

ALL ACTIONS									
Strategy	Page Number	Priority	Action Type	Sub-Action Number	General Measures	Responsible Entity	New or Ongoing?	Timeframe	Forum
Investment strategy	199	High		IS - 1	The Council will work with Bonneville and the other action agencies to ensure that past fish-and-wildlife-related investments are kept current or properly decommissioned.	Council and Bonneville	New		
Investment strategy	199	High		IS - 2	The federal action agencies shall define the comprehensive maintenance costs by fish and wildlife investment types for both the direct and reimbursable aspects of the program. Anticipated costs should be developed year by year within a 20-year timeframe and be provided annually to the Council.	Federal action agencies	New	Annual	
Investment strategy	199	High		IS - 3	The Council will convene a work group comprising action agencies and agencies and tribes with expertise in fish screens, fishways and traps, hatcheries, lands, and habitat actions, to define and develop a long-term maintenance plan and process. This work group will be assisted by the IEAB, the Wildlife Advisory Committee, Fish Screening Oversight Committee, and federal action agencies. The work group shall report to the Council quarterly on its progress toward developing a long-term plan for protecting fish and wildlife investments. The long-term plans shall be completed at the end of one year from the initial meeting of the work group. The plan will be presented to the Council for review and recommendation to Bonneville and the action agencies. Bonneville shall fund the long-term maintenance plan as reviewed and recommended by the Council.	Council	New	Quarterly Progress Report	O&M sub-committee
Investment strategy	200	High		IS - 4	The Council and the federal action agencies will work together to ensure that federal agencies provide adequate funds for long-term maintenance for facilities where they have responsibility (such as NOAA Fisheries for Mitchell Act hatcheries).	Council and federal action agencies	New		
Investment strategy	200	High		IS- 5	Annual symposiums will be convened by the Council to ensure collaboration and efficiencies are achieved by all parties seeking to protect past investments in fish and wildlife by Bonneville and the action agencies under the program.	Council	New	Annual Symposiums	
Implement Adaptive Management	102	High	Monitoring	M- 1	The ISRP will use the risk uncertainty matrix to assess whether the level of monitoring is appropriate for the proposed project and measures.	ISRP	New		
Implement Adaptive Management	102	High	Monitoring	M-2	Bonneville will ensure that all monitoring projects report the accuracy and precision of their data.	Bonneville		Annual	
Implement Adaptive Management	102	High	Monitoring	M-3	Bonneville should continue to support and require the use of Monitoring Resources , which is sponsored by the Pacific Northwest Aquatic Monitoring Partnership, to share information about how data are collected.	Bonneville	Ongoing		

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Implement Adaptive Management	102	High	Monitoring	M-4	Consistent with the goals and objectives section of this program, Bonneville should report annually on the number of juvenile fish released each year; the number of adults that contribute to harvest, are used for broodstock, and are present on the spawning grounds for all hatchery programs that receive Bonneville funding. Bonneville also should provide support to ensure that all managers have the capacity to collect this data and should support regional processes that standardize the data, facilitate reporting, and make this data publicly accessible.	Bonneville	New	Annually. The first report should be submitted in December 2014.	
Implement Adaptive Management	103	High	Monitoring	M-5	Bonneville should require project sponsors to ensure data are secured in appropriate regional data bases if those data contribute to program and regional reporting needs.	Bonneville			
Implement Adaptive Management	103	High	Monitoring	M-6	Bonneville should identify preferred methods to guide future data collection and report back to the Council annually. The Council will request the ISAB or ISRP to review the methods identified by Bonneville, and based on its review, the Council will adopt methods into the program.	Bonneville (Council, ISRP, ISAB)		Annually	
Implement Adaptive Management	103	High	Monitoring	M-7	Funding entities such as Bonneville, NOAA Fisheries, and Oregon Watershed Enhancement Board should align their implementation metrics to share information about what, and where, actions are funded in the basin. This will improve their ability to work together to achieve cost savings.	Bonneville, NOAA Fisheries, and Oregon Watershed Enhancement Board			
Implement Adaptive Management	103	High	Monitoring	M-8	Bonneville and its partners should continue to explore whether a programmatic approach for monitoring would be more cost-effective and efficient.	Bonneville and its partners	Ongoing		
Implement Adaptive Management	103	High	Monitoring	M-9	For projects assessing species and habitat conditions in intensively monitored watersheds, Bonneville will require the project sponsors to provide information on the condition of these watersheds at least every three years in a format that can be used by the Council.	Bonneville and IMW projects (Council)	Ongoing	At least every three years	
Implement Adaptive Management	103	High	Effectiveness	E - 1	Bonneville and its partners should continue to transform the effort to evaluate action effectiveness from monitoring individual projects into a cost-effective, independent third-party, standardized, and statistically valid method for habitat projects and water transactions projects.	Bonneville and its partners	Ongoing		
Implement Adaptive Management	104	High	Research	RES -1	The Council will, with federal and state fish and wildlife agencies and tribes review and update its research plan every three years beginning in 2014.	Council, ISRP/ISAB (with federal and state fish and wildlife agencies and tribes)	new/ongoing	Beginning 2014, then every three years	
Implement Adaptive Management	104	High	Research	RES -2	To assist with updating its research plan, the Council will co-sponsor Columbia River science/policy conferences to discuss scientific and technical developments in key policy areas. The Council will work with the Independent Scientific Advisory Board and others to develop the agendas.	Council, ISAB	ongong	As appropriate	

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Implement Adaptive Management	104	High	Research	RES-3	Bonneville should ensure that all contracts for research projects, including those covered by funding agreements, identify an end date.	BPA	new	BPA contracting	
Implement Adaptive Management	104	High	Research	RES-4	Bonneville will report annually to the Council on the publications resulting from program research	Bonneville		Annually	
Implement Adaptive Management	104	High	Research	RES-5	The Council will review the accomplishments of intensively monitored watersheds and the Integrated Status and Effectiveness Monitoring Project to ensure that it is cost-effective and produces useful results.	Council		During project review	
Implement Adaptive Management	105	High	Data Management	DM-1	Bonneville should ensure that data associated with broad categories of information (fish abundance, productivity, genetic diversity, geographic distribution, habitat conditions) are identified and accessible from a single, centralized website. Data users should be able to find references, data descriptions, and links to all the data collected in the program on fish abundance in such a website.	Bonneville			
Implement Adaptive Management	105	High	Data Management	DM-2	Bonneville should ensure that all information about anadromous fish is summarized by specific life-cycle stages and made accessible from a single gateway location.	Bonneville			
Implement Adaptive Management	105	High	Data Management	DM-3	Bonneville should contract for complete data products (e.g., annual population estimates for adult and juvenile spring Chinook in the Entiat) and not only collaborative processes and preliminary data collection (e.g., redd counts or weir counts of fish). And when Bonneville pays for the development of standards or protocols the contracts should include a viable strategy for adoption.	Bonneville			
Implement Adaptive Management	105	High	Reporting	RPT-1	Bonneville should require all research, monitoring, and evaluation projects, including hatchery programs, to report annually, providing an electronic summary of their results and interim findings, as well as the benefits to fish and wildlife. A high priority is to separate research reports from monitoring reports. The former should address hypotheses and critical uncertainties and the latter should provide important data about implementation, status, and trends. As appropriate, action effectiveness should be reported as part of research and monitoring reports.	Bonneville	Ongoing	Annually	
Implement Adaptive Management	106	High	Reporting	RPT-2	Bonneville should continue working with the Council to implement a concise, useful template for annual reports for research and monitoring projects that can replace other more cumbersome, more costly, and less useful reports for individual projects. The Council will continue to work with Bonneville and the ISRP to identify and assemble the information needed to produce an annual summary of results for Council review.	Bonneville, Council, ISRP	Ongoing	Annually	

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Implement Adaptive Management	106	High	Reporting	RPT-3	The Council, with the assistance of agencies, tribes and others, will periodically review and update the high-level indicators report to communicate accomplishments to Congress, the region's governors, legislators, and citizens of the Northwest. When the Council completes its work on biological objectives, it will update its high-level indicators to ensure they are consistent with these objectives.	Council, with the assistance of agencies, tribes and others	Ongoing	Periodic review and update	
Implement Adaptive Management	106	High	Reporting	RPT-4	The Council, with the assistance of agencies, tribes and others, will maintain the program's dashboard and the HLI website report, and also will produce other reports as appropriate, such as one that tracks annual anadromous fish forecasts and actual run sizes. The Council expects others to provide data and reports to the Council on a regular basis and make them available to the public [see Reporting Appendix L for a list of Council-requested reports]. This will provide easy access for the public and allow the Council to review the accuracy of the pre-season run-size estimates.	Council, with the assistance of agencies, tribes and others	Ongoing	Annually, and as appropriate	
Implement Adaptive Management	106	High	Evaluation	EV-1	Working with the region, the Council will develop an evaluation process that considers new information to verify or adjust assumptions, hypotheses, goals, biological objectives, strategies, measures, and indicators. This adaptive management approach will ensure program accountability.	Council, working with the region			
Implement Adaptive Management	106	High	Evaluation	EV-2	The Council, with input from the ISAB and ISRP, will request evaluation of data gathered over several years, with the evaluation approach overseen by those that gathered the data, to inform decisions and advance understanding supported by these data.	The Council, with input from the ISAB and ISRP			
Implement Adaptive Management	106	High	Evaluation	EV-3	The Council supports continued research and life cycle modeling to inform decision makers of the biological benefits they could expect from implementing or synchronizing different suites of measures across the life cycle.	Council			
Implement Adaptive Management	106	High	Evaluation	EV-4	Bonneville, agencies, tribes, and other entities receiving Bonneville funding will assist the Council in compiling data in the appropriate format to inform the reports described in the reporting section.	Bonneville, agencies, tribes, and other entities receiving Bonneville funding, Council			
Identify and Organize Objectives	33	High	Objectives for adult salmon and steelhead	OBJ-1	Objectives that represent different perspectives on healthy and harvestable populations already exist. The Council will work with state and federal agencies and tribes in the region to collect, organize, review, and report on these quantitative objectives by the end of 2015.	Council will work with state and federal agencies and tribes in the region	New	By the end of 2015	
Identify and Organize Objectives	33	High	Objectives for adult salmon and steelhead	OBJ-2	The Council will work with the states, federal agencies, and tribes to identify specific indicators for Bonneville-funded hatchery programs that could be tracked and reported to inform progress on meeting mitigation objectives (i.e., harvest, supplementation, reintroduction, and conservation).	Council will work with state and federal agencies and tribes in the region	New		

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Identify and Organize Objectives	34	High	Other anadromous and resident fish objectives	OBJ-3	Step 1 Once the process to produce objectives for hatchery salmon and steelhead is completed, the Council will work with the fish and wildlife agencies and tribes to survey, collect, and organize existing quantitative objectives for focal species including lamprey, bull trout, eulachon, white sturgeon, kokanee, rainbow trout, and cutthroat trout.	Council will work with the fish and wildlife agencies and tribes	New		
Identify and Organize Objectives	34	High	Other anadromous and resident fish objectives	OBJ-4	Step 2 As soon as practicable, the Council will determine which of these to consider as program objectives, as well as considering needed modifications to existing goal statements, objectives, and indicators. The Council will conduct a program amendment process if it is determined that adopting the objectives should be considered.	Council	New		
Identify and Organize Objectives	81	High	Wild Fish	WF 2	Consistent with the Council's quantitative objectives for adult salmon and steelhead, the Council will collect, organize, and review biological objectives for wild fish.	Council	New		
Identify and Organize Objectives	35	High	Ecosystem function, habitat, and hydrosystem objectives	OBJ-5	Step 1 The Council will identify measureable objectives in the region. The data needed for these objectives should be available and not require extensive new data-gathering efforts.	Council	New		
Identify and Organize Objectives	35	High		OBJ-6	Step 2 As soon as practicable, the Council will determine which objectives to consider as program objectives. The Council will conduct a program amendment process if it is determined that adopting the objectives should be considered.	Council	New		
Identify and Organize Objectives	36	High	Public engagement quantitative objectives	OBJ-7	The Council will initiate an internal process to identify objectives and indicators for this topic [see program strategies: public engagement]. Once the process to produce objectives is completed, the Council will seek public input to help identify the most useful objectives. The Council will conduct a program amendment process if it is determined that adopting the objectives should be considered.	Council	New		
Climate Change	57	High		CC-1	Support the development of improved runoff forecasting methods and techniques for Columbia River Basin watersheds	Federal action agencies, in coordination and collaboration with others			
Climate Change	57	High		CC-2	Work to provide early (e.g., late fall or early winter) runoff forecasts for the Columbia River Basin	Federal action agencies, in coordination and collaboration with others			
Climate Change	58	High		CC-3	Continue to encourage, monitor, and promote public awareness of pertinent climate change research and information and assess how it should influence program mitigation efforts	Federal action agencies, in coordination and collaboration with others	Ongoing		

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Climate Change	58	High		CC-4	Assess whether climate change effects are altering or are likely to alter critical river flows, water temperatures or other habitat attributes in a way that could significantly affect fish or wildlife important to this program, either directly or by affecting the success of current mitigation efforts and if so, evaluate whether alternative water management scenarios, including changes in flood control operations, could minimize the potential effects of climate change on mainstem hydrology and water temperatures	Federal action agencies, in coordination and collaboration with others			
Climate Change	58	High		CC-5	Evaluate the effectiveness and feasibility of possible actions to mitigate effects of climate change, including selective withdrawal from cool/cold water storage reservoirs to reduce water temperatures or other actions to create or protect cool water refugia in mainstem reaches or reservoirs	Federal action agencies, in coordination and collaboration with others			
Climate Change	58	High		CC-6	Identify and evaluate management and mitigation options for fish and wildlife under various climate-change scenarios	Federal action agencies, in coordination and collaboration with others			
Climate Change	58	High		CC-7	Assess and revise, if necessary, ongoing monitoring efforts to ensure collection of necessary data on key species responses, interactions, and productivity under future climate scenarios	Federal action agencies, in coordination and collaboration with others			
Climate Change	58	High		CC-8	Implement long-term habitat protections for resident fish and wildlife in the basin	Federal action agencies, in coordination and collaboration with others			
Climate Change	58	High		CC-9	Identify and implement a strategic expansion of the network of stations for surface weather and streamflow observations in high-altitude mountainous areas of the Columbia Basin	Federal action agencies, in coordination and collaboration with others			
Climate Change	58	High		CC-10	Investigate the feasibility of mitigating climate change impacts in the estuary and plume through changes in hydrosystem operations, including changes in flood-control operations	Federal action agencies, in coordination and collaboration with others			
Climate Change	58	High		CC-11	Variations in regional climate and ocean conditions play a large role in the survival of anadromous fish and other native species in the Columbia River Basin. Management actions shall strive to help those species accommodate a variety of climate and ocean conditions by providing a wide range of life history strategies. The Council supports the federal action agencies, in coordination and collaboration with others, monitoring salmon returns and climate-change impacts on ocean conditions in order to identify factors affecting survival in the near-ocean and plume environments.	Federal action agencies, in coordination and collaboration with others			
Climate Change	58	High		CC-12	The Council supports ongoing studies and development of assessment methods by the federal action agencies and others. Further, the Council requests other entities to collaborate with the federal action agencies on this work.	Federal action agencies, and others			
Climate Change	58	High		CC-13	The Council, in collaboration with the federal action agencies, shall convene one or more science/policy workshops on climate change effects in the Columbia Basin, including panels of climate change scientists, to inform an overarching climate change strategy for the Columbia Basin.	Council, in collaboration with the federal action agencies			
Climate Change	59	High		CC-14	The Council continues to encourage, monitor, and promote public awareness of pertinent climate change research and information and assess how it should influence program mitigation efforts.	Council			

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Climate Change	59	High		CC-15	The Council continues to require project sponsors to consider and plan for different climate change scenarios that could affect their work.	Council and project sponsors			
Predator Management	49	High		PM-1	The federal action agencies, in cooperation with the Council, state and federal fish and wildlife agencies, tribes, and others, should convene a technical work group to: (a) determine the effectiveness of predator-management actions; and (b) develop a common metric to measure the effects of predation on salmonids, such as salmon adult equivalents, to facilitate comparison and evaluation against other limiting factors.	Federal action agencies, Council, state and federal fish and wildlife agencies, tribes, and others			Technical Work Group
Predator Management	49	High		PM-2	The federal action agencies shall report to the Council annually on their respective predator-management efforts	Federal action agencies		Annually	
Predator Management	49	High		PM-3	The U.S. Army Corps of Engineers (the Corps) or Bonneville shall evaluate the extent of predation on lamprey at Bonneville and other upstream dams	U.S. Army Corps of Engineers or Bonneville			
Predator Management	49	High	Management of predator fish	PM-4	Bonneville should continue to annually implement and evaluate the base predator-control program and, where warranted, expand northern pikeminnow removals to other mainstem dams in the lower Columbia River (for example: expand the program to include northern pikeminnow removals at McNary and Bonneville dams).	Bonneville; The action agencies; NOAA Fisheries and the fish and wildlife agencies and tribes, Council		Annually	
Predator Management	50	High	Management of predator fish	PM-5	The federal action agencies should work cooperatively with NOAA Fisheries, U.S. Fish and Wildlife Service, states, tribes, and the Council to develop and implement systemwide strategies to manage and reduce non-native fish species that compete and feed on native fish (both anadromous and resident species) in the basin.	Federal action agencies, NOAA Fisheries, U.S. Fish and Wildlife Service, states, tribes, Council			
Predator Management	50	High	Management of predator birds	PM-6	The Council will encourage more aggressive efforts by the Corps and others to make the fullest possible use of their existing authority to remove or manage avian predation that is impacting wild fish populations.	Council, U.S. Army Corps of Engineers			
Predator Management	50	High	Management of predator birds	PM-7	The federal action agencies should, in collaboration with state and federal agencies, tribes, and other hydropower operators:	Federal action agencies, state and federal agencies, tribes, and other hydropower operators			
Predator Management	50	High	Management of predator birds	PM-7.1	PM -7.1 Continue efforts to reduce the number of Caspian terns on East Sand Island in the lower Columbia River and estuary by implementing the U.S. Fish and Wildlife Service Caspian Tern Management Plan	Federal action agencies, state and federal agencies, tribes, and other hydropower operators	Ongoing		
Predator Management	50	High	Management of predator birds	PM -7.2	PM -7.2 Develop a double-crested cormorant management plan encompassing additional research, development of a conceptual management plan, and implementation of warranted actions in the lower Columbia River and estuary	Federal action agencies, state and federal agencies, tribes, and other hydropower operators			

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Predator Management	50	High	Management of predator birds	PM -7.3	PM-7.3 Implement the avian management plans (for double-crested cormorants, Caspian terns, and other bird species) for Corps-owned lands and associated shallow-water habitat areas in the mid-Columbia area that have been developed through the Corps and other processes for predatory bird species in the Columbia River estuary. The action agencies should also develop and implement any management plans developed for double-crested cormorants, Caspian terns, and other bird species in the mid-Columbia area and prioritize actions for implementation.	Federal action agencies, state and federal agencies, tribes, and other hydropower operators			
Predator Management	50	High	Management of predator birds	PM-7.4	PM- 7.4 Implement predator-bird management actions in the Columbia River Basin in coordination with state and federal fish and wildlife agencies and tribes.	Federal action agencies, state and federal agencies, tribes, and other hydropower operators			
Predator Management	50	High	Management of predator birds	PM-8	The Corps should continue to implement and improve avian-deterrent programs at all lower Snake and Columbia River dams.	U.S. Army Corps of Engineers	Ongoing		
Predator Management	50	High	Management of predator seals and sea lions	PM-9	The Corps should:				
Predator Management	50	High	Management of predator seals and sea lions	PM-9.1	PM-9.1 Take actions to improve the exclusion of sea lions at all main adult fish ladder entrances and navigation locks at Bonneville Dam.	U.S. Army Corps of Engineers	Ongoing		
Predator Management	50	High	Management of predator seals and sea lions	PM-9.2	PM-9.2 Continue to support land- and water-based harassment efforts by NOAA Fisheries, the Oregon and Washington departments of fish and wildlife, and tribes to keep sea lions away from the area immediately downstream of Bonneville Dam.	U.S. Army Corps of Engineers, NOAA-f, ODFW, WDFW, tribes	Ongoing		
Predator Management	51	High	Management of predator seals and sea lions	PM-10	PM-10 The federal action agencies should fund federal, tribal, and state agencies to evaluate the extent of seal and sea lion predation on salmonids, sturgeon, and lamprey in the lower Columbia River from below Bonneville Dam to the mouth of the river.	Federal action agencies, federal, tribal, state agencies			
Predator Management	51	High	Management of predator seals and sea lions	PM-11	PM-11 The federal action agencies, in collaboration with the region's state and federal fish and wildlife agencies, tribes, and others, should identify opportunities and implement actions to reduce salmon, sturgeon, and lamprey losses through seal and sea lion management in the lower Columbia River and estuary.	Federal action agencies, federal, tribal, state agencies, others			
Predator Management	51	High	Management of predator seals and sea lions	PM-12	PM-12 When federal, state, or tribal managers determine that predation by seals and sea lions is causing significant adverse impacts to salmonids or other native fish, state and federal fish agencies employing lethal and non-lethal methods to manage predation shall continue the lethal methods if non-lethal methods are not successful.	Federal, state, tribal managers			

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Toxics	56	High	Toxics	TOX 3	The federal action agencies should partner with and support ongoing federal, state, tribal, and regional agencies' efforts to:	Federal action agencies			
Toxics	56	High	Toxics	TOX-3.1	TOX-3.1 Monitor, assess and map high priority toxic contaminant hot spots in the Columbia River Basin and evaluate their relationship, if any, to the development and operation of the hydrosystem	Federal action agencies			
Toxics	56	High	Toxics	TOX-3.2	TOX-3.2 Identify and assess the effects of toxic contaminants, alone or in combination with other stressors, on native fish, including sturgeon and lamprey, wildlife, and food webs in toxic hot spots in the Columbia River Basin	Federal action agencies			
Toxics	56	High	Toxics	TOX 4	The federal action agencies should partner with and support federal, state, tribal and regional agencies' efforts to conduct targeted monitoring in the Columbia River Basin of vulnerable native fish and wildlife species for specific, high-priority toxic contaminants and other priority contaminants of emerging concern, including in the middle and upper Columbia reaches and in the Snake River, and evaluate if toxic contaminants limit the reproductive success of native fish.	Federal action agencies, federal, state, tribal, regional agencies			
Non-native and Invasive Species	46	High	Evaluate potential adverse impacts	NNI-1	NNI-1 The Council, in coordination with the federal action agencies, other federal, state and tribal entities, and regional organizations such as the 100th Meridian Initiative-Columbia Basin Team (hereafter referred to as the Council and federal and other regional entities) should request regional power producers to evaluate the invasive potential and ecological risks of using non-native bioenergy feedstock species, cultivars, and hybrids.	Council, federal, state, tribal, and other regional entities			
Non-native and Invasive Species	47	High	Prevent establishment	NNI-2	NNI-2 The Council encourages federal and other regional entities to prevent non-native and invasive species introductions by:	Council, federal, state, tribal, and other regional entities			
Non-native and Invasive Species	47	High	Prevent establishment	NNI-2.1	NNI-2.1 Monitoring and managing the various pathways that could introduce additional aquatic nuisance species into the Columbia River Basin	Council, federal, state, tribal, and other regional entities			
Non-native and Invasive Species	47	High	Prevent establishment	NNI-2.2	NNI-2.2 Developing and implementing strategies to suppress, reduce, or control non-native invasive fish species where they are identified as a limiting factor and are negatively impacting salmonids and native fish populations	Council, federal, state, tribal, and other regional entities			
Non-native and Invasive Species	47	High	Prevent establishment	NNI-2.3	NNI-2.3 Develop strategies and public outreach tools to educate the public about regional prevention and management of invasive species	Council, federal, state, tribal, and other regional entities			

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Non-native and Invasive Species	47	High	Prevent establishment	NNI-3	BPA and other federal agencies should assist the Northwest states' efforts to prevent the establishment of quagga and zebra mussels.	BPA and other federal agencies, NW States			
Non-native and Invasive Species	47	High	Monitor and control non-native species introduction and dispersal	NNI-4	Each of the four Northwest states should continue to implement the preventative strategies in their respective state aquatic nuisance species management plans and coordinate their prevention efforts closely with the other Northwest states and British Columbia	Northwest states	Ongoing		
Non-native and Invasive Species	47	High	Monitor and control non-native species introduction and dispersal	NNI-5	If non-native fish species are to be used to achieve mitigation for hydropower system impacts, the agencies and tribes shall conduct an environmental risk assessment of potential negative impacts on native fish species prior to introduction.	Agencies and tribes			
Non-native and Invasive Species	47	High	Removal and eradication of non-native species	NNI-6	Agencies and tribes shall apply existing and new scientific research to identify situations (species, times, sizes, and places) where increased removal of non-native fish would be most effective in increasing native fish populations.	Agencies and tribes			
Non-native and Invasive Species	47	High	Removal and eradication of non-native species	NNI-7	Agencies and tribes shall minimize non-native fish impacts to native fish species by using appropriate invasive fish-removal methods (e.g., gill net, chemical control, electrofishing, changes in fishing regulations, sport reward programs, etc.) and monitor their effectiveness. Lethal take to control non-native predators or competitors, consistent with state and federal law, is appropriate when non-lethal methods of control are not successful and the adverse impacts to salmonids and native fish species or their habitat are significant.	Agencies and tribes			
Non-native and Invasive Species	47	High	Removal and eradication of non-native species	NNI-8	The agencies and tribes shall prioritize non-native species control actions to ensure program funds are spent to address the most significant threats, including predation, competition, and hybridization.	Agencies and tribes			
Non-native and Invasive Species	48	High	Removal and eradication of non-native species	NNI-9	If quagga and zebra mussels become established in the Columbia Basin, BPA and other federal agencies, along with FERC-licensed utilities, shall support regional rapid-response efforts.	BPA and other federal agencies, along with FERC-licensed utilities,			
Non-native and Invasive Species	48	High	Reduce competition	NNI-10	The federal action agencies, other federal and state agencies, tribes, and the Council should continue to review, evaluate, develop, and implement strategies to reduce competition from non-native fish species with juvenile and adult salmonids.	Federal action agencies, other federal and state agencies, tribes, and the Council	Ongoing		
Non-native and Invasive Species	48	High	Regional coordination	NNI-11	The Council will continue to coordinate regional stakeholder groups and partnerships on the issue of non-native invasive species, particularly those species that pose the greatest risk to the Columbia Basin ecosystem and the regional hydropower system.	Council	Ongoing		
Non-native and Invasive Species	48	High	Regional coordination	NNI-12	The Council will support the collaborative work of the PSMFC 100th Meridian Initiative-Columbia Basin Team and request regular reports	Council		Regular Reports	

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Non-native and Invasive Species	48	High	Regional coordination	NNI-13	The Council will assist regional entities with legislative efforts to prevent the invasion and control the spread of non-native invasive species in the Columbia Basin.	Council			
Non-native and Invasive Species	48	High	Regional coordination	NNI-14	The Council and federal action agencies should coordinate with other federal, state, and tribal entities, and regional organizations such as the 100th Meridian Initiative-Columbia Basin Team, to track and monitor data on existing non-native invasive species distribution and population trend assessments in the Columbia Basin and encourage regional data sharing on rapid response, prevention, containment, control, eradication, enforcement, and education and outreach efforts.	Council, federal action agencies, states, tribes, and regional organizations			
Anadromous Fish Mitigation in Blocked Areas	84	High	All blocked areas	AFM-1	The action agencies, in collaboration with state agencies and tribes, shall fund mitigation of anadromous fish losses, including strategies relying on habitat improvements, reintroductions, hatcheries, harvest opportunities, and other mitigation.	Action agencies, (state agencies, tribes)			
Anadromous Fish Mitigation in Blocked Areas	84	High	All blocked areas	AFM-2	Bonneville shall provide funding to:	Bonneville			
Anadromous Fish Mitigation in Blocked Areas	84	High	All blocked areas	AFM- 2.1	AFM- 2.1 Develop and increase opportunities for consumptive and non-consumptive resident fisheries for native, introduced, wild, and hatchery-reared stocks that are compatible with the continued persistence of native resident fish species and their restoration to near historic abundance	Bonneville			
Anadromous Fish Mitigation in Blocked Areas	84	High	All blocked areas	AFM -2.2	AFM -2.2 Consider passage projects to benefit native species	Bonneville			
Anadromous Fish Mitigation in Blocked Areas	84	High	All blocked areas	AFM- 2.3	AFM- 2.3 Expand and rebuild native fish numbers in blocked areas where habitat exists or can feasibly be restored or improved	Bonneville			
Anadromous Fish Mitigation in Blocked Areas	84	High	All blocked areas	AFM- 2.4	AFM- 2.4 Address anadromous fish losses with resident fish and wildlife, as appropriate, where full mitigation cannot be accomplished with resident fish alone	Bonneville			
Anadromous Fish Mitigation in Blocked Areas	84	High	All blocked areas	AFM- 2.5	AFM- 2.5 Protect and improve degraded fish habitat consistent with the habitat sub-strategy	Bonneville			

Strategy	Page Number	Priority	Action Type	Sub-Action Number	General Measures	Responsible Entity	New or Ongoing?	Timeframe	Forum
Anadromous Fish Mitigation in Blocked Areas	84	High	Reintroduction of anadromous fish above Chief Joseph and Grand Coulee dams to mainstem reaches and tributaries in the United States	AFM-3	Phased approach. Pursue a science-based, phased approach to investigating the reintroduction of anadromous fish above Chief Joseph and Grand Coulee dams including juvenile and adult passage at the dams. The phases shall include:	Bonneville, relevant federal action agencies, state and federal fish and wildlife agencies and tribes			
Anadromous Fish Mitigation in Blocked Areas	84	High	Reintroduction of anadromous fish above Chief Joseph and Grand Coulee dams to mainstem reaches and tributaries in the United States	AFM-4	Phase 1 (to be completed no later than the end of 2016):	Bonneville, relevant federal action agencies, state and federal fish and wildlife agencies and tribes		To be completed no later than the end of 2016	
Anadromous Fish Mitigation in Blocked Areas	84	High	Reintroduction of anadromous fish above Chief Joseph and Grand Coulee dams to mainstem reaches and tributaries in the United States	AFM-4.1	AFM-4.1 Evaluate information from passage studies at other blockages and from previous assessments of passage at Grand Coulee and Chief Joseph dams	Bonneville, relevant federal action agencies, state and federal fish and wildlife agencies and tribes			
Anadromous Fish Mitigation in Blocked Areas	85	High	Reintroduction of anadromous fish above Chief Joseph and Grand Coulee dams to mainstem reaches and tributaries in the United States	AFM-4.2	AFM-4.2 Investigate habitat availability, suitability and salmon survival potential in habitats above Grand Coulee. This might include selective releases of salmon and steelhead. Investigate the scientific feasibility and possible cost of upstream and downstream passage options for salmon and steelhead.	Bonneville, relevant federal action agencies, state and federal fish and wildlife agencies and tribes			
Anadromous Fish Mitigation in Blocked Areas	85	High	Reintroduction of anadromous fish above Chief Joseph and Grand Coulee dams to mainstem reaches and tributaries in the United States	AFM-4.3	AFM-4.3 As part of Phase 1, the Council will engage in discussions with tribal, state, and federal agencies and others regarding the purpose, scope and progress of reintroduction efforts above Chief Joseph and Grand Coulee dams.	Council, tribes, state and federal agencies, others			

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Anadromous Fish Mitigation in Blocked Areas	85	High	Reintroduction of anadromous fish above Chief Joseph and Grand Coulee dams to mainstem reaches and tributaries in the United States	AFM-5	Phase 2: AFM-5.1 Based on the results in the first phase, the Council in collaboration with the other relevant entities will decide how to proceed. Phase 2 activities may include one or more of the following: <input type="checkbox"/> design and test salmon and steelhead reintroduction strategies and interim fish passage facilities at Chief Joseph and Grand Coulee Dams <input type="checkbox"/> investigate alternative approaches to passage <input type="checkbox"/> identify additional studies necessary to advance the fish passage planning process <input type="checkbox"/> reintroduction pilot projects <input type="checkbox"/> monitoring, evaluation, and adaptive management of the Phase 2 activities	Council, other relevant entities			
Anadromous Fish Mitigation in Blocked Areas	85	High	Reintroduction of anadromous fish above Chief Joseph and Grand Coulee dams to mainstem reaches and tributaries in the United States	AFM-6	Phase 3: AFM -6.1 Based on the results of Phase 2, the Council in collaboration with the other relevant entities will decide whether and how to proceed to implement and fund reintroduction measures as a permanent part of the program, including construction and operation of passage facilities.	Council, other relevant entities			
Anadromous Fish Mitigation in Blocked Areas	85	High	Reintroduction of anadromous fish above Chief Joseph and Grand Coulee dams to mainstem reaches and tributaries in the United States	AFM- 6.2	AFM- 6.2 Monitor, evaluate, and adaptively manage the reintroduction efforts.	Council, other relevant entities			
Anadromous Fish Mitigation in Blocked Areas	85	High	Transboundary reintroduction	AFM-7	AFM - 7: The United States should pursue a joint program with Canada, with shared costs, to investigate and, if warranted, implement the reintroduction of anadromous fish on the mainstem Columbia River to Canadian spawning grounds. This joint program would proceed on an incremental basis, comparable to the phased approach described above.	United States, Canada			
Anadromous Fish Mitigation in Blocked Areas	85	High	Reintroductions above Grand Coulee to mainstem reaches and tributaries in the United States	AFM-8	Bonneville and the relevant federal action agencies, working in collaboration with state and federal fish and wildlife agencies and tribes, shall investigate and, if warranted, implement passage and reintroduction of anadromous fish into suitable habitats within the United States. This shall include:	Bonneville, relevant federal action agencies, state and federal fish and wildlife agencies and tribes			
Anadromous Fish Mitigation in Blocked Areas	85	High	Reintroductions above Grand Coulee to mainstem reaches and tributaries in the United States	AFM -8.1	AFM -8.1 Funding research associated with critical uncertainties at Chief Joseph and Grand Coulee dams required to inform Phase 1	Bonneville, relevant federal action agencies, state and federal fish and wildlife agencies and tribes			

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Anadromous Fish Mitigation in Blocked Areas	85	High	Reintroductions above Grand Coulee to mainstem reaches and tributaries in the United States	AFM-8.2	AFM -8.2 Funding work required for Phases 2 and 3 based on Council recommendations	Bonneville, relevant federal action agencies, state and federal fish and wildlife agencies and tribes			
Anadromous Fish Mitigation in Blocked Areas	86	High	Reintroductions above projects in the Willamette River Basin	AFM-9	The Corps and Bonneville should support and implement anadromous fish passage measures prioritized through the Willamette River Basin Flood Control Project Biological Opinion.	U.S. Army Corps of Engineers, Bonneville	Ongoing	May-15	WATER Steering Team
Sturgeon	91	High	Hydropower dam operations and fish passage (passage)	STU-1	The action agencies shall:	Action agencies			
Sturgeon	91	High	Hydropower dam operations and fish passage (passage)	STU- 1.1	STU- 1.1 Study the effects on downstream passage of sturgeon with and without removable spillway weirs.	Action agencies			
Sturgeon	91	High	Hydropower dam operations and fish passage (passage)	STU- 1.2	STU- 1.2 Estimate mortality by size for fish that pass over spillways and removable spillway weirs and those that pass downstream through turbines; if significant mortality is occurring, identify and evaluate the feasibility of mitigation measures.	Action agencies			
Sturgeon	91	High	Hydropower dam operations and fish passage (passage)	STU- 1.3	STU- 1.3 In general, evaluate the importance of connectivity among sturgeon populations; assess whether the mainstem dams isolate sturgeon populations; and if so, evaluate the feasibility of mitigation.	Action agencies			
Sturgeon	91	High	Hydropower dam operations and fish passage (passage)	STU- 1.4	STU- 1.4 Evaluate costs, benefits, and risks of passage improvements for sturgeon relative to other potential strategies.	Action agencies			
Sturgeon	91	High	Hydropower dam operations and fish passage (passage)	STU- 1.5	STU- 1.5 Evaluate opportunities for non-volitional passage by taking advantage of fish trapped in dewatered draft tubes or fish ladders during maintenance.	Action agencies			
Sturgeon	91	High	Hydropower dam operations and fish passage (passage)	STU- 1.6	STU- 1.6 Continue to develop, refine, and implement protocols to prevent sturgeon entrainment, dewatering, and mortality during planned maintenance activities at passage facilities.	Action agencies			

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Sturgeon	91	High	Hydropower dam operations and fish passage (passage)	STU- 1.7	STU- 1.7 Develop an operational protocol to block access by sturgeon to turbine draft tubes during turbine dewatering and start-up.	Action agencies			
Sturgeon	92	High	Research	STU-2	See research section of the adaptive management strategy				
Lamprey	95	High	Hydropower system (passage)	LAMP 1	The action agencies shall:	Action agencies			
Lamprey	95	High	Hydropower system (passage)	LAMP 1.2	LAMP 1.2 Monitor adult and juvenile lamprey passage at mainstem Columbia and Snake river and Willamette Basin hydropower dams to identify operations and lighting that delay, promote fall-back, obstruct, or kill migrating adult and juvenile lamprey (e.g. ramping rates, water elevation changes	Action agencies			
Lamprey	95	High	Hydropower system (passage)	LAMP 1.3	LAMP 1.3 Establish an interim passage standard for adult Pacific lamprey.	Action agencies			
Lamprey	95	High	Hydropower system (passage)	LAMP 1.4	LAMP 1.4 Evaluate dam passage, assess passage efficiency and direct mortality, and other metrics relating to migratory success of lamprey above dams with poor passage	Action agencies			
Lamprey	95	High	Hydropower system (passage)	LAMP 1.5	LAMP 1.5 Install lamprey-friendly passage structures for adult and juvenile lamprey	Action agencies			
Lamprey	95	High	Hydropower system (passage)	LAMP 1.6	LAMP 1.6 Monitor and report predation on adult and juvenile lamprey during passage at mainstem dams.	Action agencies			
Lamprey	95	High	Monitoring (passage)	LAMP 2	The action agencies, in coordination with agencies and tribes, shall:	Action agencies, agencies and tribes			
Lamprey	95	High	Monitoring (passage)	LAMP 2.1	LAMP 2.1 Develop a regional strategy for monitoring passage into tributaries to better understand differences in counts of adult lamprey between dams	Action agencies, agencies and tribes			
Lamprey	95	High	Monitoring (passage)	LAMP 2.2	LAMP 2.2 Report passage counts at dams annually and map lamprey distribution every five years	Action agencies, agencies and tribes		Annually (Counts), and 5 years (Map)	
Lamprey	95	High	Research	LAMP 3	See research section of the adaptive management strategy				
Subbasin Plans	108	High			The Council will identify subbasin plans most in need of an update.	Council			

Strategy	Page Number	Priority	Action Type	Sub-Action Number	General Measures	Responsible Entity	New or Ongoing?	Timeframe	Forum
Habitat	42	High	General Measures	HAB 1	Core measures of this strategy include:				
Habitat	42	High	General Measures	HAB 1.1	HAB 1.1 Removing fish-passage barriers				
Habitat	42	High	General Measures	HAB 1.2	HAB 1.2 Screening water diversions				
Habitat	42	High	General Measures	HAB 1.3	HAB 1.3 Protecting and improving riparian habitats in all areas of the Columbia River Basin				
Habitat	42	High	General Measures	HAB 1.4	HAB 1.4 Improving the amount, timing, and duration of instream flows through water rights and acquisitions				
Habitat	42	High	General Measures	HAB 1.5	HAB 1.5 Reconnecting floodplains through passive and active improvements in channel structure and geomorphology and re-establishing natural river processes				
Habitat	42	High	General Measures	HAB 1.6	HAB 1.6 Acquiring and enhancing terrestrial uplands for wildlife habitat				

Strategy	Page Number	Priority	Action Type	Sub-Action Number	General Measures	Responsible Entity	New or Ongoing?	Timeframe	Forum
Habitat	42	High	General Measures	HAB 1.7	HAB 1.7 Continuing Bonneville funding to acquire water and pursue water rights in subbasins where water quantity has been identified in subbasin plans as a primary limiting factor and where flow targets have been identified				
Habitat	42	High	Mainstem Habitat	HAB 2	The Council will consider primary mainstem habitat measures including:	Council			
Habitat	42	High	Mainstem Habitat	HAB 2.1	HAB 2.1 Coordinating actions with the flow measures intended to improve ecosystem function in the mainstem	Council			
Habitat	42	High	Mainstem Habitat	HAB 2.2	HAB 2.2 Enhancing the connections between the mainstem sections of the Columbia and Snake rivers and floodplains, side channels, and riparian zones	Council			
Habitat	42	High	Mainstem Habitat	HAB 2.3	HAB 2.3 Continuing actions to reconnect the river to its floodplains wherever possible in the mainstem, with special emphasis on the estuary and lower Columbia River	Council			
Habitat	42	High	Mainstem Habitat	HAB 2.4	HAB 2.4 Protecting and enhancing mainstem riparian areas and wetlands to protect aquatic conditions and form a transition to floodplain terrestrial areas and side channels	Council			
Habitat	42	High	Mainstem Habitat	HAB 2.5	HAB 2.5 Identifying, protecting, enhancing, and restoring the functions of alluvial river reaches in the mainstem	Council			

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Habitat	43	High	Mainstem Habitat	HAB 2.6	HAB 2.6 Excavating, creating and reconnecting additional backwater sloughs, alcoves, and side channels to the main channel	Council			
Habitat	43	High	Mainstem Habitat	HAB 2.7	HAB 2.7 Dredging/excavating lateral channels that have silted in	Council			
Habitat	43	High	Mainstem Habitat	HAB 2.8	HAB 2.8 Creating more shallow-water habitat	Council			
Habitat	43	High	Mainstem Habitat	HAB 2.9	HAB 2.9 Identifying, protecting, restoring, and managing thermal refugia for salmonid use during high water-temperature periods	Council			
Habitat	43	High	Mainstem Habitat	HAB 2.10	HAB 2.10 Acquiring and protecting lands adjacent to the mainstem critical to protecting habitat areas and local water quality	Council			
Habitat	43	High	Mainstem Habitat	HAB 2.11	HAB 2.11 Where feasible, reconnecting protected and enhanced lower tributary habitats to protected and enhanced mainstem habitats, especially in the area of productive mainstem populations	Council			
Habitat	43	High	Mainstem Habitat	HAB 2.12	HAB 2.12 Increasing the amount of spawning habitat for mainstem core populations of Chinook, coho, chum, sturgeon, and lamprey	Council			

Strategy	Page Number	Priority	Action Type	Sub-Action Number	General Measures	Responsible Entity	New or Ongoing?	Timeframe	Forum
Ecosystem Function	39	High	General Measures	EF 1	Identify and protect mainstem habitat areas and ecological functions that are relatively productive for spawning, resting, rearing, and migrating native anadromous and resident focal fish species and manage these areas to protect aquatic conditions and form a transition to floodplain terrestrial areas and side channels.				
Ecosystem Function	39	High	General Measures	EF 2	Restore and enhance habitat areas that connect to productive areas to support expansion of productive populations and to connect weaker and stronger populations so as to restore more natural population structures.				
Ecosystem Function	39	High	General Measures	EF 3	Protect, enhance, restore, and connect freshwater habitat in the mainstem and tributaries.				
Ecosystem Function	39	High	General Measures	EF 4	Protect and enhance ecological connectivity between aquatic areas, riparian zones, floodplains, side channels, and uplands.				
Ecosystem Function	39	High	General Measures	EF 5	Where feasible, reconnect protected and enhanced tributary habitats, especially in areas with productive populations.				
Ecosystem Function	39	High	General Measures	EF 6	Identify, protect, enhance, and restore the functions of alluvial river reaches.				
Ecosystem Function	39	High	General Measures	EF 7	Allow for biological diversity and complexity to increase among and within populations and species to increase ecological resilience to environmental variability and allow for greater life history and species diversity.				
Ecosystem Function	39	High	General Measures	EF 8	Manage water to provide appropriately timed streamflows that promote productive populations of anadromous fish and resident fish. Where feasible, support seasonal fluctuations in flow and quantity, while reducing large, rapid, short-term fluctuations. Ensure that any changes in water management are premised upon and proportionate to scientifically demonstrated fish and wildlife benefits.				
Ecosystem Function	39	High	General Measures	EF 9	Frame habitat restoration in the context of measured trends in water quantity and quality.				
Ecosystem Function	39	High	General Measures	EF 10	Decrease the disparity between water temperatures and the naturally occurring regimes of temperatures throughout the basin, using stored water to the extent feasible to manage water temperatures downstream from storage reservoirs where temperature benefits from releases can be shown to provide improved fish survival.				
Ecosystem Function	39	High	General Measures	EF 11	Identify, protect, enhance, restore, and connect ecosystem functions in the Columbia River estuary and near-shore ocean discharge plume as affected by actions within the Columbia River mainstem.				

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Ecosystem Function	39	High	General Measures	EF 12	Evaluate flow regulation and changes to estuary-area habitat and biological diversity to better understand the relationship between estuary ecology and near-shore plume characteristics and the productivity, abundance, and diversity of salmon and steelhead populations.				
Ecosystem Function	39	High	General Measures	EF 13	Understand the status of the Columbia River ecosystem in terms of habitat and other ecosystem features (both natural and human-caused) to better inform Council decisions.				
Ecosystem Function	40	High	General Measures	EF 14	Develop metrics of juvenile recruits-per-spawner in order to evaluate habitat effectiveness.				
Strongholds	44		General Measures	STR 1	Request states to identify stronghold areas	Council, States			
Strongholds	44		General Measures	STR 2	Consider for stronghold recognition areas designated by states and tribes in accordance with state law	Council			
Strongholds	44		General Measures	STR 3	Work with fish and wildlife agencies and tribes and others to keep up-to-date maps available for strongholds and other areas in the basin that are managed for wild fish stocks	Council, fish and wildlife agencies, tribes, others			
Strongholds	45		General Measures	STR 4	Inventory existing actions that have occurred and are occurring within identified stronghold areas as identified by the respective states of the Council	Council			
Strongholds	45		General Measures	STR 5	Support fish habitat improvement actions implemented within strongholds	Council			
Strongholds	45		General Measures	STR 6	Support actions intended to eradicate non-native and invasive species from, or prevent their introduction into, stronghold areas	Council			
Protected Areas	53		General Implementation Measures	PA	The Council expects the Federal Energy Regulatory Commission, in the exercise of its licensing authority under the Federal Power Act, to take the Council's hydroelectric development standards and protected areas designations into account to the fullest extent practicable. This includes a Council determination whether favorable or unfavorable on a petition for an exception to a protected area designation for a project proposed to have exceptional benefits for fish and wildlife. The Commission should implement the Council's decision in the Commission's licensing and exemption proceedings unless the Commission's legal responsibilities require otherwise. The Council also expects Bonneville not to acquire power from or provide transmission support for a new hydroelectric development in a manner inconsistent with the Council's designation of protected areas.	FERC, Council, Bonneville	Ongoing	As necessary	None
Water Quality	54		General Measures to address total dissolved gas and temperature	WQ 1	Federal and non-federal project operators should:	Federal and non-federal project operators			

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Water Quality	54		TDG and Temperature	WQ 1.1	WQ 1.1 Continue real-time monitoring and reporting of TDG and water temperatures measured at fixed monitoring sites in the Columbia River Basin	Federal and non-federal project operators		In real time	
Water Quality	54		TDG and Temperature	WQ 1.2	WQ 1.2 Continue to develop and implement fish passage strategies that produce less TDG, such as spillway flow deflectors, spillway weirs and surface passage outlets, including updates and improvements to the System Total Dissolved Gas (SYSTDG) model to reflect ongoing modifications to spillways or spill operations	Federal and non-federal project operators			
Water Quality	54		TDG and Temperature	WQ 1.3	WQ 1.3 Collaborate to complete the water temperature modeling capabilities in the mainstem Columbia River from Grand Coulee to McNary dams to better assess the effect of operations or flow depletions on summer water temperatures	Federal and non-federal project operators			
Water Quality	55		TDG and Temperature	WQ 2	The Corps should continue to:	U.S. Army Corps of Engineers			
Water Quality	55		TDG and Temperature	WQ 2.1	WQ 2.1 Develop and use the SYSTDG model for estimating TDG production to assist in real-time decision making for spill operations, including improved wind forecasting capabilities, as appropriate	U.S. Army Corps of Engineers			
Water Quality	55		TDG and Temperature	WQ 2.2	WQ 2.2 Develop and use the CE-QUAL-W2 model for estimating mainstem Snake River temperatures and cold-water releases from Dworshak Dam on the North Fork Clearwater River to assist in real-time decision-making for Dworshak summer operations	U.S. Army Corps of Engineers			
Water Quality	55		TDG and Temperature	WQ 3	The federal action agencies, FERC, and the non-federal project operators, in cooperation with the EPA and other federal, tribal, regional, and state agencies, should:	Federal action agencies, FERC, non-federal project operators, EPA, other federal, tribal, regional, and state agencies			
Water Quality	55		TDG and Temperature	WQ 3.1	WQ 3.1 Update and implement the Water Quality Plan for Total Dissolved Gas and Water Temperature in the Mainstem Columbia and Snake Rivers (WQP)	Federal action agencies, FERC, non-federal project operators, EPA, other federal, tribal, regional, and state agencies			
Water Quality	55		TDG and Temperature	WQ 3.2	WQ 3.2 Monitor water quality parameters and implement water quality improvement measures to reduce water temperatures and TDG to meet state, EPA-approved tribal, and federal water quality standards to improve the health, condition, and survival of anadromous and native resident fish, as well as their related spawning and rearing habitat, in the Columbia Basin	Federal action agencies, FERC, non-federal project operators, EPA, other federal, tribal, regional, and state agencies			

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Water Quality	55		TDG and Temperature	WQ 4	The federal action agencies should incorporate the provisions of various total maximum daily loads (TMDLs) as they are developed and approved into the regional Water Quality Plan, particularly TMDL provisions containing allocations affecting federal hydropower projects in the Columbia River Basin.	Federal action agencies			
Water Quality	55		TOXICS	TOX-1	To support ongoing regional efforts to identify, assess and reduce toxic contaminants in the Columbia River Basin, the Council may initiate and will participate in, support, and coordinate periodic science/policy workshops on characterizing the state of the science related to toxic contaminant issues. The Council will also assist regional parties in advancing public education and information on toxics issues.	Council			
Water Quality	55		TOXICS	TOX-2	The federal action agencies, in cooperation with the EPA and other federal, tribal, regional, and state agencies, should:	Federal action agencies, EPA, other federal, tribal, regional, and state agencies			
Water Quality	55		TOXICS	TOX -2.1	TOX -2.1 Support implementation of the regional 2010 Columbia River Basin Toxics Reduction Action Plan. Both the WQP and the Toxics Reduction Action Plan are comprehensive regional documents containing water quality monitoring, research, and improvement measures needed to enhance the survival of anadromous and native resident fish and to meet Northwest Power Act, ESA, and Clean Water Act responsibilities. The Council will continue to encourage preventive and remedial actions such as those identified by the WQP and the Toxics Reduction Action Plan.	Federal action agencies, EPA, other federal, tribal, regional, and state agencies, Council			
Water Quality	55		TOXICS	TOX -2.2	TOX -2.2 Monitor water quality parameters and implement water quality improvement measures to reduce toxic contaminants, as appropriate, to meet state, EPA-approved tribal, and federal water quality standards to improve the health, condition, and survival of anadromous and native resident fish, as well as their related spawning and rearing habitat, in the Columbia Basin	Federal action agencies, EPA, other federal, tribal, regional, and state agencies			
Water Quality	56		TOXICS	TOX -2.2	TOX -2.2 Monitor water quality parameters and implement water quality improvement measures to reduce toxic contaminants, as appropriate, to meet state, EPA-approved tribal, and federal water quality standards to improve the health, condition, and survival of anadromous and native resident fish, as well as their related spawning and rearing habitat, in the Columbia Basin	Federal action agencies, EPA, other federal, tribal, regional, and state agencies			

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Water Quality	56		TOXICS	TOX-6	Using all available water quality data, Bonneville and the other federal action agencies should continue to identify areas where aquatic habitat restoration projects implemented under the program may be affected by toxic contaminants and incorporate pollution reduction and mitigation techniques into restoration projects when toxic contamination is a concern.	Bonneville, other federal action agencies			
Water Quality	56		TOXICS	TOX-7	The Council urges Congress to provide funding, similar to the funding provided to other Large Aquatic Ecosystems, to protect and restore water quality in the Columbia River Basin, including efforts to:	Council			
Water Quality	56		TOXICS	TOX -2.2	TOX -2.2 Develop sensitive diagnostic indicators of chemical exposure and salmon health, such as biomarkers, for use in field studies in the Columbia Basin	Council			
Water Quality	56		TOXICS	TOX 7.2	TOX 7.2 Determine the extent to which toxics limit prey quality and abundance in degraded habitats and otherwise affect the food web	Council			
Water Quality	56		TOXICS	TOX 7.3	TOX 7.3 Improve understanding of contaminants of emerging concern, such as endocrine-disrupting pharmaceuticals and chemicals in personal care products, and their effects on salmonids, sturgeon, and lamprey.	Council			
Mainstem Hydrosystem Flow and Passage Operations	61		General Measures	MSH 1	The federal action agencies shall provide streamflows with appropriate timing, quantity, and water quality to promote productive populations of anadromous and resident fish, provide reservoir conditions to promote productive populations of native fish and wildlife, and manage water to protect and improve habitat conditions for all fish affected by the hydrosystem, not just listed species.	Federal action agencies			
Mainstem Hydrosystem Flow and Passage Operations	61		General Measures	MSH 2	The federal action agencies, in collaboration with state, federal, and tribal fish agencies, shall (1) design mainstem fish passage actions to protect biological diversity by benefitting a broad range of species, stocks, and life-history types, not just listed species and not just salmon and steelhead, and (2) favor solutions that best fit natural behavior patterns and river processes and increase the likelihood of adult returns. To meet the diverse needs of multiple species and allow for uncertainty, multiple passage methods are necessary at individual projects.	Federal action agencies, state, federal, and tribal fish agencies,			
Mainstem Hydrosystem Flow and Passage Operations	61		General Measures	MSH 3	The water management and fish passage actions, flow objectives, and passage standards in the current biological opinions under Section 7 of the Endangered Species Act and in the Columbia Basin Fish Accords are the baseline flow and passage measures for the Council's program.				

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Mainstem Hydrosystem Flow and Passage Operations	62		General Measures	MSH 4	The federal action agencies should collaborate with the Council, state, federal, and tribal fish agencies and the utilities before implementing flow and passage measures to protect habitat and improve survival of species not covered in the biological opinions including, for example, upper Columbia River summer and fall Chinook, upper Columbia sockeye, sturgeon, lamprey, and resident fish. The Council may convene a science/policy forum to investigate whether the baseline flow and passage operations in the FCRPS biological opinions are optimum for the needs of the non-listed fish important to the Council's program.	Federal action agencies, Council, state, federal, and tribal fish agencies and the utilities			
Mainstem Hydrosystem Flow and Passage Operations	62		General Measures	MSH 5	Following the principles of adaptive management, the federal action agencies, in collaboration with the Council, state, federal, and tribal fish agencies and the utilities, shall continue to investigate, develop, and implement flow and passage measures that improve fish life-cycle survival.	Federal action agencies, Council, state, federal, and tribal fish agencies and the utilities			
Mainstem Hydrosystem Flow and Passage Operations	62		General Measures	MSH 6	The Fish Passage Center provides technical assistance and information to the region's fish and wildlife agencies and tribes, and the public, on matters relating to the program's flow and passage measures. NOAA Fisheries and its Northwest Fisheries Science Center, the Corps, the Columbia River Data Access in Real Time (DART) Center at the University of Washington, the Pacific States Marine Fisheries Commission, and other entities also contribute and house information relevant to the implementation of the program's mainstem measures.	Fish Passage Center			
Mainstem Hydrosystem Flow and Passage Operations	63		General Measures	MSH 7	The FPC Oversight Board will annually review the FPC's performance and help assure regional accountability, data management compatibility, and program consistency. The Fish Passage Center functions include:	FPC Oversight Board			
Mainstem Hydrosystem Flow and Passage Operations	63		General Measures	MSH 7.1	MSH 7.1 Assemble, organize, make publicly available, and maintain the primary archive of the smolt monitoring program data	Fish Passage Center			
Mainstem Hydrosystem Flow and Passage Operations	63		General Measures	MSH 7.2	MSH 7.2 Participate in the development of the annual smolt monitoring program implementation plan, and assist in the implementation of the program	Fish Passage Center		Annual	

Strategy	Page Number	Priority	Action Type	Sub-Action Number	General Measures	Responsible Entity	New or Ongoing?	Timeframe	Forum
Mainstem Hydrosystem Flow and Passage Operations	63		General Measures	MSH 7.3	MSH 7.3 Assemble, organize and make publicly accessible, data from other primary sources, and conduct analyses as requested to meet the information needs of the fish and wildlife agencies, tribes, and public with respect to water management, spill, and fish passage	Fish Passage Center			
Mainstem Hydrosystem Flow and Passage Operations	63		General Measures	MSH 7.4	MSH 7.4 Provide technical information necessary to assist the agencies and tribes in formulating in-season flow and spill requests that implement the measures in the Council's program, while also assisting the agencies and tribes in making sure that operating criteria for storage reservoirs are satisfied	Fish Passage Center			
Mainstem Hydrosystem Flow and Passage Operations	63		General Measures	MSH 7.5	MSH 7.5 Provide the technical assistance necessary to coordinate recommendations for storage reservoir and river operations that, to the extent possible, avoid potential conflicts between anadromous and resident fish	Fish Passage Center			
Mainstem Hydrosystem Flow and Passage Operations	63		General Measures	MSH 7.6	MSH 7.6 Archive and make publicly accessible the data used in developing all analytical results, associating the specific data with the respective analyses	Fish Passage Center			
Mainstem Hydrosystem Flow and Passage Operations	63		Hanford Reach fall Chinook	MSH 8	The federal action agencies, in collaboration with the state, federal, and tribal agencies and the Mid-Columbia Public Utility Districts (PUDs), shall continue to reliably implement operations to protect spawning and emergence of fall Chinook in the Hanford Reach, consistent with the 2004 Hanford Reach Fall Chinook Protection Program Agreement. The parties to the agreement should report to the Council periodically to assure flow measures continue to be effective in protecting fall Chinook redds and juveniles from flow and river elevation fluctuations.	Federal action agencies, state, federal, and tribal agencies and the Mid-Columbia Public Utility Districts (PUDs),	Ongoing	Report periodically	
Mainstem Hydrosystem Flow and Passage Operations	63		Libby and Hungry Horse operations	MSH 9	The Council continues to support the federal action agencies' current reservoir operations at Libby and Hungry Horse dams as set forth in the relevant biological opinions. These include VARQ as well as spring and summer operations developed as part of the 2003 Mainstem Amendments. The Council encourages the action agencies to remove any reference to these operations as "experimental" in future biological opinions. The Council supports continued investigations to refine operations at Libby and Hungry Horse dams that improve conditions for fish near those reservoirs and do not adversely affect fish in the lower river, e.g., actions that help reservoir refill, reduce the potential for uncontrolled spill, reduce downstream flooding, and make operations mutually beneficial for the United States and Canada. Montana Fish, Wildlife & Parks should continue working with the pertinent parties to discuss proposals for adjustments to winter and spring operations at Libby and Hungry Horse dams including	Council, federal action agencies	Ongoing		

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Mainstem Hydrosystem Flow and Passage Operations	64		Albeni Falls Dam	MSH 10	To benefit native fish, the Corps shall investigate infrastructure changes at Albeni Falls Dam and habitat enhancements in areas impacted by the dam.	U.S. Army Corps of Engineers			
Mainstem Hydrosystem Flow and Passage Operations	64		Grand Coulee Dam Operations	MSH 11	The Council calls on the Bureau and NOAA Fisheries to work with the relevant federal and state fish and wildlife agencies and tribes to evaluate alternative operations and report back to the Council. The following principles should guide this evaluation:	Bureau, NOAA, relevant federal and state fish and wildlife agencies and tribes			
Mainstem Hydrosystem Flow and Passage Operations	64		Grand Coulee Dam Operations	MSH 11.1	MSH 11.1 Explore the optimum operations at Grand Coulee to provide improved conditions and survival for all the fish important to the program, including salmon and steelhead migration and rearing needs in the lower Columbia River, Hanford Reach fall Chinook spawning and emergence, and resident species in the reservoir that are critical to mitigation needs of the Spokane Tribe and others, including operations in the fall and winter that protect kokanee access and spawning.	Bureau, NOAA, relevant federal and state fish and wildlife agencies and tribes			
Mainstem Hydrosystem Flow and Passage Operations	64		Grand Coulee Dam Operations	MSH 11.2	MSH 11.2 Refilling the reservoirs by the end of June remains a high priority.	Bureau, NOAA, relevant federal and state fish and wildlife agencies and tribes			
Mainstem Hydrosystem Flow and Passage Operations	64		Grand Coulee Dam Operations	MSH 11.3	MSH 11.3 As much as possible within current operating constraints, manage the reservoir and dam discharges to minimize fluctuations and ramping rates and produce steady flows across each season and each day.	Bureau, NOAA, relevant federal and state fish and wildlife agencies and tribes			
Mainstem Hydrosystem Flow and Passage Operations	64		Hells Canyon Complex project operations	MSH 12	Idaho Power Company's Hells Canyon hydropower complex, consisting of three hydroelectric projects on the mainstem Snake River, is currently undergoing Federal Energy Regulatory Commission (FERC) re-licensing and ESA Section 7 consultation. The Council will review the outcome of the FERC proceeding and, as appropriate, include in the program relevant provisions recognizing the operations to benefit fish below the Hells Canyon Complex as part of the baseline flow measures of the program.	Council	Ongoing		FERC
Mainstem Hydrosystem Flow and Passage Operations	64		Investigate the potential to further improve ecosystem function and floodplain connectivity	MSH 13	The federal action agencies, in collaboration with state, federal, tribal agencies, and others, should continue to investigate and adjust system water management to improve ecosystem functions in the mainstem, estuary, and plume, with an emphasis on improvements in the following areas:	Federal action agencies, state, federal, tribal agencies, and others,			

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Mainstem Hydrosystem Flow and Passage Operations	64		Investigate the potential to further improve ecosystem function and floodplain connectivity	MSH 13.1	MSH 13.1 Reconnected floodplains related to river flows	Federal action agencies, state, federal, tribal agencies, and others,			
Mainstem Hydrosystem Flow and Passage Operations	64		Investigate the potential to further improve ecosystem function and floodplain connectivity	MSH 13.2	MSH 13.2 Enhanced Columbia River plume and near-shore ocean habitat	Federal action agencies, state, federal, tribal agencies, and others,			
Mainstem Hydrosystem Flow and Passage Operations	64		Investigate the potential to further improve ecosystem function and floodplain connectivity	MSH 13.3	MSH 13.3 Reduced salt water intrusion during summer and fall	Federal action agencies, state, federal, tribal agencies, and others,			
Mainstem Hydrosystem Flow and Passage Operations	64		Investigate the potential to further improve ecosystem function and floodplain connectivity	MSH 13.4	MSH 13.4 Fewer and shorter hypoxia and acidification events in the estuary	Federal action agencies, state, federal, tribal agencies, and others,			
Mainstem Hydrosystem Flow and Passage Operations	64		Investigate the potential to further improve ecosystem function and floodplain connectivity	MSH 13.5	MSH 13.5 Lower summer water temperatures	Federal action agencies, state, federal, tribal agencies, and others,			
Mainstem Hydrosystem Flow and Passage Operations	65		Mid-Columbia PUD dams	MSH 14	The program's baseline passage measures and objectives include the passage actions and performance standards identified and agreed to by the operators of the Mid-Columbia PUD projects in FERC licenses and associated agreements.				
Mainstem Hydrosystem Flow and Passage Operations	65		Juvenile fish passage	MSH 15	To maintain and improve juvenile fish passage survival, the Corps, in collaboration with state, federal, and tribal fish agencies shall select the most biologically effective combination of passage routes at each mainstem dam (including a spill level that does not exceed interim TDG standards or variances) which, when combined with other passage routes, maximizes juvenile fish survival and minimizes adult fish migration and fallback problems. In this effort, the Corps and its partners should:	U.S. Army Corps of Engineers, state, federal, and tribal fish agencies			

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Mainstem Hydrosystem Flow and Passage Operations	65		Juvenile fish passage	MSH 15.1	MSH 15.1 Continue to refine the operation of surface bypass systems at all federal mainstem dams. The focus should be on developing the most effective training-spill patterns at mainstem dams to improve juvenile fish passage and survival while not affecting adult passage. Surface passage structures and outlets are important tools to achieve the dual goals of safe juvenile fish passage and long-term compliance with Clean Water Act total dissolved gas standards.	U.S. Army Corps of Engineers, state, federal, and tribal fish agencies			
Mainstem Hydrosystem Flow and Passage Operations	65		Juvenile fish passage	MSH 15.2	MSH 15.2 Relocate juvenile fish bypass outfalls in those circumstances where there are problems with predation, tailrace egress, or other factors contributing to juvenile fish injury or mortality.	U.S. Army Corps of Engineers, state, federal, and tribal fish agencies			
Mainstem Hydrosystem Flow and Passage Operations	65		Juvenile fish passage	MSH 15.3	MSH 15.3 Install new, fish-friendly turbines or optimize turbine operations to improve juvenile fish survival.	U.S. Army Corps of Engineers, state, federal, and tribal fish agencies			
Mainstem Hydrosystem Flow and Passage Operations	65		Juvenile fish passage	MSH 15.4	MSH 15.4 Continue to investigate ways to reduce descaling of juvenile sockeye.	U.S. Army Corps of Engineers, state, federal, and tribal fish agencies	Ongoing		
Mainstem Hydrosystem Flow and Passage Operations	65		Spill	MSH 16	When making decisions regarding the timing and amount of spill, the federal action agencies should give priority to actions that (1) minimize impacts on returning adult fish; and (2) optimize in-river passage survival benefits for focal species, with particular emphasis on those species that cannot be or are not effectively transported.	Federal action agencies			
Mainstem Hydrosystem Flow and Passage Operations	65		Spill and other passage experiments	MSH 17	The Council continues to recognize the value of an experimental approach to salmon recovery in the Northwest. The Council supports the development of adaptive management experiments that address critical uncertainties related to species survival.	Council			
Mainstem Hydrosystem Flow and Passage Operations	66		Juvenile fish transportation	MSH 18	The Council recognizes the need to transport migrating juvenile salmon and steelhead under certain river conditions. The Council accepts this strategy as a means to achieve its biological objectives, where there are demonstrated benefits for fish. Implement juvenile fish transportation following adaptive management principles that consider and respond to new evidence regarding the relative life-cycle survival benefits when compared to in-river migration. Evaluation should include transportation effects on adult stray rates and the impacts of straying.	Council			

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Mainstem Hydrosystem Flow and Passage Operations	66		Adult fish passage	MSH 19	The Corps, in collaboration with the state, federal agencies and tribes, should continue to implement improvements to the adult fish passage facilities at mainstem dams to benefit salmon and steelhead, Pacific lamprey, white sturgeon, and bull trout. In particular, cool water releases from storage reservoirs should continue to be used to facilitate adult migration. Emphasis should also be placed on research, monitoring, and evaluation; increased accuracy of fish counts; assessment of conversion rates of all adult fish species of interest, including lamprey, through key mainstem reaches; installation of PIT-tag and radio-tag detectors; evaluation of escapement numbers to spawning grounds and hatcheries; research into water temperature and spill effects on fish passage; and the connection between fish passage design and fish behavior. In particular:	U.S. Army Corps of Engineers, state, federal, and tribal fish agencies			
Mainstem Hydrosystem Flow and Passage Operations	66		Adult fish passage	MSH 19.1	MSH 19.1 As a priority for the Corps' capital construction program, implement structural improvements to correct adult fish-passage problems or improve reliability of adult passage facilities and report to the Council on progress	U.S. Army Corps of Engineers			
Mainstem Hydrosystem Flow and Passage Operations	67		Adult fish passage	MSH 19.2	MSH 19.2 Install adult PIT-tag detectors at key mainstem projects or near the mouths of major tributaries that do not have them	U.S. Army Corps of Engineers			
Mainstem Hydrosystem Flow and Passage Operations	67		Adult fish passage	MSH 19.3	MSH 19.3 Improve fish-counting accuracy and utilize known-origin PIT-tagged fish to evaluate adult survival (conversion rates) through key reaches of the mainstem Snake and Columbia rivers	U.S. Army Corps of Engineers			
Mainstem Hydrosystem Flow and Passage Operations	67		Adult fish passage	MSH 19.4	MSH 19.4 Investigate the use of, or need for, surface flow outlets during the winter months to provide a safer fallback route for over-wintering steelhead and kelts	U.S. Army Corps of Engineers			
Mainstem Hydrosystem Flow and Passage Operations	67		Power system considerations	MSH 20	The Council will work with federal and non-federal operating agencies, federal and state fish and wildlife agencies and tribes to review, update, and implement procedures that accommodate power system and dam operation emergencies with the least impact on listed and non-listed fish and with consideration of protection, mitigation, and recovery objectives.	Council, federal and non-federal operating agencies, federal and state fish and wildlife agencies and tribes			

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Mainstem Hydrosystem Flow and Passage Operations	67		Power system considerations	MSH 21	Fish survival emergencies may require operations that temporarily reduce or curtail power production, which should be implemented in the most cost-effective manner possible by the federal action agencies and non-federal project operators.	Federal action agencies and non-federal project operators.			
Mainstem Hydrosystem Flow and Passage Operations	67		Power system considerations	MSH 22	The Council will investigate cost-effective power system strategies that improve ecosystem conditions for fish and wildlife, relax operational constraints adverse to fish and wildlife, and ensure the regional power system remains adequate, reliable, and economical	Council			
Estuary	68		General Measures	EST 1	The CEERP, along with the Council's estuary and Lower Columbia subbasin plans and locally developed recovery plans, will guide implementation, monitoring, and evaluation of habitat actions in the estuary.	CEERP			
Estuary	68		General Measures	EST 2	The Corps and Bonneville shall implement in partnership with fish and wildlife agencies and tribes and other organizations:	U.S. Army Corps of Engineers, Bonneville			
Estuary	68		General Measures	EST 2.1	EST 2.1 Assessments of opportunities for floodplain reconnection and removal or lowering of dikes and levees that block access to habitat, or installing fish-friendly tide gates for habitat reconnection, protection, and restoration of riparian areas and off-channel habitat	U.S. Army Corps of Engineers, Bonneville			
Estuary	68		General Measures	EST 2.2	EST 2.2 Effectiveness monitoring of habitat-restoration actions using a programmatic approach to mirror effectiveness monitoring elsewhere in the Columbia Basin	U.S. Army Corps of Engineers, Bonneville			
Estuary	68		General Measures	EST 2.3	EST 2.3 A long-term, continuous, status and trend monitoring and evaluation program for salmon, steelhead, and Pacific lamprey migration and survival that shall include monitoring habitat in the lower Columbia River, estuary, and the near-shore plume environment	U.S. Army Corps of Engineers, Bonneville			
Estuary	68		General Measures	EST 2.4	EST 2.4 Research and evaluation on the effects of flow regulation, dredging, and water quality (including toxics) on estuary habitat and food webs to better understand the relationship between estuary ecology and salmon and steelhead productivity, abundance, and diversity	U.S. Army Corps of Engineers, Bonneville			
Estuary	68		General Measures	EST 3.1	EST 3.1 Work with partners in the estuary to establish biological objectives and estuary indicators for habitat restoration and ecosystem function that will serve to prioritize future actions.	Council			

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Estuary	68		General Measures	EST 3.2	EST 3.2 Receive from Bonneville and the Corps, a summary report on the results of action-effectiveness, status, and trend monitoring and research uncertainties in March 2015. The report must provide information to help improve and substantiate the effectiveness of habitat actions implemented in the estuary by parties that do not monitor their own habitat actions.	Council, U.S. Army Corps of Engineers, Bonneville		Mar-15	
Estuary	69		General Measures	EST 3.2	EST 3.2 Receive from Bonneville and the Corps, a summary report on the results of action-effectiveness, status, and trend monitoring and research uncertainties in March 2015. The report must provide information to help improve and substantiate the effectiveness of habitat actions implemented in the estuary by parties that do not monitor their own habitat actions.	Council, U.S. Army Corps of Engineers, Bonneville			
Plume and Nearshore Ocean	70		General Measures	PLU 1	The Council supports monitoring plume and nearshore ocean conditions and in-river restoration actions to determine those actions of greatest benefit and to separate the effects of ocean-related mortality from that caused in the freshwater part of the life cycle.	Council	Ongoing	As necessary	Ocean and Plume Science and Management Forum
Plume and Nearshore Ocean	70		General Measures	PLU 2	The federal action agencies shall evaluate the effects of flow regulation on near-shore plume characteristics and salmon and steelhead productivity, abundance, and diversity.	Federal action agencies	Ongoing	As necessary	Ocean and Plume Science and Management Forum
Plume and Nearshore Ocean	70		General Measures	PLU 3	The Council supports continued monitoring of the Columbia River plume and ocean conditions, assessment of impacts on salmonid survival, and evaluation of the limits of restoration potential in the basin given variable ocean conditions. Predicting future ocean conditions and anadromous fish returns allows for adjustments to inland actions and may lead to increased survival benefits.	Council	Ongoing	As necessary	Ocean and Plume Science and Management Forum
Plume and Nearshore Ocean	71		General Measures	PLU 4	The Council supports coordination between ocean scientists and state fish and wildlife agencies and tribes to identify key uncertainties and opportunities to improve inriver management activities based on current ocean conditions.	Council	Ongoing	As necessary	Plume Science and Management Forum
Plume and Nearshore Ocean	71		General Measures	PLU 5	The Council supports efforts by the Ocean and Plume Science and Management Forum and science/policy exchanges to encourage coordination and communication between ocean researchers and fish and wildlife agencies and tribes. The Council will consider recommendations from the forum when making recommendations to Bonneville regarding implementation of this strategy.	Council	Ongoing	As necessary	Ocean and Plume Science and Management Forum
Plume and Nearshore Ocean	71		General Measures	PLU 6	The Council encourages scientists to develop an annual index of ocean survival from Bonneville Dam back to Bonneville Dam.	Council, Scientists	New	Uncertain	

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Wildlife Mitigation	72		General Measures	WL 1	Bonneville shall work with the agencies and tribes on the following measures:	Bonneville, agencies, tribes			
Wildlife Mitigation	73		General Measures	WL 1.1	WL 1.1 Where appropriate prioritization exists and agreements exist on the methodology, complete wildlife loss assessments for losses caused by operation of the hydropower projects	Bonneville, agencies, tribes	Ongoing	Nov-15	WAC
Wildlife Mitigation	73		General Measures	WL 1.2	WL 1.2 Develop and implement habitat acquisition and enhancement projects to fully mitigate for identified losses	Bonneville, agencies, tribes			
Wildlife Mitigation	73		General Measures	WL 1.3	WL 1.3 Coordinate habitat restoration and acquisition activities throughout the basin with fish mitigation and restoration efforts to promote terrestrial and aquatic area connectivity	Bonneville, agencies, tribes			
Wildlife Mitigation	73		General Measures	WL 1.4	WL 1.4 Maintain the values and characteristics of existing, restored, and created habitat	Bonneville, agencies, tribes			
Wildlife Mitigation	73		General Measures	WL 2	The Council encourages wildlife agencies and tribes to monitor and evaluate habitat and species responses to mitigation actions and develop a more standardized approach to wildlife monitoring.	Council, wildlife agencies, tribes			
Wildlife Mitigation	73		General Measures	WL 3	Bonneville and the fish and wildlife agencies and tribes will complete wildlife loss mitigation agreements for at least the remaining construction and inundation losses by 2016. In addition, for each wildlife agreement that does not already provide for long-term maintenance of the habitat, Bonneville and the applicable management agency shall propose a management plan adequate to sustain the minimum credited habitat values for the life of the project.	Bonneville, agencies, tribes		By 2016	
Wildlife Mitigation	73		General Measures	WL 4	Fish and wildlife agencies and tribes and Bonneville will reach agreement on how wildlife mitigation projects and fish mitigation projects should be credited toward identified losses.	Bonneville, fish and wildlife agencies, tribes			

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Wildlife Mitigation	73		Specific measures for habitat units	WL 5	Habitat units and the habitat evaluation procedure (HEP) methodology. The Council will continue to endorse habitat units as the preferred unit of measurement for mitigation accounting and the HEP methodology as the preferred method for estimating habitat units lost and acquired. Parties to a wildlife mitigation agreement may develop and use another method for evaluating potential mitigation actions if, in the Council's opinion, that alternative method adequately takes into account both habitat quantity and quality adequate to mitigate for the identified losses.	Council	Ongoing	Nov-15	WAC
Wildlife Mitigation	73		Specific measures for habitat units	WL 6	Allocation of habitat units. Bonneville shall work with the agencies and tribes for habitat acquired as mitigation for lost habitat units identified in Table C-4, which shall be acquired in the subbasin in which the lost units were located unless otherwise agreed by the fish and wildlife agencies and tribes in that subbasin.	Bonneville			
Wildlife Mitigation	73		Specific measures for habitat units	WL 7	Habitat enhancement credits. Habitat enhancement credits should be provided to Bonneville when habitat management activities funded by Bonneville lead to a net increase in habitat value when compared to the level identified in the baseline habitat inventory and subsequent habitat inventories. This determination shall be made through the periodic monitoring of the project site using the HEP methodology. Bonneville shall be credited for habitat enhancement efforts at a ratio of one habitat unit credited for every habitat unit gained.	Bonneville			
Wildlife Mitigation	74		Long-term agreements	WL 8	Whenever possible, Bonneville shall work with the agencies and tribes to ensure that wildlife mitigation shall take place through long-term agreements that have clear objectives, a plan for action over time, a committed level of funding that provides a substantial likelihood of achieving and sustaining the stated wildlife mitigation objectives, and provisions to ensure effective implementation with periodic monitoring and evaluation.	Bonneville, agencies, tribes			
Wildlife Mitigation	75		Wildlife Advisory Committee	WL 9	The Council recognizes the ongoing difficulties in addressing wildlife operational losses. At the same time the Council recognizes the progress that has been made in addressing this issue as the result of pilot projects on the Kootenai River. To address this issue the Council has directed its Wildlife Advisory Committee to examine the existing options and alternatives for providing mitigation for wildlife operational losses and to provide a recommendation to the Council for resolving the issue by October 1, 2015. In addition, the committee has been charged to make recommendations on the following issues:	Wildlife Advisory Committee	Ongoing	Nov-15	WAC

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Wildlife Mitigation	75		Wildlife Advisory Committee	WL 9.1	WL 9.1 The need for additional HEP reports and future HEP Team funding	Wildlife Advisory Committee	Ongoing	Nov-15	WAC
Wildlife Mitigation	75		Wildlife Advisory Committee	WL 9.2	WL 9.2 The diminishing need for HEP on new acquisitions as Bonneville completes construction and inundation mitigation	Wildlife Advisory Committee	Ongoing	Nov-15	WAC
Wildlife Mitigation	75		Wildlife Advisory Committee	WL 9.3	WL 9.3 Current regional need for follow-up HEP capacity to track project agreement compliance on many properties. That need may be influenced by (1) long-term settlements for operation and maintenance, (2) technology advances that may allow the region to more cost effectively track changes in habitat conditions using remote sensing or other techniques, and (3) species responses.	Wildlife Advisory Committee	Ongoing	Nov-15	WAC
Wildlife Mitigation	75		Wildlife Advisory Committee	WL 9.4	WL 9.4 The need for new methods to assess operational losses that incorporate the results of ongoing pilot projects. This could include technical testing and evaluation of operational loss models and methodologies, or other alternative habitat evaluation methods.	Wildlife Advisory Committee	Ongoing	Nov-15	WAC
Fish Propagation Including Hatchery Programs	78		General measures for R,M, assessment, and reporting on hatchery effectiveness	HAT 1	For Bonneville-funded hatchery programs, Bonneville shall locate and operate propagation actions to complement the present and future management activities of the region's agencies and appropriate Indian tribes, including complements to habitat improvements by supplementing native fish populations.	Bonneville			
Fish Propagation Including Hatchery Programs	78		General measures for R,M, assessment, and reporting on hatchery effectiveness	HAT 2	The Council's research plan will identify critical uncertainties related to hatchery performance in the Northwest. This includes determining the effectiveness of hatchery programs in meeting their intended purposes and minimizing adverse impacts to natural-origin fish.	Council			
Fish Propagation Including Hatchery Programs	78		General measures for R,M, assessment, and reporting on hatchery effectiveness	HAT 3	Bonneville should support the use of standardized performance measures by the agencies and tribes to inform effectiveness of various propagation strategies in meeting intended hatchery goals.	Bonneville			

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Fish Propagation Including Hatchery Programs	78		General measures for R,M, assessment, and reporting on hatchery effectiveness	HAT 4	The Council intends to use available reporting mechanisms where possible.	Council			
Fish Propagation Including Hatchery Programs	78		General measures for R,M, assessment, and reporting on hatchery effectiveness	HAT 5	The Council requests that NOAA Fisheries annually update the Council on the status of ESA reviews for state and tribal HGMPs.	NOAA		Annually	
Fish Propagation Including Hatchery Programs	78		General measures for R,M, assessment, and reporting on hatchery effectiveness	HAT 6	Where feasible, trends in abundance, productivity, distribution and, diversity of supplemented populations shall be compared to non-supplemented populations in “reference streams” before, during, and after implementation of the production effort.				
Fish Propagation Including Hatchery Programs	78		General measures for R,M, assessment, and reporting on hatchery effectiveness	HAT 7	The Council requests that NOAA advise the Council on the utility of updating the list of reference streams first identified by the Ad Hoc Supplementation Workgroup that are linked to distinct population segments (DPSs), and populations within evolutionarily significant units (ESUs).	NOAA			
Fish Propagation Including Hatchery Programs	78		General measures for R,M, assessment, and reporting on hatchery effectiveness	HAT 8	The Council also requests NOAA share with the Council the results of NOAA status reviews of Columbia Basin salmon and steelhead ESUs and DPSs as the reviews are completed.	NOAA			
Fish Propagation Including Hatchery Programs	79		General measures for R,M, assessment, and reporting on hatchery effectiveness	HAT 9	Recovery plans have been or are in the process of being developed for each of the listed salmon ESUs and steelhead DPSs in the Columbia River Basin. Each recovery plan includes or will include viability criteria, or targets that are based on the biological parameters of abundance, productivity, spatial structure, and diversity. Viability criteria, together with threats criteria, are considered when determining whether a species warrants delisting.				

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Fish Propagation Including Hatchery Programs	79		General measures for R,M, assessment, and reporting on hatchery effectiveness	HAT 10	Hatchery program implementation, monitoring, and evaluation results for all hatchery programs in the Columbia River Basin should be made electronically available and hatchery operators and funders should coordinate annual summary presentations to the Council.	Hatchery operators and funders, Council		Annual	
Fish Propagation Including Hatchery Programs	79		General measures for R,M, assessment, and reporting on hatchery effectiveness	HAT 11	Hatchery summary presentations should include adaptive management actions implemented or planned to improve effectiveness in meeting intended hatchery goals or changes in goals to meet broader basin management strategies.	Hatchery operators and funders			
Fish Propagation Including Hatchery Programs	79		General measures for R,M, assessment, and reporting on hatchery effectiveness	HAT 12	To promote a diversified approach to hatchery management, hatchery operators will aspire to improve hatchery program performance and, in coordination with agencies and tribes, will seek-out opportunities to test and monitor alternative hatchery strategies and approaches and alternative hatchery practices.	Hatchery operators, agencies, tribes			
Fish Propagation Including Hatchery Programs	79		General measures for R,M, assessment, and reporting on hatchery effectiveness	HAT 13	To facilitate compliance monitoring, agencies and tribes will monitor their hatchery programs for compliance with federal, state, and other relevant requirements and will make this information readily available.	Agencies, tribes			
Fish Propagation Including Hatchery Programs	79		General measures for R,M, assessment, and reporting on hatchery effectiveness	HAT 14	The Council continues to support PIT tagging and detection, coded wire tagging and recovery, acoustic and radio tagging and tracking, and genetic tagging and recovery. These all work together to help assure adequate effectiveness monitoring, and other monitoring as necessary, throughout fish life cycles and across various fish environments.	Council			
Fish Propagation Including Hatchery Programs	79		General measures for R,M, assessment, and reporting on hatchery effectiveness	HAT 15	In consideration of best available scientific information the Council will rely on information provided by the independent science panels and the agencies and tribes regarding hatchery science. The agencies and tribes will continue and expand their investments in research, monitoring and evaluation for the purpose of reducing uncertainties and improving hatchery performance, including developing a better understanding of the benefits and risks of hatchery programs.	Council, ISRP, ISAB, agencies, tribes			

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Wild Fish	81		General Measures	WF 1	The Council will consider the needs of wild fish in all facets of its fish and wildlife program including: hydrosystem passage, fish propagation facilities, climate change, predation, strongholds, research, carrying capacity, and habitat actions.	Council			
Hatcheries for Reintroduction	82		General Measures	HFR 1	Bonneville shall locate and operate hatcheries to re-establish salmon and steelhead where they have been extirpated, and substitute for extirpated salmon and steelhead in blocked areas.	Bonneville			
Hatcheries for Reintroduction	82		General Measures	HFR 2	The goals, objectives, timelines, benchmarks and experimental framework for reintroduced populations will be developed by the agencies and tribes and submitted to the Council.	Agencies, tribes, Council			
Resident Fish Mitigation	88		General Measures	RFM 1	Where feasible, Bonneville shall preserve, enhance, and restore native fish in native habitats.	Bonneville			
Resident Fish Mitigation	88		General Measures	RFM 2	Bonneville shall develop interim fisheries where native fisheries have been lost, or where native populations and habitats are actively being recovered, and need protection.	Bonneville			
Resident Fish Mitigation	88		General Measures	RFM 3	In areas where losses may be most effectively mitigated by acquiring interests in real property, Bonneville shall acquire fish habitat equal to the quality of habitat lost through the acquisition of appropriate interests in real property at a minimum ratio of 1:1 mitigation to lost distance or area [see guidance for resident fish settlements].	Bonneville			
Resident Fish Mitigation	88		General Measures	RFM 4	The Council will convene a work group of fish and wildlife agencies and tribes, and Bonneville, to develop a standardized methodology for habitat loss assessments to assist areas that currently do not have the capacity to complete this assessment and do not have a mitigation settlement agreement, and to ensure a consistent level of accuracy across the basin. This task force shall consider past efforts and will report to the Council quarterly on its progress toward developing a methodology.	Council, fish and wildlife agencies and tribes, Bonneville		Report Quarterly	Task Force
Resident Fish Mitigation	88		General Measures	RFM 5	Once loss assessments are completed and adopted by the Council, the Council encourages Bonneville to negotiate settlement agreements, as described in Appendix K.	Bonneville			
Resident Fish Mitigation	88		General Measures	RFM 6	Bonneville shall continue to support projects directed at other native freshwater species and the progression of these projects from a research and assessment phase into a restoration and monitoring phase	Bonneville			

Strategy	Page Number	Priority	Action Type	Sub-Action Number	General Measures	Responsible Entity	New or Ongoing?	Timeframe	Forum
Resident Fish Mitigation	88		General Measures	RFM 7	Bonneville shall support efforts to address all limiting factors affecting resident fish. This might include efforts to eradicate and suppress non-native species, research on critical uncertainties, impacts from ongoing operation of the hydrosystem, and other impacts.	Bonneville			
Resident Fish Mitigation	88		General Measures	RFM 8	Bonneville shall support evaluating the size of non-native fish populations to determine the potential effect of predation and implement a predator management program where appropriate in the Columbia Basin, for example Lake Roosevelt.	Bonneville			
Resident Fish Mitigation	89		General Measures	RFM 9	Bonneville, the Corps, and the Bureau shall restore passage for native resident fish where feasible, including at Albeni Falls Dam.	Bonneville, US Army Corps, Bureau of Reclamation			
Sturgeon	91		Hydropower dam operations and fish passage (passage)	STU-3	The action agencies shall:	Action Agencies			
Sturgeon	91		Hydropower dam operations and fish passage (passage)	STU 2.1	STU 2.1 Seek opportunities to operate the FCRPS to provide flow consistent with the needs of productive sturgeon populations including increased spring and summer flows, reduced flow fluctuations during spawning season, and spill where feasible. Recruitment in many lower Columbia River impounded areas has been positively correlated with high annual discharge during April through July.	Action Agencies			
Sturgeon	91		Hydropower dam operations and fish passage (passage)	STU 2.2	STU 2.2 Operate the hydropower system in a manner that balances needs of anadromous fish, Columbia River Basin sturgeon, and other native fish species in a way that improves the abundance and productivity of sturgeon.	Action Agencies			
Sturgeon	91		Mainstem habitat	STU-4	The action agencies, in coordination with the agencies and tribes, shall:	Action agencies, agencies, tribes			
Sturgeon	91		Mainstem habitat	STU-4.1	STU-4.1 Investigate the use of site-specific habitat measures such as substrate enhancement and channel restoration as viable alternatives for improving natural recruitment in some areas.	Action agencies, agencies, tribes			
Sturgeon	91		Mainstem habitat	STU-4.2	STU-4.2 Continue to identify, protect and restore habitat areas and ecological functions that are associated with productive spawning, resting, rearing, and migrating sturgeon.	Action agencies, agencies, tribes			

Strategy	Page Number	Priority	Action Type	Sub-Action Number	General Measures	Responsible Entity	New or Ongoing?	Timeframe	Forum
Sturgeon	91		Mainstem habitat	STU-4.3	STU-4.3 Identify the specific aspects of hydrosystem operations, such as duration of fluctuations in water releases and of water levels, which affect natural spawning, reproduction, growth, and survival of larval and juvenile fishes, and overall recruitment success of sturgeon.	Action agencies, agencies, tribes			
Sturgeon	91		Mainstem habitat	STU-4.4	STU-4.4 Conduct dredging operations in a manner minimizing operation-related mortality on sturgeon and their primary prey.	Action agencies, agencies, tribes			
Sturgeon	92		Predation	STU -5	See predator management strategy				
Sturgeon	92		Monitoring	STU-6	The action agencies, in coordination with the agencies and tribes, shall:	Action agencies, agencies, tribes			
Sturgeon	92		Monitoring	STU-6.1	STU-6.1 Monitor and evaluate white sturgeon restoration actions and population responses to environmental conditions consistent with the Columbia Basin White Sturgeon Planning Framework and the Lower Columbia River and Oregon Coast White Sturgeon Conservation Plan	Action agencies, agencies, tribes			
Sturgeon	92		Monitoring	STU-6.2	STU-6.2 Report on the status of sturgeon throughout the basin on a regular basis	Action agencies, agencies, tribes			
Sturgeon	92		Monitoring	STU-6.3	STU-6.3 Assess the effects of climate change on Columbia River Basin sturgeon populations and develop adaptation strategies to address these impacts	Action agencies, agencies, tribes			
Sturgeon	92		Monitoring	STU-6.4	STU-6.4 Support fishery monitoring and management in combination with the suite of other restoration options to mitigate for lost productivity and contribute to population rebuilding efforts in areas where harvest is warranted but where natural recruitment is currently limited and the subpopulation does not represent a unique component of the historical diversity	Action agencies, agencies, tribes			
Sturgeon	92		Monitoring	STU-6.5	STU-6.5 Develop a sturgeon spawning and rearing habitat model in the basin to quantify habitat throughout the year in conjunction with FCRPS operations	Action agencies, agencies, tribes			
Sturgeon	92		Monitoring	STU-7.6	STU-7.6 Continue to evaluate project operations on sturgeon reproductive success in each of the pools behind FCRPS and Mid-Columbia River dams.	Action agencies, agencies, tribes			
Sturgeon	92		Hatchery	STU-8	The action agencies shall:	Action agencies			
Sturgeon	92		Hatchery		STU 8.1 Continue to support the Kootenai Tribe Integrated Fish and Wildlife Program as interim measures to avoid extinction of endangered Kootenai white sturgeon	Action agencies			

Strategy	Page Number	Priority	Action Type	Sub-Action Number	General Measures	Responsible Entity	New or Ongoing?	Timeframe	Forum
Sturgeon	92		Hatchery	STU-9	The action agencies, in coordination with the agencies and tribes, shall:	Action agencies, agencies, tribes			
Sturgeon	92		Hatchery	STU-9.1	STU-9.1 Consider hatcheries for sturgeon as a mitigation strategy to supplement populations where natural recruitment is currently severely limited. When the strategy is implemented through the Council's step-review process for hatchery proposals, this strategy shall:	Action agencies, agencies, tribes			
Sturgeon	92		Hatchery	STU 9.2	STU 9.2 Be conservative and responsible in establishing protocols for source populations and numbers of hatchery fish released	Action agencies, agencies, tribes			
Sturgeon	92		Hatchery	STU 9.3	STU 9.3 Build on knowledge gained from ongoing hatchery efforts in other areas	Action agencies, agencies, tribes			
Sturgeon	92		Hatchery	STU 9.4	STU 9.4 Develop larval collection techniques for use in artificial propagation	Action agencies, agencies, tribes			
Sturgeon	92		Hatchery	STU 9.5	STU 9.5 Develop and implement improvements in rearing and release strategies	Action agencies, agencies, tribes			
Sturgeon	92		Hatchery	STU 9.6	STU 9.6 Utilize experimental hatchery releases and monitoring to assess ecological factors and population productivity limitations	Action agencies, agencies, tribes			
Sturgeon	92		Hatchery	STU 9.7	STU 9.7 Optimize hatchery production and practices consistent with monitoring natural production and environmental carrying capacity, which will most effectively be identified using an experimentally adaptive approach	Action agencies, agencies, tribes			
Sturgeon	93		Upper-Columbia specific	STU-10	The action agencies, in coordination with the agencies and tribes, shall:	Action agencies, agencies, tribes			
Sturgeon	93		Upper-Columbia specific	STU-10.1	STU-10.1 Conduct baseline population assessments to monitor hatchery and natural-origin sturgeon populations (size, abundance of age classes, age/length frequency, recruitment rate, mortality, distribution, and migration patterns, life history, habitat use, etc.); environmental factors limiting sturgeon abundance; and effectiveness of recovery measures in Lake Roosevelt from Grand Coulee Dam to the international border, including the Spokane arm of Lake Roosevelt	Action agencies, agencies, tribes			

Strategy	Page Number	Priority	Action Type	Sub-Action Number	General Measures	Responsible Entity	New or Ongoing?	Timeframe	Forum
Sturgeon	93		Upper-Columbia specific	STU-10.2	STU-10.2 Implement measures based on knowledge gained through assessments, limiting factors workshops, Upper Columbia White Sturgeon Recovery Initiative plans and Lake Roosevelt sturgeon recovery plans	Action agencies, agencies, tribes			
Sturgeon	93		Upper-Columbia specific	STU-10.3	STU-10.3 Continue interim hatchery production, including 100-percent PIT-tagging of hatchery sturgeon and 100-percent PIT-tagging and sonic tagging of broodstock collected in the upper Columbia River	Action agencies, agencies, tribes			
Lamprey	95		Hydropower system	LAMP 4	The action agencies shall:	Action agencies			
Lamprey	95		Hydropower system	LAMP 4.1	LAMP 4.1 Identify and seek opportunities to address effects of hydrosystem operations, including reservoir elevation fluctuations and an altered hydrograph on adult and juvenile lamprey	Action agencies			
Lamprey	95		Hydropower system	LAMP 4.2	LAMP 4.2 Assess the impacts of dredging on lamprey around hydropower dams and navigation facilities.	Action agencies			
Lamprey	95		Mainstem and tributary habitat	LAMP 5	The action agencies, in coordination with agencies and tribes, shall:	Action agencies, agencies, tribes			
Lamprey	95		Mainstem and tributary habitat	LAMP 5.1	LAMP 5.1 Implement instream habitat projects in a manner that minimizes mortality to lamprey by consulting the Best Management Practices for Pacific Lamprey	Action agencies, agencies, tribes			
Lamprey	95		Mainstem and tributary habitat	LAMP 5.2	LAMP 5.2 Continue to identify, protect, and restore habitat areas and ecological functions, such as stream channel complexity and function, that are associated with productive spawning, resting, rearing, and migrating lamprey	Action agencies, agencies, tribes			
Lamprey	95		Mainstem and tributary habitat	LAMP 5.3	LAMP 5.3 Install appropriate and effective juvenile lamprey screening for tributary water diversions	Action agencies, agencies, tribes			
Lamprey	95		Predation	LAMP 6	See predator management strategy				
Lamprey	95		Monitoring	LAMP 7	The action agencies, in coordination with agencies and tribes, shall:	Action agencies, agencies, tribes			
Lamprey	95		Monitoring	LAMP 7.1	LAMP 7.1 Create a monitoring framework to report on the status of lamprey in the basin on a regular basis	Action agencies, agencies, tribes			
Lamprey	95		Monitoring	LAMP 7.2	LAMP 7.2 Conduct occupancy and distribution surveys where lamprey abundance is unknown	Action agencies, agencies, tribes			
Lamprey	95		Monitoring	LAMP 7.3	LAMP 7.3 Develop tags suitable for adult and juvenile lamprey monitoring and evaluation needs	Action agencies, agencies, tribes			

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Lamprey	96		Propagation	LAMP 8	The action agencies, in coordination with the agencies and tribes, shall evaluate the potential role of lamprey propagation and translocation as a way to mitigate for lost lamprey production when passage and habitat improvements alone are insufficient to restore lamprey populations	Action agencies, agencies, tribes			
Lamprey	96		Other	LAMP 9	The action agencies, in coordination with agencies and tribes, shall:	Action agencies, agencies, tribes			
Lamprey	96		Other	LAMP 9.1	LAMP 9.1 Complete a loss assessment for lamprey	Action agencies, agencies, tribes			
Lamprey	96		Other	LAMP 9.2	LAMP 9.2 Determine the potential effects of climate change on lamprey, including the effects of increasing water temperatures and changing runoff regimes on lamprey energetics and performance	Action agencies, agencies, tribes			
Lamprey	96		Other	LAMP 9.3	LAMP 9.3 Consider vulnerability of lampreys to toxin accumulation in water and sediment and to chemical spills, and the exacerbation of such risks in the vicinity of mainstem hydroelectric dams	Action agencies, agencies, tribes			
Lamprey	96		Other	LAMP 9.4	LAMP 9.4 Include Pacific lamprey in the tables of measures associated with the Upper Willamette Conservation and Recovery Plan for Chinook Salmon in Appendix O.	Action agencies, agencies, tribes			
Eulachon	97		General Measures	EULA 1	The Council supports measures to implement the two eulachon conservation recommendations found in the 2014 Supplemental FCRPS Biological Opinion.	Council			
Eulachon	97		General Measures	EULA 2	Upon completion of a recovery plan for eulachon, the Council will incorporate appropriate information regarding eulachon into the program and reflect the importance of this species and the need for protection and mitigation to the extent affected by the hydrosystem. The Council will consider developing the following: o Biological objectives for eulachon population characteristics and habitat needs o A high-level indicator for eulachon abundance o Monitoring and evaluation of the status of eulachon and evaluation of the characteristics affecting their survival	Council			
Eulachon	97		General Measures	EULA 3	If NOAA Fisheries identifies actions for eulachon restoration, the Council will consider those as potential measures that may be implemented through proposed projects after science review and a Council recommendation to Bonneville.	NOAA, Council			

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Eulachon	97		Mainstem and hydrograph:	EULA 4.1	EULA 4.1 The Council, in collaboration with Bonneville, the Corps, NOAA Fisheries, and agencies and tribes, will help organize and facilitate a science/policy forum in 2015 to address the biological requirements of eulachon, combined with related inquiries into the relationship between flow, current hydropower dam operations, and the biological requirements of lamprey and sturgeon. The goal would be to report to the Council, NOAA Fisheries, and interested others on the state of the science, the reasonable next steps in the assessment process, and a recommendation for how to incorporate those steps into the recovery plan.	Council, Bonneville, US Army Corps, NOAA Fisheries, and agencies and tribes		2015, Science/policy forum	
Eulachon	98		Mainstem and hydrograph:	EULA 4.2	EULA 4.2 Monitor and report eulachon abundance at Bonneville Dam.	Council, Bonneville, US Army Corps, NOAA Fisheries, and agencies and tribes			
Eulachon	98		Mainstem and hydrograph:	EULA 4.3	EULA 4.3 Study the role of eulachon as an alternative prey for sea lions.	Council, Bonneville, US Army Corps, NOAA Fisheries, and agencies and tribes			
Eulachon	98		Ocean and estuary	EULA 5	Monitor and evaluate the importance of the tidal freshwater, estuary, plume and nearshore ocean environment to the recovery of eulachon in the Columbia River Basin.	Council, Bonneville, US Army Corps, NOAA Fisheries, and agencies and tribes			
Public Engagement	99		General Measures	PE 1	The Council will inform and involve the public including elected officials through print, electronic, and social media; documents posted on the Council website and made available through public websites and libraries; updates of subbasin dashboards on the Council's website; comment periods on draft fish and wildlife programs (and reports on these hearings and comments); general and specific comment periods with our subbasin partners at Council meetings, including leveraging other opportunities in addition to regular Council meetings	Council			
Public Engagement	100		General Measures	PE 2	The Council, in partnership with Bonneville and other interested parties, will publicly recognize and acknowledge entities that provide good examples of productive partnerships across social and ecological boundaries.	Council, Bonneville, other interested parties			
Public Engagement	100		General Measures	PE 3	The Council will monitor the success of its outreach and involvement efforts.	Council			
How the Program is Implemented	113		Tracking Measures	TRM	TRM 1 Bonneville, the Corps, and the Bureau, in collaboration with federal and state agencies and tribes, shall report annually to the Council and the region on the implementation of program measures.	Bonneville, US Army Corps, Bureau, federal and state agencies and tribes	New	Annually	None/RCF if necessary

Strategy	Page Number	Priority	Action Type	Sub-Action Number	General Measures	Responsible Entity	New or Ongoing?	Timeframe	Forum
Investment strategy	116		Emerging Program Priorities	EPP 1	EPP 1 The Council is providing the following guidance to Bonneville, the other federal agencies, and the region in general as to which of these new measures are emerging priorities for implementation in the next five years. During the course of the next five years, the Council anticipates that Bonneville will take the necessary steps to integrate these priorities into the program and will report annually to the Council on its progress. The Council may adjust the following ordered program priorities:	Council to Bonneville, the other federal agencies, and the region in general		Annually	
Investment Strategy	116		Bonneville funding for emerging program priorities	EPP 1.1	EPP 1.1 Bonneville should fund any new fish and wildlife obligations from identifying savings within the current program and as necessary, from additional expenditures. Savings from the current program should not compromise productive projects that are addressing needs identified in this program.	Bonneville			
Investment Strategy	116		Bonneville funding for emerging program priorities	EPP 1.2	EPP 1.2 Prior to every rate case Bonneville should report to the Council how it plans to budget for implementation of the fish and wildlife program.	Bonneville		Prior to every rate case	
Program Coordination	121		Program coordination funding		All entities receiving funding for coordination of program activities must develop a work plan detailing the coordination elements, objectives, deliverables, and budget, as well as submit annual reports on this work, based on the upcoming year's priorities as outlined in the annual forum.	Regional Coordination entities		Annually	
Program Coordination	121		Coordination with other regional programs		The Council will continue to pursue opportunities to implement the program in coordination with other federal, state, tribal, Canadian, and volunteer fish and wildlife restoration programs. The Council will continue to work with national programs that influence our work in the basin. The Council will coordinate with organizations that track and monitor data on non-native species distribution, climate change, and human population change at the Northwest regional scale. There are also ongoing efforts to monitor trends in Northwest habitat quality, ocean conditions, and fish and wildlife that the Council will continue to track and participate in on an ongoing basis as it affects our program work. Continued coordination with these larger efforts is important as their products and reports can directly influence our work in the basin and help to guide decision-making	Council, federal, state, tribal, Canadian, and volunteer fish and wildlife restoration programs.			
Independent Scientific and Economic Review	123		ISRP		The ISRP reviews individual projects in the context of the program and makes recommendations on matters related to those projects.	ISRP			

Strategy	Page Number	Priority	Action Type	Sub-Action Number	General Measures	Responsible Entity	New or Ongoing?	Timeframe	Forum
Independent Scientific and Economic Review	124		ISRP and peer review groups have responsibilities in three areas:		Review projects proposed for Bonneville funding to implement the Council's program:	ISRP			
Independent Scientific and Economic Review	124		ISRP and peer review groups have responsibilities in three areas:		Review program results:	ISRP			
Independent Scientific and Economic Review	124		ISRP and peer review groups have responsibilities in three areas:		Review projects funded through Bonneville's reimbursable program:	ISRP			
Independent Scientific and Economic Review	123		ISAB		The ISAB provides advice to the region on key scientific issues affecting Columbia River Basin fish and wildlife with the intent to avoid gridlock over scientific uncertainty, circumvent unnecessary additional research, and resolve conflicting advice and opinions on recovery issues and measures.	ISAB			
Independent Scientific and Economic Review	124		ISAB		Evaluate the fish and wildlife program on its scientific merits in time to inform amendments to the program and before the Council requests recommendations from the region	ISAB			
Independent Scientific and Economic Review	124		ISAB		Evaluate NOAA Fisheries' recovery plans for Columbia River Basin stocks and aspects of the recovery process when requested	ISAB			
Independent Scientific and Economic Review	124		ISAB		Provide scientific advice and review of topics identified as critical to fish recovery and conservation in the Columbia River Basin	ISAB			
Independent Scientific and Economic Review	124		ISAB		Evaluate the scientific merits of plans and measures proposed to ensure satisfaction and continuation of tribal treaty fishing rights in the Columbia River Basin and other tribal efforts to restore and manage fish and wildlife resources	ISAB			

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Independent Scientific and Economic Review	124		ISAB		Provide specific scientific advice on topics and questions requested from the region or the ISAB and approved by majority vote of the Council's, NOAA Fisheries', and the tribes' representatives overseeing the ISAB's administration.	ISAB			
Independent Scientific and Economic Review	123		IEAB	IEAB-1	The Independent Economic Advisory Board advises the Council on the economics of issues within the Council's statutory responsibilities.	IEAB			
Independent Scientific and Economic Review	125		IEAB	IEAB-2	Advising the Council on the appropriate methods of economic analysis for proposed fish protection and mitigation measures and projects as well as other issues within the Council's statutory responsibilities. This advice will include the appropriate role and limits of economic analysis in making policy decisions and, where applicable, the associated economic costs and benefits of those decisions. The Independent Economic Analysis Board will fulfill this role by:	IEAB			
Independent Scientific and Economic Review	126		IEAB	IEAB 2.1	IEAB 2.1 Interacting as an advisory committee with the Council regarding methods of economic analysis for alternative fish recovery measures and other issues, including economic costs and benefits, within the Council's statutory responsibilities	IEAB			
Independent Scientific and Economic Review	125		IEAB	IEAB 2.2	IEAB 2.2 Assisting the Council to evaluate new analytical tools, and advising on the most appropriate study designs	IEAB			
Independent Scientific and Economic Review	125		IEAB	IEAB 2.3	IEAB 2.3 Helping to identify sources of information and data	IEAB			
Independent Scientific and Economic Review	125		IEAB	IEAB 2.4	IEAB 2.4 Performing specific tasks assigned by the Council on a cost reimbursement basis	IEAB			
Independent Scientific and Economic Review	125		IEAB	IEAB 2.5	IEAB 2.5 Assisting in the review and interpretation of study results	IEAB			

Strategy	Page Number	Priority	Action Type	Sub-Action Number	General Measures	Responsible Entity	New or Ongoing?	Timeframe	Forum
Appendix C. Wildlife mitigation priorities, construction and inundation loss assessments, and dam licensing	145		WL Mitigation	APP C-1	APP C-1 Bonneville and wildlife agencies and tribes: Ensure that wildlife mitigation projects implemented in fulfillment of this program consider the basinwide implementation priorities described in Tables C-1, C-2 and C-3, below.....The Council requests the Wildlife Advisory Committee revisit and update the priorities, if necessary, and report to the Council....	Bonneville and wildlife agencies and tribes; WAC	Ongoing	Nov-15	WAC
Appendix C. Wildlife mitigation priorities, construction and inundation loss assessments, and dam licensing considerations	152		WL Mitigation in dam licensing decisions	APP C-3.1	APP C-3.1 Federal Energy Regulatory Commission Non-federal hydroelectric projects are licensed by the Federal Energy Regulatory Commission. The Northwest Power Act and the Electric Consumers Protection Act of 1986 require the Federal Energy Regulatory Commission to give equal consideration to the protection, mitigation of damage to, and enhancement of wildlife in licensing and relicensing decisions. In developing license conditions, take into account to the fullest extent practicable the policies established in this section, and the measures taken by Bonneville and others to implement this section. In particular, it is important to take into account the mitigation efforts at federal projects undertaken pursuant to this section, to ensure that license conditions are consistent with and complement these wildlife mitigation projects and contribute fully and proportionately to regional wildlife mitigation goals.	FERC			
Appendix C. Wildlife mitigation priorities, construction and inundation loss assessments, and dam licensing	152		WL Mitigation in dam licensing decisions	APP C-3.2	APP-C 3.2 Council The Council will monitor the Federal Energy Regulatory Commission licensing and relicensing proceedings and comment or intervene where appropriate.	Council			
Appendix F. Future hydropower electric development and licensing, and protected areas	163		General Measures - Standards for new hydroelectric development and licensing:	PROT 1 Potential effects on fish	PROT 1 The Federal Energy Regulatory Commission, Corps of Engineers, Bureau of Reclamation and Bonneville shall not license, exempt from license, relicense, propose, recommend, agree to acquire or wheel power from, grant billing credits for, or otherwise support any hydroelectric development in the Columbia River Basin without specifically providing for these development conditions:	FERC, US Army Corps, Bureau of Reclamation and Bonneville			

Strategy	Page Number	Priority	Action Type	Sub-Action Number	General Measures	Responsible Entity	New or Ongoing?	Timeframe	Forum
Appendix F. Future hydropower electric development and licensing, and protected areas	163		General Measures - Standards for new hydroelectric development and licensing:	PROT 1 Potential effects on fish	PROT 1.1 Consultation with the fish and wildlife agencies and tribes and the Council throughout study, design, construction, and operation of the project PROT 1.2 Development of specific plans for flows and fish facilities prior to construction PROT 1.3 Use of the best available means for aiding downstream and upstream passage of anadromous and resident fish PROT 1.4 Provision of Columbia and Snake river flows and reservoir levels of sufficient quantity and quality to protect spawning, incubation, rearing, and migration PROT 1.5 Full compensation for unavoidable fish losses or fish habitat losses through habitat restoration or replacement, appropriate production, or similar measures consistent with the provisions of this program	FERC, US Army Corps, Bureau of Reclamation and Bonneville, fish and wildlife agencies and tribes and the Council			
Appendix F. Future hydropower electric development and licensing, and protected areas	164		General Measures - Standards for new hydroelectric development and licensing:	PROT 1 Potential effects on fish	PROT 1.6 Assurance that the project will not inundate the usual and accustomed, traditional, or contemporary fishing places of any tribe without tribal approval PROT 1.7 Assurance that the project will not degrade fish habitat or reduce numbers of fish in such a way that the exercise of treaty or executive-order tribal rights will be diminished PROT 1.8 Assurance that all fish protection measures are fully operational at the time the project begins operation	FERC, US Army Corps, Bureau of Reclamation and Bonneville, fish and wildlife agencies and tribes and the Council			
Appendix F. Future hydropower electric development and licensing, and protected areas	164		General Measures - Standards for new hydroelectric development and licensing:	PROT 1 Potential effects on fish	PROT 1.9 Assurance that the project developer will collect data needed to monitor and evaluate the results of the fish protection efforts PROT 1.10 Assurance that the project will not degrade water quality beyond the point necessary to sustain sensitive fish species (as designated in consultation with the fish and wildlife agencies and tribes).	FERC, US Army Corps, Bureau of Reclamation and Bonneville, fish and wildlife agencies and tribes and the Council			
Appendix F. Future hydropower electric development and licensing, and protected areas	164		General Measures - Standards for new hydroelectric development and licensing:	PROT 2 Potential effects on wildlife	PROT 2 The Federal Energy Regulatory Commission, Corps of Engineers, Bureau of Reclamation and Bonneville shall not license, relicense, exempt from license, propose, recommend, agree to acquire or wheel power from, grant billing credits for, or otherwise support any hydroelectric development in the Columbia River Basin without specifically providing for these development conditions:	FERC, US Army Corps, Bureau of Reclamation and Bonneville			

Strategy	Page Number	Priority	Action Type	Sub-Action Number	General Measures	Responsible Entity	New or Ongoing?	Timeframe	Forum
Appendix F. Future hydropower electric development and licensing, and protected areas	164		General Measures - Standards for new hydroelectric development and licensing:	PROT 2 Potential effects on wildlife	<p>PROT 2.1 Consulting with fish and wildlife agencies and tribes and the Council throughout study, design, construction and operation of the project</p> <p>PROT 2.2 Avoiding inundation of wildlife habitat, insofar as practical</p> <p>PROT 2.3 Timing construction activities, insofar as practical, to reduce adverse effects on nesting and wintering grounds</p> <p>PROT 2.4 Locating temporary access roads in areas to be inundated</p> <p>PROT 2.5 Constructing sub-impoundments and using all suitable excavated material to create islands, if appropriate, before the reservoir is filled</p> <p>PROT 2.6 Avoiding all unnecessary or premature clearing of land before filling the reservoir</p> <p>PROT 2.7 Providing artificial nest structures when appropriate</p> <p>PROT 2.8 Avoiding construction, insofar as practical, within 250 meters of active raptor nests</p>	FERC, US Army Corps, Bureau of Reclamation and Bonneville, fish and wildlife agencies and tribes and the Council			
Appendix F. Future hydropower electric development and licensing, and protected areas	165		General Measures - Standards for new hydroelectric development and licensing:	PROT 2 Potential effects on wildlife	<p>PROT 2.9 Avoiding critical riparian habitat (as designated in consultation with the fish and wildlife agencies and tribes) when clearing, rip-rapping, dredging, disposing of spoils and wastes, constructing diversions, and relocating structures and facilities</p> <p>PROT 2.10 Replacing riparian vegetation if natural revegetation is inadequate</p> <p>PROT 2.11 Creating sub-impoundments by diking backwater slough areas, creating islands and nesting areas</p> <p>PROT 2.12 Regulating water levels to reduce adverse effects on wildlife during critical wildlife periods (as defined in consultation with the fish and wildlife agencies and tribes)</p> <p>PROT 2.13 Improving the wildlife capacity of undisturbed portions of new project areas (through such activities as managing vegetation, reducing disturbance, and supplying food, cover and water) as compensation for otherwise unmitigated harm to wildlife and wildlife habitat in other parts of the project area</p>	FERC, US Army Corps, Bureau of Reclamation and Bonneville			
Appendix F. Future hydropower electric development and licensing, and protected areas			General Measures - Standards for new hydroelectric development and licensing:	PROT 2 Potential effects on wildlife	<p>PROT 2.14 Acquiring land or management rights, such as conservation easements, where necessary to compensate for lost wildlife habitat at the same time other project land is acquired and including the associated costs in project cost estimates</p> <p>PROT 2.15 Funding operation and management of the acquired wildlife land for the life of the project</p> <p>PROT 2.16 Granting management easement rights on the acquired wildlife lands to appropriate management entities</p> <p>PROT 2.17 Collecting data needed to monitor and evaluate the results of the wildlife protection efforts</p> <p>PROT 2.18 Assuring that the project will not inundate the usual and accustomed, traditional or contemporary hunting places of any tribe without tribal approval</p> <p>PROT 2.19 Assuring that the project will not degrade wildlife habitat or reduce numbers of wildlife in such a way that the exercise of treaty or executive order tribal rights will be diminished</p>	FERC, US Army Corps, Bureau of Reclamation and Bonneville			

Strategy	Page Number	Priority	Action Type	Sub-Action Number	General Measures	Responsible Entity	New or Ongoing?	Timeframe	Forum
Appendix F. Future hydropower electric development and licensing, and protected areas			General Measures - Standards for new hydroelectric development and licensing:	PROT 2 Potential effects on wildlife	PROT 2.1 Ensure that all licenses for hydroelectric projects or documents that propose, recommend, or otherwise support hydroelectric development explain in detail how the provisions of this section will be accomplished or the reasons why the provisions cannot be incorporated into the project.	FERC, US Army Corps, Bureau of Reclamation and Bonneville			
Appendix F. Future hydropower electric development and licensing, and protected areas	166		Implementing Protected Areas	PROT 3	PROT 3.1 Bonneville Power Administration o Shall not acquire power from hydroelectric projects located in protected areas. The Council believes that the Long-Term Intertie Access Policy's reliance on protected areas is consistent with the Council's power plan and Fish and Wildlife Program as they apply to fish and wildlife in the Columbia River Basin. The Council continues to recommend that Bonneville adopt a similar policy with respect to protected areas outside the Columbia River Basin.	Bonneville			
Appendix F. Future hydropower electric development and licensing, and protected areas	167		FERC	PROT 3.2	PROT 3.2 Federal Energy Regulatory Commission o Under the Northwest Power Act, the Federal Energy Regulatory Commission, and all other federal agencies responsible for managing, operating, or regulating federal or non-federal hydroelectric facilities located on the Columbia River or its tributaries are required to take protected area designations into account to the fullest extent practicable at all relevant stages of decision-making processes. The Council recognizes that the Federal Energy Regulatory Commission makes licensing and exemption decisions for nonfederal projects, and does not expect that the Commission will abandon its normal processes with regard to projects located in protected areas. Rather, consistent with Section 4(h)(11) of the Northwest Power Act, the Council expects that the Federal Energy Regulatory Commission will take the Council's judgment into account, and implement that judgment in licensing and exemption decisions unless the Federal Energy Regulatory Commission's legal responsibilities require otherwise.	FERC			
Appendix F. Future hydropower electric development and licensing, and protected areas	170		General Implementation Measures	PROT 4	PROT 4.1 Shall review simultaneously all applications or proposals for hydroelectric development in a single river drainage, through consolidated hearings, environmental impact statements or assessments, or other appropriate methods. This review shall assess cumulative environmental effects of existing and proposed hydroelectric development on fish and wildlife.	Federal project operators and regulators			

Strategy	Page Number	Priority	Action Type	Sub-Action Number	General Measures	Responsible Entity	New or Ongoing?	Timeframe	Forum
Appendix F. Future hydropower electric development and licensing, and protected areas	170		Federal Energy Regulatory Commission	PROT 5	PROT 5 Shall require all applicants for licenses (including license renewals, amendments, and exemptions) and preliminary permits in the Columbia River Basin to demonstrate in their applications how the proposed project would take this program into account to the fullest extent practicable. FERC also shall provide the Council with copies of all applications for licenses (including license renewals, amendments, and exemptions) and preliminary permits in the Columbia River Basin so that the Council can comment in a timely manner on the consistency of the proposed project with this fish and wildlife program. This provision is not intended to supplant review of such applications by the fish and wildlife agencies and tribes.	FERC			
Appendix F. Future hydropower electric development and licensing, and protected areas	170		Federal land managers, federal and state fish and wildlife agencies and other state agencies	PROT 6	PROT 6 Federal and state fish and wildlife agencies and federal resource agencies shall incorporate pertinent elements of the fish and wildlife program in the terms and conditions they apply to projects exempted from licensing under Federal Energy Regulatory Commission exemption procedures. The Council also requests that federal land managers incorporate the development provisions of this program into their permit procedures related to hydroelectric development on lands they manage. And the Council requests that state agencies that grant permits for hydroelectric projects also apply these principles.	Federal land managers, federal and state fish and wildlife agencies and other state agencies			
Appendix F. Future hydropower electric development and licensing, and protected areas	171		Corps of Engineers, Bureau of Reclamation, and any other federal agency studying or proposing hydroelectric development in the Columbia River Basin	PROT 7	PROT 7 Shall provide opportunity for Council review and comment.	U.S. Army Corps of Engineers, Bureau of Reclamation, and any other federal agency studying or proposing hydroelectric development in the Columbia River Basin			
Appendix K. Resident fish mitigation settlements	178		RFSA	RFSA 1	RFSA 1.1 The Bonneville Power Administration will require, wherever possible, that resident fish mitigation agreements through habitat acquisitions include a management plan with clear objectives; a plan for action over time; a committed level of funding that ensures long term maintenance to sustain the stated mitigation objectives; and provisions to ensure effective implementation with periodic monitoring and evaluation.	Bonneville			

ANNUAL ACTIONS											
Strategy	Page Number	Priority	Action Type	Sub-Action Number	General Measures	Responsible Entity	New or Ongoing?	Timeframe	Milestones	Products	Status
Lamprey	95	High	Monitoring (passage)	LAMP 2.2	LAMP 2.2 Report passage counts at dams annually and map lamprey distribution every five years	Action agencies, agencies and tribes		Annually (Counts), and 5 years (Map)			
Implement Adaptive Management	102	High	Monitoring	M-2	Bonneville will ensure that all monitoring projects report the accuracy and precision of their data.	Bonneville		Annual			
Implement Adaptive Management	104	High	Research	RES-4	Bonneville will report annually to the Council on the publications resulting from program research	Bonneville		Annually	Annual Report from BPA	Publications resulting from program research	
Implement Adaptive Management	105	High	Reporting	RPT-1	Bonneville should require all research, monitoring, and evaluation projects, including hatchery programs, to report annually, providing an electronic summary of their results and interim findings, as well as the benefits to fish and wildlife. A high priority is to separate research reports from monitoring reports. The former should address hypotheses and critical uncertainties and the latter should provide important data about implementation, status, and trends. As appropriate, action effectiveness should be reported as part of research and monitoring reports.	Bonneville	Ongoing	Annually	Annual reports for all research, M&E, and hatchery programs to include summary of results, interim findings, and benefits to fish and wildlife; research reports are separate from monitoring reports; research reports include hypotheses and critical uncertainties addressed; M&E to include data regarding implementation and status and trend information. As appropriate, action effectiveness should be reported as part of research and monitoring reports.	Electronic summary of the results and interim findings, including benefits to fish and wildlife, for all research, M&E, and hatchery programs	Template was presented to the Council at the 4 November 2014 Council meeting. Template memo attached: http://www.nwcouncil.org/media/7148417/2.pdf ; Some project sponsors are using the template for reports this year(2014), with BPA requiring that all research and monitoring projects utilize the template next year. ; The Council has developed a letter to the ISAB requesting their assistance in updating the research plan (in conjunction with NOAA and the tribes)
Implement Adaptive Management	102	High	Monitoring	M-4	Consistent with the goals and objectives section of this program, Bonneville should report annually on the number of juvenile fish released each year; the number of adults that contribute to harvest, are used for broodstock, and are present on the spawning grounds for all hatchery programs that receive Bonneville funding. Bonneville also should provide support to ensure that all managers have the capacity to collect this data and should support regional processes that standardize the data, facilitate reporting, and make this data publicly accessible.	Bonneville	New	Annually. The first report should be submitted in December 2014.		Annual Report from BPA	
Implement Adaptive Management	103	High	Monitoring	M-6	Bonneville should identify preferred methods to guide future data collection and report back to the Council annually. The Council will request the ISAB or ISRP to review the methods identified by Bonneville, and based on its review, the Council will adopt methods into the program.	Bonneville (Council, ISRP, ISAB)		Annually	BPA identifies preferred methods, reports annually to the Council; ISRP or ISAB review of products; NPCC adoption of methods	Council adopted methods for data collection	

Strategy	Page Number	Priority	Action Type	Sub-Action Number	General Measures	Responsible Entity	New or Ongoing?	Timeframe	Milestones	Products	Status
Implement Adaptive Management	106	High	Reporting	RPT-2	Bonneville should continue working with the Council to implement a concise, useful template for annual reports for research and monitoring projects that can replace other more cumbersome, more costly, and less useful reports for individual projects. The Council will continue to work with Bonneville and the ISRP to identify and assemble the information needed to produce an annual summary of results for Council review.	Bonneville, Council, ISRP	Ongoing	Annually	Reporting template that the Council and BPA agree on that results in the identification and assembly of information to produce an annual summary of results for Council review.	The Council will continue to work with Bonneville and the ISRP to identify and assemble the information needed to produce an annual summary of results for Council review.	
How the Program is Implemented	113		Tracking Measures	TRM	TRM 1 Bonneville, the Corps, and the Bureau, in collaboration with federal and state agencies and tribes, shall report annually to the Council and the region on the implementation of program measures.	Bonneville, US Army Corps, Bureau, federal and state agencies and tribes	New	Annually			
Predator Management	49	High	Management of predator fish	PM-4	Bonneville should continue to annually implement and evaluate the base predator-control program and, where warranted, expand northern pikeminnow removals to other mainstem dams in the lower Columbia River (for example: expand the program to include northern pikeminnow removals at McNary and Bonneville dams).	Bonneville; The action agencies; NOAA Fisheries and the fish and wildlife agencies and tribes, Council		Annually	BPA ~implement and evaluate the base predator-control program and, where warranted, expand northern pikeminnow removals to other mainstem dams in the lower Columbia River; ~Action Agencies: evaluate annually the biological and cost effectiveness of focused pikeminnow removals for these expanded dam angling efforts and	Scoping of focused pikeminnow removals at other mainstem dams in the lower Columbia River will be based on evaluations and adaptive management principles with input from NOAA Fisheries and the fish and wildlife agencies and tribes and the Council.	
Investment strategy	200	High		IS- 5	Annual symposiums will be convened by the Council to ensure collaboration and efficiencies are achieved by all parties seeking to protect past investments in fish and wildlife by Bonneville and the action agencies under the program.	Council	New	Annual Symposiums	Annual Symposium		
Investment strategy	116		Emerging Program Priorities	EPP 1	EPP 1The Council is providing the following guidance to Bonneville, the other federal agencies, and the region in general as to which of these new measures are emerging priorities for implementation in the next five years. During the course of the next five years, the Council anticipates that Bonneville will take the necessary steps to integrate these priorities into the program and will report annually to the Council on its progress. The Council may adjust the following ordered program priorities:	Council to Bonneville, the other federal agencies, and the region in general		Annually			
Implement Adaptive Management	106	High	Reporting	RPT-4	The Council, with the assistance of agencies, tribes and others, will maintain the program's dashboard and the HLI website report, and also will produce other reports as appropriate, such as one that tracks annual anadromous fish forecasts and actual run sizes. The Council expects others to provide data and reports to the Council on a regular basis and make them available to the public [see Reporting Appendix L for a list of Council-requested reports]. This will provide easy access for the public and allow the Council to review the accuracy of the pre-season run-size estimates.	Council, with the assistance of agencies, tribes and others	Ongoing	Annually, and as appropriate		The Council expects others to provide data and reports to the Council on a regular basis and make them available to the public . This will provide easy access for the public and allow the Council to review the accuracy of the pre-season run-size estimates.	

Strategy	Page Number	Priority	Action Type	Sub-Action Number	General Measures	Responsible Entity	New or Ongoing?	Timeframe	Milestones	Products	Status
Investment strategy	199	High		IS- 2	The federal action agencies shall define the comprehensive maintenance costs by fish and wildlife investment types for both the direct and reimbursable aspects of the program. Anticipated costs should be developed year by year within a 20-year timeframe and be provided annually to the Council.	Federal action agencies	New	Annual			
Predator Management	49	High		PM-2	The federal action agencies shall report to the Council annually on their respective predator-management efforts	Federal action agencies		Annually		Report to the Council annually on their respective predator-management efforts	
Mainstem Hydrosystem Flow and Passage Operations	63		General Measures	MSH 7.2	MSH 7.2 Participate in the development of the annual smolt monitoring program implementation plan, and assist in the implementation of the program	Fish Passage Center		Annual			
Fish Propagation Including Hatchery Programs	79		General measures for R,M, assessment, and reporting on hatchery effectiveness	HAT 10	Hatchery program implementation, monitoring, and evaluation results for all hatchery programs in the Columbia River Basin should be made electronically available and hatchery operators and funders should coordinate annual summary presentations to the Council.	Hatchery operators and funders, Council		Annual			
Fish Propagation Including Hatchery Programs	78		General measures for R,M, assessment, and reporting on hatchery effectiveness	HAT 5	The Council requests that NOAA Fisheries annually update the Council on the status of ESA reviews for state and tribal HGMPs.	NOAA		Annually			
Program Coordination	121		Program coordination funding		All entities receiving funding for coordination of program activities must develop a work plan detailing the coordination elements, objectives, deliverables, and budget, as well as submit annual reports on this work, based on the upcoming year's priorities as outlined in the annual forum.	Regional Coordination entities		Annually			

SPECIFIC DEADLINES												
Strategy	Page Number	Priority	Action Type	Sub-Action Number	General Measures	Responsible Entity	New or Ongoing?	Timeframe	Forum	Milestones	Products	Status
Implement Adaptive Management	104	High	Research	RES -1	The Council will, with federal and state fish and wildlife agencies and tribes review and update its research plan every three years beginning in 2014.	Council, ISRP/ISAB (with federal and state fish and wildlife agencies and tribes)	new/ongoing	Beginning 2014, then every three years		1) begin with an update of how previous research funds were allocated to particular categories and critical uncertainties; The Independent Scientific Review Panel and the Independent Scientific Advisory Board will assist with updating the critical	Updated Research Plan	Letter sent to ISRP/ISAB 2/23/2015
Estuary	68		General Measures	EST 3.2	EST 3.2 Receive from Bonneville and the Corps, a summary report on the results of action-effectiveness, status, and trend monitoring and research uncertainties in March 2015. The report must provide information to help improve and substantiate the effectiveness of habitat actions implemented in the estuary by parties that do not monitor their own habitat actions.	Council, U.S. Army Corps of Engineers, Bonneville		Mar-15				
Anadromous Fish Mitigation in Blocked Areas	86	High	Reintroductions above projects in the Willamette River Basin	AFM-9	The Corps and Bonneville should support and implement anadromous fish passage measures prioritized through the Willamette River Basin Flood Control Project Biological Opinion.	U.S. Army Corps of Engineers, Bonneville	Ongoing	May-15	WATER Steering Team	Willamette Biological Opinion timelines	Configuration and Operations Plan (COP) from the Corps and Bonneville that will guide the passage actions for the North and South Santiam, McKenzie and Middle Fork Willamette	COP is in draft and being reviewed by NMFS and US Fish and Wildlife Service. Will be shared with ODFW and other members of the WATER Steering Team once negotiations with NMFS and US Fish
Wildlife Mitigation	73		General Measures	WL 1.1	WL 1.1 Where appropriate prioritization exists and agreements exist on the methodology, complete wildlife loss assessments for losses caused by operation of the hydropower projects	Bonneville, agencies, tribes	Ongoing	Nov-15	WAC	Method for quantifying operational (perhaps secondary?) losses	Report to Council on operational losses	Will be discussed by WAC throughout spring and summer in
Wildlife Mitigation	73		Specific measures for habitat units	WL 5	Habitat units and the habitat evaluation procedure (HEP) methodology. The Council will continue to endorse habitat units as the preferred unit of measurement for mitigation accounting and the HEP methodology as the preferred method for estimating habitat units lost and acquired. Parties to a wildlife	Council	Ongoing	Nov-15	WAC	Report on the continued use of HEP methodology or change in status of HEP to Committee and Council from the WAC	Report to Council	WAC has not discussed byut will begin consideration of the matter in April or May WAC meeting

Strategy	Page Number	Priority	Action Type	Sub-Action Number	General Measures	Responsible Entity	New or Ongoing?	Timeframe	Forum	Milestones	Products	Status
Wildlife Mitigation	75		Wildlife Advisory Committee	WL 9	The Council recognizes the ongoing difficulties in addressing wildlife operational losses. At the same time the Council recognizes the progress that has been made in addressing this issue as the result of pilot projects on the Kootenai River. To address this issue the Council has directed its Wildlife Advisory Committee to examine the existing options and	Wildlife Advisory Committee	Ongoing	Nov-15	WAC	Method for quantifying operational (perhaps secondary?) losses	Report to Council on operational losses	Will be discussed by WAC throughout spring and summer in
Wildlife Mitigation	75		Wildlife Advisory Committee	WL 9.1	WL 9.1 The need for additional HEP reports and future HEP Team funding	Wildlife Advisory Committee	Ongoing	Nov-15	WAC	Report on the continued use of HEP methodology or change in status of HEP to Committee and Council from the WAC	Report to Council	WAC has not discussed byut will begin consideration of the matter in April or May WAC meeting
Wildlife Mitigation	75		Wildlife Advisory Committee	WL 9.2	WL 9.2 The diminishing need for HEP on new acquisitions as Bonneville completes construction and inundation mitigation	Wildlife Advisory Committee	Ongoing	Nov-15	WAC	Report on the continued use of HEP methodology or change in status of HEP to Committee and Council from the WAC	Report to Council	WAC has not discussed byut will begin consideration of the matter in April or May WAC meeting
Wildlife Mitigation	75		Wildlife Advisory Committee	WL 9.3	WL 9.3 Current regional need for follow-up HEP capacity to track project agreement compliance on many properties. That need may be influenced by (1) long-term settlements for operation and maintenance, (2) technology advances that may allow the region to more cost effectively track changes in habitat conditions using remote	Wildlife Advisory Committee	Ongoing	Nov-15	WAC	Report on the continued use of HEP methodology or change in status of HEP to Committee and Council from the WAC	Report to Council	WAC has not discussed byut will begin consideration of the matter in April or May WAC meeting
Wildlife Mitigation	75		Wildlife Advisory Committee	WL 9.4	WL 9.4 The need for new methods to assess operational losses that incorporate the results of ongoing pilot projects. This could include technical testing and evaluation of operational loss models and methodologies, or other alternative habitat evaluation methods.	Wildlife Advisory Committee	Ongoing	Nov-15	WAC	Method for quantifying operational (perhaps secondary?) losses	Report to Council on operational losses	Will be discussed by WAC throughout spring and summer in
Appendix C --Wildlife mitigation priorities, construction and inundation loss assessments, and dam licensing considerations	145		WL Mitigation	APP C-1	APP C-1 Bonneville and wildlife agencies and tribes: Ensure that wildlife mitigation projects implemented in fulfillment of this program consider the basinwide implementation priorities described in Tables C-1, C-2 and C-3, below.....The Council requests the Wildlife Advisory Committee revisit and update the priorities, if necessary, and report to the Council....	Bonneville and wildlife agencies and tribes; WAC	Ongoing	Nov-15	WAC	Priorities identified/affirmed	Report to Council	Not clear at this time. Might be discussed in WAC this year.

Strategy	Page Number	Priority	Action Type	Sub-Action Number	General Measures	Responsible Entity	New or Ongoing?	Timeframe	Forum	Milestones	Products	Status
Eulachon	97		Mainstem and hydrograph:	EULA 4	EULA 4.1 The Council, in collaboration with Bonneville, the Corps, NOAA Fisheries, and agencies and tribes, will help organize and facilitate a science/policy forum in 2015 to address the biological requirements of eulachon, combined with related inquiries into the relationship between flow, current hydropower dam operations, and the biological	Council, Bonneville, US Army Corps, NOAA Fisheries, and agencies and tribes		2015, Science/policy forum				
Identify and Organize Objectives	33	High	Objectives for adult salmon and steelhead	OBJ-1	Objectives that represent different perspectives on healthy and harvestable populations already exist. The Council will work with state and federal agencies and tribes in the region to collect, organize, review, and report on these quantitative objectives by the end of 2015.	Council will work with state and federal agencies and tribes in the region	New	By the end of 2015		This effort should include a review of agency and tribal management plans, draft and final federal recovery plans, subbasin plans and other relevant documents and reports. The Council will rely on the agencies and tribes to identify "best source" locations of	The final report will include, but not be limited to, an inventory of non-ESA listed populations of salmon and steelhead that lack federal recovery objectives.	
Wildlife Mitigation	73		General Measures	WL 3	agencies and tribes will complete wildlife loss mitigation agreements for at least the remaining construction and inundation losses by 2016. In addition, for each wildlife agreement that does not already provide for long-term maintenance of the habitat, Bonneville and the applicable	Bonneville, agencies, tribes		By 2016				
Anadromous Fish Mitigation in Blocked Areas	84	High	Reintroduction of anadromous fish above Chief Joseph and Grand Coulee dams to mainstem reaches and tributaries in the United States	AFM- 4	Phase 1 (to be completed no later than the end of 2016):	Bonneville, relevant federal action agencies, state and federal fish and wildlife agencies and tribes		To be completed no later than the end of 2016				
Resident Fish Mitigation	88		General Measures	RFM 4	of fish and wildlife agencies and tribes, and Bonneville, to develop a standardized methodology for habitat loss assessments to assist areas that currently do not have the capacity to complete this assessment and do not have a mitigation settlement agreement, and to ensure a consistent level of accuracy across the basin. This task force shall consider past efforts	Council, fish and wildlife agencies and tribes, Bonneville		Report Quarterly	Task Force			

Strategy	Page Number	Priority	Action Type	Sub-Action Number	General Measures	Responsible Entity	New or Ongoing?	Timeframe	Forum	Milestones	Products	Status
Implement Adaptive Management	103	High	Monitoring	M-9	For projects assessing species and habitat conditions in intensively monitored watersheds, Bonneville will require the project sponsors to provide information on the condition of these watersheds at least every three years in a format that can be used by the Council.	Bonneville and IMW projects (Council)	Ongoing	At least every three years			Report from the project sponsors to provide information on the condition of these watersheds at least every three years in a format that can be used by the Council.	
Implement Adaptive Management	104	High	Research	RES-5	accomplishments of intensively monitored watersheds and the Integrated Status and Effectiveness Monitoring Project to ensure that it is cost-effective and produces useful results.	Council		During project review		Council review		
Water Quality	54		TDG and Temperature		WQ 1.1 Continue real-time monitoring and reporting of TDG and water temperatures measured at fixed monitoring sites in the Columbia River Basin	Federal and non-federal project operators		In real time				
Implement Adaptive Management	106	High	Reporting	RPT-3	The Council, with the assistance of agencies, tribes and others, will periodically review and update the high-level indicators report to communicate accomplishments to Congress, the region's governors, legislators, and citizens of the Northwest. When the Council completes its work on biological	Council, with the assistance of agencies, tribes and others	Ongoing	Periodic review and update			When the Council completes its work on biological objectives, it will update its high-level indicators to ensure they are consistent with these objectives.	
Investment Strategy	116		Bonneville funding for emerging program priorities	EPP 1.2	EPP 1.2 Prior to every rate case Bonneville should report to the Council how it plans to budget for implementation of the fish and wildlife program.	Bonneville		Prior to every rate case				
Non-native and Invasive Species	48	High	Regional coordination	NNI-12	The Council will support the collaborative work of the PSMFC 100th Meridian Initiative-Columbia Basin Team and request regular reports	Council		Regular Reports			regular reports from that group on the following items: current regional efforts for inspection and decontamination; early detection efforts and rapid response	

Strategy	Page Number	Priority	Action Type	Sub-Action Number	General Measures	Responsible Entity	New or Ongoing?	Timeframe	Forum	Milestones	Products	Status
Mainstem Hydrosystem Flow and Passage Operations	63		Hanford Reach fall Chinook	MSH 8	The federal action agencies, in collaboration with the state, federal, and tribal agencies and the Mid-Columbia Public Utility Districts (PUDs), shall continue to reliably implement operations to protect spawning and emergence of fall Chinook in the Hanford Reach, consistent with the 2004 Hanford Reach Fall Chinook Protection Program Agreement. The parties to the agreement should report to the Council periodically to assure flow measures continue to be effective in protecting fall Chinook redds and juveniles from flow and river elevation fluctuations.	Federal action agencies, state, federal, and tribal agencies and the Mid-Columbia Public Utility Districts (PUDs),	Ongoing	Report periodically				
Protected Areas	53		General Implementation Measures	PA	The Council expects the Federal Energy Regulatory Commission, in the exercise of its licensing authority under the Federal Power Act, to take the Council's hydroelectric development standards and protected areas designations into account to the fullest extent practicable. This includes a Council determination whether favorable or unfavorable on a petition for an exception to a protected area designation for a project proposed to have exceptional benefits for fish and wildlife. The Commission should	FERC, Council, Bonneville	Ongoing	As necessary	None			Ongoing monitoring of FERC related activities in protected areas.
Plume and Nearshore Ocean	70		General Measures	PLU 1	The Council supports monitoring plume and nearshore ocean conditions and in-river restoration actions to determine those actions of greatest benefit and to separate the effects of ocean-related mortality from that caused in the freshwater part of the life cycle.	Council	Ongoing	As necessary	Ocean and Plume Science and Management Forum			
Plume and Nearshore Ocean	70		General Measures	PLU 2	The federal action agencies shall evaluate the effects of flow regulation on near-shore plume characteristics and salmon and steelhead productivity, abundance, and diversity.	Federal action agencies	Ongoing	As necessary	Ocean and Plume Science and Management Forum			

Strategy	Page Number	Priority	Action Type	Sub-Action Number	General Measures	Responsible Entity	New or Ongoing?	Timeframe	Forum	Milestones	Products	Status
Plume and Nearshore Ocean	70		General Measures	PLU 3	The Council supports continued monitoring of the Columbia River plume and ocean conditions, assessment of impacts on salmonid survival, and evaluation of the limits of restoration potential in the basin given variable ocean conditions. Predicting future ocean conditions and anadromous fish returns allows for adjustments to inland actions and may lead to increased survival benefits.	Council	Ongoing	As necessary	Ocean and Plume Science and Management Forum			
Plume and Nearshore Ocean	71		General Measures	PLU 4	The Council supports coordination between ocean scientists and state fish and wildlife agencies and tribes to identify key uncertainties and opportunities to improve inriver management activities based on current ocean conditions.	Council	Ongoing	As necessary	Ocean and Plume Science and Management Forum			
Plume and Nearshore Ocean	71		General Measures	PLU 5	Ocean and Plume Science and Management Forum and science/policy exchanges to encourage coordination and communication between ocean researchers and fish and wildlife agencies and tribes. The Council will consider recommendations from the forum when making recommendations to Bonneville	Council	Ongoing	As necessary	Ocean and Plume Science and Management Forum			
Implement Adaptive Management	104	High	Research	RES-3	Bonneville should ensure that all contracts for research projects, including those covered by funding agreements, identify an end date.	BPA	new	BPA contracting			End date identified in all Bonneville-funded contracts for all research projects.	

RESPONSIBLE ENTITY ACTIONS -ALL												
Strategy	Page Number	Priority	Action Type	Sub-Action Number	General Measures	Responsible Entity	New or Ongoing?	Timeframe	Forum	Milestones	Products	Status
Sturgeon	91	High	Hydropower dam operations and fish passage (passage)	STU- 1.1	STU- 1.1 Study the effects on downstream passage of sturgeon with and without removable spillway weirs.	Action agencies						
Sturgeon	91	High	Hydropower dam operations and fish passage (passage)	STU- 1.2	STU- 1.2 Estimate mortality by size for fish that pass over spillways and removable spillway weirs and those that pass downstream through turbines; if significant mortality is occurring, identify and evaluate the feasibility of mitigation measures.	Action agencies						
Sturgeon	91	High	Hydropower dam operations and fish passage (passage)	STU- 1.3	STU- 1.3 In general, evaluate the importance of connectivity among sturgeon populations; assess whether the mainstem dams isolate sturgeon populations; and if so, evaluate the feasibility of mitigation.	Action agencies						
Sturgeon	91	High	Hydropower dam operations and fish passage (passage)	STU- 1.4	STU- 1.4 Evaluate costs, benefits, and risks of passage improvements for sturgeon relative to other potential strategies.	Action agencies						
Sturgeon	91	High	Hydropower dam operations and fish passage (passage)	STU- 1.5	STU- 1.5 Evaluate opportunities for non-volitional passage by taking advantage of fish trapped in dewatered draft tubes or fish ladders during maintenance.	Action agencies						
Sturgeon	91	High	Hydropower dam operations and fish passage (passage)	STU- 1.6	STU- 1.6 Continue to develop, refine, and implement protocols to prevent sturgeon entrainment, dewatering, and mortality during planned maintenance activities at passage facilities.	Action agencies						
Sturgeon	91	High	Hydropower dam operations and fish passage (passage)	STU- 1.7	STU- 1.7 Develop an operational protocol to block access by sturgeon to turbine draft tubes during turbine dewatering and start-up.	Action agencies						
Lamprey	95	High	Hydropower system (passage)	LAMP 1.2	LAMP 1.2 Monitor adult and juvenile lamprey passage at mainstem Columbia and Snake river and Willamette Basin hydropower dams to identify operations and lighting that delay, promote fall-back, obstruct, or kill migrating adult and juvenile lamprey (e.g. ramping rates, water elevation changes)	Action agencies						
Lamprey	95	High	Hydropower system (passage)	LAMP 1.3	LAMP 1.3 Establish an interim passage standard for adult Pacific lamprey.	Action agencies						
Lamprey	95	High	Hydropower system (passage)	LAMP 1.4	LAMP 1.4 Evaluate dam passage, assess passage efficiency and direct mortality, and other metrics relating to migratory success of lamprey above dams with poor passage	Action agencies						

Strategy	Page Number	Priority	Action Type	Sub-Action Number	General Measures	Responsible Entity	New or Ongoing?	Timeframe	Forum	Milestones	Products	Status
Lamprey	95	High	Hydropower system (passage)	LAMP 1.5	LAMP 1.5 Install lamprey-friendly passage structures for adult and juvenile lamprey	Action agencies						
Lamprey	95	High	Hydropower system (passage)	LAMP 1.6	LAMP 1.6 Monitor and report predation on adult and juvenile lamprey during passage at mainstem dams.	Action agencies						
Sturgeon	91		Hydropower dam operations and fish passage (passage)	STU 2.1	STU 2.1 Seek opportunities to operate the FCRPS to provide flow consistent with the needs of productive sturgeon populations including increased spring and summer flows, reduced flow fluctuations during spawning	Action Agencies						
Sturgeon	91		Hydropower dam operations and fish passage (passage)	STU 2.2	STU 2.2 Operate the hydropower system in a manner that balances needs of anadromous fish, Columbia River Basin sturgeon, and other native fish species in a way that improves the abundance and productivity of sturgeon.	Action Agencies						
Sturgeon	92		Hatchery	STU 8.1	STU 8.1 Continue to support the Kootenai Tribe Integrated Fish and Wildlife Program as interim measures to avoid extinction of endangered Kootenai white sturgeon	Action agencies						
Lamprey	95		Hydropower system	LAMP 4.1	LAMP 4.1 Identify and seek opportunities to address effects of hydrosystem operations, including reservoir elevation fluctuations and an altered hydrograph on adult and juvenile lamprey	Action agencies						
Lamprey	95		Hydropower system	LAMP 4.2	LAMP 4.2 Assess the impacts of dredging on lamprey around hydropower dams and navigation facilities.	Action agencies						
Anadromous Fish Mitigation in Blocked Areas	84	High	All blocked areas	AFM-1	The action agencies, in collaboration with state agencies and tribes, shall fund mitigation of anadromous fish losses, including strategies relying on habitat improvements, reintroductions, hatcheries, harvest opportunities, and other mitigation.	Action agencies, (state agencies, tribes)						
Lamprey	95	High	Monitoring (passage)	LAMP 2	The action agencies, in coordination with agencies and tribes, shall:	Action agencies, agencies and tribes						
Lamprey	95	High	Monitoring (passage)	LAMP 2.1	LAMP 2.1 Develop a regional strategy for monitoring passage into tributaries to better understand differences in counts of adult lamprey between dams	Action agencies, agencies and tribes						
Lamprey	95	High	Monitoring (passage)	LAMP 2.2	LAMP 2.2 Report passage counts at dams annually and map lamprey distribution every five years	Action agencies, agencies and tribes		Annually (Counts), and 5 years (Map)				
Sturgeon	91		Mainstem habitat	STU-4	The action agencies, in coordination with the agencies and tribes, shall:	Action agencies, agencies, tribes						

Strategy	Page Number	Priority	Action Type	Sub-Action Number	General Measures	Responsible Entity	New or Ongoing?	Timeframe	Forum	Milestones	Products	Status
Sturgeon	91		Mainstem habitat	STU-4.1	STU-4.1 Investigate the use of site-specific habitat measures such as substrate enhancement and channel restoration as viable alternatives for improving natural recruitment in some areas.	Action agencies, agencies, tribes						
Sturgeon	91		Mainstem habitat	STU-4.2	STU-4.2 Continue to identify, protect and restore habitat areas and ecological functions that are associated with productive spawning, resting, rearing, and migrating sturgeon.	Action agencies, agencies, tribes						
Sturgeon	91		Mainstem habitat	STU-4.3	STU-4.3 Identify the specific aspects of hydrosystem operations, such as duration of fluctuations in water releases and of water levels, which affect natural spawning, reproduction, growth, and survival of larval and juvenile	Action agencies, agencies, tribes						
Sturgeon	91		Mainstem habitat	STU-4.4	STU-4.4 Conduct dredging operations in a manner minimizing operation-related mortality on sturgeon and their primary prey.	Action agencies, agencies, tribes						
Sturgeon	92		Monitoring	STU-6	The action agencies, in coordination with the agencies and tribes, shall:	Action agencies, agencies, tribes						
Sturgeon	92		Monitoring	STU-6.1	STU-6.1 Monitor and evaluate white sturgeon restoration actions and population responses to environmental conditions consistent with the Columbia Basin White Sturgeon Planning Framework and the Lower Columbia River and Oregon Coast White Sturgeon Conservation Plan	Action agencies, agencies, tribes						
Sturgeon	92		Monitoring	STU-6.2	STU-6.2 Report on the status of sturgeon throughout the basin on a regular basis	Action agencies, agencies, tribes						
Sturgeon	92		Monitoring	STU-6.3	STU-6.3 Assess the effects of climate change on Columbia River Basin sturgeon populations and develop adaptation strategies to address these impacts	Action agencies, agencies, tribes						
Sturgeon	92		Monitoring	STU-6.4	STU-6.4 Support fishery monitoring and management in combination with the suite of other restoration options to mitigate for lost productivity and contribute to population rebuilding efforts in areas where harvest is warranted but where natural recruitment is currently limited and the subpopulation does not represent a unique component of the historical diversity	Action agencies, agencies, tribes						
Sturgeon	92		Monitoring	STU-6.5	STU-6.5 Develop a sturgeon spawning and rearing habitat model in the basin to quantify habitat throughout the year in conjunction with FCRPS operations	Action agencies, agencies, tribes						

Strategy	Page Number	Priority	Action Type	Sub-Action Number	General Measures	Responsible Entity	New or Ongoing?	Timeframe	Forum	Milestones	Products	Status
Sturgeon	92		Monitoring	STU-7.6	STU-7.6 Continue to evaluate project operations on sturgeon reproductive success in each of the pools behind FCRPS and Mid-Columbia River dams.	Action agencies, agencies, tribes						
Sturgeon	92		Hatchery	STU-9	The action agencies, in coordination with the agencies and tribes, shall:	Action agencies, agencies, tribes						
Sturgeon	92		Hatchery	STU-9.1	STU-9.1 Consider hatcheries for sturgeon as a mitigation strategy to supplement populations where natural recruitment is currently severely limited. When the strategy is implemented through the Council's step-review process for hatchery proposals, this strategy shall:	Action agencies, agencies, tribes						
Sturgeon	92		Hatchery	STU 9.2	STU 9.2 Be conservative and responsible in establishing protocols for source populations and numbers of hatchery fish released	Action agencies, agencies, tribes						
Sturgeon	92		Hatchery	STU 9.3	STU 9.3 Build on knowledge gained from ongoing hatchery efforts in other areas	Action agencies, agencies, tribes						
Sturgeon	92		Hatchery	STU 9.4	STU 9.4 Develop larval collection techniques for use in artificial propagation	Action agencies, agencies, tribes						
Sturgeon	92		Hatchery	STU 9.5	STU 9.5 Develop and implement improvements in rearing and release strategies	Action agencies, agencies, tribes						
Sturgeon	92		Hatchery	STU 9.6	STU 9.6 Utilize experimental hatchery releases and monitoring to assess ecological factors and population productivity limitations	Action agencies, agencies, tribes						
Sturgeon	92		Hatchery	STU 9.7	STU 9.7 Optimize hatchery production and practices consistent with monitoring natural production and environmental carrying capacity, which will most effectively be identified using an experimentally adaptive approach	Action agencies, agencies, tribes						
Sturgeon	93		Upper-Columbia specific	STU-10	The action agencies, in coordination with the agencies and tribes, shall:	Action agencies, agencies, tribes						

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Sturgeon	93		Upper-Columbia specific	STU-10.1	STU-10.1 Conduct baseline population assessments to monitor hatchery and natural-origin sturgeon populations (size, abundance of age classes, age/length frequency, recruitment rate, mortality, distribution, and migration patterns, life history, habitat use, etc.); environmental factors limiting sturgeon abundance; and effectiveness of recovery measures in Lake Roosevelt from Grand Coulee Dam to the international border, including the Spokane arm of Lake Roosevelt	Action agencies, agencies, tribes						
Sturgeon	93		Upper-Columbia specific	STU-10.2	STU-10.2 Implement measures based on knowledge gained through assessments, limiting factors workshops, Upper Columbia White Sturgeon Recovery Initiative plans and Lake Roosevelt sturgeon recovery plans	Action agencies, agencies, tribes						
Sturgeon	93		Upper-Columbia specific	STU-10.3	STU-10.3 Continue interim hatchery production, including 100-percent PIT-tagging of hatchery sturgeon and 100-percent PIT-tagging and sonic tagging of broodstock collected in the upper Columbia River	Action agencies, agencies, tribes						
Lamprey	95		Mainstem and tributary habitat	LAMP 5	The action agencies, in coordination with agencies and tribes, shall:	Action agencies, agencies, tribes						
Lamprey	95		Mainstem and tributary habitat	LAMP 5.1	LAMP 5.1 Implement instream habitat projects in a manner that minimizes mortality to lamprey by consulting the Best Management Practices for Pacific Lamprey	Action agencies, agencies, tribes						
Lamprey	95		Mainstem and tributary habitat	LAMP 5.2	LAMP 5.2 Continue to identify, protect, and restore habitat areas and ecological functions, such as stream channel complexity and function, that are associated with productive spawning, resting, rearing, and migrating lamprey	Action agencies, agencies, tribes						
Lamprey	95		Mainstem and tributary habitat	LAMP 5.3	LAMP 5.3 Install appropriate and effective juvenile lamprey screening for tributary water diversions	Action agencies, agencies, tribes						
Lamprey	95		Monitoring	LAMP 7	The action agencies, in coordination with agencies and tribes, shall:	Action agencies, agencies, tribes						
Lamprey	95		Monitoring	LAMP 7.1	LAMP 7.1 Create a monitoring framework to report on the status of lamprey in the basin on a regular basis	Action agencies, agencies, tribes						
Lamprey	95		Monitoring	LAMP 7.2	LAMP 7.2 Conduct occupancy and distribution surveys where lamprey abundance is unknown	Action agencies, agencies, tribes						

Strategy	Page Number	Priority	Action Type	Sub-Action Number	General Measures	Responsible Entity	New or Ongoing?	Timeframe	Forum	Milestones	Products	Status
Lamprey	95		Monitoring	LAMP 7.3	LAMP 7.3 Develop tags suitable for adult and juvenile lamprey monitoring and evaluation needs	Action agencies, agencies, tribes						
Lamprey	96		Propagation	LAMP 8	The action agencies, in coordination with the agencies and tribes, shall evaluate the potential role of lamprey propagation and translocation as a way to mitigate for lost lamprey production when passage and habitat improvements alone are insufficient to restore lamprey populations	Action agencies, agencies, tribes						
Lamprey	96		Other	LAMP 9	The action agencies, in coordination with agencies and tribes, shall:	Action agencies, agencies, tribes						
Lamprey	96		Other	LAMP 9.1	LAMP 9.1 Complete a loss assessment for lamprey	Action agencies, agencies, tribes						
Lamprey	96		Other	LAMP 9.2	LAMP 9.2 Determine the potential effects of climate change on lamprey, including the effects of increasing water temperatures and changing runoff regimes on lamprey energetics and performance	Action agencies, agencies, tribes						
Lamprey	96		Other	LAMP 9.3	LAMP 9.3 Consider vulnerability of lampreys to toxin accumulation in water and sediment and to chemical spills, and the exacerbation of such risks in the vicinity of mainstem hydroelectric dams	Action agencies, agencies, tribes						
Lamprey	96		Other	LAMP 9.4	LAMP 9.4 Include Pacific lamprey in the tables of measures associated with the Upper Willamette Conservation and Recovery Plan for Chinook Salmon in Appendix O.	Action agencies, agencies, tribes						
Non-native and Invasive Species	47	High	Monitor and control non-native species introduction and dispersal	NNI-5	If non-native fish species are to be used to achieve mitigation for hydropower system impacts, the agencies and tribes shall conduct an environmental risk assessment of potential negative impacts on native fish species prior to introduction.	Agencies and tribes					If non-native fish species are introduced, these shall be managed to maximize the use of available existing	
Non-native and Invasive Species	47	High	Removal and eradication of non-native species	NNI-6	Agencies and tribes shall apply existing and new scientific research to identify situations (species, times, sizes, and places) where increased removal of non-native fish would be most effective in increasing native fish populations.	Agencies and tribes						

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Non-native and Invasive Species	47	High	Removal and eradication of non-native species	NNI-7	Agencies and tribes shall minimize non-native fish impacts to native fish species by using appropriate invasive fish-removal methods (e.g., gill net, chemical control, electrofishing, changes in fishing regulations, sport reward programs, etc.) and monitor their effectiveness. Lethal take to control non-native predators or competitors, consistent with state and federal law, is appropriate when non-lethal methods of control are not successful and the adverse impacts to salmonids and native fish species or their habitat are significant.	Agencies and tribes						
Non-native and Invasive Species	47	High	Removal and eradication of non-native species	NNI-8	The agencies and tribes shall prioritize non-native species control actions to ensure program funds are spent to address the most significant threats, including predation, competition, and hybridization.	Agencies and tribes						
Fish Propagation Including Hatchery Programs	79		General measures for R,M, assessment, and reporting on hatchery effectiveness	HAT 13	To facilitate compliance monitoring, agencies and tribes will monitor their hatchery programs for compliance with federal, state, and other relevant requirements and will make this information readily available.	Agencies, tribes						
Hatcheries for Reintroduction	82		General Measures	HFR 2	The goals, objectives, timelines, benchmarks and experimental framework for reintroduced populations will be developed by the agencies and tribes and submitted to the Council.	Agencies, tribes, Council						
Implement Adaptive Management	102	High	Monitoring	M-2	Bonneville will ensure that all monitoring projects report the accuracy and precision of their data.	Bonneville		Annual				
Implement Adaptive Management	102	High	Monitoring	M-3	Bonneville should continue to support and require the use of Monitoring Resources , which is sponsored by the Pacific Northwest Aquatic Monitoring Partnership, to share information about how data are collected.	Bonneville	Ongoing					
Implement Adaptive Management	102	High	Monitoring	M-4	Consistent with the goals and objectives section of this program, Bonneville should report annually on the number of juvenile fish released each year; the number of adults that contribute to harvest, are used for broodstock, and are present on the spawning grounds for all hatchery programs that receive Bonneville funding. Bonneville also should provide support to ensure that all managers have the capacity to collect this data and should support regional processes that standardize the data, facilitate reporting, and make this data publicly accessible.	Bonneville	New	Annually. The first report should be submitted in December 2014.			Annual Report from BPA	
Implement Adaptive Management	103	High	Monitoring	M-5	Bonneville should require project sponsors to ensure data are secured in appropriate regional data bases if those data contribute to program and regional reporting needs.	Bonneville						

Strategy	Page Number	Priority	Action Type	Sub-Action Number	General Measures	Responsible Entity	New or Ongoing?	Timeframe	Forum	Milestones	Products	Status
Implement Adaptive Management	104	High	Research	RES-4	Bonneville will report annually to the Council on the publications resulting from program research	Bonneville		Annually		Annual Report from BPA	Publications resulting from program research	
Implement Adaptive Management	105	High	Data Management	DM-1	Bonneville should ensure that data associated with broad categories of information (fish abundance, productivity, genetic diversity, geographic distribution, habitat conditions) are identified and accessible from a single, centralized website. Data users should be able to find references, data descriptions, and links to all the data collected in the program on fish abundance in such a website.	Bonneville					Data users should be able to find references, data descriptions, and links to all the data collected in the program on fish abundance in such a website.	
Implement Adaptive Management	105	High	Data Management	DM-2	Bonneville should ensure that all information about anadromous fish is summarized by specific life-cycle stages and made accessible from a single gateway location.	Bonneville				Specific anadromous fish information is summarized by life-cycle stage; information is made accessible from a single gateway location.	Summarized anadromous fish life-cycle information is available from a single gateway location	
Implement Adaptive Management	105	High	Data Management	DM-3	Bonneville should contract for complete data products (e.g., annual population estimates for adult and juvenile spring Chinook in the Entiat) and not only collaborative processes and preliminary data collection (e.g., redd counts or weir counts of fish). And when Bonneville pays for the development of standards or protocols the contracts should include a viable strategy for adoption.	Bonneville					BPA-funded data products; adoption of standards and protocols for data products	
Implement Adaptive Management	105	High	Reporting	RPT-1	Bonneville should require all research, monitoring, and evaluation projects, including hatchery programs, to report annually, providing an electronic summary of their results and interim findings, as well as the benefits to fish and wildlife. A high priority is to separate research reports from monitoring reports. The former should address hypotheses and critical uncertainties and the latter should provide important data about implementation, status, and trends. As appropriate, action effectiveness should be reported as part of research and monitoring reports.	Bonneville	Ongoing	Annually		Annual reports for all research, M&E, and hatchery programs to include summary of results, interim findings, and benefits to fish and wildlife; research reports are separate from monitoring reports; research reports include hypotheses and	Electronic summary of the results and interim findings, including benefits to fish and wildlife, for all research, M&E, and hatchery programs	Template was presented to the Council at the 4 November 2014 Council meeting. Template memo attached: http://www.nwcouncil.org/media/7148417/2.pdf ; Some project sponsors are using the template for reports this year,

Strategy	Page Number	Priority	Action Type	Sub-Action Number	General Measures	Responsible Entity	New or Ongoing?	Timeframe	Forum	Milestones	Products	Status
Implement Adaptive Management	106	High	Reporting	RPT-2	Bonneville should require all research, monitoring, and evaluation projects, including hatchery programs, to report annually, providing an electronic summary of their results and interim findings, as well as the benefits to fish and wildlife. A high priority is to separate research reports from monitoring reports. The former should address hypotheses and critical uncertainties and the latter should provide important data about implementation, status, and trends. As appropriate, action effectiveness should be reported as part of research and monitoring reports.	Bonneville	Ongoing	Annually		Annual reports for all research, M&E, and hatchery programs to include summary of results, interim findings, and benefits to fish and wildlife; research reports are separate from monitoring reports; research reports include hypotheses and	Electronic summary of the results and interim findings, including benefits to fish and wildlife, for all research, M&E, and hatchery programs	Template was presented to the Council at the 4 November 2014 Council meeting. Template memo attached: http://www.nwcouncil.org/media/7148417/2.pdf ; Some project sponsors are using the template for reports this year,
Anadromous Fish Mitigation in Blocked Areas	84	High	All blocked areas	AFM- 2.1	AFM- 2.1 Develop and increase opportunities for consumptive and non-consumptive resident fisheries for native, introduced, wild, and hatchery-reared stocks that are compatible with the continued persistence of native resident fish species and their restoration to near historic abundance	Bonneville						
Anadromous Fish Mitigation in Blocked Areas	84	High	All blocked areas	AFM -2.2	AFM -2.2 Consider passage projects to benefit native species	Bonneville						
Anadromous Fish Mitigation in Blocked Areas	84	High	All blocked areas	AFM- 2.3	AFM- 2.3 Expand and rebuild native fish numbers in blocked areas where habitat exists or can feasibly be restored or improved	Bonneville						
Anadromous Fish Mitigation in Blocked Areas	84	High	All blocked areas	AFM- 2.4	AFM- 2.4 Address anadromous fish losses with resident fish and wildlife, as appropriate, where full mitigation cannot be accomplished with resident fish alone	Bonneville						
Anadromous Fish Mitigation in Blocked Areas	84	High	All blocked areas	AFM- 2.5	AFM- 2.5 Protect and improve degraded fish habitat consistent with the habitat sub-strategy	Bonneville						
Wildlife Mitigation	73		Specific measures for habitat units	WL 6	Allocation of habitat units. Bonneville shall work with the agencies and tribes for habitat acquired as mitigation for lost habitat units identified in Table C-4, which shall be acquired in the subbasin in which the lost units were located unless otherwise agreed by the fish and wildlife agencies and tribes in that subbasin.	Bonneville						

Strategy	Page Number	Priority	Action Type	Sub-Action Number	General Measures	Responsible Entity	New or Ongoing?	Timeframe	Forum	Milestones	Products	Status
Wildlife Mitigation	73		Specific measures for habitat units	WL 7	Habitat enhancement credits. Habitat enhancement credits should be provided to Bonneville when habitat management activities funded by Bonneville lead to a net increase in habitat value when compared to the level identified in the baseline habitat inventory and subsequent habitat inventories. This determination shall be made through the periodic monitoring of the project site using the HEP methodology. Bonneville shall be credited for habitat enhancement efforts at a ratio of one habitat unit credited for every habitat unit gained.	Bonneville						
Hatcheries for Reintroduction	82		General Measures	HFR 1	Bonneville shall locate and operate hatcheries to re-establish salmon and steelhead where they have been extirpated, and substitute for extirpated salmon and steelhead in blocked areas.	Bonneville						
Resident Fish Mitigation	88		General Measures	RFM 1	Where feasible, Bonneville shall preserve, enhance, and restore native fish in native habitats.	Bonneville						
Resident Fish Mitigation	88		General Measures	RFM 2	Bonneville shall develop interim fisheries where native fisheries have been lost, or where native populations and habitats are actively being recovered, and need protection.	Bonneville						
Resident Fish Mitigation	88		General Measures	RFM 3	In areas where losses may be most effectively mitigated by acquiring interests in real property, Bonneville shall acquire fish habitat equal to the quality of habitat lost through the acquisition of appropriate interests in real property at a minimum ratio of 1:1 mitigation to lost distance or area [see guidance for resident fish settlements].	Bonneville						
Resident Fish Mitigation	88		General Measures	RFM 5	Once loss assessments are completed and adopted by the Council, the Council encourages Bonneville to negotiate settlement agreements, as described in Appendix K.	Bonneville						
Resident Fish Mitigation	88		General Measures	RFM 6	Bonneville shall continue to support projects directed at other native freshwater species and the progression of these projects from a research and assessment phase into a restoration and monitoring phase	Bonneville						
Resident Fish Mitigation	88		General Measures	RFM 7	Bonneville shall support efforts to address all limiting factors affecting resident fish. This might include efforts to eradicate and suppress non-native species, research on critical uncertainties, impacts from ongoing operation of the hydrosystem, and other impacts.	Bonneville						

Strategy	Page Number	Priority	Action Type	Sub-Action Number	General Measures	Responsible Entity	New or Ongoing?	Timeframe	Forum	Milestones	Products	Status
Resident Fish Mitigation	88		General Measures	RFM 8	Bonneville shall support evaluating the size of non-native fish populations to determine the potential effect of predation and implement a predator management program where appropriate in the Columbia Basin, for example Lake Roosevelt.	Bonneville						
Investment Strategy	116		Bonneville funding for emerging program priorities	EPP 1.1	EPP 1.1 Bonneville should fund any new fish and wildlife obligations from identifying savings within the current program and as necessary, from additional expenditures. Savings from the current program should not compromise productive projects that are addressing needs identified in this program.	Bonneville						
Investment Strategy	116		Bonneville funding for emerging program priorities	EPP 1.2	EPP 1.2 Prior to every rate case Bonneville should report to the Council how it plans to budget for implementation of the fish and wildlife program.	Bonneville		Prior to every rate case				
Appendix F. Future hydropower electric development and licensing, and protected areas	166		Implementing Protected Areas	PROT 3	PROT 3.1 Bonneville Power Administration o Shall not acquire power from hydroelectric projects located in protected areas. The Council believes that the Long-Term Intertie Access Policy's reliance on protected areas is consistent with the Council's power plan and Fish and Wildlife Program as they apply to fish and wildlife in the Columbia River Basin. The Council continues to	Bonneville						
Appendix K. Resident fish mitigation settlements			RFSA	RFSA 1	RFSA 1.1 The Bonneville Power Administration will require, wherever possible, that resident fish mitigation agreements through habitat acquisitions include a management plan with clear objectives; a plan for action over time; a committed level of funding that ensures long term maintenance to sustain the stated mitigation objectives; and provisions to ensure effective implementation with periodic monitoring and evaluation.	Bonneville						
Fish Propagation Including Hatchery Programs	78		General measures for R,M, assessment, and reporting on hatchery effectiveness	HAT 1	For Bonneville-funded hatchery programs, Bonneville shall locate and operate propagation actions to complement the present and future management activities of the region's agencies and appropriate Indian tribes, including complements to habitat improvements by supplementing native fish populations.	Bonneville						
Fish Propagation Including Hatchery Programs	78		General measures for R,M, assessment, and reporting on hatchery effectiveness	HAT 3	Bonneville should support the use of standardized performance measures by the agencies and tribes to inform effectiveness of various propagation strategies in meeting intended hatchery goals.	Bonneville						
Implement Adaptive Management	103	High	Monitoring	M-9	For projects assessing species and habitat conditions in intensively monitored watersheds, Bonneville will require the project sponsors to provide information on the condition of these watersheds at least every three years in a format that can be used by the Council.	Bonneville and IMW projects (Council)	Ongoing	At least every three years			Report from the project sponsors to provide information on the condition of these watersheds at least every three years in a format	

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Implement Adaptive Management	103	High	Monitoring	M-8	Bonneville and its partners should continue to explore whether a programmatic approach for monitoring would be more cost-effective and efficient.	Bonneville and its partners	Ongoing					
Implement Adaptive Management	103	High	Effectiveness	E - 1	Bonneville and its partners should continue to transform the effort to evaluate action effectiveness from monitoring individual projects into a cost-effective, independent third-party, standardized, and statistically valid method for habitat projects and water transactions projects.	Bonneville and its partners	Ongoing				A cost-effective, independent third-party, standardized, and statistically valid method for monitoring habitat projects and water	
Implement Adaptive Management	103	High	Monitoring	M-6	Bonneville should identify preferred methods to guide future data collection and report back to the Council annually. The Council will request the ISAB or ISRP to review the methods identified by Bonneville, and based on its review, the Council will adopt methods into the program.	Bonneville (Council, ISRP, ISAB)		Annually		BPA identifies preferred methods, reports annually to the Council; ISRP or ISAB review of products; NPCC adoption of	Council adopted methods for data collection	
Appendix C -- Wildlife mitigation priorities, construction and inundation loss assessments, and dam licensing considerations	145		WL Mitigation	APP C-1	APP C-1 Bonneville and wildlife agencies and tribes: Ensure that wildlife mitigation projects implemented in fulfillment of this program consider the basinwide implementation priorities described in Tables C-1, C-2 and C-3, below.....The Council requests the Wildlife Advisory Committee revisit and update the priorities, if necessary, and report to the Council....	Bonneville and wildlife agencies and tribes; WAC	Ongoing	Nov-15	WAC	Priorities identified/affirmed	Report to Council	Not clear at this time. Might be discussed in WAC this year.
Anadromous Fish Mitigation in Blocked Areas	84	High	Reintroduction of anadromous fish above Chief Joseph and Grand Coulee dams to mainstem reaches and tributaries in the	AFM-3	Phased approach. Pursue a science-based, phased approach to investigating the reintroduction of anadromous fish above Chief Joseph and Grand Coulee dams including juvenile and adult passage at the dams. The phases shall include:	Bonneville, relevant federal action agencies, state and federal fish and wildlife agencies and tribes						
Anadromous Fish Mitigation in Blocked Areas	84	High	Reintroduction of anadromous fish above Chief Joseph and Grand Coulee dams to mainstem reaches and tributaries in the	AFM- 4	Phase 1 (to be completed no later than the end of 2016):	Bonneville, relevant federal action agencies, state and federal fish and wildlife agencies and tribes		To be completed no later than the end of 2016				
Anadromous Fish Mitigation in Blocked Areas	84	High	Reintroduction of anadromous fish above Chief Joseph and Grand Coulee dams to mainstem reaches and tributaries in the	AFM-4.1	AFM-4.1 Evaluate information from passage studies at other blockages and from previous assessments of passage at Grand Coulee and Chief Joseph dams	Bonneville, relevant federal action agencies, state and federal fish and wildlife agencies and tribes						
Anadromous Fish Mitigation in Blocked Areas	85	High	Reintroduction of anadromous fish above Chief Joseph and Grand Coulee dams to mainstem reaches and tributaries in the	AFM-4.2	AFM-4.2 Investigate habitat availability, suitability and salmon survival potential in habitats above Grand Coulee. This might include selective releases of salmon and steelhead. Investigate the scientific feasibility and possible cost of upstream and downstream passage options for salmon and steelhead.	Bonneville, relevant federal action agencies, state and federal fish and wildlife agencies and tribes					Before funding new investigations, provide the Council with a report for consideration of subsequent work to	

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Anadromous Fish Mitigation in Blocked Areas	85	High	Reintroductions above Grand Coulee to mainstem reaches and tributaries in the United States	AFM-8	Bonneville and the relevant federal action agencies, working in collaboration with state and federal fish and wildlife agencies and tribes, shall investigate and, if warranted, implement passage and reintroduction of anadromous fish into suitable habitats within the United States. This shall include:	Bonneville, relevant federal action agencies, state and federal fish and wildlife agencies and tribes						
Anadromous Fish Mitigation in Blocked Areas	85	High	Reintroductions above Grand Coulee to mainstem reaches and tributaries in the United States	AFM -8.1	AFM -8.1 Funding research associated with critical uncertainties at Chief Joseph and Grand Coulee dams required to inform Phase 1	Bonneville, relevant federal action agencies, state and federal fish and wildlife agencies and tribes						
Anadromous Fish Mitigation in Blocked Areas	85	High	Reintroductions above Grand Coulee to mainstem reaches and tributaries in the United States	AFM -8.2	AFM -8.2 Funding work required for Phases 2 and 3 based on Council recommendations	Bonneville, relevant federal action agencies, state and federal fish and wildlife agencies and tribes						
Wildlife Mitigation	72		General Measures	WL 1	Bonneville shall work with the agencies and tribes on the following measures:	Bonneville, agencies, tribes						
Wildlife Mitigation	73		General Measures	WL 1.1	WL 1.1 Where appropriate prioritization exists and agreements exist on the methodology, complete wildlife loss assessments for losses caused by operation of the hydropower projects	Bonneville, agencies, tribes	Ongoing	Nov-15	WAC	Method for quantifying operational (perhaps	Report to Council on operational losses	Will be discussed by WAC throughout spring and summer in
Wildlife Mitigation	73		General Measures	WL 1.2	WL 1.2 Develop and implement habitat acquisition and enhancement projects to fully mitigate for identified losses	Bonneville, agencies, tribes						
Wildlife Mitigation	73		General Measures	WL 1.3	WL 1.3 Coordinate habitat restoration and acquisition activities throughout the basin with fish mitigation and restoration efforts to promote terrestrial and aquatic area connectivity	Bonneville, agencies, tribes						
Wildlife Mitigation	73		General Measures	WL 1.4	WL 1.4 Maintain the values and characteristics of existing, restored, and created habitat	Bonneville, agencies, tribes						
Wildlife Mitigation	73		General Measures	WL 3	Bonneville and the fish and wildlife agencies and tribes will complete wildlife loss mitigation agreements for at least the remaining construction and inundation losses by 2016. In addition, for each wildlife agreement that does not already provide for long-term maintenance of the habitat, Bonneville and the applicable management agency shall propose a management plan adequate to sustain the minimum credited habitat values for the life of the project.	Bonneville, agencies, tribes		By 2016				

Strategy	Page Number	Priority	Action Type	Sub-Action Number	General Measures	Responsible Entity	New or Ongoing?	Timeframe	Forum	Milestones	Products	Status
Wildlife Mitigation	74		Long-term agreements	WL 8	Whenever possible, Bonneville shall work with the agencies and tribes to ensure that wildlife mitigation shall take place through long-term agreements that have clear objectives, a plan for action over time, a committed level of funding that provides a substantial likelihood of achieving and sustaining the stated wildlife mitigation objectives, and provisions to ensure effective implementation with	Bonneville, agencies, tribes						
Implement Adaptive Management	106	High	Evaluation	EV-4	Bonneville, agencies, tribes, and other entities receiving Bonneville funding will assist the Council in compiling data in the appropriate format to inform the reports described in the reporting section.	Bonneville, agencies, tribes, and other entities receiving Bonneville funding, Council					Reports - compiled data in the appropriate format to inform the reports described in the reporting	
Implement Adaptive Management	106	High	Reporting	RPT-2	Bonneville should continue working with the Council to implement a concise, useful template for annual reports for research and monitoring projects that can replace other more cumbersome, more costly, and less useful reports for individual projects. The Council will continue to work with Bonneville and the ISRP to identify and assemble the information needed to produce an annual summary of	Bonneville, Council, ISRP	Ongoing	Annually		Reporting template that the Council and BPA agree on that results in the identification and assembly of information to	The Council will continue to work with Bonneville and the ISRP to identify and assemble the information needed to produce an	
Wildlife Mitigation	73		General Measures	WL 4	Fish and wildlife agencies and tribes and Bonneville will reach agreement on how wildlife mitigation projects and fish mitigation projects should be credited toward identified losses.	Bonneville, fish and wildlife agencies, tribes						
Implement Adaptive Management	103	High	Monitoring	M-7	Funding entities such as Bonneville, NOAA Fisheries, and Oregon Watershed Enhancement Board should align their implementation metrics to share information about what, and where, actions are funded in the basin. This will improve their ability to work together to achieve cost savings.	Bonneville, NOAA Fisheries, and Oregon Watershed Enhancement Board					Aligned implementation metrics to share information about what, and where, actions are funded	
Water Quality	56		TOXICS	TOX-6	Using all available water quality data, Bonneville and the other federal action agencies should continue to identify areas where aquatic habitat restoration projects implemented under the program may be affected by toxic contaminants and incorporate pollution reduction and mitigation techniques into restoration projects when toxic contamination is a concern.	Bonneville, other federal action agencies						
Resident Fish Mitigation	89		General Measures	RFM 9	Bonneville, the Corps, and the Bureau shall restore passage for native resident fish where feasible, including at Albeni Falls Dam.	Bonneville, US Army Corps, Bureau of Reclamation						
How the Program is Implemented	113		Tracking Measures	TRM	TRM 1 Bonneville, the Corps, and the Bureau, in collaboration with federal and state agencies and tribes, shall report annually to the Council and the region on the implementation of program measures.	Bonneville, US Army Corps, Bureau, federal and state agencies and tribes	New	Annually				

Strategy	Page Number	Priority	Action Type	Sub-Action Number	General Measures	Responsible Entity	New or Ongoing?	Timeframe	Forum	Milestones	Products	Status
Predator Management	49	High	Management of predator fish	PM-4	Bonneville should continue to annually implement and evaluate the base predator-control program and, where warranted, expand northern pikeminnow removals to other mainstem dams in the lower Columbia River (for example: expand the program to include northern pikeminnow removals at McNary and Bonneville dams).	Bonneville; The action agencies; NOAA Fisheries and the fish and wildlife agencies and tribes, Council		Annually		BPA ~implement and evaluate the base predator-control program and, where warranted, expand northern	Scoping of focused pikeminnow removals at other mainstem dams in the lower Columbia River will be based on evaluations and	
Implement Adaptive Management	104	High	Research	RES-3	Bonneville should ensure that all contracts for research projects, including those covered by funding agreements, identify an end date.	BPA	new	BPA contracting			End date identified in all Bonneville-funded contracts for all research projects.	
Non-native and Invasive Species	48	High	Removal and eradication of non-native species	NNI-9	If quagga and zebra mussels become established in the Columbia Basin, BPA and other federal agencies, along with FERC-licensed utilities, shall support regional rapid-response efforts.	BPA and other federal agencies, along with FERC-licensed utilities,						
Non-native and Invasive Species	47	High	Prevent establishment	NNI-3	BPA and other federal agencies should assist the Northwest states' efforts to prevent the establishment of quagga and zebra mussels.	BPA and other federal agencies, NW States						
Mainstem Hydrosystem Flow and Passage Operations	64		Grand Coulee Dam Operations	MSH 11	The Council calls on the Bureau and NOAA Fisheries to work with the relevant federal and state fish and wildlife agencies and tribes to evaluate alternative operations and report back to the Council. The following principles should guide this evaluation:	Bureau, NOAA, relevant federal and state fish and wildlife agencies and tribes						
Mainstem Hydrosystem Flow and Passage Operations	64		Grand Coulee Dam Operations	MSH 11.1	MSH 11.1 Explore the optimum operations at Grand Coulee to provide improved conditions and survival for all the fish important to the program, including salmon and steelhead migration and rearing needs in the lower Columbia River, Hanford Reach fall Chinook spawning and emergence, and resident species in the reservoir that are	Bureau, NOAA, relevant federal and state fish and wildlife agencies and tribes						
Mainstem Hydrosystem Flow and Passage Operations	64		Grand Coulee Dam Operations	MSH 11.2	MSH 11.2 Refilling the reservoirs by the end of June remains a high priority.	Bureau, NOAA, relevant federal and state fish and wildlife agencies and tribes						
Mainstem Hydrosystem Flow and Passage Operations	64		Grand Coulee Dam Operations	MSH 11.3	MSH 11.3 As much as possible within current operating constraints, manage the reservoir and dam discharges to minimize fluctuations and ramping rates and produce steady flows across each season and each day.	Bureau, NOAA, relevant federal and state fish and wildlife agencies and tribes						
Estuary	68		General Measures	EST 1	The CEERP, along with the Council's estuary and Lower Columbia subbasin plans and locally developed recovery plans, will guide implementation, monitoring, and evaluation of habitat actions in the estuary.	CEERP						

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Investment strategy	199	High		IS- 3	The Council will convene a work group comprising action agencies and agencies and tribes with expertise in fish screens, fishways and traps, hatcheries, lands, and habitat actions, to define and develop a long-term maintenance plan and process. This work group will be assisted by the IEAB, the Wildlife Advisory Committee, Fish Screening Oversight Committee, and federal action agencies. The	Council	New	Quarterly Progress Report	O&M sub-committee			
Investment strategy	200	High		IS- 5	Annual symposiums will be convened by the Council to ensure collaboration and efficiencies are achieved by all parties seeking to protect past investments in fish and wildlife by Bonneville and the action agencies under the program.	Council	New	Annual Symposiums		Annual Symposium		
Implement Adaptive Management	104	High	Research	RES-5	The Council will review the accomplishments of intensively monitored watersheds and the Integrated Status and Effectiveness Monitoring Project to ensure that it is cost-effective and produces useful results.	Council		During project review		Council review		
Implement Adaptive Management	106	High	Evaluation	EV-3	The Council supports continued research and life cycle modeling to inform decision makers of the biological benefits they could expect from implementing or synchronizing different suites of measures across the life cycle.	Council					Life cycle modeling that informs decision makers of the biological benefits they could	
Identify and Organize Objectives	34	High	Other anadromous and resident fish objectives	OBJ-4	Step 2 As soon as practicable, the Council will determine which of these to consider as program objectives, as well as considering needed modifications to existing goal statements, objectives, and indicators. The Council will conduct a program amendment process if it is determined that adopting the objectives should be considered.	Council	New			The Council will determine which of these to consider as program objectives, as well as considering needed modifications to existing goal statements,	The Council will conduct a program amendment process if it is determined that adopting the objectives should be considered.	
Identify and Organize Objectives	81	High	Wild Fish	WF 2	Consistent with the Council's quantitative objectives for adult salmon and steelhead, the Council will collect, organize, and review biological objectives for wild fish.	Council	New					
Climate Change	59	High		CC-14	The Council continues to encourage, monitor, and promote public awareness of pertinent climate change research and information and assess how it should influence program mitigation efforts.	Council						
Non-native and Invasive Species	48	High	Regional coordination	NNI-11	The Council will continue to coordinate regional stakeholder groups and partnerships on the issue of non-native invasive species, particularly those species that pose the greatest risk to the Columbia Basin ecosystem and the regional hydropower system.	Council	Ongoing				The Council will continue to assist with regional communication, coordination and public outreach efforts in the	
Non-native and Invasive Species	48	High	Regional coordination	NNI-12	The Council will support the collaborative work of the PSMFC 100th Meridian Initiative-Columbia Basin Team and request regular reports	Council		Regular Reports			Regular reports from that group on the following items: current regional	

Strategy	Page Number	Priority	Action Type	Sub-Action Number	General Measures	Responsible Entity	New or Ongoing?	Timeframe	Forum	Milestones	Products	Status
Non-native and Invasive Species	48	High	Regional coordination	NNI-13	The Council will assist regional entities with legislative efforts to prevent the invasion and control the spread of non-native invasive species in the Columbia Basin.	Council						
Subbasin Plans	108	High			The Council will identify subbasin plans most in need of an update.	Council						
Habitat	42	High	Mainstem Habitat	HAB 2	The Council will consider primary mainstem habitat measures including:	Council						
Habitat	42	High	Mainstem Habitat	HAB 2.1	HAB 2.1 Coordinating actions with the flow measures intended to improve ecosystem function in the mainstem	Council						
Habitat	42	High	Mainstem Habitat	HAB 2.2	HAB 2.2 Enhancing the connections between the mainstem sections of the Columbia and Snake rivers and floodplains, side channels, and riparian zones	Council						
Habitat	42	High	Mainstem Habitat	HAB 2.3	HAB 2.3 Continuing actions to reconnect the river to its floodplains wherever possible in the mainstem, with special emphasis on the estuary and lower Columbia River	Council						
Habitat	42	High	Mainstem Habitat	HAB 2.4	HAB 2.4 Protecting and enhancing mainstem riparian areas and wetlands to protect aquatic conditions and form a transition to floodplain terrestrial areas and side channels	Council						
Habitat	42	High	Mainstem Habitat	HAB 2.5	HAB 2.5 Identifying, protecting, enhancing, and restoring the functions of alluvial river reaches in the mainstem	Council						
Habitat	43	High	Mainstem Habitat	HAB 2.6	HAB 2.6 Excavating, creating and reconnecting additional backwater sloughs, alcoves, and side channels to the main channel	Council						
Habitat	43	High	Mainstem Habitat	HAB 2.7	HAB 2.7 Dredging/excavating lateral channels that have silted in	Council						
Habitat	43	High	Mainstem Habitat	HAB 2.8	HAB 2.8 Creating more shallow-water habitat	Council						
Habitat	43	High	Mainstem Habitat	HAB 2.9	HAB 2.9 Identifying, protecting, restoring, and managing thermal refugia for salmonid use during high water-temperature periods	Council						

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Habitat	43	High	Mainstem Habitat	HAB 2.10	HAB 2.10 Acquiring and protecting lands adjacent to the mainstem critical to protecting habitat areas and local water quality	Council						
Habitat	43	High	Mainstem Habitat	HAB 2.11	HAB 2.11 Where feasible, reconnecting protected and enhanced lower tributary habitats to protected and enhanced mainstem habitats, especially in the area of productive mainstem populations	Council						
Habitat	43	High	Mainstem Habitat	HAB 2.12	HAB 2.12 Increasing the amount of spawning habitat for mainstem core populations of Chinook, coho, chum, sturgeon, and lamprey	Council						
Strongholds	44		General Measures	STR 2	Consider for stronghold recognition areas designated by states and tribes in accordance with state law	Council						
Strongholds	45		General Measures	STR 4	Inventory existing actions that have occurred and are occurring within identified stronghold areas as identified by the respective states of the Council	Council						
Strongholds	45		General Measures	STR 5	Support fish habitat improvement actions implemented within strongholds	Council						
Strongholds	45		General Measures	STR 6	Support actions intended to eradicate non-native and invasive species from, or prevent their introduction into, stronghold areas	Council						
Mainstem Hydrosystem Flow and Passage Operations	64		Hells Canyon Complex project operations	MSH 12	Idaho Power Company's Hells Canyon hydropower complex, consisting of three hydroelectric projects on the mainstem Snake River, is currently undergoing Federal Energy Regulatory Commission (FERC) re-licensing and ESA	Council	Ongoing	Unknown	FERC	Just getting to and end point in the relicensing process	A new FERC license, currently on renewed one-year licenses	Relicensing application filed with FERC in December 2003.
Mainstem Hydrosystem Flow and Passage Operations	65		Spill and other passage experiments	MSH 17	The Council continues to recognize the value of an experimental approach to salmon recovery in the Northwest. The Council supports the development of adaptive management experiments that address critical	Council						
Mainstem Hydrosystem Flow and Passage Operations	66		Juvenile fish transportation	MSH 18	The Council recognizes the need to transport migrating juvenile salmon and steelhead under certain river conditions. The Council accepts this strategy as a means to achieve its biological objectives, where there are	Council						
Mainstem Hydrosystem Flow and Passage Operations	67		Power system considerations	MSH 22	The Council will investigate cost-effective power system strategies that improve ecosystem conditions for fish and wildlife, relax operational constraints adverse to fish and wildlife, and ensure the regional power system remains	Council						
Estuary	68		General Measures	EST 3.1	EST 3.1 Work with partners in the estuary to establish biological objectives and estuary indicators for habitat restoration and ecosystem function that will serve to prioritize future actions.	Council						

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Plume and Nearshore Ocean	70		General Measures	PLU 1	The Council supports monitoring plume and nearshore ocean conditions and in-river restoration actions to determine those actions of greatest benefit and to separate the effects of ocean-related mortality from that caused in the freshwater part of the life cycle.	Council	Ongoing	As necessary	Ocean and Plume Science and Management Forum			
Plume and Nearshore Ocean	70		General Measures	PLU 3	The Council supports continued monitoring of the Columbia River plume and ocean conditions, assessment of impacts on salmonid survival, and evaluation of the limits of restoration potential in the basin given variable ocean conditions. Predicting future ocean conditions and anadromous fish returns allows for adjustments to inland	Council	Ongoing	As necessary	Ocean and Plume Science and Management Forum			
Plume and Nearshore Ocean	71		General Measures	PLU 4	The Council supports coordination between ocean scientists and state fish and wildlife agencies and tribes to identify key uncertainties and opportunities to improve inriver management activities based on current ocean conditions.	Council	Ongoing	As necessary	Ocean and Plume Science and Management Forum			
Plume and Nearshore Ocean	71		General Measures	PLU 5	The Council supports efforts by the Ocean and Plume Science and Management Forum and science/policy exchanges to encourage coordination and communication between ocean researchers and fish and wildlife agencies and tribes. The Council will consider recommendations from the forum when making recommendations to Bonneville regarding implementation of this strategy.	Council	Ongoing	As necessary	Ocean and Plume Science and Management Forum			
Fish Propagation Including Hatchery Programs	78		General measures for R,M, assessment, and reporting on hatchery effectiveness	HAT 2	The Council's research plan will identify critical uncertainties related to hatchery performance in the Northwest. This includes determining the effectiveness of hatchery programs in meeting their intended purposes and minimizing adverse impacts to natural-origin fish.	Council						
Fish Propagation Including Hatchery Programs	78		General measures for R,M, assessment, and reporting on hatchery effectiveness	HAT 4	The Council intends to use available reporting mechanisms where possible.	Council						
Fish Propagation Including Hatchery Programs	79		General measures for R,M, assessment, and reporting on hatchery effectiveness	HAT 14	The Council continues to support PIT tagging and detection, coded wire tagging and recovery, acoustic and radio tagging and tracking, and genetic tagging and recovery. These all work together to help assure adequate effectiveness monitoring, and other monitoring as necessary, throughout fish life cycles and across various fish environments.	Council						
Wild Fish	81		General Measures	WF 1	The Council will consider the needs of wild fish in all facets of its fish and wildlife program including: hydrosystem passage, fish propagation facilities, climate change, predation, strongholds, research, carrying capacity, and habitat actions.	Council						
Public Engagement	99		General Measures	PE 1	The Council will inform and involve the public including elected officials through print, electronic, and social media; documents posted on the Council website and made available through public websites and libraries; updates of subbasin dashboards on the Council's website; comment	Council						

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Public Engagement	100		General Measures	PE 3	The Council will monitor the success of its outreach and involvement efforts.	Council						
Wildlife mitigation priorities, construction and inundation loss	152		WL Mitigation in dam licensing decisions	APP C-3.2	APP-C 3.2 Council The Council will monitor the Federal Energy Regulatory Commission licensing and relicensing proceedings and comment or intervene where appropriate.	Council						
Identify and Organize Objectives	35	High	Ecosystem function, habitat, and hydrosystem objectives	OBJ-5	Step 1 The Council will identify measureable objectives in the region. The data needed for these objectives should be available and not require extensive new data-gathering	Council	New				Identification of measureable objectives in the region.	
Identify and Organize Objectives	35	High		OBJ-6	Step 2 As soon as practicable, the Council will determine which objectives to consider as program objectives. The Council will conduct a program amendment process if it is determined that adopting the objectives should be considered.	Council	New			the Council will determine which objectives to consider as program objectives.	The Council will conduct a program amendment process if it is determined that adopting the objectives should be	
Identify and Organize Objectives	36	High	Public engagement quantitative objectives	OBJ-7	The Council will initiate an internal process to identify objectives and indicators for this topic [see program strategies: public engagement]. Once the process to produce objectives is completed, the Council will seek public input to help identify the most useful objectives. The Council will conduct a program amendment process if it is determined that adopting the objectives should be considered.	Council	New			~ initiate an internal process to identify objectives and indicators for this topic ~ the Council will seek public input to help identify the most useful objectives	The Council will conduct a program amendment process if it is determined that adopting the objectives should be considered.	
Water Quality	55		TOXICS	TOX-1	To support ongoing regional efforts to identify, assess and reduce toxic contaminants in the Columbia River Basin, the Council may initiate and will participate in, support, and coordinate periodic science/policy workshops on characterizing the state of the science related to toxic contaminant issues. The Council will also assist regional parties in advancing public education and information on toxics issues.	Council						
Water Quality	56		TOXICS	TOX-7	The Council urges Congress to provide funding, similar to the funding provided to other Large Aquatic Ecosystems, to protect and restore water quality in the Columbia River Basin, including efforts to:	Council						
Water Quality	56		TOXICS	TOX 7.1	TOX 7.1 Develop sensitive diagnostic indicators of chemical exposure and salmon health, such as biomarkers, for use in field studies in the Columbia Basin	Council						
Water Quality	56		TOXICS	TOX 7.2	TOX 7.2 Determine the extent to which toxics limit prey quality and abundance in degraded habitats and otherwise affect the food web	Council						
Water Quality	56		TOXICS	TOX 7.3	TOX 7.3 Improve understanding of contaminants of emerging concern, such as endocrine-disrupting pharmaceuticals and chemicals in personal care products, and their effects on salmonids, sturgeon, and lamprey.	Council						

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Wildlife Mitigation	73		Specific measures for habitat units	WL 5	Habitat units and the habitat evaluation procedure (HEP) methodology. The Council will continue to endorse habitat units as the preferred unit of measurement for mitigation accounting and the HEP methodology as the preferred method for estimating habitat units lost and acquired. Parties to a wildlife mitigation agreement may develop and	Council	Ongoing	Nov-15	WAC	Report on the continued use of HEP methodology or change in status of HEP to Committee and Council from	Report to Council	WAC has not discussed but will begin consideration of the matter in April or May WAC meeting
Eulachon	97		General Measures	EULA 1	The Council supports measures to implement the two eulachon conservation recommendations found in the 2014 Supplemental FCRPS Biological Opinion.	Council						
Eulachon	97		General Measures	EULA 2	Upon completion of a recovery plan for eulachon, the Council will incorporate appropriate information regarding eulachon into the program and reflect the importance of this species and the need for protection and mitigation to the extent affected by the hydrosystem. The Council will consider developing the following: o Biological objectives for eulachon population characteristics and habitat needs o A high-level indicator for eulachon abundance	Council						
Investment strategy	199	High		IS - 1	The Council will work with Bonneville and the other action agencies to ensure that past fish-and-wildlife-related investments are kept current or properly decommissioned.	Council and Bonneville	New					
Investment strategy	200	High		IS - 4	The Council and the federal action agencies will work together to ensure that federal agencies provide adequate funds for long-term maintenance for facilities where they have responsibility (such as NOAA Fisheries for Mitchell Act hatcheries).	Council and federal action agencies	New				Adequate funds for long-term maintenance for facilities where they have responsibility	
Climate Change	59	High		CC-15	The Council continues to require project sponsors to consider and plan for different climate change scenarios that could affect their work.	Council and project sponsors						
Investment strategy	116		Emerging Program Priorities	EPP 1	EPP 1The Council is providing the following guidance to Bonneville, the other federal agencies, and the region in general as to which of these new measures are emerging priorities for implementation in the next five years. During	Council to Bonneville, the other federal agencies, and the region in general		Annually				
Identify and Organize Objectives	33	High	Objectives for adult salmon and steelhead	OBJ-1	Objectives that represent different perspectives on healthy and harvestable populations already exist. The Council will work with state and federal agencies and tribes in the region to collect, organize, review, and report on these	Council will work with state and federal agencies and tribes in the region	New	By the end of 2015		This effort should include a review of agency and tribal management plans,	The final report will include, but not be limited to, an inventory of non-	
Identify and Organize Objectives	33	High	Objectives for adult salmon and steelhead	OBJ-2	The Council will work with the states, federal agencies, and tribes to identify specific indicators for Bonneville-funded hatchery programs that could be tracked and reported to inform progress on meeting mitigation objectives (i.e.,	Council will work with state and federal agencies and tribes in the region	New			The Council, agencies, and tribes will work with the Coordinated	Identification of specific indicators for Bonneville-funded hatchery	Potential indicators that should be tracked include: contribution to
Identify and Organize Objectives	34	High	Other anadromous and resident fish objectives	OBJ-3	Step 1 Once the process to produce objectives for hatchery salmon and steelhead is completed, the Council will work with the fish and wildlife agencies and tribes to survey, collect, and organize existing quantitative objectives for focal species including lamprey, bull trout, eulachon, white sturgeon, kokanee, rainbow trout, and cutthroat trout.	Council will work with the fish and wildlife agencies and tribes	New				Survey, collect, and organize existing quantitative objectives for focal species including lamprey, bull trout, eulachon, white sturgeon, kokanee,	

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Implement Adaptive Management	106	High	Reporting	RPT-3	The Council, with the assistance of agencies, tribes and others, will periodically review and update the high-level indicators report to communicate accomplishments to Congress, the region's governors, legislators, and citizens of the Northwest. When the Council completes its work on biological objectives, it will update its high-level indicators to ensure they are consistent with these objectives.	Council, with the assistance of agencies, tribes and others	Ongoing	Periodic review and update			When the Council completes its work on biological objectives, it will update its high-level indicators to ensure they are consistent with these	
Implement Adaptive Management	106	High	Reporting	RPT-4	The Council, with the assistance of agencies, tribes and others, will maintain the program's dashboard and the HLI website report, and also will produce other reports as appropriate, such as one that tracks annual anadromous fish forecasts and actual run sizes. The Council expects others to provide data and reports to the Council on a regular basis and make them available to the public [see Reporting Appendix L for a list of Council-requested reports]. This will provide easy access for the public and allow the Council to review the accuracy of the pre-season run-size estimates.	Council, with the assistance of agencies, tribes and others	Ongoing	Annually, and as appropriate			The Council expects others to provide data and reports to the Council on a regular basis and make them available to the public. This will provide easy access for the public and allow the Council to review the accuracy of the pre-season run-size	
Eulachon	97		Mainstem and hydrograph:	EULA 4.1	EULA 4.1 The Council, in collaboration with Bonneville, the Corps, NOAA Fisheries, and agencies and tribes, will help organize and facilitate a science/policy forum in 2015 to address the biological requirements of eulachon, combined with related inquiries into the relationship between flow, current hydropower dam operations, and the biological requirements of lamprey and sturgeon. The goal would be to report to the Council, NOAA Fisheries, and interested others on the state of the science, the reasonable next steps in the assessment process, and a recommendation for how to incorporate those steps into the recovery plan.	Council, Bonneville, US Army Corps, NOAA Fisheries, and agencies and tribes		2015, Science/policy forum				
Eulachon	98		Mainstem and hydrograph:	EULA 4.2	EULA 4.2 Monitor and report eulachon abundance at Bonneville Dam.	Council, Bonneville, US Army Corps, NOAA Fisheries, and agencies and tribes						
Eulachon	98		Mainstem and hydrograph:	EULA 4.3	EULA 4.3 Study the role of eulachon as an alternative prey for sea lions.	Council, Bonneville, US Army Corps, NOAA Fisheries, and agencies and tribes						
Eulachon	98		Ocean and estuary	EULA 5	Monitor and evaluate the importance of the tidal freshwater, estuary, plume and nearshore ocean environment to the recovery of eulachon in the Columbia River Basin.	Council, Bonneville, US Army Corps, NOAA Fisheries, and agencies and tribes						
Public Engagement	100		General Measures	PE 2	The Council, in partnership with Bonneville and other interested parties, will publicly recognize and acknowledge entities that provide good examples of productive partnerships across social and ecological boundaries.	Council, Bonneville, other interested parties						

Strategy	Page Number	Priority	Action Type	Sub-Action Number	General Measures	Responsible Entity	New or Ongoing?	Timeframe	Forum	Milestones	Products	Status
Mainstem Hydrosystem Flow and Passage Operations	63		Libby and Hungry Horse operations	MSH 9	The Council continues to support the federal action agencies' current reservoir operations at Libby and Hungry Horse dams as set forth in the relevant biological opinions. These include VARQ as well as spring and summer operations developed as part of the 2003 Mainstem Amendments. The Council encourages the action agencies to remove any reference to these operations as "experimental" in future biological opinions. The Council supports continued investigations to refine operations at Libby and Hungry Horse dams that improve conditions for fish near those reservoirs and do not adversely affect fish in the lower river, e.g., actions that help reservoir refill, reduce the potential for uncontrolled spill, reduce downstream flooding, and make operations mutually beneficial for the United States and Canada. Montana Fish, Wildlife & Parks should continue working with the pertinent parties to discuss proposals for adjustments to winter and spring operations at Libby and Hungry Horse dams including consideration of the potential impacts of winter operations at Libby Dam (including winter power peaking) on the recovery of native fish species, the food	Council, federal action agencies	Ongoing					
Non-native and Invasive Species	48	High	Regional coordination	NNI-14	The Council and federal action agencies should coordinate with other federal, state, and tribal entities, and regional organizations such as the 100th Meridian Initiative-Columbia Basin Team, to track and monitor data on existing non-native invasive species distribution and population trend assessments in the Columbia Basin and encourage regional data sharing on rapid response, prevention, containment, control, eradication, enforcement, and education and outreach efforts.	Council, federal action agencies, states, tribes, and regional organizations						
Mainstem Hydrosystem Flow and Passage Operations	67		Power system considerations	MSH 20	The Council will work with federal and non-federal operating agencies, federal and state fish and wildlife agencies and tribes to review, update, and implement procedures that accommodate power system and dam operation emergencies with the least impact on listed and non-listed fish and with consideration of protection, mitigation, and recovery objectives.	Council, federal and non-federal operating agencies, federal and state fish and wildlife agencies and tribes						
Non-native and Invasive Species	46	High	Evaluate potential adverse impacts	NNI-1	NNI-1 The Council, in coordination with the federal action agencies, other federal, state and tribal entities, and regional organizations such as the 100th Meridian Initiative-Columbia Basin Team (hereafter referred to as the Council and federal and other regional entities) should request regional power producers to evaluate the invasive potential and ecological risks of using non-native bioenergy feedstock species, cultivars, and hybrids.	Council, federal, state, tribal, and other regional entities						
Non-native and Invasive Species	47	High	Prevent establishment	NNI-2	NNI-2 The Council encourages federal and other regional entities to prevent non-native and invasive species introductions by:	Council, federal, state, tribal, and other regional entities						

Strategy	Page Number	Priority	Action Type	Sub-Action Number	General Measures	Responsible Entity	New or Ongoing?	Timeframe	Forum	Milestones	Products	Status
Non-native and Invasive Species	47	High	Prevent establishment	NNI-2.1	NNI-2.1 Monitoring and managing the various pathways that could introduce additional aquatic nuisance species into the Columbia River Basin	Council, federal, state, tribal, and other regional entities						
Non-native and Invasive Species	47	High	Prevent establishment	NNI-2.2	NNI-2.2 Developing and implementing strategies to suppress, reduce, or control non-native invasive fish species where they are identified as a limiting factor and are negatively impacting salmonids and native fish populations	Council, federal, state, tribal, and other regional entities						
Non-native and Invasive Species	47	High	Prevent establishment	NNI-2.3	NNI-2.3 Develop strategies and public outreach tools to educate the public about regional prevention and management of invasive species	Council, federal, state, tribal, and other regional entities						
Program Coordination	121		Coordination with other regional programs		The Council will continue to pursue opportunities to implement the program in coordination with other federal, state, tribal, Canadian, and volunteer fish and wildlife restoration programs. The Council will continue to work with national programs that influence our work in the basin. The Council will coordinate with organizations that track and monitor data on non-native species distribution, climate change, and human population change at the Northwest regional scale. There are also ongoing efforts to monitor trends in Northwest habitat quality, ocean conditions, and fish and wildlife that the Council will continue to track and participate in on an ongoing basis as it affects our program work. Continued coordination with	Council, federal, state, tribal, Canadian, and volunteer fish and wildlife restoration programs.						
Resident Fish Mitigation	88		General Measures	RFM 4	The Council will convene a work group of fish and wildlife agencies and tribes, and Bonneville, to develop a standardized methodology for habitat loss assessments to assist areas that currently do not have the capacity to	Council, fish and wildlife agencies and tribes, Bonneville		Report Quarterly	Task Force			
Strongholds	44		General Measures	STR 3	Work with fish and wildlife agencies and tribes and others to keep up-to-date maps available for strongholds and other areas in the basin that are managed for wild fish stocks	Council, fish and wildlife agencies, tribes, others						
Climate Change	58	High		CC-13	The Council, in collaboration with the federal action agencies, shall convene one or more science/policy workshops on climate change effects in the Columbia Basin, including panels of climate change scientists, to inform an overarching climate change strategy for the Columbia Basin.	Council, in collaboration with the federal action agencies						
Implement Adaptive Management	104	High	Research	RES -2	To assist with updating its research plan, the Council will co-sponsor Columbia River science/policy conferences to discuss scientific and technical developments in key policy areas. The Council will work with the Independent Scientific Advisory Board and others to develop the agendas.	Council, ISAB	ongong	As appropriate		The Council will work with the Independent Scientific Advisory Board and others to develop the	Columbia River science/policy conferences	Nothing scheduled at current time

Strategy	Page Number	Priority	Action Type	Sub-Action Number	General Measures	Responsible Entity	New or Ongoing?	Timeframe	Forum	Milestones	Products	Status
Fish Propagation Including Hatchery Programs	79		General measures for R,M, assessment, and reporting on hatchery effectiveness	HAT 15	In consideration of best available scientific information the Council will rely on information provided by the independent science panels and the agencies and tribes regarding hatchery science. The agencies and tribes will continue and expand their investments in research, monitoring and evaluation for the purpose of reducing uncertainties and improving hatchery performance, including developing a better understanding of the benefits and risks of hatchery programs.	Council, ISRP, ISAB, agencies, tribes						
Implement Adaptive Management	104	High	Research	RES -1	The Council will, with federal and state fish and wildlife agencies and tribes review and update its research plan every three years beginning in 2014.	Council, ISRP/ISAB (with federal and state fish and wildlife agencies and tribes)	new/ongoing	Beginning 2014, then every three years		1) begin with an update of how previous research funds were	Updated Research Plan	Letter sent to ISRP/ISAB 2/23/2015
Anadromous Fish Mitigation in Blocked Areas	85	High	Reintroduction of anadromous fish above Chief Joseph and Grand Coulee dams to mainstem reaches and	AFM-5	Phase 2: AFM-5.1 Based on the results in the first phase, the Council in collaboration with the other relevant entities will decide how to proceed. Phase 2 activities may include one or more of the following:	Council, other relevant entities						
Anadromous Fish Mitigation in Blocked Areas	85	High	Reintroduction of anadromous fish above Chief Joseph and Grand Coulee dams to mainstem reaches and tributaries in the United States	AFM-6	Phase 3: AFM -6.1 Based on the results of Phase 2, the Council in collaboration with the other relevant entities will decide whether and how to proceed to implement and fund reintroduction measures as a permanent part of the program, including construction and operation of passage facilities.	Council, other relevant entities						
Anadromous Fish Mitigation in Blocked Areas	85	High	anadromous fish above Chief Joseph and Grand Coulee dams to mainstem reaches and	AFM- 6.2	AFM- 6.2 Monitor, evaluate, and adaptively manage the reintroduction efforts.	Council, other relevant entities						
Plume and Nearshore Ocean	71		General Measures	PLU 6	The Council encourages scientists to develop an annual index of ocean survival from Bonneville Dam back to Bonneville Dam.	Council, Scientists	New	Uncertain				
Strongholds	44		General Measures	STR 1	Request states to identify stronghold areas	Council, States						
Anadromous Fish Mitigation in Blocked Areas	85	High	anadromous fish above Chief Joseph and Grand Coulee dams to mainstem reaches and	AFM-4.3	AFM-4.3 As part of Phase 1, the Council will engage in discussions with tribal, state, and federal agencies and others regarding the purpose, scope and progress of reintroduction efforts above Chief Joseph and Grand	Council, tribes, state and federal agencies, others						
Predator Management	50	High	Management of predator birds	PM-6	The Council will encourage more aggressive efforts by the Corps and others to make the fullest possible use of their existing authority to remove or manage avian predation that is impacting wild fish populations.	Council, U.S. Army Corps of Engineers						

Strategy	Page Number	Priority	Action Type	Sub-Action Number	General Measures	Responsible Entity	New or Ongoing?	Timeframe	Forum	Milestones	Products	Status
Estuary	68		General Measures	EST 3.2	EST 3.2 Receive from Bonneville and the Corps, a summary report on the results of action-effectiveness, status, and trend monitoring and research uncertainties in March 2015. The report must provide information to help improve and substantiate the effectiveness of habitat actions implemented in the estuary by parties that do not monitor their own habitat actions.	Council, U.S. Army Corps of Engineers, Bonneville		Mar-15				
Estuary	69		General Measures	EST 3.2	EST 3.2 Receive from Bonneville and the Corps, a summary report on the results of action-effectiveness, status, and trend monitoring and research uncertainties in March 2015. The report must provide information to help improve and substantiate the effectiveness of habitat actions implemented in the estuary by parties that do not monitor their own habitat actions.	Council, U.S. Army Corps of Engineers, Bonneville						
Wildlife Mitigation	73		General Measures	WL 2	The Council encourages wildlife agencies and tribes to monitor and evaluate habitat and species responses to mitigation actions and develop a more standardized approach to wildlife monitoring.	Council, wildlife agencies, tribes						
Implement Adaptive Management	106	High	Evaluation	EV-1	Working with the region, the Council will develop an evaluation process that considers new information to verify or adjust assumptions, hypotheses, goals, biological objectives, strategies, measures, and indicators. This adaptive management approach will ensure program accountability.	Council, working with the region					Development of an evaluation process that considers new information to verify or adjust assumptions,	
Investment strategy	199	High		IS- 2	The federal action agencies shall define the comprehensive maintenance costs by fish and wildlife investment types for both the direct and reimbursable aspects of the program. Anticipated costs should be developed year by year within a 20-year timeframe and be provided annually to the Council.	Federal action agencies	New	Annual				
Toxics	56	High	Toxics	TOX 3	The federal action agencies should partner with and support ongoing federal, state, tribal, and regional agencies' efforts to:	Federal action agencies						
Toxics	56	High	Toxics	TOX-3.1	TOX-3.1 Monitor, assess and map high priority toxic contaminant hot spots in the Columbia River Basin and evaluate their relationship, if any, to the development and operation of the hydrosystem	Federal action agencies						
Toxics	56	High	Toxics	TOX-3.2	TOX-3.2 Identify and assess the effects of toxic contaminants, alone or in combination with other stressors, on native fish, including sturgeon and lamprey, wildlife, and food webs in toxic hot spots in the Columbia River Basin	Federal action agencies						
Mainstem Hydrosystem Flow and Passage Operations	61		General Measures	MSH 1	The federal action agencies shall provide streamflows with appropriate timing, quantity, and water quality to promote productive populations of anadromous and resident fish, provide reservoir conditions to promote productive	Federal action agencies						

Strategy	Page Number	Priority	Action Type	Sub-Action Number	General Measures	Responsible Entity	New or Ongoing?	Timeframe	Forum	Milestones	Products	Status
Mainstem Hydrosystem Flow and Passage Operations	65		Spill	MSH 16	When making decisions regarding the timing and amount of spill, the federal action agencies should give priority to actions that (1) minimize impacts on returning adult fish; and (2) optimize in-river passage survival benefits for focal species, with particular emphasis on those species that cannot be or are not effectively transported.	Federal action agencies						
Plume and Nearshore Ocean	70		General Measures	PLU 2	The federal action agencies shall evaluate the effects of flow regulation on near-shore plume characteristics and salmon and steelhead productivity, abundance, and diversity.	Federal action agencies	Ongoing	As necessary	Ocean and Plume Science and Management Forum			
Predator Management	49	High		PM-2	The federal action agencies shall report to the Council annually on their respective predator-management efforts	Federal action agencies		Annually			Report to the Council annually on their respective predator-	
Predator Management	50	High	Management of predator fish	PM-5	The federal action agencies should work cooperatively with NOAA Fisheries, U.S. Fish and Wildlife Service, states, tribes, and the Council to develop and implement systemwide strategies to manage and reduce non-native fish species that compete and feed on native fish (both anadromous and resident species) in the basin.	Federal action agencies, NOAA Fisheries, U.S. Fish and Wildlife Service, states, tribes, Council					Development and implementation of systemwide strategies to manage and reduce non-native fish	
Predator Management	50	High	Management of predator birds	PM-7	The federal action agencies should, in collaboration with state and federal agencies, tribes, and other hydropower operators:	Federal action agencies, state and federal agencies, tribes, and other hydropower operators						
Predator Management	50	High	Management of predator birds	PM -7.1	PM -7.1 Continue efforts to reduce the number of Caspian terns on East Sand Island in the lower Columbia River and estuary by implementing the U.S. Fish and Wildlife Service Caspian Tern Management Plan	Federal action agencies, state and federal agencies, tribes, and other hydropower operators	Ongoing					
Predator Management	50	High	Management of predator birds	PM -7.2	PM -7.2 Develop a double-crested cormorant management plan encompassing additional research, development of a conceptual management plan, and implementation of warranted actions in the lower Columbia River and estuary	Federal action agencies, state and federal agencies, tribes, and other hydropower operators					Development of a double-crested cormorant management plan, and implementation of actions, if	
Predator Management	50	High	Management of predator birds	PM-7.3	PM-7.3 Implement the avian management plans (for double-crested cormorants, Caspian terns, and other bird species) for Corps-owned lands and associated shallow-water habitat areas in the mid-Columbia area that have been developed through the Corps and other processes for predatory bird species in the Columbia River estuary. The	Federal action agencies, state and federal agencies, tribes, and other hydropower operators					Implement the avian management plans (for double-crested cormorants, Caspian terns, and other bird species) for Corps-	
Predator Management	50	High	Management of predator birds	PM- 7.4	PM- 7.4 Implement predator-bird management actions in the Columbia River Basin in coordination with state and federal fish and wildlife agencies and tribes.	Federal action agencies, state and federal agencies, tribes, and other hydropower operators					Implementation of coordinated predator-bird management actions in the Columbia River	

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Mainstem Hydrosystem Flow and Passage Operations	62		General Measures	MSH 5	Following the principles of adaptive management, the federal action agencies, in collaboration with the Council, state, federal, and tribal fish agencies and the utilities, shall continue to investigate, develop, and implement flow and passage measures that improve fish life-cycle survival.	Federal action agencies, Council, state, federal, and tribal fish agencies and the utilities						
Climate Change	58	High		CC-12	The Council supports ongoing studies and development of assessment methods by the federal action agencies and others. Further, the Council requests other entities to collaborate with the federal action agencies on this work.	Federal action agencies, and others						
Predator Management	49	High		PM-1	The federal action agencies, in cooperation with the Council, state and federal fish and wildlife agencies, tribes, and others, should convene a technical work group to: (a) determine the effectiveness of predator-management actions; and (b) develop a common metric to measure the	Federal action agencies, Council, state and federal fish and wildlife agencies, tribes, and others			Technical Work Group	Convene a technical work group to: (a) determine the effectiveness of predator-	Once developed and agreed upon, future predator-management evaluations funded	
Mainstem Hydrosystem Flow and Passage Operations	61		General Measures	MSH 2	The federal action agencies, in collaboration with state, federal, and tribal fish agencies, shall (1) design mainstem fish passage actions to protect biological diversity by benefitting a broad range of species, stocks, and life-history types, not just listed species and not just salmon and steelhead, and (2) favor solutions that best fit natural behavior patterns and river processes and increase the likelihood of adult returns. To meet the diverse needs of multiple species and allow for uncertainty, multiple passage methods are necessary at individual projects.	Federal action agencies, state, federal, and tribal fish agencies						
Water Quality	55		TOXICS	TOX-2	The federal action agencies, in cooperation with the EPA and other federal, tribal, regional, and state agencies, should:	Federal action agencies, EPA, other federal, tribal, regional, and state agencies						
Water Quality	55		TOXICS	TOX -2.2	TOX -2.2 Monitor water quality parameters and implement water quality improvement measures to reduce toxic contaminants, as appropriate, to meet state, EPA-approved tribal, and federal water quality standards to improve the	Federal action agencies, EPA, other federal, tribal, regional, and state agencies						
Water Quality	56		TOXICS	TOX -2.2	TOX -2.2 Monitor water quality parameters and implement water quality improvement measures to reduce toxic contaminants, as appropriate, to meet state, EPA-approved tribal, and federal water quality standards to improve the	Federal action agencies, EPA, other federal, tribal, regional, and state agencies						
Water Quality	55		TOXICS	TOX -2.1	TOX -2.1 Support implementation of the regional 2010 Columbia River Basin Toxics Reduction Action Plan. Both the WQP and the Toxics Reduction Action Plan are comprehensive regional documents containing water	Federal action agencies, EPA, other federal, tribal, regional, and state agencies, Council						
Predator Management	51	High	Management of predator seals and sea lions	PM-10	PM-10 The federal action agencies should fund federal, tribal, and state agencies to evaluate the extent of seal and sea lion predation on salmonids, sturgeon, and lamprey in the lower Columbia River from below Bonneville Dam to the mouth of the river.	Federal action agencies, federal, tribal, state agencies						

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Predator Management	51	High	Management of predator seals and sea lions	PM-11	PM-11 The federal action agencies, in collaboration with the region's state and federal fish and wildlife agencies, tribes, and others, should identify opportunities and implement actions to reduce salmon, sturgeon, and	Federal action agencies, federal, tribal, state agencies, others						
Water Quality	55		TDG and Temperature	WQ 3	The federal action agencies, FERC, and the non-federal project operators, in cooperation with the EPA and other federal, tribal, regional, and state agencies, should:	Federal action agencies, FERC, non-federal project operators, EPA, other federal, tribal, regional, and state agencies						
Water Quality	55		TDG and Temperature	WQ 3.1	WQ 3.1 Update and implement the Water Quality Plan for Total Dissolved Gas and Water Temperature in the Mainstem Columbia and Snake Rivers (WQP)	Federal action agencies, FERC, non-federal project operators, EPA, other federal, tribal, regional, and state agencies						
Water Quality	55		TDG and Temperature	WQ 3.2	WQ 3.2 Monitor water quality parameters and implement water quality improvement measures to reduce water temperatures and TDG to meet state, EPA-approved tribal, and federal water quality standards to improve the health, condition, and survival of anadromous and native resident fish, as well as their related spawning and rearing habitat, in the Columbia Basin	Federal action agencies, FERC, non-federal project operators, EPA, other federal, tribal, regional, and state agencies						
Climate Change	57	High		CC-1	Support the development of improved runoff forecasting methods and techniques for Columbia River Basin watersheds	Federal action agencies, in coordination and collaboration with others					Improved runoff forecasting methods and techniques for Columbia River Basin watersheds	
Climate Change	57	High		CC-2	Work to provide early (e.g., late fall or early winter) runoff forecasts for the Columbia River Basin	Federal action agencies, in coordination and collaboration with others					or early winter) runoff forecasts for the Columbia River Basin	
Climate Change	58	High		CC-3	Continue to encourage, monitor, and promote public awareness of pertinent climate change research and information and assess how it should influence program mitigation efforts	Federal action agencies, in coordination and collaboration with others	Ongoing					
Climate Change	58	High		CC-4	Assess whether climate change effects are altering or are likely to alter critical river flows, water temperatures or other habitat attributes in a way that could significantly affect fish or wildlife important to this program, either directly or by affecting the success of current mitigation	Federal action agencies, in coordination and collaboration with others						
Climate Change	58	High		CC-5	Evaluate the effectiveness and feasibility of possible actions to mitigate effects of climate change, including selective withdrawal from cool/cold water storage reservoirs to reduce water temperatures or other actions to create or protect cool water refugia in mainstem reaches or	Federal action agencies, in coordination and collaboration with others						

Strategy	Page Number	Priority	Action Type	Sub-Action Number	General Measures	Responsible Entity	New or Ongoing?	Timeframe	Forum	Milestones	Products	Status
Climate Change	58	High		CC-6	Identify and evaluate management and mitigation options for fish and wildlife under various climate-change scenarios	Federal action agencies, in coordination and collaboration with others						
Climate Change	58	High		CC-7	Assess and revise, if necessary, ongoing monitoring efforts to ensure collection of necessary data on key species responses, interactions, and productivity under future climate scenarios	Federal action agencies, in coordination and collaboration with others						
Climate Change	58	High		CC-8	Implement long-term habitat protections for resident fish and wildlife in the basin	Federal action agencies, in coordination and collaboration with others						
Climate Change	58	High		CC-9	Identify and implement a strategic expansion of the network of stations for surface weather and streamflow observations in high-altitude mountainous areas of the Columbia Basin	Federal action agencies, in coordination and collaboration with others						
Climate Change	58	High		CC-10	Investigate the feasibility of mitigating climate change impacts in the estuary and plume through changes in hydrosystem operations, including changes in flood-control operations	Federal action agencies, in coordination and collaboration with others						
Climate Change	58	High		CC-11	Variations in regional climate and ocean conditions play a large role in the survival of anadromous fish and other native species in the Columbia River Basin. Management actions shall strive to help those species accommodate a variety of climate and ocean conditions by providing a wide	Federal action agencies, in coordination and collaboration with others						
Non-native and Invasive Species	48	High	Reduce competition	NNI-10	The federal action agencies, other federal and state agencies, tribes, and the Council should continue to review, evaluate, develop, and implement strategies to reduce competition from non-native fish species with juvenile and adult salmonids.	Federal action agencies, other federal and state agencies, tribes, and the Council	Ongoing					
Mainstem Hydrosystem Flow and Passage Operations	63		Hanford Reach fall Chinook	MSH 8	The federal action agencies, in collaboration with the state, federal, and tribal agencies and the Mid-Columbia Public Utility Districts (PUDs), shall continue to reliably implement operations to protect spawning and emergence of fall Chinook in the Hanford Reach, consistent with the 2004	Federal action agencies, state, federal, and tribal agencies and the Mid-Columbia Public Utility Districts (PUDs),	Ongoing	Report periodically				
Mainstem Hydrosystem Flow and Passage Operations	64		Investigate the potential to further improve ecosystem function and floodplain	MSH 13	The federal action agencies, in collaboration with state, federal, tribal agencies, and others, should continue to investigate and adjust system water management to improve ecosystem functions in the mainstem, estuary, and	Federal action agencies, state, federal, tribal agencies, and others,						
Mainstem Hydrosystem Flow and Passage Operations	64		Investigate the potential to further improve ecosystem function and floodplain	MSH 13.1	MSH 13.1 Reconnected floodplains related to river flows	Federal action agencies, state, federal, tribal agencies, and others,						

Strategy	Page Number	Priority	Action Type	Sub-Action Number	General Measures	Responsible Entity	New or Ongoing?	Timeframe	Forum	Milestones	Products	Status
Mainstem Hydrosystem Flow and Passage Operations	64		Investigate the potential to further improve ecosystem function and floodplain	MSH 13.2	MSH 13.2 Enhanced Columbia River plume and near-shore ocean habitat	Federal action agencies, state, federal, tribal agencies, and others,						
Mainstem Hydrosystem Flow and Passage Operations	64		Investigate the potential to further improve ecosystem function and floodplain	MSH 13.3	MSH 13.3 Reduced salt water intrusion during summer and fall	Federal action agencies, state, federal, tribal agencies, and others,						
Mainstem Hydrosystem Flow and Passage Operations	64		Investigate the potential to further improve ecosystem function and floodplain	MSH 13.4	MSH 13.4 Fewer and shorter hypoxia and acidification events in the estuary	Federal action agencies, state, federal, tribal agencies, and others,						
Mainstem Hydrosystem Flow and Passage Operations	64		Investigate the potential to further improve ecosystem function and floodplain	MSH 13.5	MSH 13.5 Lower summer water temperatures	Federal action agencies, state, federal, tribal agencies, and others,						
Water Quality	54		General Measures to address total dissolved gas and temperature	WQ 1	Federal and non-federal project operators should:	Federal and non-federal project operators						
Water Quality	54		TDG and Temperature	WQ 1.1	WQ 1.1 Continue real-time monitoring and reporting of TDG and water temperatures measured at fixed monitoring sites in the Columbia River Basin	Federal and non-federal project operators		In real time				
Water Quality	54		TDG and Temperature	WQ 1.2	WQ 1.2 Continue to develop and implement fish passage strategies that produce less TDG, such as spillway flow deflectors, spillway weirs and surface passage outlets, including updates and improvements to the System Total	Federal and non-federal project operators						
Water Quality	54		TDG and Temperature	WQ 1.3	WQ 1.3 Collaborate to complete the water temperature modeling capabilities in the mainstem Columbia River from Grand Coulee to McNary dams to better assess the effect of operations or flow depletions on summer water	Federal and non-federal project operators						
Appendix F. Future hydropower electric development and licensing, and protected areas	170		Federal land managers, federal and state fish and wildlife agencies and other state agencies	PROT 6	PROT 6 Federal and state fish and wildlife agencies and federal resource agencies shall incorporate pertinent elements of the fish and wildlife program in the terms and conditions they apply to projects exempted from licensing under Federal Energy Regulatory Commission exemption procedures. The Council also requests that federal land managers incorporate the development provisions of this program into their permit procedures related to	Federal land managers, federal and state fish and wildlife agencies and other state agencies						
Appendix F. Future hydropower electric development and licensing, and protected areas	170		General Implementation Measures	PROT 4.1	PROT 4.1 Shall review simultaneously all applications or proposals for hydroelectric development in a single river drainage, through consolidated hearings, environmental impact statements or assessments, or other appropriate methods. This review shall assess cumulative environmental effects of existing and proposed hydroelectric development on fish and wildlife.	Federal project operators and regulators						

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Predator Management	51	High	Management of predator seals and sea lions	PM-12	PM-12 When federal, state, or tribal managers determine that predation by seals and sea lions is causing significant adverse impacts to salmonids or other native fish, state and federal fish agencies employing lethal and non-lethal methods to manage predation shall continue the lethal methods if non-lethal methods are not successful.	Federal, state, tribal managers						
Water Quality	55		TDG and Temperature	WQ 4	The federal action agencies should incorporate the provisions of various total maximum daily loads (TMDLs) as they are developed and approved into the regional Water Quality Plan, particularly TMDL provisions containing allocations affecting federal hydropower projects in the Columbia River Basin.	Federal action agencies						
Toxics	56	High	Toxics	TOX 4	The federal action agencies should partner with and support federal, state, tribal and regional agencies' efforts to conduct targeted monitoring in the Columbia River Basin of vulnerable native fish and wildlife species for specific, high-priority toxic contaminants and other priority contaminants of emerging concern, including in the middle and upper Columbia reaches and in the Snake River, and evaluate if toxic contaminants limit the reproductive success of native fish.	Federal action agencies, federal, state, tribal, regional agencies						
Appendix C -- Wildlife mitigation priorities, construction and inundation loss assessments, and	152		WL Mitigation in dam licensing decisions	APP C-3.1	APP C-3.1 Federal Energy Regulatory Commission Non-federal hydroelectric projects are licensed by the Federal Energy Regulatory Commission. The Northwest Power Act and the Electric Consumers Protection Act of 1986 require the Federal Energy Regulatory Commission to give equal consideration to the protection, mitigation of	FERC						
Appendix F. Future hydropower electric development and licensing, and protected areas	167		FERC	PROT 3.2	PROT 3.2 Federal Energy Regulatory Commission o Under the Northwest Power Act, the Federal Energy Regulatory Commission, and all other federal agencies responsible for managing, operating, or regulating federal or non-federal hydroelectric facilities located on the Columbia River or its tributaries are required to take	FERC						
Appendix F. Future hydropower electric development and licensing, and protected areas	170		Federal Energy Regulatory Commission	PROT 5	PROT 5 Shall require all applicants for licenses (including license renewals, amendments, and exemptions) and preliminary permits in the Columbia River Basin to demonstrate in their applications how the proposed project would take this program into account to the fullest extent practicable. FERC also shall provide the Council with	FERC						
Protected Areas	53		General Implementation Measures	PA	The Council expects the Federal Energy Regulatory Commission, in the exercise of its licensing authority under the Federal Power Act, to take the Council's hydroelectric development standards and protected areas designations	FERC, Council, Bonneville	Ongoing	As necessary	None			Ongoing monitoring of FERC related activities in protected areas.
Appendix F. Future hydropower electric development and licensing, and protected areas	164		General Measures - Standards for new hydroelectric development and licensing:	PROT 2	PROT 2 The Federal Energy Regulatory Commission, Corps of Engineers, Bureau of Reclamation and Bonneville shall not license, relicense, exempt from license, propose, recommend, agree to acquire or wheel power from, grant billing credits for, or otherwise support any hydroelectric	FERC, US Army Corps, Bureau of Reclamation and Bonneville						

Strategy	Page Number	Priority	Action Type	Sub-Action Number	General Measures	Responsible Entity	New or Ongoing?	Timeframe	Forum	Milestones	Products	Status
Appendix F. Future hydropower electric development and licensing, and protected areas	165		General Measures - Standards for new hydroelectric development and licensing:	PROT 2.9	PROT 2.9 Avoiding critical riparian habitat (as designated in consultation with the fish and wildlife agencies and tribes) when clearing, rip-rapping, dredging, disposing of spoils and wastes, constructing diversions, and relocating structures and facilities PROT 2.10 Replacing riparian vegetation if natural revegetation is inadequate	FERC, US Army Corps, Bureau of Reclamation and Bonneville						
hydropower electric development and licensing, and protected areas			Standards for new hydroelectric development and licensing:	PROT 2.14	PROT 2.14 Acquiring land or management rights, such as conservation easements, where necessary to compensate for lost wildlife habitat at the same time other project land is acquired and including the associated costs in project	FERC, US Army Corps, Bureau of Reclamation and Bonneville						
Appendix F. Future hydropower electric development and licensing, and protected areas			General Measures - Standards for new hydroelectric development and licensing:	PROT 2.1	PROT 2.1 Ensure that all licenses for hydroelectric projects or documents that propose, recommend, or otherwise support hydroelectric development explain in detail how the provisions of this section will be accomplished or the reasons why the provisions cannot be incorporated into the project.	FERC, US Army Corps, Bureau of Reclamation and Bonneville						
Appendix F. Future hydropower electric development and licensing, and protected areas	163		General Measures - Standards for new hydroelectric development and licensing:	PROT 1	PROT 1 The Federal Energy Regulatory Commission, Corps of Engineers, Bureau of Reclamation and Bonneville shall not license, exempt from license, relicense, propose, recommend, agree to acquire or wheel power from, grant billing credits for, or otherwise support any hydroelectric development in the Columbia River Basin without specifically providing for these development conditions:	FERC, US Army Corps, Bureau of Reclamation and Bonneville						
Appendix F. Future hydropower electric development and licensing, and protected areas	163		General Measures - Standards for new hydroelectric development and licensing:	PROT 1.1	PROT 1.1 Consultation with the fish and wildlife agencies and tribes and the Council throughout study, design, construction, and operation of the project PROT 1.2 Development of specific plans for flows and fish facilities prior to construction PROT 1.3 Use of the best available means for aiding downstream and upstream passage of anadromous and	FERC, US Army Corps, Bureau of Reclamation and Bonneville, fish and wildlife agencies and tribes and the Council						
Appendix F. Future hydropower electric development and licensing, and protected areas	164		General Measures - Standards for new hydroelectric development and licensing:	PROT 1.6	PROT 1.6 Assurance that the project will not inundate the usual and accustomed, traditional, or contemporary fishing places of any tribe without tribal approval PROT 1.7 Assurance that the project will not degrade fish habitat or reduce numbers of fish in such a way that the exercise of treaty or executive-order tribal rights will be diminished PROT 1.8 Assurance that all fish protection measures are	FERC, US Army Corps, Bureau of Reclamation and Bonneville, fish and wildlife agencies and tribes and the Council						
Appendix F. Future hydropower electric development and licensing, and protected areas	164		General Measures - Standards for new hydroelectric development and licensing:	PROT 1.9	PROT 1.9 Assurance that the project developer will collect data needed to monitor and evaluate the results of the fish protection efforts PROT 1.10 Assurance that the project will not degrade water quality beyond the point necessary to sustain sensitive fish species (as designated in consultation with the fish and wildlife agencies and tribes).	FERC, US Army Corps, Bureau of Reclamation and Bonneville, fish and wildlife agencies and tribes and the Council						
Appendix F. Future hydropower electric development and licensing, and protected areas	164		General Measures - Standards for new hydroelectric development and licensing:	PROT 2.1	PROT 2.1 Consulting with fish and wildlife agencies and tribes and the Council throughout study, design, construction and operation of the project PROT 2.2 Avoiding inundation of wildlife habitat, insofar as practical PROT 2.3 Timing construction activities, insofar as practical, to reduce adverse effects on nesting and	FERC, US Army Corps, Bureau of Reclamation and Bonneville, fish and wildlife agencies and tribes and the Council						

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Mainstem Hydrosystem Flow and Passage Operations	62		General Measures	MSH 6	The Fish Passage Center provides technical assistance and information to the region's fish and wildlife agencies and tribes, and the public, on matters relating to the program's flow and passage measures. NOAA Fisheries and its	Fish Passage Center						
Mainstem Hydrosystem Flow and Passage Operations	63		General Measures	MSH 7.1	MSH 7.1 Assemble, organize, make publicly available, and maintain the primary archive of the smolt monitoring program data	Fish Passage Center						
Mainstem Hydrosystem Flow and Passage Operations	63		General Measures	MSH 7.2	MSH 7.2 Participate in the development of the annual smolt monitoring program implementation plan, and assist in the implementation of the program	Fish Passage Center		Annual				
Mainstem Hydrosystem Flow and Passage Operations	63		General Measures	MSH 7.3	MSH 7.3 Assemble, organize and make publicly accessible, data from other primary sources, and conduct analyses as requested to meet the information needs of the fish and wildlife agencies, tribes, and public with respect to water management, spill, and fish passage	Fish Passage Center						
Mainstem Hydrosystem Flow and Passage Operations	63		General Measures	MSH 7.4	MSH 7.4 Provide technical information necessary to assist the agencies and tribes in formulating in-season flow and spill requests that implement the measures in the Council's program, while also assisting the agencies and tribes in making sure that operating criteria for storage reservoirs are satisfied	Fish Passage Center						
Mainstem Hydrosystem Flow and Passage Operations	63		General Measures	MSH 7.5	MSH 7.5 Provide the technical assistance necessary to coordinate recommendations for storage reservoir and river operations that, to the extent possible, avoid potential conflicts between anadromous and resident fish	Fish Passage Center						
Mainstem Hydrosystem Flow and Passage Operations	63		General Measures	MSH 7.6	MSH 7.6 Archive and make publicly accessible the data used in developing all analytical results, associating the specific data with the respective analyses	Fish Passage Center						
Mainstem Hydrosystem Flow and Passage Operations	63		General Measures	MSH 7	The FPC Oversight Board will annually review the FPC's performance and help assure regional accountability, data management compatibility, and program consistency. The Fish Passage Center functions include:	FPC Oversight Board						
Fish Propagation Including Hatchery Programs	79		General measures for R,M, assessment, and reporting on hatchery effectiveness	HAT 11	Hatchery summary presentations should include adaptive management actions implemented or planned to improve effectiveness in meeting intended hatchery goals or changes in goals to meet broader basin management strategies.	Hatchery operators and funders						
Fish Propagation Including Hatchery Programs	79		General measures for R,M, assessment, and reporting on hatchery effectiveness	HAT 10	Hatchery program implementation, monitoring, and evaluation results for all hatchery programs in the Columbia River Basin should be made electronically available and hatchery operators and funders should coordinate annual summary presentations to the Council.	Hatchery operators and funders, Council		Annual				

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Fish Propagation Including Hatchery Programs	79		General measures for R,M, assessment, and reporting on hatchery effectiveness	HAT 12	To promote a diversified approach to hatchery management, hatchery operators will aspire to improve hatchery program performance and, in coordination with agencies and tribes, will seek-out opportunities to test and monitor alternative hatchery strategies and approaches and alternative hatchery practices.	Hatchery operators, agencies, tribes						
Independent Scientific and Economic Review	123		IEAB	IEAB-1	The Independent Economic Advisory Board advises the Council on the economics of issues within the Council's statutory responsibilities.	IEAB						
Independent Scientific and Economic Review	125		IEAB	IEAB-2	Advising the Council on the appropriate methods of economic analysis for proposed fish protection and mitigation measures and projects as well as other issues within the Council's statutory responsibilities. This advice will include the appropriate role and limits of economic analysis in making policy decisions and, where applicable, the associated economic costs and benefits of those decisions. The Independent Economic Analysis Board will fulfill this role by:	IEAB						
Independent Scientific and Economic Review	126		IEAB	IEAB 2.1	IEAB 2.1 Interacting as an advisory committee with the Council regarding methods of economic analysis for alternative fish recovery measures and other issues, including economic costs and benefits, within the Council's statutory responsibilities	IEAB						
Independent Scientific and Economic Review	125		IEAB	IEAB 2.2	IEAB 2.2 Assisting the Council to evaluate new analytical tools, and advising on the most appropriate study designs	IEAB						
Independent Scientific and Economic Review	125		IEAB	IEAB 2.3	IEAB 2.3 Helping to identify sources of information and data	IEAB						
Independent Scientific and Economic Review	125		IEAB	IEAB 2.4	IEAB 2.4 Performing specific tasks assigned by the Council on a cost reimbursement basis	IEAB						
Independent Scientific and Economic Review	125		IEAB	IEAB 2.5	IEAB 2.5 Assisting in the review and interpretation of study results	IEAB						
Independent Scientific and Economic Review	123		ISAB		The ISAB provides advice to the region on key scientific issues affecting Columbia River Basin fish and wildlife with the intent to avoid gridlock over scientific uncertainty, circumvent unnecessary additional research, and resolve conflicting advice and opinions on recovery issues and measures.	ISAB						
Independent Scientific and Economic Review	124		ISAB		Evaluate the fish and wildlife program on its scientific merits in time to inform amendments to the program and before the Council requests recommendations from the region	ISAB						

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Independent Scientific and Economic Review	124		ISAB		Evaluate NOAA Fisheries' recovery plans for Columbia River Basin stocks and aspects of the recovery process when requested	ISAB						
Independent Scientific and Economic Review	124		ISAB		Provide scientific advice and review of topics identified as critical to fish recovery and conservation in the Columbia River Basin	ISAB						
Independent Scientific and Economic Review	124		ISAB		Evaluate the scientific merits of plans and measures proposed to ensure satisfaction and continuation of tribal treaty fishing rights in the Columbia River Basin and other tribal efforts to restore and manage fish and wildlife	ISAB						
Independent Scientific and Economic Review	124		ISAB		Provide specific scientific advice on topics and questions requested from the region or the ISAB and approved by majority vote of the Council's, NOAA Fisheries', and the tribes' representatives overseeing the ISAB's administration.	ISAB						
Implement Adaptive Management	102	High	Monitoring	M- 1	The ISRP will use the risk uncertainty matrix to assess whether the level of monitoring is appropriate for the proposed project and measures.	ISRP	New					
Independent Scientific and Economic Review	123		ISRP		The ISRP reviews individual projects in the context of the program and makes recommendations on matters related to those projects.	ISRP						
Independent Scientific and Economic Review	124		ISRP and peer review groups have responsibilities in three areas:		Review projects proposed for Bonneville funding to implement the Council's program:	ISRP						
Independent Scientific and Economic Review	124		ISRP and peer review groups have responsibilities in three areas:		Review program results:	ISRP						
Independent Scientific and Economic Review	124		ISRP and peer review groups have responsibilities in three areas:		Review projects funded through Bonneville's reimbursable program:	ISRP						
Fish Propagation Including Hatchery Programs	78		General measures for R,M, assessment, and reporting on hatchery effectiveness	HAT 5	The Council requests that NOAA Fisheries annually update the Council on the status of ESA reviews for state and tribal HGMPs.	NOAA		Annually				
Fish Propagation Including Hatchery Programs	78		General measures for R,M, assessment, and reporting on hatchery effectiveness	HAT 7	The Council requests that NOAA advise the Council on the utility of updating the list of reference streams first identified by the Ad Hoc Supplementation Workgroup that are linked to distinct population segments (DPSs), and populations within evolutionarily significant units (ESUs).	NOAA						

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Fish Propagation Including Hatchery Programs	78		General measures for R,M, assessment, and reporting on hatchery effectiveness	HAT 8	The Council also requests NOAA share with the Council the results of NOAA status reviews of Columbia Basin salmon and steelhead ESUs and DPSs as the reviews are completed.	NOAA						
Eulachon	97		General Measures	EULA 3	If NOAA Fisheries identifies actions for eulachon restoration, the Council will consider those as potential measures that may be implemented through proposed projects after science review and a Council recommendation to Bonneville.	NOAA, Council						
Non-native and Invasive Species	47	High	Monitor and control non-native species introduction and dispersal	NNI-4	Each of the four Northwest states should continue to implement the preventative strategies in their respective state aquatic nuisance species management plans and coordinate their prevention efforts closely with the other Northwest states and British Columbia	Northwest states	Ongoing					
Program Coordination	121		Program coordination funding		All entities receiving funding for coordination of program activities must develop a work plan detailing the coordination elements, objectives, deliverables, and budget, as well as submit annual reports on this work, based on the upcoming year's priorities as outlined in the annual forum.	Regional Coordination entities		Annually				
Implement Adaptive Management	106	High	Evaluation	EV-2	The Council, with input from the ISAB and ISRP, will request evaluation of data gathered over several years, with the evaluation approach overseen by those that gathered the data, to inform decisions and advance understanding supported by these data.	The Council, with input from the ISAB and ISRP					data gathered over several years, with the evaluation approach overseen by those that	
Predator Management	50	High	Management of predator birds	PM-8	The Corps should continue to implement and improve avian-deterrent programs at all lower Snake and Columbia River dams.	U.S. Army Corps of Engineers	Ongoing					
Predator Management	50	High	Management of predator seals and sea lions	PM-9.1	PM-9.1 Take actions to improve the exclusion of sea lions at all main adult fish ladder entrances and navigation locks at Bonneville Dam.	U.S. Army Corps of Engineers	Ongoing					
Water Quality	55		TDG and Temperature	WQ 2	The Corps should continue to:	U.S. Army Corps of Engineers						
Water Quality	55		TDG and Temperature	WQ 2.1	WQ 2.1 Develop and use the SYSTDG model for estimating TDG production to assist in real-time decision making for spill operations, including improved wind forecasting capabilities, as appropriate	U.S. Army Corps of Engineers						
Water Quality	55		TDG and Temperature	WQ 2.2	WQ 2.2 Develop and use the CE-QUAL-W2 model for estimating mainstem Snake River temperatures and cold-water releases from Dworshak Dam on the North Fork Clearwater River to assist in real-time decision-making for Dworshak summer operations	U.S. Army Corps of Engineers						
Mainstem Hydrosystem Flow and Passage Operations	64		Albeni Falls Dam	MSH 10	To benefit native fish, the Corps shall investigate infrastructure changes at Albeni Falls Dam and habitat enhancements in areas impacted by the dam.	U.S. Army Corps of Engineers						

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Mainstem Hydrosystem Flow and Passage Operations	66		Adult fish passage	MSH 19.1	MSH 19.1 As a priority for the Corps' capital construction program, implement structural improvements to correct adult fish-passage problems or improve reliability of adult passage facilities and report to the Council on progress	U.S. Army Corps of Engineers						
Mainstem Hydrosystem Flow and Passage Operations	67		Adult fish passage	MSH 19.2	MSH 19.2 Install adult PIT-tag detectors at key mainstem projects or near the mouths of major tributaries that do not have them	U.S. Army Corps of Engineers						
Mainstem Hydrosystem Flow and Passage Operations	67		Adult fish passage	MSH 19.3	MSH 19.3 Improve fish-counting accuracy and utilize known-origin PIT-tagged fish to evaluate adult survival (conversion rates) through key reaches of the mainstem Snake and Columbia rivers	U.S. Army Corps of Engineers						
Mainstem Hydrosystem Flow and Passage Operations	67		Adult fish passage	MSH 19.4	MSH 19.4 Investigate the use of, or need for, surface flow outlets during the winter months to provide a safer fallback route for over-wintering steelhead and kelts	U.S. Army Corps of Engineers						
Predator Management	49	High		PM-3	The U.S. Army Corps of Engineers (the Corps) or Bonneville shall evaluate the extent of predation on lamprey at Bonneville and other upstream dams	U.S. Army Corps of Engineers or Bonneville					Evaluation of the extent of predation on lamprey at Bonneville and	
Anadromous Fish Mitigation in Blocked Areas	86	High	Reintroductions above projects in the Willamette River Basin	AFM-9	The Corps and Bonneville should support and implement anadromous fish passage measures prioritized through the Willamette River Basin Flood Control Project Biological Opinion.	U.S. Army Corps of Engineers, Bonneville	Ongoing	May-15	WATER Steering Team	Willamette Biological Opinion timelines	Configuration and Operations Plan (COP) from the Corps and	COP is in draft and being reviewed by NMFS and US Fish and Wildlife
Estuary	68		General Measures	EST 2	The Corps and Bonneville shall implement in partnership with fish and wildlife agencies and tribes and other organizations:	U.S. Army Corps of Engineers, Bonneville						
Estuary	68		General Measures	EST 2.1	EST 2.1 Assessments of opportunities for floodplain reconnection and removal or lowering of dikes and levees that block access to habitat, or installing fish-friendly tide gates for habitat reconnection, protection, and restoration	U.S. Army Corps of Engineers, Bonneville						
Estuary	68		General Measures	EST 2.2	EST 2.2 Effectiveness monitoring of habitat-restoration actions using a programmatic approach to mirror effectiveness monitoring elsewhere in the Columbia Basin	U.S. Army Corps of Engineers, Bonneville						
Estuary	68		General Measures	EST 2.3	EST 2.3 A long-term, continuous, status and trend monitoring and evaluation program for salmon, steelhead, and Pacific lamprey migration and survival that shall include monitoring habitat in the lower Columbia River,	U.S. Army Corps of Engineers, Bonneville						
Estuary	68		General Measures	EST 2.4	EST 2.4 Research and evaluation on the effects of flow regulation, dredging, and water quality (Including toxics) on estuary habitat and food webs to better understand the relationship between estuary ecology and salmon and	U.S. Army Corps of Engineers, Bonneville						
hydropower electric development and licensing, and protected areas	171		Bureau of Reclamation, and any other federal agency studying or proposing hydroelectric	PROT 7	PROT 7 Shall provide opportunity for Council review and comment.	Engineers, Bureau of Reclamation, and any other federal agency studying or proposing						

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Predator Management	50	High	Management of predator seals and sea lions	PM-9.2	PM-9.2 Continue to support land- and water-based harassment efforts by NOAA Fisheries, the Oregon and Washington departments of fish and wildlife, and tribes to keep sea lions away from the area immediately downstream of Bonneville Dam.	U.S. Army Corps of Engineers, NOAA-f, ODFW, WDFW, tribes	Ongoing					
Mainstem Hydrosystem Flow and Passage Operations	65		Juvenile fish passage	MSH 15	To maintain and improve juvenile fish passage survival, the Corps, in collaboration with state, federal, and tribal fish agencies shall select the most biologically effective combination of passage routes at each mainstem dam (including a spill level that does not exceed interim TDG standards or variances) which, when combined with other passage routes, maximizes juvenile fish survival and minimizes adult fish migration and fallback problems. In this effort, the Corps and its partners should:	U.S. Army Corps of Engineers, state, federal, and tribal fish agencies						
Mainstem Hydrosystem Flow and Passage Operations	65		Juvenile fish passage	MSH 15.1	MSH 15.1 Continue to refine the operation of surface bypass systems at all federal mainstem dams. The focus should be on developing the most effective training-spill patterns at mainstem dams to improve juvenile fish passage and survival while not affecting adult passage. Surface passage structures and outlets are important tools to achieve the dual goals of safe juvenile fish passage and long-term compliance with Clean Water Act total dissolved gas standards.	U.S. Army Corps of Engineers, state, federal, and tribal fish agencies						
Mainstem Hydrosystem Flow and Passage Operations	65		Juvenile fish passage	MSH 15.2	MSH 15.2 Relocate juvenile fish bypass outfalls in those circumstances where there are problems with predation, tailrace egress, or other factors contributing to juvenile fish injury or mortality.	U.S. Army Corps of Engineers, state, federal, and tribal fish agencies						
Mainstem Hydrosystem Flow and Passage Operations	65		Juvenile fish passage	MSH 15.3	MSH 15.3 Install new, fish-friendly turbines or optimize turbine operations to improve juvenile fish survival.	U.S. Army Corps of Engineers, state, federal, and tribal fish agencies						
Mainstem Hydrosystem Flow and Passage Operations	65		Juvenile fish passage	MSH 15.4	MSH 15.4 Continue to investigate ways to reduce descaling of juvenile sockeye.	U.S. Army Corps of Engineers, state, federal, and tribal fish agencies	Ongoing					
Mainstem Hydrosystem Flow and Passage Operations	66		Adult fish passage	MSH 19	The Corps, in collaboration with the state, federal agencies and tribes, should continue to implement improvements to the adult fish passage facilities at mainstem dams to benefit salmon and steelhead, Pacific lamprey, white sturgeon, and bull trout. In particular, cool water releases from storage reservoirs should continue to be used to facilitate adult migration. Emphasis should also be placed on research, monitoring, and evaluation; increased accuracy of fish counts; assessment of conversion rates of all adult fish species of interest, including lamprey, through key mainstem reaches; installation of PIT-tag and radio-tag detectors; evaluation of escapement numbers to spawning grounds and hatcheries; research into water temperature and spill effects on fish passage; and the connection between fish passage design and fish behavior. In particular:	U.S. Army Corps of Engineers, state, federal, and tribal fish agencies						

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Anadromous Fish Mitigation in Blocked Areas	85	High	Transboundary reintroduction	AFM-7	AFM - 7: The United States should pursue a joint program with Canada, with shared costs, to investigate and, if warranted, implement the reintroduction of anadromous fish on the mainstem Columbia River to Canadian spawning	United States, Canada						
Wildlife Mitigation	75		Wildlife Advisory Committee	WL 9	The Council recognizes the ongoing difficulties in addressing wildlife operational losses. At the same time the Council recognizes the progress that has been made in addressing this issue as the result of pilot projects on the	Wildlife Advisory Committee	Ongoing	Nov-15	WAC	Method for quantifying operational (perhaps	Report to Council on operational losses	Will be discussed by WAC throughout spring and summer in
Wildlife Mitigation	75		Wildlife Advisory Committee	WL 9.1	WL 9.1 The need for additional HEP reports and future HEP Team funding	Wildlife Advisory Committee	Ongoing	Nov-15	WAC	Report on the continued use of HEP methodology or change in status of	Report to Council	WAC has not discussed byut will begin consideration of the matter in
Wildlife Mitigation	75		Wildlife Advisory Committee	WL 9.2	WL 9.2 The diminishing need for HEP on new acquisitions as Bonneville completes construction and inundation mitigation	Wildlife Advisory Committee	Ongoing	Nov-15	WAC	Report on the continued use of HEP methodology or change in status of	Report to Council	WAC has not discussed byut will begin consideration of the matter in
Wildlife Mitigation	75		Wildlife Advisory Committee	WL 9.3	WL 9.3 Current regional need for follow-up HEP capacity to track project agreement compliance on many properties. That need may be influenced by (1) long-term settlements for operation and maintenance, (2) technology advances	Wildlife Advisory Committee	Ongoing	Nov-15	WAC	Report on the continued use of HEP methodology or change in status of	Report to Council	WAC has not discussed byut will begin consideration of the matter in
Wildlife Mitigation	75		Wildlife Advisory Committee	WL 9.4	WL 9.4 The need for new methods to assess operational losses that incorporate the results of ongoing pilot projects. This could include technical testing and evaluation of operational loss models and methodologies, or other	Wildlife Advisory Committee	Ongoing	Nov-15	WAC	Method for quantifying operational (perhaps	Report to Council on operational losses	Will be discussed by WAC throughout spring and summer in