPT (Recommendation) (200712000)
		Acquisition and Maintenance of Habitat for Anadromous and Resident Fish	BPT (Recommendation)
	Monitor habitat and water quality improvements by utilizing methodologies identified in the Malheur River Subbasin Native Salmonid Monitoring Plan	Malheur Subbasin Habitat Restoration and Fish Enhancement – Logan Valley	BPT (Recommendation) (200712000)
		Malheur Subbasin Habitat Restoration and Fish Enhancement – Stinkingwater Project	BPT (Recommendation) (200712000)
		Acquisition and Maintenance of Habitat for Anadromous and Resident Fish	BPT (Recommendation)
		Malheur Subbasin Habitat Restoration and Fish Enhancement – Logan Valley	BPT (Recommendation) (200712000)

Remove or control non-native fish populations that impact native fish populations	Determine site-specific levels of competition and hybridization with introduced sport fish and assess impacts of those interactions	Evaluate the Life History of Native Salmonids in the Malheur Subbasin	BPT (Recommendation) (199701900)	
	Develop and implement an educational effort to address problems and consequences of unauthorized fish introductions		CBFWA (Recommendation)	
	Monitor habitat and water quality improvements by utilizing methodologies identified in the Malheur River Subbasin Native Salmonid Monitoring Plan	Acquisition and Maintenance of Habitat for Anadromous and Resident Fish		BPT (Recommendation)
		Malheur Subbasin Habitat Restoration and Fish Enhancement – Logan Valley		BPT (Recommendation) (200712000)
		Malheur Subbasin Habitat Restoration and Fish Enhancement – Stinkingwater Project		BPT (Recommendation) (200712000)
Restore nutrient cycle and prey base interactions	Investigate potential for restoring historic prey base by reintroducing anadromous species		CBFWA (Recommendation)	
	Evaluate food web interactions in drainages most affected by introduced fishes, reservoir operations, loss of anadromous species (prey base/nutrients), etc		CBFWA (Recommendation)	
	Utilize anadromous fish carcass planting methodologies to restore lost marine derived nutrients and monitor effectiveness of these actions		CBFWA (Recommendation)	
	Monitor habitat and water quality improvements by utilizing methodologies identified in the Malheur River Subbasin Native Salmonid Monitoring Plan	Acquisition and Maintenance of Habitat for Anadromous and Resident Fish		BPT (Recommendation)
		Malheur Subbasin Habitat Restoration and Fish Enhancement – Logan Valley		BPT (Recommendation) (200712000)
		Malheur Subbasin Habitat Restoration and Fish Enhancement – Stinkingwater Project		BPT (Recommendation) (200712000)

Strategies and Measures for Owyhee Redband Trout

Strategy	Recommended Measure		Source of Measure
Identify all potential redband trout habitat	Survey all streams that allow for permanent residence, spawning, and rearing of young	Shoshone-Paiute Habitat Enhancement	SPT (Recommendation) (199701100)
	Classify streams by proper functioning condition	Shoshone-Paiute Habitat Enhancement	SPT (Recommendation) (199701100)
Protect existing properly functioning streams	Exclude livestock from critical areas using fences, stock troughs, and strategically placed salt licks	Shoshone-Paiute Habitat Enhancement	SPT (Recommendation) (199701100)
	Reduce sedimentation from roads by improving road crossings, maintaining culverts, and restricting access during wet portions of the year	Shoshone-Paiute Habitat Enhancement	SPT (Recommendation) (199701100)
Improve streams with inadequate proper functioning condition	Exclude livestock from critical areas using fences, troughs, and strategically placed salt licks	Shoshone-Paiute Habitat Enhancement	SPT (Recommendation) (199701100)
	Reduce sedimentation from roads by improving road crossings, maintaining culverts, and restricting access during wet seasons of the year	Shoshone-Paiute Habitat Enhancement	SPT (Recommendation) (199701100)
	Improve bank stabilization by reestablishing native vegetation such as willows and other hydrophilic plants	Shoshone-Paiute Habitat Enhancement	SPT (Recommendation) (199701100)
Bank stabilization, road maintenance, and livestock exclusion from critical areas	Revegetating shore and banks by active planting	Duck Valley Fisheries Project – Operations, Maintenance, Monitoring, and Evaluation	SPT (Recommendation) (199501500)
	Requesting road maintenance as needed	Duck Valley Fisheries Project – Operations, Maintenance, Monitoring, and Evaluation	SPT (Recommendation) (199501500)
	Constructing livestock fences, water troughs, and strategically placing salt licks to reduce impacts from livestock	Duck Valley Fisheries Project – Operations, Maintenance, Monitoring, and Evaluation	SPT (Recommendation) (199501500)

Change stocking practices to include only triploid rainbow trout	Purchasing of only triploid rainbow trout to minimize interbreeding of redband strains and other strains	Duck Valley Fisheries Project – Operations, Maintenance, Monitoring, and Evaluation	SPT (Recommendation) (199501500)
Ensuring that sufficient flows are maintained in road crossings to allow migration upstream and downstream	Installation of culverts, rock crossings, and other types of stream crossings at each location roads intersect streams and designed to maintain adequate flows through each structure to allow fish passage	Shoshone-Paiute Habitat Enhancement	SPT (Recommendation) (199701100)

Strategies and Measures for Powder Bull Trout

Strategy	Recommended Measure		Source of Measure
Improve stream channel processes	Allow stream flow processes to maintain channels through restoration of natural flow regimes and floodplain connection		CBFWA (Recommendation)
	Improve instream channel habitat through placement of large woody debris and boulders, bank stabilization efforts and flow augmentation/improvement		CBFWA (Recommendation)
	Develop off-channel habitat, remove or modify levies, berms, roads or dikes where appropriate		CBFWA (Recommendation)
	Re-configure modified channels through active restoration		CBFWA (Recommendation)
Improve riparian, floodplain and wetland habitats	Maintain/protect existing riparian, floodplain and wetland habitats		CBFWA (Recommendation)
	Implement proper grazing management		CBFWA (Recommendation)
	Establish buffers to improve riparian areas through conservation easements, riparian fencing and implementation of setbacks		CBFWA (Recommendation)

	Reestablish wetlands through easements, restoration and enhancement		CBFWA (Recommendation)
	Plant native vegetation		CBFWA (Recommendation)
	Restore and maintain connection of stream channels to their floodplains and restore floodplain function		CBFWA (Recommendation)
Improve water quality	Maintain or create adequate vegetation in buffers to intercept overland and subsurface sources of pollution		CBFWA (Recommendation)
	Appropriate application of herbicides and insecticides to protect water quality and aquatic resources		CBFWA (Recommendation)
	Implement nutrient management, and implement sewage and stormwater management		CBFWA (Recommendation)
Reduce upland erosion and sedimentation	Encourage improvements in road management to reduce erosion		CBFWA (Recommendation)
	Encourage improvements in grazing management		CBFWA (Recommendation)
	Encourage improvements in timber management		CBFWA (Recommendation)
	Encourage improvements in agricultural practices including methods such as not till farming or cover crops		CBFWA (Recommendation)
Reduce out-of- stream water use through efficiency, conservation, lease or purchase	Improve irrigation and water management to increase flow (may include lease and purchase of water where necessary and available)		CBFWA (Recommendation)

Improve habitat connectivity and fish passage	Create fish passage at dams and irrigation water diversion structures		CBFWA (Recommendation)
	Remove unnecessary dams and diversion structures		CBFWA (Recommendation)
	Remove barriers at roads; repair/improve culverts to allow fish passage, eliminate barriers created by dewatered reaches and poor water quality		CBFWA (Recommendation)
	Install approved fish screens at irrigation diversions		CBFWA (Recommendation)

Strategies and Measures for Powder Redband Trout

Strategy	Recommended Measure		Source of Measure
Improve stream channel processes	Allow stream flow processes to maintain channels through restoration of natural flow regimes and floodplain connection, and improve instream channel habitat through placement of large woody debris and boulders, bank stabilization efforts and flow augmentation/improvement		CBFWA (Recommendation)
	Develop off-channel habitat, remove or modify levies, berms, roads or dikes where appropriate, and re-configure modified channels through active restoration		CBFWA (Recommendation)

Improve riparian, floodplain and wetland habitats	Maintain/protect existing riparian, floodplain and wetland habitats		CBFWA (Recommendation)
	Implement proper grazing management		CBFWA (Recommendation)
	Establish buffers to improve riparian areas through conservation easements, riparian fencing and implementation of setbacks		CBFWA (Recommendation)
	Reestablish wetlands through easements, restoration and enhancement		CBFWA (Recommendation)
	Plant native vegetation		CBFWA (Recommendation)
	Restore and maintain connection of stream channels to their floodplains and restore floodplain function		CBFWA (Recommendation)
Improve water quality	Maintain or create adequate vegetation in buffers to intercept overland and subsurface sources of pollution		CBFWA (Recommendation)
	Appropriate application of herbicides and insecticides to protect water quality and aquatic resources		CBFWA (Recommendation)
	Implement nutrient management		CBFWA (Recommendation)
	Implement sewage and stormwater management		CBFWA (Recommendation)
Reduce upland erosion and sedimentation	Encourage improvements in road management to reduce erosion		CBFWA (Recommendation)
	Encourage improvements in grazing management		CBFWA (Recommendation)
	Encourage improvements in timber management		CBFWA (Recommendation)
	Encourage improvements in agricultural practices including methods such as not till farming or cover crops		CBFWA (Recommendation)

Strategies and Measures for Upper, Headwaters, Closed Yellowstone Cutthroat Trout (IDFG)

Strategy	Recommended Measure		Source of Measure
Restore peak springtime flows in the South Fork of the Snake River	Monitor fish populations to evaluate effectiveness of managed flow regimes		CBFWA (Recommendation)
	Obtain sufficient normative river flows and river processes to minimize survival bottlenecks of Yellowstone cutthroat trout, and to hinder successful reproduction of rainbow trout		CBFWA (Recommendation)
	Provide a maximum springtime: minimum winter flow ratio of at least 15:1 in at least two of every three years		CBFWA (Recommendation)
Increase stream flows during critical periods for migration or mid-late summer rearing	Identify opportunities to increase stream flows and provide funding (eg, water purchase programs, donated water rights, more efficient irrigation practices, and possibly conversion to groundwater use)		CBFWA (Recommendation)
	Provide access to thermal refugia by restoring connectivity in key systems		CBFWA (Recommendation)
Reduce impacts from development along river and stream corridors and reduce sediment delivery to the stream network	Identify on-the-ground habitat Specific Measure (Project Reference)s to protect key riparian habitats and stream corridors (eg, through conservation easements, acquisitions, and technical guidance to prospective developers		CBFWA (Recommendation)
Reduce impacts from introduced species	Conserve the genetic integrity of the YCT population through development and operation of fish trapping facilities on the four main cutthroat trout spawning tributaries to the South Fork of the Snake River	South Fork Snake River Yellowstone Cutthroat Trout Recruitment and Survival Improvement	IDFG (200717000)
	Continue efforts to encourage harvest of rainbow	South Fork Snake River Yellowstone Cutthroat Trout	IDFG

	and hybrid trout in the South Fork of the Snake River and in other areas where they pose direct threat to the genetic integrity of Yellowstone cutthroat trout	Recruitment and Survival Improvement	(200717000)
	Where rainbow or hybrid trout are stocked in waters supporting native Yellowstone cutthroat trout populations, only triploid (sterile) fish will be used		CBFWA (Recommendation)
	Develop informational programs to educate anglers and the public to risks of random introductions of exotic species		CBFWA (Recommendation)
	Through planning, use enforcement efforts to curtail illegal introductions		CBFWA (Recommendation)
	Consider drainage restoration Specific Measure (Project Reference)s that result in the removal of hybridized rainbow trout X Yellowstone cutthroat trout population and the subsequent transplant of genetically pure YCY in naturally or artificially isolated populations		CBFWA (Recommendation)
Reduce impacts from introduced species	Control impacts of introduced fish species	South Fork Snake River Yellowstone Cutthroat Trout Recruitment and Survival Improvement	IDFG (Recommendation) (200717000)
	Where brook trout are stocked in waters supporting native Yellowstone cutthroat trout populations, only triploid (sterile) fish will be used		CBFWA (Recommendation)
	Develop informational programs to educate anglers and the public to risks of random introductions of exotic species		CBFWA (Recommendation)
	Through planning, use enforcement efforts to curtail illegal introductions		CBFWA (Recommendation)
	Provide liberal regulations on brook trout		CBFWA (Recommendation)
Reduce pelican predation on spawning	Develop management strategies that will balance conservation and recreation interests for both fish and pelican populations in Idaho		CBFWA (Recommendation)

YCT			
Reduce impacts associated with the illegal harvest of cutthroat trout	Produce and install easy to read road side signs that inform anglers of what the fishing regulations are when traveling the major roads within the Upper Snake subbasin		CBFWA (Recommendation)
	Increase enforcement and education in areas where non-compliance with fishing regulations have been found to be a problem		CBFWA (Recommendation)
Restore connectivity to important spawning, rearing and refugia habitat	Identify and inventory, impassible roads crossings, subdivisions, railroads, dikes and other man-caused developments that potentially jeopardize fish populations		CBFWA (Recommendation)
	Develop a data base to demonstrate the magnitude of habitat loss and more effectively influence land use decisions		CBFWA (Recommendation)
	Work with the Forest Service, Idaho Department of Lands, other agencies, water users, non-governmental organizations, private developers, landowners, county planners and interested angling groups to make protection of fisheries habitat a primary concern in land use decisions Work with the above entities to insure mitigation of habitat loss or to restore access whenever possible		CBFWA (Recommendation)
Unscreened irrigation diversions that entrain fish	Reduce entrainment to irrigation diversions in systems where native fish populations are adversely impacted	South Fork Snake River Yellowstone Cutthroat Trout Recruitment and Survival Improvement	IDFG (200717000)
Improve water quality	Determine levels of in stream contaminants		CBFWA (Recommendation)
	Work with Department of Environmental Quality, Environmental Protection Agency, US Fish and Wildlife Service, Bureau of Land Management, US Forest Service, private developers, landowners, and		CBFWA (Recommendation)

	other agencies to improve riparian habitat conditions	
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Strategies and Measures for Upper, Headwaters, Closed Northern Leatherside Chub

Strategy	Recommended Measure		Source of Measure
Enhance and preserve riparian habitat	Assess population status and linkages to potentially critical habitat		CBFWA (Recommendation)
	Provide information to land management agencies and public on identification, population status and distribution of leatherside chub in the drainage		CBFWA (Recommendation)
	Work with local regulatory agencies and landowners to minimize impacts of livestock grazing on riparian areas		CBFWA (Recommendation)
Identify current distribution and evaluate genetic composition	Develop baseline population structure information		CBFWA (Recommendation)
	Work with local regulatory agencies and collection permit applicants to document the presence of Northern leatherside chub in the Raft and Goose creek drainages and to secure tissue samples for genetic evaluation		CBFWA (Recommendation)

Strategies and Measures for Upper, Headwaters, Closed Yellowstone Cutthroat Trout (SBT)

Strategy	Recommended Measure		Source of Measure
Increase species composition to greater than 90% pure Yellowstone cutthroat all sample sites (mountain streams and Bottoms) Increase catch per hour from 10 to 25 for the Bottoms streams	Evaluate the role of hatcheries for YCT restoration and enhancement in streams once populated by pure YCT	Crystal Springs Hatchery	SBT (MOA)
	Remove all non-native salmonids through harvest, and weirs	Habitat Improvement/Enhancement – Fort Hall, Idaho	SBT (199201000)
	Continue stocking native cutthroat only	Crystal Springs Hatchery	SBT (MOA)
	Continue with on-going restoration Specific Measure (Project Reference)s	Habitat Improvement/Enhancement – Fort Hall, Idaho	SBT (199201000)
	Inform public of YCT conservation importance	Habitat Improvement/Enhancement – Fort Hall, Idaho	SBT (199201000)
	Develop and implement Fort Hall fish management plan	Habitat Improvement/Enhancement – Fort Hall, Idaho	SBT (199201000)
	Protect and enhance YCT core populations (0% hybridized) in the Ross Fork Creek watershed	Habitat Improvement/Enhancement – Fort Hall, Idaho	SBT (199201000)
	Restore creeks in the Bannock Creek watershed from 25% to greater than 90% YCT and increase trout densities at all sites: West Fork 01m ² to 10m ² for trout >300mm; restore 0 back to 40m ² at site on Moonshine cr; restore back to 10m ² from 27m ² at Rattlesnake Creek	Habitat Improvement/Enhancement – Fort Hall, Idaho	SBT (199201000)
	Utilize hatchery facility to assist enhancement of core and conservation populations of YCT on the Reservation, and restoring I/E streams in closed systems	Crystal Springs Hatchery	SBT (MOA)
	Protect all spawning sites	Habitat Improvement/Enhancement – Fort Hall, Idaho	SBT (Recommendation) (199201000)
Identify and evaluate limiting factors of adult trout	Habitat Improvement/Enhancement – Fort Hall, Idaho	SBT	

	on the Fort Hall Bottoms		(Recommendation) (199201000)
	Supplement fishery through stocking of native cutthroat trout	Crystal Springs Hatchery	SBT (MOA)
	Utilize hatchery facility to assist enhancement of core and conservation populations of YCT on the Reservation, and restoring I/E streams in closed systems	Crystal Springs Hatchery	SBT (MOA)
Protect and enhance fish and wildlife habitat	Meet TMDLs	Habitat Improvement/Enhancement – Fort Hall, Idaho	SBT (Recommendation) (199201000)
Reduce contamination	Identify areas of contamination and determine any contamination to aquatic and terrestrial spp and ecosystems	Habitat Improvement/Enhancement – Fort Hall, Idaho	SBT (Recommendation) (199201000)
	Enforce existing laws	Habitat Improvement/Enhancement – Fort Hall, Idaho	SBT (Recommendation) (199201000)
	Inform public and tribal membership	Habitat Improvement/Enhancement – Fort Hall, Idaho	SBT (Recommendation) (199201000)
Improve riparian habitat	Land acquisitions, conservation easements, transfers and exchanges	Habitat Improvement/Enhancement – Fort Hall, Idaho	SBT (Recommendation) (199201000)
	Regional planning, interagencies and private landowners	Habitat Improvement/Enhancement – Fort Hall, Idaho	SBT (Recommendation) (199201000)
	Protect and enhance fish and wildlife habitat through altered grazing practices	Habitat Improvement/Enhancement – Fort Hall, Idaho	SBT (Recommendation) (199201000)

Increase flows	Establish criteria for instream flows	Habitat Improvement/Enhancement – Fort Hall, Idaho	SBT (Recommendation) (199201000)
	Improve irrigation management (water delivery)	Habitat Improvement/Enhancement – Fort Hall, Idaho	SBT (Recommendation) (199201000)
	Screen diversions	Habitat Improvement/Enhancement – Fort Hall, Idaho	SBT (Recommendation) (199201000)
	Develop and implement Fort Hall Fish Management Plan	Habitat Improvement/Enhancement – Fort Hall, Idaho	SBT (Recommendation) (199201000)

Strategies and Measures for Freshwater Mussels

Strategy	Recommended Measure		Source of Measure
Determine and restore preferred habitat	Conduct field studies and re-location efforts to identify preferred physical habitat of all three genera	Freshwater Mussel Research and Restoration Project	CTUIR (Recommendation) (200203700)
	Determine optimal stream flows, especially in reaches dewatered for irrigation or impacted by dams	Freshwater Mussel Research and Restoration Project	CTUIR (Recommendation) (200203700)
	Determine habitat preferences through re-location experiments; increase habitat diversity	Freshwater Mussel Research and Restoration Project	CTUIR (Recommendation) (200203700)
Design and implement a basic monitoring program to determine trends in river mussel populations throughout the Columbia River drainage Determine what factors may positively and	Determine if recruitment is occurring, through cohort studies, in selected mussel populations throughout the basin for all three genera of river mussels	Freshwater Mussel Research and Restoration Project	CTUIR (Recommendation) (200203700)
	Determine age structure of selected populations Investigate which factors positively (eg, abundance of host fish) or negatively (water quality thresholds) impact recruitment into existing mussel beds	Freshwater Mussel Research and Restoration Project	CTUIR (Recommendation) (200203700)

negatively influence recruitment			
Determine which genera and species occur in the Columbia River Basin, and which stocks of mussels in the basin, based partly on genotypic diversity, may be best suited for targeted reintroduction efforts	Determine genetically which genera of <i>Anodonta</i> occur in the Columbia River Basin (a recent new genus has been discovered)	Freshwater Mussel Research and Restoration Project	CTUIR (Recommendation) (200203700)
	Conduct systematic genetic surveys of mussels in the basin to match existing genetic makeup of populations with extant populations in nearby drainages to find most suitable candidates for re-introduction efforts	Freshwater Mussel Research and Restoration Project	CTUIR (Recommendation) (200203700)
Determine host fish and minimum host fish population levels needed to maintain self-sustaining mussel populations	Determine host fish through laboratory experiments, culture juvenile mussels in hatchery setting for possible re-introduction trials, determine optimal habitats for both fish hosts and mussel species	Freshwater Mussel Research and Restoration Project	CTUIR (Recommendation) (200203700)
Determine host fish and minimum host fish population levels needed to maintain self-sustaining mussel populations	Determine host fish through laboratory experiments, culture juvenile mussels in hatchery setting for possible re-introduction trials	Freshwater Mussel Research and Restoration Project	CTUIR (Recommendation) (200203700)
	Determine optimal habitats for both fish hosts and mussel species	Freshwater Mussel Research and Restoration Project	CTUIR (Recommendation) (200203700)
Determine if existing water quality in selected reaches of the Columbia River Basin will maintain viable and self-sustaining mussel populations	Conduct physiological and condition experiments to determine lethal limits for mussels in regards to summer temperatures, dislodging flows, food availability and composition, and overall water quality requirements	Freshwater Mussel Research and Restoration Project	CTRUIR (Recommendation) (200203700)