

RPA Action	Description	Expectation for 2002	Finding	Proposed Implementation/ Comments
1	The Action Agencies, coordinating with NMFS and USFWS, shall annually develop 1- and 5-year plans to implement specific measures in hydro, habitat, hatcheries, harvest, research, monitoring, and evaluation needed to meet and evaluate the performance standards contained in this biological opinion.	Prepare 2003 Implementation Plan and 2003-2007 Five-Year Plan. Begin planning for 2003 midpoint evaluation.	Implementation as expected	Action Agencies propose to prepare plans during summer of 2002.
2	The Action Agencies shall coordinate development and implementation of the hydro portion of the 1- and 5-year implementation plans through the Regional Forum, chaired by NMFS.	Coordinate development and implementation of the hydro portion of the 2003 Implementation Plan and 2003-2007 5-year implementation plan through the Regional Forum	Implementation as expected	Action Agencies propose to coordinate through the Regional Forum.
3	The Action Agencies, coordinating through the Technical Management Team, shall develop and implement a 1- and 5-year water management plan and in-season action plans for the operation of the FCRPS.	Develop and implement a 2003 1-year and 2003-2007 5-year Water Management Plan and in-season action plans	Implementation as expected	Action Agencies propose to prepare 2003 IP and 2003-2007 IP during summer 2002, based on 2002 Water Management Plan - update with 2003 Water Management Plan in early 2003.
4	The Action Agencies, coordinating through the System Configuration Team, shall annually develop and implement a 1- and 5-year capital investment plan for the configuration of the FCRPS projects.	Develop and implement a 2003 and 2003-2007 5-year capital investment plan for the configuration of the FCRPS projects, coordinating through the System Configuration Team	Implementation as expected	Action Agencies propose to coordinate through System Configuration Team.
5	The Action Agencies, coordinating through the Water Quality Team, shall annually develop a 1- and 5-year water quality plan for operation and configuration measures at FCRPS projects.	Develop a 2003 and 2003-2007 5-year water quality plans for all RPA water quality-related operation and configuration measures at FCRPS projects, and incorporate into the appropriate 1- and 5-year implementation plans.	Implementation as expected	Action Agencies propose to coordinate this through Water Quality Team. In addition, Action Agencies are currently working cooperatively with NMFS, EPA, USFWS, state and Tribal entities, and others towards development of a Mainstem/System-wide Water Quality Plan, as proposed in Appendix B of the Opinion.
6	The Corps and BPA, through the annual planning process, shall develop and implement 1- and 5-year operations and maintenance (O&M) plans and budgets that enhance the capability to operate and maintain fish facilities at FCRPS projects for listed salmonid stocks.	Develop and implement 2003 and 2003-2007 5-year O&M plans and budgets	Implementation as expected	Action Agencies propose to use 2002 O&M Plan to develop the IPs during summer of 2002, and update as necessary with 2003 O&M Plan in 2003.
7	The Action Agencies, with assistance from NMFS and USFWS, shall annually develop 1- and 5-year plans for habitat measures that provide offsite mitigation.	Develop 2003 Implementation Plan and 2003-2007 5-year IP for habitat measures that provide offsite mitigation.	Implementation as expected	Action Agencies propose to prepare plans during summer of 2002.

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8	The Action Agencies, with assistance from NMFS and USFWS, shall annually develop 1- and 5-year plans for hatchery and harvest measures that provide offsite mitigation.	Develop 2003 Implementation Plan and 2003-2007 5-year IP for hatchery and harvest measures that provide offsite mitigation.	Implementation as expected	Action Agencies propose to prepare plans during summer of 2002.
9	The Action Agencies, with assistance from NMFS and USFWS, shall annually develop 1- and 5- year plans for research, monitoring, and evaluation to further develop and to determine the effectiveness of the suite of actions in this RPA.	Develop 2003 Implementation Plan and 2003-2007 5-year IP for RM&E measures that provide offsite mitigation.	Implementation as expected	Action Agencies propose to prepare plans during summer of 2002.
10	The Action Agencies shall work with NMFS and others to promptly incorporate the results of recovery planning into annual Fish and Wildlife Program implementation funding, including support for incorporation of the results into the NWPPC's Fish and Wildlife Program.	Incorporate the results of recovery planning into 2003 annual Fish and Wildlife Program implementation funding, including support for incorporation of the results into the Council's Fish and Wildlife Program.	Implementation as expected	Action Agencies propose to prepare IPs, including relevant recovery planning information, during summer of 2002.
11	By September 30, 2001, the Action Agencies shall develop procedures for carrying out actions that could not be anticipated in the planning process, but that are necessary or prudent to achieve the performance standards.	Develop procedures for carrying out unanticipated actions.	Modification not a concern	Procedures for carrying out unanticipated actions were not developed in 2001 as required by this Action, but they will be completed in 2002 according to the 2002 IP. NMFS finds that there will be no effect of this delay since Action Agencies have been accommodating new or unplanned activities through informal means. NMFS recommends that the Corps, Reclamation, and BPA meet with NMFS as soon as possible to formalize procedures for carrying out unanticipated actions. One of the approaches that should be considered for all agencies is the method that the Corps and NMFS have been using to evaluate operational changes in response to implementation of RPA Actions and unplanned events. This coordination procedure is documented in a June 5, 2001, letter from B. Brown (NMFS) to Brigadier General C. Strock (Corps).

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12	The Action Agencies shall coordinate with NMFS and USFWS in the review of the 1- and 5-year plans to facilitate timely review and approval as part of the annual decision process.	Coordinate with NMFS and USFWS in the review of the 2003 Implementation Plan and 2003-2007 5-year IP to facilitate timely review and approval as part of the annual decision process	Implementation as expected	Action Agencies propose to submit IPs to NMFS and USFWS during summer of 2002.
13	The Action Agencies shall issue annual reports to NMFS and USFWS on progress toward achieving the performance standards set out in this biological opinion, including comprehensive cumulative reviews in years 3, 5, and 8.	Develop 2002 Progress Report	Implementation as expected	Action Agencies propose to prepare 2002 Progress Report by spring 2003. Information from the Progress Report will be used to update the 2003 IP, if necessary.
14	The Action Agencies shall operate FCRPS dams and reservoirs with the intent of meeting the flow objectives (Table 9.6-1) on both a seasonal and weekly average basis for the benefit of migrating juvenile salmon.	Operate the FCRPS dams in compliance with the 2002 Water Management Plan in coordination with the TMT.	Implementation as expected	The drought and power emergency impacted the ability to operate dams and reservoirs with the intent of meeting flow targets in 2001. However, the draft 2002 Water Management Plan has been completed and the Action Agencies are operating the system in 2002 consistent with the intent of meeting the flow objectives in coordination with the TMT.
15	The Action Agencies shall operate the FCRPS to provide flows to support chum salmon spawning in the Ives Island area below Bonneville Dam.	Provide flows to support chum spawning in the Ives Island area below Bonneville from the start of spawning (late October or early November) until the end of emergence in Spring.	Implementation as expected	The drought and power emergency impacted the ability to maintain chum flows through the entire incubation period during the 2000-2001 season. However, a chum spawning operation has been completed for the 2001-2002 fish passage season that met the conditions established in the Opinion.
16	The Action Agencies shall operate the FCRPS to provide access for chum salmon spawning in Hamilton and Hardy creeks.	Provide access for chum spawning in Hamilton and Hardy creeks if there is insufficient storage to maintain spawning flows of at least 125 kcfs throughout the 2001-2002 spawning season for chum.	Implementation as expected	During the 2001-2002 season there was sufficient water in storage to maintain spawning flow of at least 125 kcfs throughout the chum spawning season. Although the obligation to implement Action 16 is contingent upon not meeting adequate flows in Action 15 and they were met, there still was access to the Hamilton and Hardy creeks during this fish passage season. There also was access to the creeks during the 2000-2001 passage season.

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17	The Action Agencies shall coordinate with NMFS, USFWS, and the states and Tribes in preseason planning and in-season management of flow and spill operations. This coordination shall occur in the Technical Management Team process (see Section 9.4.2.2).	Action Agencies coordinate during the 2002 passage season with NMFS, USFWS, and the states and Tribes on preseason planning and in-season management of flow and spill operations.	Implementation as expected	Given the drought and power emergency in 2001, many operation decisions were made by regional executives and not by TMT representatives. However, during 2002, the Action Agencies have been participating and coordinating in Regional processes, such as the TMT, in a manner anticipated by the Opinion.
18	The Action Agencies shall operate the FCRPS during the fall and winter months in a manner that achieves refill to April 10 flood control elevations, while meeting project and system minimum flow and flood control constraints before April 10. During the spring, the Action Agencies shall operate the FCRPS to meet the flow objectives and refill the storage reservoirs (Albeni Falls, Dworshak, Grand Coulee, Hungry Horse, and Libby) by approximately June 30.	Operate the FCRPS during the fall 2001 and winter 2002 months in a manner that achieves refill to April 10 flood control elevations, while meeting project and system minimum flow and flood control constraints before April 10. Operate the FCRPS during the spring to meet the flow objectives and refill the storage reservoirs (Albeni Falls, Dworshak, Grand Coulee, Hungry Horse, and Libby) by approximately June 30.	Modification requires resolution	Given the drought, chum salmon operations, and power emergency, reservoirs were not operated to their upper rules curves nor were flow objectives met in 2001. During the 2002 fish passage season, reservoir operations and flow management measures generally have been and are expected to be operated as anticipated by the Opinion. The exception has been Grand Coulee spring 2002 operations. This project was operated to meet its April 10 flood control, but Reclamation would not allow a significant draft of the reservoir below its flood control draft level to meet weekly spring flow objectives. The effect of this modification was reduced flow during the early spring migration, which contributed to missing flow objectives during this period. During the latter part of the spring migration, flow objectives were met, but lack of reservoir storage resulted in involuntary spill, which contributed to high dissolved gas levels. NMFS recommends that Reclamation meet with NMFS prior to the 2003 migration to discuss improved operational approaches for meeting both flood control and fish migration requirements.

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19	The Action Agencies shall operate specific FCRPS projects as follows:	In 2002, achieve the probability of reaching flood control rule curve elevations and refill objectives at Albeni Falls, Dworshak, Grand Coulee, Hungry Horse, and Libby as specified in the Opinion.	Implementation as expected	In 2001, operations were modified because of the drought and power emergency. However, in 2002, operations are being implemented as expected. Change in the Libby VarQ schedule is not expected to impact 2002 operations at that project because the Corps forecasts the reservoir to refill anyway and operations elsewhere are also expected to meet the Opinion's conditions.
20	The Corps shall operate the lower Snake River reservoirs within 1 foot of MOP from approximately April 3 until small numbers of juvenile migrants are present and shall operate the John Day pool within a 1½-foot range of the minimum level that provides irrigation pumping from April 10 to September 30.	Operate within 1 foot of MOP during the fish passage season.	Implementation as expected	In 2001 the system was operated within MOP constraints, other than for allowable exceptions under the Water Management Plan. In 2002, this Action is being implemented similarly to 2001 and as noted in the 2002 Water Management Plan.
21	The Corps shall routinely identify opportunities to shift system flood control evacuation volumes from Brownlee and Dworshak reservoirs to Lake Roosevelt and identify such opportunities for the Technical Management Team. The Corps shall implement flood control shifts as necessary to best protect listed fish, as called for by NMFS in coordination with the Technical Management Team, taking into account water quality issues and the concerns of all interested parties.	Implement flood control shifts from different reservoirs in the Columbia and Snake rivers as necessary to increase river flows in a manner that best protects listed salmon and steelhead.	Implementation as expected	No shift was possible in 2001, since both projects operated well below flood control. However, a Dworshak - Grand Coulee flood control shift was implemented in 2002.

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22	The Corps and BOR shall implement VARQ flood control operations, as defined by the Corps (1999d), at Libby by October 1, 2001, and at Hungry Horse by January 1, 2001. By February 1, 2001, the Corps shall develop a schedule to complete all disclosures, NEPA compliance, and Canadian coordination necessary to implement VARQ flood control at Libby.	Refill Libby and Hungry Horse reservoirs during 2002 in a way that allows them to be operated for fish passage purposes in the manner anticipated by the Opinion.	Modification requires resolution	<p>The Opinion calls for the implementation of variable flow flood control (VarQ) at Libby and Hungry Horse for the 2002 fish migration season. VarQ has been implemented by Reclamation on schedule at Hungry Horse. Preparation of an EIS precludes implementation by the Corps at Libby on the schedule specified in the Opinion. Therefore, VarQ is delayed at Libby for at least one year. The 2002 Implementation Plan states that the Corps and Reclamation are planning to develop an EIS and implement VarQ with the following schedule: (1) scoping and hydraulic/hydrologic/ flood control studies in FY 2001-2002; (2) fishery and other impact analyses, publication of a draft EIS with public review in 2003; (3) EIS finalized and Record of Decision issued in FY 2004; and (4) VarQ implementation in 2005.</p>
				<p>However, as identified in a March 29, 2002, transmittal to NMFS (Fisher 2002), the Corps, in coordination with Reclamation, BPA, NMFS and USFWS, is now considering interim implementation of VarQ at Libby beginning in 2003. The Corps has developed a plan that: 1) completes a spill test at Libby in June 2002 to study spill/dissolved gas relationships; 2) completes hydrologic studies for new VarQ operation in 2002; 3) begins coordination with Canada on this new operation in 2002; 4) calls for Reclamation to review recently collected information on contaminant levels in sediments at Grand Coulee Dam; and 5) completes NEPA documentation sufficient to make a decision on an interim operation. A decision on whether to proceed with an interim VarQ operation will be made in December 2002. Actions to compensate for delayed implementation of VarQ are being considered by the Seattle District of the Corps.</p>
				<p>Recently, the Corps has informed NMFS that Libby is likely to refill in July 2002,</p>

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				<p>which is the NMFS objective for VarQ operation. Therefore, the schedule change for this Action will not affect this summer's fish passage flow operations. If the Corps proceeds with VarQ in December 2002, the change in schedule will not reduce the likelihood of substantially meeting expectations in 2003, 2005, and 2008. However, if the Corps delays the decision beyond 2002 or decides not to proceed with VarQ, this modification of the action could reduce the likelihood of meeting expectations in 2003, 2005, and 2008 if Libby refill is compromised. This is because VarQ provides for significant additional water during the fish passage season in years of normal and below normal runoff. NMFS recommends that the Corps and Reclamation proceed with the amended schedule outlined above and adopt VarQ before the 2003 fish passage season. If it delays a decision on VarQ or rejects the action, NMFS recommends that the Corps identify other actions to compensate for the lost volume.</p>
23	<p>BOR shall operate Banks Lake at an elevation 5 feet from full during August by reducing the volume of water pumped from Lake Roosevelt into Banks Lake by about 130 kaf during this time.</p>	<p>Operate Banks Lake at an elevation 5 feet from full during August.</p>	<p>Implementation as expected</p>	<p>Banks Lake was operated as planned in 2001. In 2002, it is also being implemented on schedule and in a manner anticipated by the Opinion and described in the 2002 Water Management Plan.</p>
24	<p>BPA and the Corps shall continue to request and negotiate agreements to annually provide 1 Maf of Treaty storage from January through April 15, release the water during the migration season, and seek additional storage amounts.</p>	<p>Request and negotiate to provide the 1 Maf of Treaty storage from January through April 15, release during the migration season, and seek additional storage amounts.</p>	<p>Implementation as expected</p>	<p>1 Maf was not stored in 2001 because of the power emergency, chum salmon operations, and drought. However, there has been agreement between the Entities for 2002. The 1 Maf has been stored for this year and is being released. The portion of the action seeking additional amounts is addressed in Action 26.</p>
25	<p>BPA and the Corps shall continue to request, and negotiate with BC Hydro for storage of water in non-Treaty storage space during the spring for subsequent release in July and August for flow enhancement, as long as operations forecasts indicate that water stored in the spring can be released in July and August.</p>	<p>Request the use of non-Treaty storage for 2002 and negotiate for it with the Canadian Entities.</p>	<p>Implementation as expected</p>	<p>A letter of agreement has been signed and storage is currently ongoing for release in July and August 2002.</p>

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26	BPA and the Corps shall continue to evaluate, request, and negotiate with BC Hydro the shaping and release of water behind Canadian Treaty storage projects in addition to the non-Treaty storage water previously discussed during July and August.	Evaluate, request, and negotiate with BC Hydro the shaping and release of water behind Canadian Treaty storage projects in addition to the non-Treaty storage water previously discussed during July and August. Also expected in 2002 is a report that will be considered by the Entity Chairs regarding the potential of adding turbine units at Mica and Revelstoke Dam .	Implementation as expected	BPA and the Corps have explored the potential of adding turbine units at Mica and Revelstoke Dam to increase the volume of water available in the lower Columbia River during July and August. A draft report was provided to NMFS on the status of these discussion in 2002. The report indicated that increases in summer flow may be feasible through different operating alternatives, or through a capital-investment program calling for installation of one or more additional turbines at both Mica and Revelstoke Dams. No further action has been proposed by the U.S. Entities. In addition, the shaping and release of water behind Canadian Treaty storage projects for 2002 and beyond has been requested of the Canadian entities.
27	Before entering into any agreement to commit currently uncontracted water or storage space in any of its reservoirs covered by this biological opinion to any other use than salmon flow augmentation, BOR shall consult with NMFS under ESA Section 7(a)(2). Such consultations shall identify the amount of discretionary storage or water being sought, the current probability of such storage or water being available for salmon flow augmentation, and any plan to replace the storage volume currently available to salmon flow augmentation that would be lost as a result of the proposed commitment. Also, BOR shall consult with NMFS before entering into any new contract or contract amendment to increase the authorized acreage served by any irrigation district receiving BOR-supplied water. NMFS' criterion in conducting such reviews is to ensure that there be zero net impact from any such BOR commitment on the ability to meet the seasonal flow objectives established in this biological opinion. Replacement supplies should have at least an equal probability of being available for salmon flow augmentation as the storage space or water that is being committed.	Consult with NMFS under ESA Section 7(a)(2) and generally consider impact that a transfer by Reclamation would have on possible salmon flow augmentation operations before that agency enters into any agreement in 2002 to commit currently uncontracted water or storage space in its reservoirs. Also, Reclamation will consult with NMFS before entering into any new contract or contract amendment in 2002 to increase the authorized acreage served by any irrigation district receiving Reclamation-supplied water.	No schedule, implementation underway	Reclamation has consulted on one lease transfer and has committed to consulting on any new or renewed lease prior to signing. NMFS understands that Reclamation will be requesting consultation on the re-issuance of the water service contracts for the Lucky Peak Project (Boise River).
28	BOR shall pursue water conservation improvements at its projects and shall use all mechanisms available to it under state and Federal law to ensure that a reasonable portion of any water conserved will benefit listed species.	No schedule in Opinion - no specific expectations for 2002.	No schedule, implementation underway	Reclamation has stated that it will pursue this action under the existing Water Conservation Field Services Program. This would be the first step in a strategy to eventually provide some of the conserved water for instream flow.

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29	Within 2 years from the date this opinion is signed, BOR shall provide NMFS with a detailed progress report addressing possible instances where BOR-supplied water within the Columbia River basin is being used without apparent BOR authorization to irrigate lands. In the report, BOR shall indicate how it shall proceed to identify and address instances of unauthorized use.	Receive a detailed progress report from Reclamation addressing possible instances of where water it supplies is being used without apparent authorization to irrigate lands within the Columbia River basin by December 2002. In the report, Reclamation will indicate how it will identify and address instances of unauthorized use.	Implementation as expected	NMFS' finding is based on Reclamation's verbal commitment and comments in a March 29, 2002, Action Agency transmittal to NMFS (Fisher 2002) that states: "...Reclamation has agreed to provide the information [on unauthorized water use]. Reclamation will work with NMFS to provide a format to display the necessary information." While Reclamation has provided little information to support their assertion of progress, it has recently begun efforts to correct some instances of unauthorized use - primarily through reclassification and boundary extensions on which they are consulting.

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30	<p>For those BOR projects located in the Columbia River and its tributaries downstream from Chief Joseph Dam (Table 9.6-2), BOR shall, as appropriate, work with NMFS in a timely manner to complete supplemental, project-specific consultations. These supplemental consultations shall address effects on tributary habitat and tributary water quality, as well as direct effects on salmon survival (e.g., impingement, entrainment in diversions, false attraction to return flows, and others). These supplemental consultations shall address effects on mainstem flows only to the extent to which they reveal additional effects on the in-stream flow regime not considered in this biological opinion (e.g., flood control).</p>	<p>Complete consultation on Umatilla and Yakima projects. Prioritize and initiate consultation on remaining supplemental projects based on potential improvement to anadromous fish tributary survival needs. Begin a sufficient number of consultations to ensure that all 10 identified supplemental project consultations are completed by 2003 per NMFS' expectation in Appendix F.</p>	<p>Modification not a concern</p>	<p>Reclamation is to work with NMFS to complete consultations on 10 projects located downstream from Chief Joseph Dam on the Columbia River. Appendix F indicates NMFS' expectation that these consultations will be completed by 2003. NMFS has received biological assessments (BA) and requests for consultation on two of the identified supplemental projects. The 2002 IP proposes to initiate and complete consultations on four additional projects in 2002. Due to the amount of time required to consult on the first of these complex projects, it appears unlikely that all 10 consultations will be completed by the 2003 checkpoint. For example, BAs for the Yakima and Umatilla projects were submitted to NMFS prior to the completion of the Opinion. These two consultations have not been completed and solutions are still being worked out to address, in part, instream flow, temperature, and passage issues. Some significant policy issues regarding the expected level of survival improvements from these tributary projects have been elevated for regional executive resolution. However, this anticipated delay in completing consultations will not be significant if resolution of these complex policy issues identified in the first consultations accelerates completion of consultation on the remaining projects. NMFS recommends that Reclamation develop standard monitoring elements to ensure that all supplemental projects contribute to tributary survival improvement needs consistent with expectations established in the Opinion.</p>

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31	BOR shall assess the likely environmental effects of operating Banks Lake up to 10 feet down from full pool during August. The assessment and NEPA compliance work shall be completed by June 2002 to determine future operations at this project by the summer of 2002.	Conduct an assessment and NEPA compliance review by the Fall 2002 for operating Banks Lake 10 feet from full pool in August.	Modification not a concern	Over the past year and a half, Reclamation has conducted public meetings and initiated a NEPA process on the likely environmental effects of operating Banks Lake as much as 10 feet down from full pool during August. Reclamation has missed the June 2002 BiOp schedule for completing the NEPA compliance for a 10 foot draft at Banks Lake. However, this is not a significant problem because completion of the NEPA compliance is anticipated later in 2002 and any resulting management actions could be implemented in time for the 2003 fish passage season.
32	The Action Agencies shall acquire water for instream use from BOR's Upper Snake River basin projects and Idaho Power Company's Hells Canyon Complex during the spring and summer flow augmentation periods to improve the likelihood of achieving spring and summer flow objectives at Lower Granite Dam.	No schedule in Opinion - no specific expectations for 2002.	No schedule, implementation underway	Reclamation is acquiring additional waters in ID and OR for augmentation and the Action Agencies are negotiating with IPC for the release of stored water from Brownlee.
33	The Corps, in coordination with USFWS, shall design and implement appropriate repairs and modifications to provide water supply temperatures for the Dworshak National Fish Hatchery that are conducive to fish health and growth, while allowing variable discharges of cold water from Dworshak Reservoir to mitigate adverse temperature effects on salmon downstream in the lower Snake River.	Complete the design and implement the appropriate repairs of the Dworshak Hatchery water supply system.	Implementation as expected	The modifications will be completed by the end of 2002 and used in the winter of 2003 to make up for loss in growth of hatchery steelhead due to summer 2002 Dworshak water releases.
34	The Action Agencies shall evaluate potential benefits to adult Snake River steelhead and fall chinook salmon passage by drafting Dworshak Reservoir to elevation 1,500 feet in September. An evaluation of the temperature effects and adult migration behavior should accompany a draft of Dworshak Reservoir substantially below elevation 1,520 feet.	Draft Dworshak Reservoir in September 2002 to an elevation of 1,500 feet to evaluate the potential benefits of the operation on adult Snake River steelhead and fall chinook.	Implementation as expected	The operation is in the 2002 Water Management Plan. Continuing discussions need to occur this year in the Regional Forum regarding the details of the study and system operations.
35	The Corps shall develop and conduct a detailed feasibility analysis of modifying current system flood control operations to benefit the Columbia River ecosystem, including salmon. The Corps shall consult with all interested state, Federal, Tribal, and Canadian agencies in developing its analysis. Within 6 months after receiving funding, the Corps shall provide a feasibility analysis study plan for review to NMFS and all interested agencies, including a peer-review panel (at least three independent reviewers, acceptable to NMFS, with expertise in water management, flood control, or Columbia River basin anadromous salmonids). A final study plan shall be provided to NMFS and all interested agencies 4 months after submitting the draft plan for review. The Corps shall provide a draft feasibility analysis to all interested agencies, NMFS, and the peer-review panel by September 2005.	Receive funding for 2003 to initiate develop and conduct a detailed feasibility analysis of modifying current system flood control operations in the Columbia basin to benefit salmon.	Modification not a concern	At least 1 year delay because of failure to receive appropriations in 2002. Corps has a national no new start policy. The one-year delay in the Columbia River flood control study will have unknown effects, which NMFS therefore considers a potentially minor impact. Although the Opinion stated that this study could benefit salmon by improving the likelihood of meeting flow targets, the results of the study cannot be determined in advance.

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36	By October 1, 2002, the Corps shall develop and, if feasible, implement a revised storage reservation diagram for Libby Reservoir that replaces the existing fall draft to a fixed end-of-December elevation. One option is to evaluate variable drafts based on the El Niño Southern Oscillation Index (SOI) predictions or other forecast methodologies of runoff volume. To implement this change, the Corps shall complete successful coordination with Canada under the Columbia River Treaty.	Complete the forecasting phase of a revised storage reservation diagram for Libby Reservoir by October 2002.	Modification requires resolution	There are two phases of this task: development of a new seasonal volume forecasting method and evaluation of the impacts of the forecasting method on local and system flood control. The Opinion requires completion of both tasks by October 2002, but only the forecasting method is likely to be completed by this date. The potential first year of implementation of a new end-of-December flood control plan will be delayed by one year. This potentially will cause lower than anticipated flows if 2003 is a below-average water year which may result in failure to meet an anticipated survival improvement during that time. NMFS recommends that the Corps modify the schedule for completion of this Action to conform to the June 2003 date in the USFWS 2000 FCRPS biological opinion. NMFS also recommends that the forecast phase of this Action be completed by October 1, 2002, as originally scheduled. Corps staff have indicated that this schedule is feasible.
37	BOR shall investigate the attraction of listed salmon and steelhead into wasteways and natural streams receiving waste water from the Columbia Basin Project. If listed fish are found to be attracted into these channels, BOR shall work with NMFS to identify and implement structural or operational measures to avoid or minimize such use, as warranted.	No schedule in Opinion - no specific expectations for 2002.	No schedule, implementation underway	In 2001, Reclamation investigated anadromous salmon habitat availability and usage in three watersheds of the Columbia Basin Irrigation Project. Two of the watersheds are irrigation wasteways. This investigation is scheduled for completion in 2002. NMFS recommends that the final report thoroughly address the attraction of listed salmon and steelhead into the wasteways and natural streams considered in the report.
38	By March 1, 2002, BOR shall install screens meeting NMFS' screen criteria at the canal intakes to the Burbank No. 2 and Burbank No. 3 pump plants. BOR shall connect the Burbank No. 3 intake canal to Burbank Slough to provide juvenile fish egress. BOR shall coordinate with NMFS on each of the actions identified above.	Complete the final phase of construction.	Implementation as expected	Construction is nearly complete, pending NMFS engineering review.

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39	<p>BOR shall evaluate the water quality characteristics of each point of surface return flows from the Columbia Basin Project to the Columbia River and estimate the effects these return flows may have on listed fish in the Columbia River and in the wasteways accessible to listed fish. By June 1, 2001, BOR shall provide NMFS with a detailed water quality monitoring plan, including a list of water quality parameters to be evaluated. If the water quality sampling reveals enough water quality degradation to adversely affect listed fish, BOR shall develop and initiate implementation of a wasteway water quality remediation plan within 12 months of the completion of the monitoring program.</p>	<p>Evaluate the water quality characteristics by Reclamation of the waters in irrigation wasteways and return flows to the Columbia Basin Project through a detailed monitoring and evaluation plan that includes current use pesticides and is closely coordinate with NAWQA.</p>	<p>Modification not a concern</p>	<p>This Action requires, as an initial step, that Reclamation prepare a detailed water monitoring plan, including a list of water quality parameters to be evaluated, by June 1, 2001. Reclamation would evaluate water quality characteristics of the waters in irrigation wasteways and return flows from the Columbia Basin Project and estimate the potential adverse effects on Upper Columbia River steelhead. In May 2001, Reclamation submitted their water monitoring plan. This plan reflected Reclamation's intent to limit the monitoring of pesticides to those chemicals used by the irrigation districts to control aquatic plant growth in canals and laterals. Reclamation proposed to monitor the following: (1) field parameters - dissolved oxygen, PH, and specific conductivity; (2) agrichemicals - acrolien, copper sulfate, and xylene, and (3) conventional water quality parameters - dissolved minerals (sodium, potassium, magnesium, chloride, sulfate, and calcium), mineral hardness (bicarbonates, carbonates, SAR, and alkalinity), nutrients (total phosphates, ortho-phosphates, ammonia-nitrogen, TKN, nitrate, and total nitrogen), chemical oxygen demand, and suspended solids. NMFS did not consider the plan to adequately reflect the scope of Action 39 and worked with Reclamation to develop an agreed-upon scope of the Water quality monitoring effort, as noted below. NMFS' concern at the time was that the May 2001 list is not a "detailed water quality monitoring plan" and contains no provisions for monitoring and evaluating other pesticides or contaminants that may be currently in use. Reclamation's concern was that it should focus its monitoring for pesticides for which it has statutory and regulatory authority for remediation, if needed.</p> <p>Although completion of a water quality plan of adequate scope has been delayed, the delay will not have significant effects and continuing discussions indicate that the final monitoring plan will be</p>

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				<p>sufficiently comprehensive. Since its initial proposal, Reclamation has agreed to fund additional sampling through the USGS, National Water Quality Assessment Program, although it may not have authority for remediation based on possible findings in the additional sampling. This sampling would include current use pesticides, especially those that have been previously detected in the eastern Washington Columbia Plateau. These materials include organophosphates and carbamate classes of insecticides. Sampling locations have been identified through discussion between NMFS, Reclamation, and USGS. The USGS' analytical techniques provide a wide initial screening for pesticides and that method may provide cost effective results for this evaluation. Finally, Reclamation's sampling frequency and timing for the evaluation will need to reflect current agricultural water delivery practices. Work is progressing among the agencies to make refinements in the monitoring program, sampling frequency, and protocol. Monitoring is expected to begin in summer of 2002.</p>
40	<p>The Corps shall continue to transport all non-research juvenile salmonids collected at the Snake River collector projects. The Corps and BPA shall continue to implement voluntary spill at all three Snake River collector projects when seasonal average flows are projected to meet or exceed 85 kcfs.</p>	<p>Establish operational protocols to transport all non-research juvenile salmonids collected at the Snake River collector projects and to implement voluntary spill at all three Snake River collector projects when seasonal average flows are projected to meet or exceed 85 kcfs.</p>	<p>Implementation as expected</p>	<p>Protocols are in the 2002 Water Management Plan and 2002 Fish Management Plan.</p>

RPA Action	Description	Expectation for 2002	Finding	Proposed Implementation/ Comments
41	The Corps and BPA shall continue (pending results of the McNary Transport Evaluation) to bypass juvenile spring migrants collected at McNary Dam and shall provide the spring spill levels described for that project.	Continue (pending results of the McNary Transport Evaluation) to bypass juvenile spring migrants collected at McNary Dam and provide the spring spill levels described for that project, which are described in the 2002 Water Management Plan.	Implementation as expected	During the spring of 2001, juvenile spring migrants were transported from McNary Dam on an alternating day basis. Spring transportation was implemented because of the poor in-river conditions caused by the drought and power emergency. Project operations specified in the Opinion, which calls for returning spring migrants to the river, were resumed in 2002, with the exception of fish comprising the transport study group for Action 45.
42	The Corps and BPA shall operate the collector projects to maximize collection and transportation during the summer migration (i.e., no voluntary spill except as NMFS deems necessary for approved research).	Operate the collector projects during the 2002 fish passage season to maximize collection and transportation during the summer migration (i.e., no voluntary spill except as NMFS deems necessary for approved research).	Implementation as expected	The action is described in the 2002 Water Management Plan.
43	The Corps shall not initiate collection of subyearling fall chinook for transportation at McNary Dam until inriver migratory conditions are deteriorating (i.e., no longer spring-like).	Initiate the collection of subyearling fall chinook for transportation at McNary Dam when inriver migratory conditions are deteriorating (i.e., no longer spring-like).	Implementation as expected	This action is covered by the 2002 Water Management Plan.
44	The Corps shall extend the period of barge transportation from the lower Snake River dams and McNary to further reduce reliance on trucking.	No schedule in Opinion - no specific expectations for 2002.	No schedule, implementation underway	The Corps and NMFS are discussing extending barge transportation from the lower Snake River dams and McNary into August to further reduce reliance on trucking. This would be an extension over previous years. This Action also was implemented in 2001, when barging was extended 5 weeks to July 31.
45	By the end of 2001, the Corps shall develop, in coordination with NMFS and the other Federal, state, and Tribal salmon managers, a McNary Dam transportation evaluation study plan specifically focusing on the response of UCR spring chinook and steelhead to transportation. Approved research should begin by 2002, if feasible.	Develop a study through the Andromous Fish Evaluation Program for a McNary Dam transportation evaluation study plan and begin implementation of field studies in 2002.	Implementation as expected	2002 is the first year of what is expected to be a three-year study.

RPA Action	Description	Expectation for 2002	Finding	Proposed Implementation/ Comments
46	The Corps and BPA, in coordination with NMFS through the annual planning process, shall evaluate transport to inriver return ratios for wild SR yearling chinook salmon and steelhead. In addition, the Corps and BPA shall also evaluate the effects of transportation on summer-migrating subyearling SR chinook salmon.	Provide through the Andromous Fish Evaluation Program additional reports in 2002 that evaluate transport to inriver return ratios for wild SR yearling chinook salmon and steelhead and and evaluate the effects of transportation on summer-migrating subyearling SR chinook salmon.	Implementation as expected	Estimated as part of ongoing transport studies.
47	During all transport evaluations, the Corps and BPA, in coordination with NMFS through the annual planning process, shall include an evaluation of delayed mortality (D) of transported versus inriver migrating juvenile anadromous salmonids.	Provide evaluations through the Andromous Fish Evaluation Process in 2002 on differential post-Bonneville survival of transported versus inriver migrating juvenile anadromous salmonids ("D").	Implementation as expected	"D" being estimated in ongoing studies.
48	The Corps and BPA shall evaluate the effects of prior transport as smolts on the homing of adults.	No schedule in Opinion - no specific expectations for 2002.	No schedule, implementation not underway	In 2002 the Action Agencies and NMFS will be considering whether specific studies can be designed to address these issues.
49	The Corps shall evaluate strategies to enhance post-release survival of transported fish; examples of such strategies include timing releases so that fish arrival at the estuary corresponds to minimal interactions with predators and maximum availability of forage and locating releases so as to decrease passage time through areas of high predation.	No schedule in Opinion; no specific expectations in 2002.	No schedule, implementation underway	Studies which may provide some insight into this issue have been conducted and are also included in ongoing research.
50	BPA and the Corps shall install necessary adult PIT-tag detectors at appropriate FCRPS projects before the expected return of adult salmon from the 2001 juvenile outmigration.	Determine if the adult PIT-tag detectors already installed at FCRPS projects are adequate for the Opinion research before the expected return of adult salmon from the 2001 juvenile outmigration.	Implementation as expected	Detectors have been installed at Bonneville and McNary Dam and are being tested in 2002.

RPA Action	Description	Expectation for 2002	Finding	Proposed Implementation/ Comments
51	If results of Snake River studies indicate that survival of juvenile salmon and steelhead collected and transported during any segment of the juvenile migration (i.e., before May 1) is no better than the survival of juvenile salmon that migrate inriver, the Corps and BPA, in coordination with NMFS through the annual planning process, shall identify and implement appropriate measures to optimize inriver passage at the collector dams during those periods.	Transport at Lower Monumental Dam beginning May 1, 2002. Provide 24-hour spill at Little Goose Dam until May 1, 2002.	No schedule, implementation underway	Data from adults which returned from the 1995 and 1998 juvenile outmigrations indicate the benefit of transportation increases substantially in late April. Given this trend, the decision was made to delay transporting fish from Lower Monumental Dam until May 1, 2002, and to extend the spill hours at Little Goose. These actions were taken to increase the number of fish that remained in-river until May 1 (as an offset to lack of spill at Lower Monumental in 2002).
52	The Corps shall identify and implement improvements to the transportation program.	Delay transport of fish from selected projects until May 1, 2002. Extend barging until August 15 in 2002.	Implementation as expected	2002 Water Management Plan. See Actions 44, 51, 53.
53	The Corps shall evaluate and implement structural and operational alternatives to improve juvenile transportation at the collector dams.	Change procedures in 2002 at the Lower Monumental project to prevent crowding, injury, and stress to juvenile migrants.	Implementation as expected	Changes made in Appendix B of the 2002 Fish Passage Plan
54	The Corps and BPA shall implement an annual spill program, consistent with the spill volumes and TDG limits identified in Table 9.6-3, at all mainstem Snake and Columbia River FCRPS projects as part of the annual planning effort to achieve the juvenile salmon and steelhead performance standards.	Operate an annual spill program, consistent with the spill volumes and TDG limits identified in the Opinion at all mainstem Snake and Columbia River FCRPS projects as part of the 2002 Water Management Plan.	Implementation as expected	Spill was reduced from specified levels in 2001 in response to drought and power emergency. However, in 2002, spill levels required by the Opinion are being implemented as proposed in the 2002 Water Management Plan.
55	To improve the future flexibility of the transmission system, BPA's Transmission Business Line shall initiate planning and design necessary to construct a Schultz-Hanford 500-kV line or an equivalent project, with a planned schedule for implementation by 2004 or 2005.	Complete draft EIS in February 2002. Continue preparation of a NEPA Record of Decision for completion in March 2003.	Implementation as expected	BPA began a public review process by releasing a scoping document to evaluate this project in 2001. BPA is proceeding with the NEPA planning, but needs Congress to authorize an increase in borrowing authority for the agency to complete construction of the Schultz-Hanford transmission line project.

RPA Action	Description	Expectation for 2002	Finding	Proposed Implementation/ Comments
56	BPA's Transmission Business Line shall continue efforts to evaluate, plan, design, and construct a joint transmission project to upgrade the west-of-Hatwai cutplane and improve the transfer limitations from Montana.	Update environmental and cultural surveys; complete draft EIS in 2002 in conjunction with public scoping meetings on this project that were held in early 2002. Continue preparation of a NEPA Record of Decision for completion in January, 2003.	Implementation as expected	BPA is proceeding with the NEPA planning, but needs Congress to authorize an increase in borrowing authority for the agency to complete construction of this transmission line project.
57	BPA's Transmission Business Line shall continue to evaluate strategically located generation additions and other transmission system improvements and report progress to NMFS annually. BPA's Transmission Business Line shall also limit future reservations for transmission capacity, as needed, to enable additional spill to meet performance standards, while minimizing effects on transmission rights holders.	No schedule in Opinion.	No schedule, implementation underway	BPA will continue to keep NMFS apprised of generation additions and transmission system improvements and their associated effect on the Opinion's spill program. A BPA report on 2002 accomplishments and planned 2003 activities is scheduled to be submitted in the fall of 2002.
58	The Corps and BPA, in coordination with the Fish Passage Operations and Maintenance Coordination Team (FPOM), shall operate all turbine units at FCRPS dams for optimum fish passage survival. Methods to achieve this objective shall include, but are not limited to, activities outlined in the following paragraphs. (See RPA)	Develop the process and provide the annual summary report detailing compliance with the 1% peak efficiency turbine operation guidelines for the FCRPS projects.	Implementation as expected	Corps proposes to do this through 2002 FPOM.
59	The Action Agencies, in coordination with the Regional Forum, shall determine the appropriate operating range of turbines equipped with minimum gap runners (MGRs) to increase survival of juvenile migrants passing through these new turbine designs.	No schedule in Opinion; no specific expectations in 2002.	No schedule, implementation underway	Action Agencies propose to produce modeling work at ERDC in 2002.
60	The Corps and BPA shall evaluate adult fallback and juvenile fish passage under daytime spill to the gas cap at Bonneville Dam in 2002 and 2003, after deflector optimization improvements allow for increased spill above current levels. Research results will be considered, in consultation with NMFS through the annual planning process, to determine implementation of additional changes in spill to further improve fish survival.	Continue adult and juvenile passage studies, including Bonneville adult fallback in 2002.	Implementation as expected	Ongoing studies.
61	The Corps shall complete the ongoing prototype powerhouse system surface collection evaluations at Bonneville First Powerhouse in 2000. The Corps shall compare the prototype with screened bypass systems and, if warranted, design and construct permanent facilities after full consideration and resolution of biological and engineering uncertainties, especially high-flow outfall investigations.	No schedule in Opinion after date of signature; no specific expectations in 2002.	No schedule, implementation underway	Action Agencies propose to complete the B1 configuration decision report in 2002. Further work is dependent upon this decision (see Action 97).

RPA Action	Description	Expectation for 2002	Finding	Proposed Implementation/ Comments
62	The Corps shall complete Bonneville First Powerhouse prototype evaluations of extended submerged intake and gatewell vertical barrier screens, including an assessment of fry passage.	No schedule in Opinion; no specific expectations in 2002.	No schedule, implementation underway	Biological studies were completed in 1999; hydraulic studies continue in 2002. Corps proposes to continue ongoing studies in 2002 on hydraulic modeling to investigate VBS porosity.
63	The Corps shall complete the design of debris removal facilities for the Bonneville First Powerhouse forebay.	No schedule in Opinion; no specific expectations in 2002.	No schedule, implementation underway	Plans are complete. Installation is dependent upon Bonneville decision process per Action 97.
64	The Corps shall continue the investigation of minimum gap runners at the Bonneville First Powerhouse.	No schedule in Opinion; no specific expectations in 2002.	No schedule, implementation underway	Action Agencies propose to proceed with modeling at ERDC in 2002.
65	The Corps shall complete Bonneville Second Powerhouse post-construction evaluation of the new juvenile fish bypass outfall and address design and operational refinements as warranted.	No schedule in Opinion; no specific expectations in 2002.	No schedule, implementation underway	Action Agencies propose to conduct fry tests on switch gate in 2002.
66	The Corps shall continue design development and construction of a Bonneville Second Powerhouse permanent corner collector at the existing sluice chute, pending results of high-flow outfall investigations. The Corps shall construct new facilities if, and as soon as, evaluations confirm the optimum design configuration and survival benefits.	No schedule in Opinion; no specific expectations in 2002.	No schedule, implementation underway	Action Agencies propose to continue plans for Corner Collector construction in 2002.
67	The Corps shall continue Bonneville Second Powerhouse investigations of measures to improve intake screen fish guidance efficiency and safe passage through the gatewell environment. This work shall include an assessment of fry passage.	No schedule in Opinion; no specific expectations in 2002.	No schedule, implementation underway	Action Agencies propose to continue FGE and OPE studies in 2002.
68	The Corps and BPA shall continue spill and passage survival studies at The Dalles Dam in 2001. Research results shall be considered, in consultation with NMFS through the annual planning process, to assess the need for additional changes in spill to further improve fish survival by 2002, if possible, but no later than 2005.	Continue studies to identify cause of low spill survival in 2002.	Implementation as expected	Critical spill evaluation work was completed in 2001. Additional work proposed by Action Agencies for 2002.
69	The Corps shall continue design development and 2001 prototype testing of upper turbine intake occlusion devices at The Dalles, with a goal of increased non-turbine passage rates through either the sluiceway or the spillway. The Corps shall install occlusion devices across the entire powerhouse, as warranted.	No schedule in Opinion; no specific expectations in 2002.	No schedule, implementation underway	Action Agencies propose to identify prototype performance at The Dalles in 2002.
70	The Corps shall continue biological and engineering investigations and design of a composite ice and trash sluiceway outfall relocation and adult ladder auxiliary water system at The Dalles Dam and shall construct such devices as warranted.	No schedule in Opinion; no specific expectations in 2002.	No schedule, implementation underway	Action Agencies propose to define new outfall locations through modeling at ERDC in 2002.

RPA Action	Description	Expectation for 2002	Finding	Proposed Implementation/ Comments
71	The Corps and BPA shall continue investigation of 24-hour spill at John Day Dam in 2001. Research results will be considered, in consultation with NMFS through the annual planning process, to determine implementation of daytime spill to further improve juvenile fish survival as needed for its contribution to the performance standard.	Conclude study by the end of 2002.	Implementation as expected	24-hr spill was not evaluated in 2001 due to drought and power emergency. However, this work is proposed by Action Agencies for 2002.
72	The Corps shall continue design development of a prototype RSW and extended deflector for testing at John Day in 2002. The Corps should synthesize evaluation results, determine the fish survival benefits of one or more RSWs or a skeleton bay surface bypass, and install the units as warranted.	Decide whether to develop a smaller RSW than the one that is currently planned.	Implementation as expected	A prototype removable spillway weir (RSW) test at John Day will be delayed from 2002 until at least 2003. This will be a beneficial effect because (1) there are risks associated with deployment in a skeleton bay that were not fully anticipated in the Opinion, and (2) new information from recent hydraulic modeling indicates that the planned RSW at John Day Dam would increase the collection of juvenile migrants and improve water quality, but would also create dangerous eddies and stagnant zones in the project's tailrace. This could cause the fish to spend excessive time in the tailrace and lead to their increased predation. The standard remedial action for this problem would be to increase training spill (more spill at the spillbays adjacent to the RSW) but that would reduce the effectiveness of RSW collection. Additional time is needed beyond that originally scheduled to balance these competing concerns.
73	The Corps shall continue John Day prototype development and investigations of extended submerged intake screens, gatewell vertical barrier screens, and, if necessary, orifices to optimize guidance and safe passage through the system, including a gatewell debris cleaning plan. This work shall include an assessment of fry passage. The Corps shall design and construct new screen systems for safe passage of juvenile salmonids, as warranted. Juvenile bypass outfall survival investigations shall also be conducted.	Continue biological evaluations.	Implementation as expected	Proposed by Action Agencies for 2002
74	The Corps shall continue evaluations to assess the need for improvements of the existing intake screens, gatewell vertical barrier screen cleaning system, and bypass facilities (including debris containment and removal systems, separation, sampling, loading, and outfall facilities) at McNary to determine where improvements are necessary to reduce problems experienced during the 1996 flood, increase fish survival, and resolve holding and loading facility problems, including raceway jumping by juvenile salmon and steelhead and debris plugging of bypass lines. Additionally, the Corps shall evaluate whether the existing juvenile bypass system outfall should be relocated.	No schedule in Opinion; no specific expectations in 2002.	No schedule, implementation underway	Action Agencies propose to evaluate outfall locations, screen redesigns, and debris handling methods in 2002

RPA Action	Description	Expectation for 2002	Finding	Proposed Implementation/ Comments
75	The Corps shall investigate a surface bypass RSW at McNary Dam, based on prototype results at other locations, and shall install the unit in multiple spillway bays, as warranted.	No schedule in Opinion; no specific expectations in 2002.	No schedule, implementation underway	Action Agencies propose to evaluate the Lower Granite removable spillway weir prototype in 2002. The evaluation of the Lower Granite RSW is an initial step in the the RSW placement decision at McNary.
76	The Corps shall investigate, design, and construct, as warranted, a new juvenile bypass outfall at Lower Monumental Dam. Investigations shall be conducted in conjunction with spillway deflector and spill pattern optimization studies.	No schedule in Opinion; no specific expectations in 2002.	No schedule, implementation underway	Action Agencies propose to conduct additional hydraulic modeling in 2002. A report is due in 2003 addressing the best means of improving the outfall.
77	The Corps shall investigate surface bypass (e.g., RSW) at Lower Monumental Dam, based on prototype results at other locations, and install in multiple spillway bays, as warranted.	No schedule in Opinion; no specific expectations in 2002.	No schedule, implementation underway	Action Agencies propose to evaluate the Lower Granite removable spillway weir prototype in 2002. RSW will be considered for Lower Monumental after 2002 RSW prototype evaluations at Lower Granite.
78	The Corps shall initiate design development and testing of extended submerged intake screens and vertical barrier screens at Lower Monumental Dam and construct units as warranted.	No schedule in Opinion; no specific expectations in 2002.	No schedule, implementation underway	Action Agencies propose to initiate evaluation of ESBS in 2002.
79	The Corps shall conduct a post-construction evaluation of the new debris containment boom at Little Goose to monitor populations and behavior of aquatic predators when debris accumulates at the log boom.	No schedule in Opinion; no specific expectations in 2002.	No schedule, implementation not underway	
80	The Corps shall continue the design development, fabrication/deployment, and testing of a prototype RSW at Lower Granite, in conjunction with the existing prototype powerhouse occlusion devices, including the forebay behavioral guidance structure (BGS) and upper turbine intake occlusion devices. As warranted by prototype test results, the Corps shall install one or more permanent RSWs and occlusion devices at appropriate lower Snake hydro projects, in coordination with the annual planning process.	Evaluate the Lower Granite removable spillway weir prototype in 2002.	Implementation as expected	Testing was expected to begin in 2001 but because of the drought and delay in installation, testing will begin in 2002. NMFS expects prototype testing to be completed in 2003 per Appendix F.
81	The Corps shall complete design for new juvenile bypass facilities at Lower Granite Dam, including enlarged orifices and bypass gallery, open-channel flow bypass, improved separator for juvenile separation by size, and improved fish distribution flumes and barge-loading facilities and shall proceed to construction, as warranted.	No schedule in Opinion; no specific expectations in 2002.	No schedule, implementation not underway	Although no activity is anticipated this year, an agreement was reached in SCT to resume funding of this item in 2003, starting with revision of 1995 preliminary design documents.
82	The Action Agencies, in coordination with NMFS through the annual planning process, shall investigate the spillway passage survival of juvenile salmonids at appropriate FCRPS dams. These investigations shall assess the effect of spill patterns and per-bay spill volumes on fish survival, across a range of flow conditions. The Action Agencies shall develop a phased approach (including costs and schedules) and set priorities, in consultation with NMFS in the annual planning process, to continue spillway passage survival studies in 2001 and future years.	No schedule in Opinion; no specific expectations in 2002.	No schedule, implementation underway	Action Agencies propose to continue ongoing studies at Bonneville, The Dalles John Day, McNary, Ice Harbor and Lower Granite in 2002.

RPA Action	Description	Expectation for 2002	Finding	Proposed Implementation/ Comments
83	The Action Agencies, in coordination with NMFS through the annual planning process, shall evaluate the effect of spill duration and volume on spillway effectiveness (percent of total project passage via spill), spill efficiency (fish per unit flow), forebay residence time, and total project and system survival of juvenile steelhead and salmon passing FCRPS dams. Studies shall include both collector and non-collector projects. Adult passage considerations and potential adult fallback shall also be considered in study designs. Little Goose and Lower Granite dams shall be specifically considered for daytime spill studies. An overall phased study approach for spill evaluations will be determined in the 1- and 5-year implementation plans.	No schedule in Opinion; no specific expectations in 2002.	No schedule, implementation underway	Action Agencies propose to continue ongoing studies in 2002 at Bonneville, John Day, Lower Granite.
84	The Corps shall continue high-flow outfall investigations to determine whether it is appropriate to modify bypass outfall criteria in the context of high-discharge bypass discharges.	No schedule in Opinion; no specific expectations in 2002.	No schedule, implementation underway	Action Agencies propose to evaluate the safety of outfall flows in excess of 1000 cfs and entrance velocities in excess of 25 ft/s in 2002.
85	The Corps shall continue to develop and evaluate improved fish-tracking technologies and computational fluid dynamics (numerical modeling). The ability to integrate these technologies and fluid dynamics shall be assessed as a potentially improved means of determining fish responses to forebay hydraulic conditions.	No schedule in Opinion; no specific expectations in 2002.	No schedule, implementation underway	Corps proposes to conduct integration research at Lower Granite -RSW prototype in 2003
86	The Corps shall continue to investigate a way to increase entry rates of fish approaching surface bypass/collector entrances.	No schedule in Opinion; no specific expectations in 2002.	No schedule, implementation underway	Corps proposes to conduct integration research at Lower Granite -RSW prototype in 2003
87	The Corps and BPA shall assess less-intrusive, PIT-tag interrogation methods at FCRPS juvenile bypass systems with interrogation sites, including McNary, John Day, and Bonneville dams. The Corps and BPA shall also assess providing a similar detection capability for the Ice Harbor juvenile bypass system.	No schedule in Opinion; no specific expectations in 2002.	No schedule, implementation underway	Action Agencies propose to evaluate McNary less-intrusive detectors in 2002 with the preliminary discussions of next appropriate site to be dependent on McNary results.
88	The Corps and BPA, in coordination with the Fish Facility Design Review Work Group and the Fish Passage Improvement Through Turbines Technical Work Group, shall continue the program to improve turbine survival of juvenile and adult salmonids.	No schedule in Opinion; no specific expectations in 2002.	No schedule, implementation underway	Action Agencies propose modeling at ERDC and field testing at McNary Dam in 2002.
89	The Action Agencies shall investigate hydraulic and behavioral aspects of turbine passage by juvenile steelhead and salmon through turbines to develop biologically based turbine design and operating criteria. The Corps shall submit a report to NMFS stating the findings of the first phase of the Turbine Passage Survival Program by October 2001. Annual progress reports will be provided after this date.	No schedule in Opinion; no specific expectations in 2002.	No schedule, implementation underway	Action Agencies propose modeling at ERDC and field testing at McNary Dam in 2002
90	The Action Agencies shall examine the effects of draft tubes and powerhouse tailraces on the survival of fish passing through turbines.	No schedule in Opinion; no specific expectations in 2002.	No schedule, implementation underway	Action Agencies propose modeling at ERDC and field testing at McNary Dam in 2002

RPA Action	Description	Expectation for 2002	Finding	Proposed Implementation/ Comments
91	The Action Agencies shall remove all unnecessary obstructions in the higher velocity areas of the intake-to-draft tube sections of the turbine units.	No schedule in Opinion; no specific expectations in 2002.	No schedule, implementation underway	Action Agencies propose removal of all unnecessary obstructions in the higher velocity areas of the intake-to-draft tube sections of the turbine units at The Dalles Dam in 2002.
92	The Action Agencies shall consider all state-of-the-art turbine design technology to decrease fish injury and mortality before the implementation of any future turbine rehabilitation program (including any major repair programs, the ongoing rehabilitation program at The Dalles Dam, and any future program at Ice Harbor Dam). The Action Agencies shall coordinate within the annual planning process before making decisions that would preclude the use of fish-friendly technologies and to minimize any adverse effects of project downtime.	No schedule in Opinion; no specific expectations in 2002.	No schedule, implementation not underway	
93	The Action Agencies shall determine the number of adults passed through turbines, then, if warranted, investigate the survival of adult salmonid passage through turbines (including steelhead kelts).	No schedule in Opinion; no specific expectations in 2002.	No schedule, implementation underway	Action Agencies propose a pilot study at McNary of adult survival through turbines and radio tag information of adults passing through powerhouses in 2002.
94	The Corps shall continue to evaluate the need for improvements of the existing intake screens, gatewell vertical barrier screens' cleaning system, and bypass facilities (including debris containment and removal systems, separation, sampling, loading, and outfall facilities) at the four lower Snake River hydropower projects.	No schedule in Opinion; no specific expectations in 2002.	No schedule, implementation underway	Action Agencies propose to evaluate the need for improvements of the existing intake screens, gatewell vertical barrier screens' cleaning system, and bypass facilities (including debris containment and removal systems, separation, sampling, loading, and outfall facilities) at the four lower Snake River hydropower projects in 2002.
95	The Corps shall complete investigations of improved wet separator designs in 2002. The Corps shall design and construct a new wet separator at McNary, Lower Monumental, and Little Goose dams, as warranted.	No schedule in Opinion; no specific expectations in 2002.	No schedule, implementation underway	Action Agencies propose to complete investigations of improved wet separator designs in 2002.
96	The Corps shall complete the extended submerged intake screen systemwide letter report and implement recommended improvements.	No schedule in Opinion; no specific expectations in 2002.	No schedule, implementation underway	Action Agencies propose to install improvements of Little Goose extended submerged bar screens (ESBS) at McNary ESBS; construct spare ESBS/final improvements in 2002.

RPA Action	Description	Expectation for 2002	Finding	Proposed Implementation/ Comments
97	By January 2002, the Action Agencies shall develop an analysis that compares the relative passage survival benefits of an extended-length, intake screen bypass system, a surface-collection bypass system, and hybrid alternatives at Bonneville First Powerhouse. Through the annual planning process, the Corps shall determine which of these configurations to implement.	Develop an analysis that compares alternative juvenile passage modifications at Bonneville.	Modification not a concern	A subgroup of SCT worked through 2001 to develop a decision process and report regarding configuration of Bonneville Dam. Towards the end of the year it became clear that additional information was needed before a prudent final decision could be made regarding juvenile passage alternatives for the First Powerhouse. This information included spring survival through the existing First Powerhouse bypass, passage efficiency and adult fallback through the spillway, FGE improvements through the Second Powerhouse bypass system and performance of the soon-to-be built Second Powerhouse Corner Collector. Because of these additional information needs and the added desire to have the ISRP review the decision process, the subgroup (and SCT) agreed to delay the final configuration decision beyond the January 2002 dated specified in the Opinion until at least 2003 and, perhaps, longer depending upon corner collector information needs. NMFS agreed that this postponement was in the best interest of listed stock survival. The alternative choices at this project could result in a questionable increase in survival at a significant cost, which would commit a major portion of the funding of the Columbia River Fish Mitigation (CRFM) project. Because funding for the CRFM is limited, a delay in funding this project allows for the expedited funding of other priority CRFM activities.
98	By January 2003, the Action Agencies shall develop an analysis that compares the relative passage survival benefits of replacing existing standard-length intake screens with extended-length screens at the John Day Dam powerhouse to surface collection at one or more skeleton or spillway bays. Through the annual planning process, the Action Agencies shall then determine the need for, and the implementation priority of, these configuration alternatives.	Initiate egress studies and re-test gateway mortality factors in 2002.	Implementation as expected	This study is sequentially dependent upon the implementation of an RSW, Action 36, which is delayed pending resolution of the juvenile egress issue. The rationale for delaying the RSW test, coupled with the need to implement these Actions sequentially, indicates that this, like Action 36, also will be a beneficial modification.

RPA Action	Description	Expectation for 2002	Finding	Proposed Implementation/ Comments
99	By January, 2003, the Action Agencies shall develop an analysis that compares the relative passage survival benefits of replacing existing standard-length intake screens with extended-length screens at the Lower Monumental Dam powerhouse turbines to a removable RSW surface bypass system.	Make sufficient progress in 2002 to produce analysis by 2003.	Modification not a concern	The configuration analysis, which compares passage alternatives at Lower Monumental Dam, was initiated in 2002. The analysis will not be completed by January 2003, as specified in the Opinion, due to spill basin erosion repair in 2002 at Lower Monumental Dam and the delayed removable spillway weir evaluation at Lower Granite, which will begin this year. This analysis is not expected to be completed until at least January 2004. However, the delay in the analysis should not affect implementing survival improvements at Lower Monumental Dam within the 2008 comprehensive review schedule of the Opinion. [Note: Opinion's Appendix F identified this Action as lacking a specific schedule; however, Action 99 requires development of the analysis by 2003].
100	The Action Agencies shall continue to implement and study methods to reduce the loss of juvenile salmonids to predacious fishes in the lower Columbia and lower Snake rivers. This effort will include continuation and improvement of the ongoing Northern Pikeminnow Management Program and evaluation of methods to control predation by non-indigenous predacious fishes, including smallmouth bass, walleye, and channel catfish.	Continue the program and provide reporting in 2002.	Implementation as expected	Proposed by Action Agencies for 2002.
101	The Corps, in coordination with the NMFS Regional Forum process, shall implement and maintain effective means of discouraging avian predation (e.g., water spray, avian predator lines) at all forebay, tailrace, and bypass outfall locations where avian predator activity has been observed at FCRPS dams. These controls shall remain in effect from April through August, unless otherwise coordinated through the Regional Forum process. This effort shall also include removal of the old net frames attached to the two submerged outfall bypasses at Bonneville Dam. The Corps shall work with NMFS, FPOM, USDA Wildlife Services, and USFWS on recommendations for any additional measures and implementation schedules and report progress in the annual facility operating reports to NMFS. Following consultation with NMFS, corrective measures shall be implemented as soon as possible.	No schedule in Opinion; no specific expectations in 2002.	No schedule, implementation underway	Action Agencies propose to use avian wires at all dams in 2002, as well as other control methods where appropriate.
102	The Action Agencies, in coordination with the Caspian Tern Working Group, shall continue to conduct studies (including migrational behavior) to evaluate avian predation of juvenile salmonids in the FCRPS reservoirs above Bonneville Dam. If warranted and after consultation with NMFS and USFWS, the Action Agencies shall develop and implement methods of control that may include reducing the populations of these predators.	Evaluate PIT tags recovered from gull and tern colonies in 2002.	Implementation as expected	Proposed by Action Agencies for 2002.

RPA Action	Description	Expectation for 2002	Finding	Proposed Implementation/ Comments
103	The Action Agencies shall quantify the extent of predation by white pelicans on juvenile salmon in the McNary pool and tailrace. A study plan shall be submitted to NMFS by September 30, 2001, detailing the study objectives, methods, and schedule. Based on study findings, and in consultation with USFWS and NMFS, the Action Agencies shall develop recommendations and, if appropriate, an implementation plan.	Conduct study in 2002.	Implementation as expected	Proposed by Action Agencies for 2002.
104	The Action Agencies shall recover PIT-tag information from predacious bird colonies and evaluate trends, including hatchery-to-hatchery and hatchery-to-wild depredation ratios.	No schedule in Opinion; no specific expectations in 2002.	No schedule, implementation underway	Action Agencies propose to continue studies in the estuary and upriver bird colonies in 2002.
105	The Action Agencies shall develop a pilot study to assess the feasibility of enhancing the function of ecological communities to reduce predation losses and increase survival in reservoirs and the estuary.	No schedule in Opinion; no specific expectations in 2002.	No schedule, implementation not underway	
106	The Action Agencies, in coordination with NMFS, shall investigate marine mammal predation in the tailrace of Bonneville Dam. A study plan shall be submitted to NMFS by June 30, 2001, detailing the study objectives, methods, and schedule.	No schedule in Opinion; no specific expectations in 2002.	No schedule, implementation underway	Action Agencies propose to evaluate predation by marine mammals in Bonneville tailrace by Corps Fisheries Field Unit in 2002.
107	The Action Agencies shall conduct a comprehensive evaluation to assess survival of adult salmonids migrating upstream and factors contributing to unaccounted losses.	Continue a comprehensive evaluation to assess survival of adult salmonids migrating upstream and factors contributing to unaccounted losses. Include radio tracking studies in the lower Columbia River.	Implementation as expected	Ongoing studies proposed to continue in 2002.
108	The Corps and BPA shall conduct a comprehensive evaluation to investigate the causes of headburn in adult salmonids and shall implement corrective measures, as warranted.	No schedule in Opinion; no specific expectations in 2002.	No schedule, implementation underway	A study plan to investigate causes of headburn has been approved through the FY02 Studies Review Work Group.
109	The Corps shall initiate an adult steelhead downstream migrant (kelt) assessment program to determine the magnitude of passage, the contribution to population diversity and growth, and potential actions to provide safe passage.	Conduct an AFEP steelhead kelt study in 2002.	Implementation as expected	Proposed by Action Agencies for 2002.
110	The Corps shall use information from previous and ongoing investigations regarding the problem of adult steelhead holding and jumping in the fish ladders at John Day Dam, develop a proposed course of action, and implement it, as warranted.	No schedule in Opinion; no specific expectations in 2002.	No schedule, implementation underway	Action Agencies propose to start construction in the fall 2002 and complete construction in the spring 2003.

RPA Action	Description	Expectation for 2002	Finding	Proposed Implementation/ Comments
111	The Corps shall investigate and enumerate fallback of upstream migrant salmonids through turbine intakes at all lower Snake and lower Columbia River dams. The Corps shall implement corrective measures to reduce turbine mortality, as warranted.	No schedule in Opinion; no specific expectations in 2002.	No schedule, implementation underway	Action Agencies propose to evaluate direct turbine mortality at McNary in May, 2002. Radio tracking studies and specific balloon tag studies are also scheduled for 2002.
112	The Corps shall investigate ways to provide egress to adult fish that have fallen back into juvenile collection galleries and primary dewatering facilities at Ice Harbor and McNary dams. The Corps shall either install structural, or implement operational, remedies to minimize delay and injury of fish that fall back, as warranted.	No schedule in Opinion; no specific expectations in 2002.	No schedule, implementation underway	Action Agencies propose to collect and reduce data, and quantify how many fall-back adults are delayed and how long they are delayed. This work is in progress. An engineering feasibility report for McNary has been completed.
113	The Corps shall investigate measures to reduce adult steelhead and salmon fallback and mortality through the Bonneville Dam spillway. A final report shall be submitted to NMFS stating the findings of these investigations and recommending corrective measures. Potential remedies shall be included in the annual planning process.	Complete full evaluation and finalize studies.	Implementation as expected	There was no evaluation in 2001 because of the drought. Proposed 2002 studies will be final year before report completion and implementation.
114	The Corps shall examine existing fish-ladder water temperature and adult radio-telemetry data to determine whether observed temperature differences in fishways adversely affect fish passage time and holding behavior. If non-uniform temperatures are found to cause delay, means for supplying cooler water to identified areas of warmer temperatures should be developed and implemented in coordination with the annual planning process.	No schedule in Opinion; no specific expectations in 2002.	No schedule, implementation underway	Action Agencies propose continuing ongoing adult radio tag studies in 2002.
115	The Corps and BPA shall conduct a comprehensive depth and temperature investigation to characterize direct mortality sources at an FCRPS project considered to have high unaccountable adult losses (either from counts and/or previous adult evaluations).	No schedule in Opinion; no specific expectations in 2002.	No schedule, implementation underway	Action Agencies propose continuing ongoing adult radio tag studies in 2002.
116	The Corps shall investigate adult fish delay and fallback at ladder junction pools and implement remedies to reduce this problem, as warranted.	No schedule in Opinion; no specific expectations in 2002.	No schedule, implementation underway	Part of adult passage study. Action Agencies propose continuing the ongoing adult radio tag studies in 2002.
117	The Corps shall evaluate adult count station facilities and rehabilitate where necessary at all projects to either minimize delay of adults or minimize counting difficulties that reduce count accuracy.	Continue to evaluate adult count station facilities and rehabilitate where necessary at all projects to either minimize delay of adults or minimize counting difficulties that reduce count accuracy.	Implementation as expected	Proposed by Action Agencies for 2002.

RPA Action	Description	Expectation for 2002	Finding	Proposed Implementation/ Comments
118	The Corps shall develop and implement a program to better assess and enumerate indirect prespawning mortality of adult upstream-migrating fish. Such mortality may be due to, or exacerbated by, passage through the FCRPS hydro projects. If measures are identified which will reduce the unaccountable adult loss rate and/or the prespawning mortality rate, the Corps shall implement these measures as warranted. The program should also enhance efforts to enumerate unaccountable losses associated with tributary turnoff, harvest, or other factors in FCRPS mainstem reservoirs and upstream of FCRPS projects.	Identify unaccounted losses and determine spawning success through studies in 2002.	Implementation as expected	Proposed by Action Agencies
119	The Corps shall ensure that alterations to fish ladders and adult passage facilities to accommodate Pacific lamprey passage do not adversely affect salmonid passage timing and success.	No schedule in Opinion; no specific expectations in 2002.	No schedule, implementation underway	Action Agencies propose to investigate lamprey passage in on-going 2002 studies. No salmon passage problems noted in 2001.
120	The Corps shall develop improved operations for adult fishway main entrances at FCRPS dams so that the best possible attraction conditions are provided for adult migrants, both at the four Columbia River hydro projects and the four lower Snake hydro projects (where reservoir elevations are held near MOP). The Corps shall report the findings of fishway entrance flow-balancing investigations in a report to NMFS by the end of 2001 and shall continue to work through FPOM to evaluate and implement, as warranted, structural changes to satisfy fish passage plan fishway entrance criteria.	No schedule in Opinion; no specific expectations in 2002.	No schedule, implementation underway	Action Agencies propose to conduct numerical modeling of AWS systems and will conduct adult fishway hydraulic evaluations of four Snake River projects.
121	The Corps shall develop and maintain an auxiliary water-supply, emergency-parts inventory for all adult fishways where determined necessary, in coordination with NMFS.	No schedule in Opinion; no specific expectations in 2002.	No schedule, implementation underway	Action Agencies are procuring parts in 2002.
122	The Corps shall continue design development and, subsequently, construct an emergency auxiliary water supply system at The Dalles Dam's east ladder.	No schedule in Opinion; no specific expectations in 2002.	No schedule, implementation underway	The modeling occurred in 2001 but further action has been halted until the results of the collection channel dewatering is complete, which is expected by 2003.
123	The Corps shall continue to investigate alternatives to dewater adult auxiliary water system floor diffusers for inspection at The Dalles adult fishway powerhouse collection channel. The Corps shall implement design and construction of needed changes, as warranted.	No schedule in Opinion; no specific expectations in 2002.	No schedule, implementation underway	Collection channel dewatering is funded for 2002.
124	The Corps shall investigate methods to provide additional emergency auxiliary water to The Dalles Dam north fishway when the normal auxiliary water supply is interrupted.	No schedule in Opinion; no specific expectations in 2002.	No schedule, implementation not underway	
125	The Corps shall develop and implement an automated monitoring and alarm system at appropriate FCRPS projects, as determined in the NMFS Regional Forum, to monitor changes in head differential remotely between the primary auxiliary water supply conduits/channels and the adult collection channels and to minimize diffuser damage due to excessive differentials. The Corps shall ensure that diffuser gratings for all auxiliary water supply systems are securely fastened. The Corps shall work through FPOM to develop a monitoring program for inspecting diffuser gratings and grating fasteners.	No schedule in Opinion; no specific expectations in 2002.	No schedule, implementation underway	Action Agencies propose to continue O&M investigation.

RPA Action	Description	Expectation for 2002	Finding	Proposed Implementation/ Comments
126	The Corps shall initiate an investigation and prepare a report on the Bonneville First Powerhouse Bradford Island and Cascade Island adult fishway auxiliary water system by the end of 2001. In the report, the Corps shall identify measures that will improve or replace aging components, thereby enhancing current and long-term performance and reliability.	No schedule in Opinion; no specific expectations in 2002.	No schedule, implementation underway	Action Agencies propose to review the ladder system through FPOM in 2002.
127	The Corps shall continue its investigation of the Bonneville Second Powerhouse adult fishway auxiliary water system and shall identify measures to satisfactorily address emergency backup auxiliary water needs.	No schedule in Opinion; no specific expectations in 2002.	No schedule, implementation underway	Action Agencies propose to develop an operational plan in 2002 to deal with emergency AWS needs. Some construction will be required to close powerhouse orifices.
128	The Corps shall initiate an engineering study to evaluate existing limitations relating to its inability to satisfy fish passage plan operating criteria at the John Day Dam north shore ladder.	No schedule in Opinion; no specific expectations in 2002.	No schedule, implementation underway	Action Agencies propose to complete letter report in early 2002.
129	The Corps shall complete adult fishway auxiliary water supply evaluations at each lower Snake River hydro project and implement corrective measures as warranted.	No schedule in Opinion; no specific expectations in 2002.	No schedule, implementation underway	Action Agencies propose to implement recommendations at Ice Harbor and Lower Granite and continue detailed numerical hydraulic modeling of the AWS systems at Lower Monumental and Little Goose. Ice Harbor and Lower Granite evaluations are completed.
130	The Corps shall complete its DGAS by April 2001. The results of this study will be used to guide future studies and decisions about implementation of some long-term structural measures to reduce TDG.	None - this Action has been completed.	Implementation as expected	Report completed in 2001. [Note: opinion Appendix F identified this Action as lacking a specific schedule; however, Action 130 required completion of the DGAS report by 2001].
131	The Action Agencies shall monitor the effects of TDG. This annual program shall include physical and biological monitoring and shall be developed and implemented in consultation with the Water Quality Team and the Mid-Columbia PUDs' monitoring programs.	Monitor the physical effects of spill; i.e., the generation of TDG. Make any necessary adjustments of spill to stay within the state-authorized TDG limits. Accomplish the biological monitoring through the smolt monitoring program.	Implementation as expected	See 2002 Water Management Plan for monitoring the physical effects of spill.

RPA Action	Description	Expectation for 2002	Finding	Proposed Implementation/ Comments
132	The Action Agencies shall develop a plan to conduct a systematic review and evaluation of the TDG fixed monitoring stations in the forebays of all the mainstem Columbia and Snake river dams (including the Camas/Washougal monitor). The evaluation plan shall be developed by February 2001 and included as part of the first annual water quality improvement plan. The Action Agencies shall conduct the evaluation and make changes in the location of fixed monitoring sites, as warranted, and in coordination with the Water Quality Team. It should be possible to make some modifications by the start of the 2001 spill season.	Complete report and begin implementing recommendations.	Modification not a concern	The Opinion requires a systematic review and evaluation of the TDG fixed monitoring stations by February 2001 and implement at least some of the identified changes by spring 2001. The evaluation plan was not completed in 2001, but is expected to be completed in 2002. This delay is not a significant problem because no spill occurred in 2001 and because significant progress was made on developing an improved TDG monitoring program. Extra stations are being placed in the system in 2002 in selected positions. A test is to be conducted at John Day on a scroll case sampling system intended to minimize the influence of environmental parameters to forebay TDG measurements. Depending on the outcome, similar installations could be made at McNary, Ice Harbor, Lower Monumental, Little Goose, and Lower Granite dams. A subgroup of the Water Quality Team, which includes members of the Action Agencies, will review the 2002 results and make further recommendations on the Fixed Monitoring Stations for 2003.

RPA Action	Description	Expectation for 2002	Finding	Proposed Implementation/ Comments
133	As part of DGAS, the Corps shall complete development of a TDG model to be used as a river operations management tool by spring 2001. Once a model is developed, the applications and results shall be coordinated through the Water Quality Team. The Corps shall coordinate the systemwide management applications of gas abatement model studies with the annual planning process, the Transboundary Gas Group, the Mid-Columbia Public Utilities, and other interested parties.	Coordinate the system-wide management applications of gas abatement model studies with the annual planning process, the Transboundary Gas Group, the Mid-Columbia Public Utilities, and other interested parties.	Implementation as expected	The Corps has developed three dissolved gas models. The SYSTDG model is based on an Excel spreadsheet and could be used as a river operations management tool. During 2001, the model was upgraded to include dissolved gas data up to and through 2000. The second set of models was developed for the Corps by Battelle Northwest. These models are based on MASS 1 and MASS 2 and could be used in evaluation of anticipated gas abatement due to implementation of alternative abatement plans at individual mainstem projects. The SYSTDG model has been made available to those who participated in the training workshops in February and March 2001. These models have undergone some peer reviews. At this time, none of the three models are real-time models. [Note: Opinion's Appendix F identified this Action as lacking a specific schedule; however, Action 133 requires completion of a model by 2001].
134	The Corps shall continue the spillway deflector optimization program at each FCRPS project and implement it, as warranted. The Corps and BPA shall conduct physical and biological evaluations to ensure optimum gas abatement and fish passage conditions. Implementation decisions will be based on the effect of spill duration and volume on TDG, spillway effectiveness, spill efficiency, forebay residence time, and total project and system survival of juvenile salmon and steelhead passing FCRPS dams.	No schedule in Opinion; no specific expectations in 2002.	No schedule, implementation underway	Action Agencies propose to continue the completion and evaluation of spillway deflector optimization program and continue to conduct physical and biological evaluations to ensure optimum gas abatement and fish passage conditions. Implementation decisions will be based on the effect of spill duration and volume on TDG, spillway effectiveness, spill efficiency, forebay residence time, and total project and system survival of juvenile salmon and steelhead passing FCRPS dams.
135	The Corps shall include evaluations of divider walls at each FCRPS project in the spillway deflector optimization program. Design development and construction of divider walls would begin only after coordination within the annual planning process, and only if warranted.	No schedule in Opinion; no specific expectations in 2002.	No schedule, implementation underway	The Corps will continue to evaluate divider walls at FCRPS projects in the spillway deflector optimization program. Design development and construction of divider walls would begin only after coordination within the annual planning process, and only if warranted.

RPA Action	Description	Expectation for 2002	Finding	Proposed Implementation/ Comments
136	The Corps shall continue to develop and construct spillway deflectors at Chief Joseph Dam by 2004 to minimize TDG levels associated with system spill.	Develop spillway deflectors.	Modification requires resolution	This Action requires the Corps to develop and construct spillway deflectors at Chief Joseph Dam by 2004 to reduce FCRPS total dissolved gas. Implementation of this project has three phases: (1) prepare and submit to the Corps Division/HQ, a feasibility-level General Reevaluation Report (GRR) of study alternatives, (2) Planning, Engineering and Design, and (3) construction and implementation. In the spring of 2000, the Corps completed the GRR and recommended installation of flow deflectors. Funds were requested in 2001 and again in 2002. Funds were not provided in either FY2001 or FY2002, which will delay deflector installation for at least one year. This results in a failure to meet anticipated survival improvement based on lack of TDG reductions for at least one year. NMFS recommends that, to the extent that this delay will impact the ability to meet performance standards, the Corps identify other actions to improve survival to ensure meeting these standards. NMFS also recommends that the Corps continue to seek funding for the project. NMFS understands that \$800,000 is required in FY2003 in order to complete modeling design and initiate construction, and \$16 million would be required in both FY04 and FY05 to complete the construction of the spillway deflectors.
137	The Corps shall investigate TDG abatement options at Libby Dam, including the installation of spillway deflectors and/or additional turbine units. The Corps shall construct gas abatement improvements at Libby on the Kootenai River, as warranted, to reduce TDG levels below the project.	No schedule in Opinion; no specific expectations in 2002.	No schedule, implementation underway	Action Agencies propose to conduct a spill test at Libby in the later half of June 2002.
138	The Corps shall continue to investigate RSWs, in conjunction with extended spillway deflectors, as a means of optimizing safe spillway passage of adult steelhead kelts and juvenile migrants.	No schedule in Opinion; no specific expectations in 2002.	No schedule, implementation underway	Action Agencies propose to conduct RSW testing in 2002 at Lower Granite. They will consider the juvenile egress issue at John Day in 2002 before making a decision on that RSW.
139	The Corps shall investigate TDG abatement options at Dworshak Dam and implement options, as warranted, in coordination with the annual planning process.	No schedule in Opinion; no specific expectations in 2002.	No schedule, implementation not underway	

RPA Action	Description	Expectation for 2002	Finding	Proposed Implementation/ Comments
140	The Corps shall design the spillway Number 1 (end bay) deflector at John Day Dam, and implement as warranted, in coordination with the annual planning process.	No schedule in Opinion; no specific expectations in 2002.	No schedule, implementation underway	Action Agencies initiating related tailrace egress studies in 2002. Decision to install deflector depends on outcome of these investigations.
141	The Action Agencies shall evaluate juvenile fish condition due to disease in relation to high temperature impacts during critical migration periods. This evaluation should include monitoring summer migrants at lower Columbia and lower Snake river dams to clarify the possible link between temperature and fish disease and mortality. This information will be used to assess the long-term impacts of water temperature on juvenile fish survival.	No schedule in Opinion; no specific expectations in 2002.	No schedule, implementation underway	Implementation underway in 2002. The USGS will undertake a study of warm water effects on fall chinook salmon in the Snake and Columbia rivers, beginning in the summer of 2002.
142	The Corps shall work through the regional forum process to identify and implement measures to address juvenile fish mortality associated with high summer temperatures at McNary Dam. As a starting point, the Corps shall assemble and analyze the temperature data that have been recorded in the McNary forebay, collection channel, and juvenile facilities. The Corps shall examine relationships among juvenile mortality, temperatures, river flow rates, and unit operations in detail. The Corps shall investigate the feasibility of developing a hydrothermal computational fluid dynamics model of the McNary forebay to evaluate the potential to determine optimal powerhouse operations or structural modifications for minimizing thermal stress of juvenile salmon collected in the summer and to conduct a modeling program, if warranted.	No schedule in Opinion; no specific expectations in 2002.	No schedule, implementation underway	Implementation underway in 2002. Contract let with Batelle to do CFD modeling; agreement with USGS for a McNary Dam study of warm water effects on fish, beginning in the summer of 2002.
143	By June 30, 2001, the Action Agencies shall develop and coordinate with NMFS and EPA on a plan to model the water temperature effects of alternative Snake River operations. The modeling plan shall include a temperature data collection strategy developed in consultation with EPA, NMFS, and state and Tribal water quality agencies. The data collection strategy shall be sufficient to develop and operate the model and to document the effects of project operations.	Complete plan and begin implementation.	Implementation as expected	The modeling plan was not completed in 2001 but should be completed in 2002. This is a beneficial change because the final product should be an improvement over the product envisioned in the Opinion because of the additional coordination. A subgroup of the WQT has been formed to address the needs of this measure. Members include representatives from the Action Agencies, fish managers, state agencies, EPA, and the Fish Passage Center. The group began meeting in February 2002 and is reviewing the results of previous work on Snake River temperature, existing models that might be applied to the Snake River thermal management issues, and the list of questions the overall project will address. A draft report, which is being drafted through the Corps in conjunction with a subgroup of the WQT, is expected by August 2002.

RPA Action	Description	Expectation for 2002	Finding	Proposed Implementation/ Comments
144	The Corps, in coordination with the Regional Forum, shall maintain juvenile and adult fish facilities within identified criteria and operate FCRPS projects within operational guidelines contained in the Corps' Fish Passage Plan. The Corps shall coordinate with NMFS on the development of these criteria and operational guidelines before the start of each fish passage season (generally February 1).	Maintain juvenile and adult fish facilities within identified criteria and operate FCRPS projects within operational guidelines contained in the Corps' Fish Passage Plan. The Corps shall coordinate with NMFS on the development of these criteria and operational guidelines before the start of each fish passage season (generally February 1).	Implementation as expected	See 2002 Fish Passage Plan
145	The Corps shall develop and implement preventative maintenance programs for fish passage facilities that ensure long-term reliability, thereby minimizing repair costs.	Develop and implement preventative maintenance programs for fish passage facilities that ensure long-term reliability, thereby minimizing repair costs in 2002.	Implementation as expected	2002 Fish Passage O&M Plan. Corps has drafted an initial 5 year O&M Plan that should be completed in 2002.
146	The Corps shall address debris-handling needs and continue to assess more efficient and effective debris-handling techniques to ensure that the performance of both new and old fish passage facilities will not be compromised.	Initiate construction on Bonneville 2nd Powerhouse gatewell debris removal. Re-test gatewell mortality issues at John Day extended length screens. Second year of debris and biological testing of McNary cylindrical dewatering prototype evaluation. Replace north shore trash rake at The Dalles Dam. General operations and maintenance at all the lower Snake River dams and McNary Dam.	Implementation as expected	Proposed by Action Agencies for 2002.

RPA Action	Description	Expectation for 2002	Finding	Proposed Implementation/ Comments
147	<p>As a contingency plan, the Corps (in cooperation with other Federal agencies) shall develop a project management plan to reevaluate more intensive hydropower-related actions (including breaching) for the four lower Snake River dams. The project management plan will identify the scope, schedule, costs, tasks, products, and responsibilities for the reevaluation study. The study should assess all significant changed conditions to the Lower Snake River Feasibility Report and Environmental Impact Statement (Corps 1999c). The project management plan should be consistent with direction from Congress, Corps authorities, and other legal requirements. The completed project management plan should be coordinated with the appropriate regional interests. The project management plan should include, but not be limited to, plans to mitigate disproportionate impacts to communities, industries, and Tribes, detailed water and air quality effects, implementation plans, and a complete public involvement program. The decision to start the reevaluation study should result from the NMFS check-in process in Section 9.5. The Corps will request funding or reprogramming to complete the project management plan within 1 year after NMFS' issuance of a check-in report indicating the need to seek additional authority. The study should result in a general reevaluation report and supplemental environmental impact statement, which would be used to seek authorization and/or appropriations to implement, recommended action(s), if needed. The general reevaluation report/ supplemental environmental impact statement will require approximately 2 years to complete.</p>	No specific expectations for 2002.	No schedule, implementation not underway	This activity will not commence until after the 2005 mid-point evaluation, and only then if it is determined that the Corps needs to seek additional authority.
148	<p>The Corps shall conduct detailed engineering and design work for improvements recommended in the general reevaluation report and supplemental environmental impact statement described in the preceding action. The Corps shall seek funding to allow initiation of the engineering and design work to occur immediately upon completion of the final general reevaluation report. The engineering and design work shall include only those activities on (or near) the implementation schedule critical path for the recommended actions, up to the award of the first construction contract. For a dam breach recommendation, the critical path activities shall include turbine physical modeling (for use as low level outlets), rock source explorations for embankment erosion protection (riprap), and hydraulic (physical) modeling for the embankment removal and channelization. Tentative milestones for the general reevaluation report/EIS and engineering and design work are as follows, based on the check-in process identified in Section 9.5. (see RPA for list)</p>	No specific expectations for 2002.	No schedule, implementation not underway	This activity will not commence until after the 2005 mid-point evaluation, and only then if it is determined that the Corps needs to seek additional authority.

RPA Action	Description	Expectation for 2002	Finding	Proposed Implementation/ Comments
149	<p>BOR shall initiate programs in three priority subbasins (identified in the Conceptual Recovery Plan) per year over 5 years, in coordination with NMFS, FWS, the states and others, to address all flow, passage, and screening problems in each subbasin over 10 years. The Corps shall implement demonstration projects to improve habitat in subbasins where water-diversion-related problems could cause take of listed species. Under the NWPPC program, BPA addresses passage, screening, and flow problems, where they are not the responsibility of others. BPA expects to expand on these measures in coordination with the NWPPC process to complement BOR actions described in the action above.</p>	<p>Reclamation will continue addressing all water related issues in subbasins that it has entered to date. Reclamation will evaluate workload needs and establish proposals for this Action in the Wenatchee and Upper Salmon subbasins. The Corps shall continue to develop demonstration projects. BPA will address passage, screening, and flow problems, where they are not the responsibility of others.</p>	<p>Modification not a concern</p>	<p>There are several parts to this Action. Most are proceeding as expected, but one of which is of concern. Reclamation's ability to address all flow, passage, and screening problems has been delayed due to a lack of Congressional authority for activities such as modifying screens and retrofitting passage barriers. Reclamation has initiated, or plans to initiate, programs in 2001-2002 in the six required priority subbasins (Methow, Lemhi, Upper John Day, Middle John Day, Upper Salmon and Wenatchee) and the draft 5-year plan indicates that they will enter three other subbasins in 2003. The set of subbasins prioritized in the Basinwide Salmon Recovery Strategy to achieve basin-wide objectives include some which are not within the range of the eight ESUs that are the subject of the Opinion's RPA. Reclamation and the other Action Agencies will work with NMFS to identify the appropriate subbasins within the range of the jeopardized species.</p> <p>Although Reclamation is undertaking significant planning and design work and has been creative in partnering with other agencies to fund additional work that is not currently in their authority to fund directly, the scope of the proposed work in 2002, coupled with work already completed in 2001, does not appear to fully meet the expectations of the Action in the absence of those additional authorities. Because this is a 10-year program in each subbasin, NMFS finds that this is a relatively minor modification at this point in the implementation process, because work on this Action is in the early stages and is progressing at least to some extent in six subbasins. However, this conclusion could change in future findings if significant progress is not made in each subbasin that Reclamation has entered.</p> <p>NMFS recommends that Reclamation continue to seek authority for additional activities and continue to partner with other agencies to fund necessary projects</p>

RPA Action	Description	Expectation for 2002	Finding	Proposed Implementation/ Comments
				in these subbasins. Also, to the extent that somewhat delayed implementation and reduced scope of this Action will affect the Action Agencies' ability to meet performance standards, NMFS suggests that Action Agencies identify alternative actions to assist in meeting these standards.
150	In subbasins with listed salmon and steelhead, BPA shall fund protection of currently productive non-Federal habitat, especially if at risk of being degraded, in accordance with criteria and priorities BPA and NMFS will develop by June 1, 2001.	Continue to fund protection of currently productive habitat. Complete criteria for land acquisition.	Modification not a concern	This Action requires BPA to fund protection of currently-productive non-Federal habitat, especially if at risk of being degraded, in subbasins with listed salmon and steelhead. Criteria for land acquisition were to be developed by June 2001. This appears to have been delayed at least a year, but should be completed during 2002 according to the 2002 Implementation Plan. NMFS and BPA are currently working on draft interim criteria. Impacts are minimal since land acquisitions are proceeding, even without the criteria, through the Council review process.
151	BPA shall, in coordination with NMFS, experiment with innovative ways to increase tributary flows by, for example, establishing a water brokerage. BPA will begin these experiments as soon as possible and submit a report evaluating their efficacy at the end of 5 years. In 2001, BPA will fund development of a methodology acceptable to NMFS for ascertaining instream flows that meet ESA requirements.	Implement the program to experiment with innovative strategies to increase tributary flows consistent with the Action.	Modification not a concern	In 2001, BPA was to fund development of a methodology acceptable to NMFS for ascertaining instream flows that meet ESA requirements. The Implementation Plan does not propose to fund development of the methodology in 2002. NMFS considers this a relatively minor modification because, at this time, the delay in this procedural step will not delay the subsequent substantive actions of purchasing quantities of water that will be necessary for achieving biological goals. A number of innovative water purchases were made in 2001 and 2002. In addition, BPA has selected a regional water entity and nine local water entities to address the element of RPA 151 that calls for development of transactional strategies for securing instream flow. NMFS recommends that BPA continues discussion with NMFS regarding funding for completion of an instream flow protocol in 2002.

RPA Action	Description	Expectation for 2002	Finding	Proposed Implementation/ Comments
152	The Action Agencies shall coordinate their efforts and support offsite habitat enhancement measures undertaken by other Federal agencies, states, Tribes, and local governments by the following: (See RPA)	Continue coordination and support in 2002.	No schedule, implementation underway	The Action Agencies propose to share technical expertise and training with other entities and leverage funds through cooperative projects and agreements. The Action Agencies will participate as appropriate in TMDL coordination and consultation meetings and will coordinate with the states in the Subbasin Plans.

RPA Action	Description	Expectation for 2002	Finding	Proposed Implementation/ Comments
153	BPA shall, working with agricultural incentive programs such as the Conservation Reserve Enhancement Program, negotiate and fund long-term protection for 100 miles of riparian buffers per year in accordance with criteria BPA and NMFS will develop by June 1, 2001.	100 miles per year of long-term/permanent riparian easements.	Modification requires resolution	<p>This Action calls for 100 miles per year of long-term/permanent protection to riparian buffers. Long-term protection for these buffers is to be developed in cooperation with agricultural incentive programs and in accordance with criteria that were to have been developed by BPA and NMFS by June 2001. The Action Agencies report that projects funded in 2001 and 2002 will "protect over 100 miles of riparian habitat." These include some outright acquisitions that are beneficial but are outside the scope of this measure and may be more appropriately included under Action 150. Action 153 is intended to leverage BPA funding by coordinating with incentive-based agricultural riparian conservation easement programs to protect greater amounts of riparian habitat than could be afforded through outright acquisition. This is an obvious opportunity to leverage BPA funding with other Federal funding and, given its potential contribution to instream flows and water quality, should be considered in connection with coordinated tributary projects, innovative approaches to establishing instream flows, and ESA/TMDL integration projects.</p> <p>NMFS has previously commented in "gaps" letters for the Gorge, Plateau, Blue Mountain, and Mountain Snake provinces (Brown 2001, 2002) that, although these projects may include actions to secure and protect riparian areas, virtually none provide long-term or permanent protection. This RPA Action may best be implemented at a programmatic level. BPA and NMFS have not yet developed the specific criteria for funding projects under this Action. This represents a change in schedule and scope that could affect substantive implementation of this Action.</p> <p>BPA and NMFS will work together to develop the criteria for implementation of this Action and refine strategies for providing permanent protection through such a program. This may result in</p>

RPA Action	Description	Expectation for 2002	Finding	Proposed Implementation/ Comments
154	BPA shall work with the NWPPC to ensure development and updating of subbasin assessments and plans; match state and local funding for coordinated development of watershed assessments and plans; and help fund technical support for subbasin and watershed plan implementation from 2001 to 2006. Planning for priority subbasins should be completed by the 2003 check-in. The action agencies will work with other Federal agencies to ensure that subbasin and watershed assessments and plans are coordinated across non-Federal and Federal land ownerships and programs.	Ensure development and updating of subbasin assessments and plans, which must be completed for priority subbasins by 2003, with the remainder finished by 2006.	Implementation as expected	revisiting existing contracts to attempt to extend their duration. NMFS notes that BPA has begun discussion with the Farm Service Agency, Natural Resources Conservation Service and NMFS to explore strategies that will effectively meet the enrolled mileage requirements of Action 153. These discussions should result in methods of improving CREP enrollment by augmenting funding for outreach, technical support, and increasing incentives.
155	BPA, working with BOR, the Corps, EPA, and USGS, shall develop a program to 1) identify mainstem habitat sampling reaches, survey conditions, describe cause-and-effect relationships, and identify research needs; 2) develop improvement plans for all mainstem reaches; and 3) initiate improvements in three mainstem reaches. Results shall be reported annually.	Continue program development and implementation in 2002.	Implementation as expected	In 2002 the Action Agencies plan to sponsor a workshop on research needs and then initiate a research program that identifies mainstem habitat sampling reaches and identifies survey conditions.

RPA Action	Description	Expectation for 2002	Finding	Proposed Implementation/ Comments
156	The Action Agencies and NMFS shall study the feasibility (including both biological benefits and ecological risks) of habitat modification to improve spawning conditions for chum salmon in the Ives Island area.	Expect sufficient progress in 2002 to complete feasibility study by 2003.	Implementation as expected	The Corps and BPA have begun a feasibility study for potential chum salmon spawning habitat restoration projects in the lower Columbia below The Dalles Dam, including the Ives Island area. They expect to complete the study and narrow the field of potential projects from 15 to three in 2002. As a result, the costs and benefits of habitat improvement/alteration in the Ives Island area will be compared to a range of potential chum salmon improvement projects.
157	BPA shall fund actions to improve and restore tributary and mainstem habitat for CR chum salmon in the reach between The Dalles Dam and the mouth of the Columbia River.	Continue Duncan Creek project in 2002.	Implementation as expected	Studies and programs are underway (e.g., Duncan Creek restoration project).
158	During 2001, the Corps and BPA shall seek funding and develop an action plan to rapidly inventory estuarine habitat, model physical and biological features of the historical lower river and estuary, identify limiting biological and physical factors in the estuary, identify impacts of the FCRPS system on habitat and listed salmon in the estuary relative to other factors, and develop criteria for estuarine habitat restoration.	Continue program development and implementation. Complete required action plan to rapidly inventory estuarine habitat.	Modification not a concern	The Corps and BPA were required to develop an action plan to rapidly inventory estuarine habitat, etc., in 2001. The plan has not yet been completed, and is delayed at least one year. However, project criteria have been selected, so it is likely that research projects in the estuary will be able to proceed on schedule. Therefore, effects of this delay are minimal.
159	BPA and the Corps, working with LCREP and NMFS, shall develop a plan addressing the habitat needs of salmon and steelhead in the estuary.	Make sufficient progress in 2002 to complete plan by 2003.	Implementation as expected	Development of a plan is underway. The Corps and BPA just started this effort, which requires BPA and the Corps, working with LCREP and NMFS, to develop a plan addressing the habitat needs of salmon and steelhead in the estuary. The required plan should be finished by 2003, if the proposed schedule is maintained. NMFS recommends that the Corps connect the development of this plan to their General Investigation Study and continue to collaborate with LCREP on this effort. NMFS also recommends that the Action Agencies prepare and provide NMFS with a detailed work plan and schedule for completing this Action by 2003.

RPA Action	Description	Expectation for 2002	Finding	Proposed Implementation/ Comments
160	<p>The Corps and BPA, working with LCREP, shall develop and implement an estuary restoration program with a goal of protecting and enhancing 10,000 acres of tidal wetlands and other key habitats over 10 years, beginning in 2001, to rebuild productivity for listed populations in the lower 46 river miles of the Columbia River. The Corps shall seek funds for the Federal share of the program, and BPA shall provide funding for the non-Federal share. The Action Agencies shall provide planning and engineering expertise to implement the non-Federal share of on-the-ground habitat improvement efforts identified in LCREP, Action 2.</p>	<p>Continue development and implementation of an estuary restoration program, as described by the Action.</p>	<p>Modification not a concern</p>	<p>This Action requires the Corps and BPA to develop and implement an estuary restoration program that will protect and enhance 10,000 acres over 10 years beginning in 2001. Appendix F indicates that NMFS expects restoration efforts to be identified, funded, and underway by 2003. Although the Corps proposes to continue a General Investigation Study of the estuary to inform implementation of this Action, the Corps and BPA have not provided NMFS with a "master plan" that describes how they intend to accomplish this. Nor have they presented NMFS with any formalized criteria for choosing projects, or how their existing authorities will be fully utilized or redirected to complete this work. At this time, NMFS considers this a relatively minor shortcoming because there is still time to complete this Action on schedule if efforts are further directed towards planning in 2002. NMFS recommends that the Action Agencies prepare and provide NMFS with a detailed work plan and schedule for completion of this Action in the 2003 Annual Implementation Plan. This plan should explain how the Corps General Investigation Study connects to this work.</p>

RPA Action	Description	Expectation for 2002	Finding	Proposed Implementation/ Comments
161	Between 2001 and 2010, the Corps and BPA shall fund a monitoring and research program acceptable to NMFS and closely coordinated with the LCREP monitoring and research efforts (Management Plan Action 28) to address the estuary objectives of this biological opinion.	Continue program development and implementation.	Implementation as expected	<p>The Corps and BPA are required to fund an estuarine monitoring and research program between 2001 and 2010. Appendix F indicates that NMFS expects the program to be underway by 2003. While the Action Agencies have made no apparent progress on an overall plan, significant effort on research was undertaken in 2001, including 7 research related efforts in the estuary. These were undertaken with NMFS' support to get underway prior to a full planning effort. Studies under the Corps Anadromous Fish Evaluation Program include: (1) EST-P-01, A study to estimate salmonid survival through the Columbia River estuary using acoustic tags; (2) EST-02-2, Estuarine habitat and juvenile salmon - current and historic linkages in the lower Columbia River and estuary; (3) EST-02-3, Evaluation of the relationship among time of ocean entry, physical, and biological characteristics of the estuary and plume environment, and adult return rates; (4) TPE-W-00-1, Evaluation of migration and survival of juvenile fall chinook following transportation; (5) BPS-00-10, Evaluation of delayed mortality of juvenile salmonids in the near ocean environment following passage through the Columbia River hydrosystem; and (7) TPE-W-00-1, A study to compare smolt-to-adult returns of inriver migrating versus transported anadromous salmonids.</p> <p>The FY02 Plan says that the strategy associated with this Action will be implemented in the Columbia River Estuary Province in nine areas during 2002, so NMFS concludes that this Action is being implemented as anticipated. However, it is unclear how the Action Agencies intend to achieve the 2002 goals because details regarding how this will be accomplished are not available in the Plan. NMFS recommends that the Action Agencies prepare and provide NMFS with a detailed work plan and schedule for implementing this Action in nine areas</p>

RPA Action	Description	Expectation for 2002	Finding	Proposed Implementation/ Comments
162	During 2000, BPA, working with NMFS, shall continue to develop a conceptual model of the relationship between estuarine conditions and salmon population structure and resilience. The model will highlight the relationship among hydropower, water management, estuarine conditions, and fish response. The work will enable the agencies to identify information gaps that have to be addressed to develop recommendations for FCRPS management and operations.	Complete development of conceptual model.	Modification not a concern	during 2002. The Corps and BPA were required to develop a conceptual model of the relation between estuarine conditions and salmon population structure and resilience in 2000. This model was not produced in 2000 or 2001. The 2002 IP anticipates completing the study in 2002. The delay should have minimal effects because one year delay in developing a conceptual model shouldn't affect the ability to evaluate 2005 and 2008 check-in criteria or delay anticipated survival improvements.
163	The Action Agencies and NMFS, in conjunction with the Habitat Coordination Team, will develop a compliance monitoring program for inclusion in the first 1- and 5-year plans.	Complete the compliance monitoring program.	Modification not a concern	This Action requires Action Agencies to develop a compliance monitoring plan for inclusion in the first 1- and 5-year implementation plans. This is not included in the 2002 IP, so is delayed at least a year. However, compliance reporting has begun through Action Agencies' 2001 Progress Report and a data base system at BPA is being used to help in this effort. BPA is currently working to develop a reporting procedure for their oversight work that will meet NMFS's need for project tracking information. Therefore, NMFS anticipates that the impact of this delay will be minimal.
164	The Action Agencies shall work with NMFS, USFWS, and Tribal and state fishery management agencies in a multiyear program to develop, test, and deploy selective fishing methods and gear that enable fisheries to target nonlisted fish while holding incidental impacts on listed fish within NMFS-defined limits. The design of this program and initial implementation (i.e., at least the testing of new gear types and methods) shall begin in FY 2001. Studies and/or pilot projects shall be under way and/or methods deployed by the 3-year check-in.	Continue project design and studies.	Implementation as expected	Continuation of tooth-tangle net, trawl gear, and tribal large-mesh gill net tests. Possible additional testing.

RPA Action	Description	Expectation for 2002	Finding	Proposed Implementation/ Comments
165	The Action Agencies shall work with NMFS, USFWS, Tribal and state fishery managers, and the relevant Pacific Salmon Commission and Pacific Fishery Management Council (PFMC) technical committees to develop and implement methods and analytical procedures (including revising and/or replacing current fishery management and stock assessment models based on these methods and procedures) to estimate fishery and stock-specific management parameters (e.g., harvest rates). The Action Agencies shall place particular emphasis on current methods and procedures affected by the transition to mass marking of Columbia River basin hatchery produced fish and/or deployment of selective fishery regimes in the Columbia River basin, addressing these concerns within a time frame necessary to make the new selective fishing regimes feasible. Specifically, the Action Agencies shall facilitate the development of models, methods, and analytical procedures by the 3-year check-in.	Develop models, methods, and analytical procedures for harvest management	Implementation as expected	These activities are currently underway and additional projects will be solicited through the Mainstem/System-wide provincial review.
166	The Action Agencies shall work with NMFS, USFWS, the Pacific States Marine Fisheries Commission, and Tribal and state fishery management agencies to implement and/or enable changes in catch sampling programs and data recovery systems, including any required changes in current databases (e.g., reformatting) and associated data retrieval systems, pursuant to the time frame necessary to implement and monitor mass marking programs and/or selective fishery regimes in the Columbia River basin. Specifically, the Action Agencies shall facilitate the revision of programs and systems, as needed, by the 3-year check-in.	Continue development of program and begin funding related projects.	Implementation as expected	These activities are currently underway and additional projects will be solicited through the Mainstem/System-wide provincial review.
167	The Action Agencies shall work with NMFS, USFWS, and Tribal and state fishery management agencies to develop improved methods for estimating incidental mortalities in fisheries, with particular emphasis on selective fisheries in the Columbia River basin, doing so within the time frame necessary to make new marking and selective fishery regimes feasible. The Action Agencies shall initiate studies and/or develop methods by the 3-year check-in.	Make progress in 2002 to develop methods and/or initiate studies by 2003.	Implementation as expected	The Action Agencies will continue a project to determine the existence and estimated impacts of lost fishing nets in Zone 6 to estimate and reduce incidental mortalities. They developed plans and strategies designed to identify additional needed projects and will solicit proposals in the upcoming Mainstem/System-wide provincial review.
168	The Action Agencies shall work with NMFS, USFWS, and Tribal and state fishery management agencies to develop methods for crediting harvest reforms, and the survival benefits they produce, toward FCRPS offsite mitigation responsibilities. A crediting approach shall be agreed upon by the 3-year check-in.	Make sufficient progress in 2002 so that an agreed-upon crediting approach will be available by 2003.	Implementation as expected	Action Agencies propose to begin convening appropriate Tribes and agencies to develop a white paper on this subject in 2002.
169	The Action Agencies shall fund the development of NMFS-approved HGMPs for implementation, including plans for monitoring and revising them as necessary as new information becomes available. HGMPs have to be completed first for the facilities and programs affecting the most at-risk species (Upper Columbia and Snake River ESUs), followed by those affecting mid-Columbia, and then the Lower Columbia ESUs. HGMPs for all the Columbia basin hatchery programs and facilities should be completed (and approved by NMFS) by the 3-year check-in.	Sufficient progress in 2002 to have all HGMPs completed by 2003.	Implementation as expected	HGMPs under development

RPA Action	Description	Expectation for 2002	Finding	Proposed Implementation/ Comments
170	Using new authorizations and appropriations and/or BPA funds as necessary and appropriate, the Corps, working with USFWS, shall oversee the design and construction of capital modifications identified as necessary in the HGMP planning process for Lower Snake River Compensation Plan anadromous fish hatchery programs. These improvements shall begin immediately after the relevant HGMPs are completed and approved by NMFS, and shall be completed as expeditiously as is feasible. BPA shall provide for the operations and maintenance costs of these reforms and shall reimburse the Federal Treasury for an appropriate share of the capital costs. The Corps shall have begun to implement reforms for programs affecting the most at-risk species by the 3-year check-in.	No specific results expected for 2002.	Implementation as expected	Dependent upon completion of HGMPs per Action 169.
171	BOR shall implement the reforms identified in the HGMP planning process for the Grand Coulee mitigation anadromous fish hatchery programs, beginning immediately following completion of the relevant (NMFS approved) HGMPs and completing the work as expeditiously as feasible. BPA shall fund the operations and maintenance costs of the reforms and shall reimburse the Federal Treasury for an appropriate share of the capital costs. BOR shall have begun to implement reforms for programs affecting the most at-risk species by the 3-year check-in	No specific results expected for 2002.	Implementation as expected	Dependent upon completion of HGMPs per Action 169.
172	The Corps shall implement the reforms identified in the HGMP planning process for the Corp's Columbia River basin mitigation anadromous fish hatchery programs, beginning immediately after the relevant HGMPs are completed and are approved by NMFS. The work shall be completed as expeditiously as feasible. BPA shall fund the operations and maintenance costs of the reforms and shall reimburse the Federal Treasury for an appropriate share of the capital costs. The Corps shall have begun to implement reforms for the programs affecting the most at-risk species by the 3-year check-in.	No specific results expected for 2002.	Implementation as expected	Dependent upon completion of HGMPs per Action 169.
173	BPA shall implement the reforms identified in the HGMP planning process for Federal and Federally funded hatcheries, beginning immediately after the relevant HGMPs are completed and approved by NMFS. The work shall be completed as expeditiously as possible. BPA shall have begun to implement reforms for the programs affecting the most at-risk species by the 3-year check-in.	No specific results expected for 2002.	Implementation as expected	Dependent upon completion of HGMPs per Action 169.
174	1. Develop a comprehensive marking strategy for all salmon and steelhead artificial production programs in the Columbia River basin by the end of 2001. 2. Provide funding by March 1, 2001, to begin marking all spring chinook salmon that are currently released unmarked from Federal or Federally funded hatcheries. 3. Provide funding, beginning in FY 2002, to implement the Action Agencies' share of the comprehensive marking plan for production not addressed in (2) above.4. Obtain funding contributions as appropriate for additional sampling efforts and specific experiments to determine relative distribution and timing of hatchery and natural spawners.	Comprehensive marking strategy was to have been developed and all fish marked at Federal or Federally-funded hatcheries in 2001, marking program for non-Federal hatcheries to begin in 2002, and make progress in 2002 to begin conducting associated research.	Modification not a concern	Development of a comprehensive marking strategy is underway, but was not completed in 2001. Proposal is to complete strategy and begin implementation in 2002. Implementation at Federal hatcheries is already underway. The reason for the delay for the comprehensive program is to allow regional interests to work through policy and technical issues. The delay should have minimal impact because only one year's hatchery production will be affected.

RPA Action	Description	Expectation for 2002	Finding	Proposed Implementation/ Comments
175	BPA shall, in coordination with NMFS, USFWS, and the relevant state and Tribal comanagers, fund the four-step planning process described above as quickly as possible and, if so determined by that process, implement safety-net projects as quickly as possible at least for the following salmon and steelhead populations: 1) A-run steelhead populations in the Lemhi River, main Salmon River tributaries, East Fork Salmon River, and Lower Salmon River; 2) B-run steelhead populations in the Upper Lochsa River and South Fork Salmon River; and 3) spring/summer chinook populations in the Lemhi, East Fork, and Yankee Fork Salmon rivers, and Valley Creek.	Complete planning process by 12/31/01. Implement safety net programs for populations most urgently requiring assistance.	Implementation as expected	Planning process delayed by up to one year to allow co-managers to better define and coordinate the components of the program. In addition to allowing better coordination of the program with co-managers, Action 175 specified specific populations as initial candidates for the safety net program based on information available to NMFS when the opinion was written. The new schedule is beneficial because it will allow a more considered selection of candidate safety net populations in light of additional information being developed by the state, tribal, and Federal agencies now collaborating on its implementation, thus resulting in actions that better implement the intent of Action 175. High spawner returns in '00 and '01 should reduce the effect of delaying implementation of safety net projects.
176	BPA shall, in coordination with NMFS, USFWS, and the relevant state and Tribal comanagers, fund the development of HGMPs for the Grande Ronde and Tucannon spring/summer chinook safety-net programs.	Continue to develop HGMPs for Tucannon and Grande Ronde.	Implementation as expected	Studies and programs are underway for Tucannon and Grand Ronde. Being implemented on schedule, and in the manner anticipated in the biological opinion.
177	In 2002, BPA shall begin to implement and sustain NMFS-approved, safety-net projects.	Continue operation of existing safety-net projects	Implementation as expected	Some safety-net projects already in progress and will continue to be sustained.
178	BPA shall commit to a process whereby funds can be made quickly available for funding the planning and implementation of additional safety-net projects for high-risk salmon and steelhead populations NMFS identified during the term of this biological opinion.	No specific expectations in 2002.	Implementation as expected	BPA has committed to the SNAPP process (RPA Action 175) to review and plan for safety net projects in addition to those populations identified as "high priority." BPA has not committed to a specific process to expedite implementation of projects as yet, but there is sufficient time to develop a process by the 2003 date specified in Appendix F. Recommend that BPA work with NMFS and USFWS by end of 2002, to address the process that will be used to expedite funding for both high-priority and any additional safety-net populations that may be identified through the Action 175 review process.

RPA Action	Description	Expectation for 2002	Finding	Proposed Implementation/ Comments
179	The Action Agencies and NMFS shall work with affected parties to establish regional priorities within the congressional appropriations processes to set and provide the appropriate level of FCRPS funding to develop recovery goals for listed salmon ESUs in the Columbia River basin. Tasks shall include defining populations based on biological criteria and evaluating population viability in accordance with NMFS' viable salmonid population approach. These tasks shall be completed by 2003.	Sufficient progress in 2002 so that recovery tasks will be completed by 2003.	Implementation as expected	Continued work by TRT in 2002.

RPA Action	Description	Expectation for 2002	Finding	Proposed Implementation/ Comments
180	<p>The Action Agencies and NMFS shall work within regional prioritization and congressional appropriation processes to establish and provide the level of FCRPS funding to develop and implement a basinwide hierarchical monitoring program. This program shall be developed collaboratively with appropriate regional agencies and shall determine population and environmental status (including assessment of performance measures and standards) and allow ground-truthing of regional databases. A draft program including protocols for specific data to be collected, frequency of samples, and sampling sites shall be developed by September 2001. Implementation should begin no later than the spring of 2002 and will be fully implemented no later than 2003.</p>	<p>Sufficient progress in 2002 so that a draft program will be complete and implementation on schedule by 2003</p>	<p>Modification requires resolution</p>	<p>This Action requires the Action Agencies and NMFS to work through regional processes and congressional appropriations to provide the level of FCRPS funding to develop a population and environmental status monitoring protocol by September 2001 and implement the status monitoring program by the spring of 2002. Implementation is delayed because NMFS and the Action Agencies are still working together to delineate their respective roles and responsibilities. The Opinion anticipates that costs and implementation will be shared, commensurate with agency responsibilities, for status monitoring activities. The delay also reflects the need to cooperatively develop status monitoring activities with other regional entities.</p>
				<p>The 2002 IP (p. 39) proposes to work with other regional entities and provide technical assistance and cost sharing for development of a regionally coordinated RM&E plan (including data-collection protocols). The 2002 IP (p. 39) also proposes two actions in 2002 related to status monitoring in tributaries (where spawning occurs for all ESUs except Snake River fall chinook salmon and some aggregations of Columbia River chum salmon). First, the Action Agencies will assist with developing status monitoring sampling designs as one component of an RM&E pilot study in the John Day River. Second, the Action Agencies will monitor emergence, growth, migration timing, and survival of Snake River fall chinook salmon.</p>
				<p>Implementation of Action 180 will be necessary to evaluate biological performance standards in 2005 and 2008. NMFS recommends the following modified schedule to ensure that a status monitoring program will be in place before the 2005 mid-point evaluation. A draft program including protocols for specific data to be collected, frequency of samples, and sampling sites should be developed by NMFS, in conjunction with</p>

RPA Action	Description	Expectation for 2002	Finding	Proposed Implementation/ Comments
181	The Action Agencies and NMFS shall work within regional prioritization and congressional appropriations processes to establish and provide the appropriate level of FCRPS funding for a program to acquire and digitize aerial or satellite imagery of the entire Columbia River basin once every 3 to 5 years.	Sufficient progress in 2002 to ensure that a coordinated program is defined and underway by the 2003 mid-point review.	Modification requires resolution	<p>the Action Agencies, by September 2002. Implementation of a pilot monitoring program in the John Day and at least two other priority subbasins should begin no later than the spring of 2003 and be fully implemented no later than the spring of 2004. NMFS will support and actively participate in development of these plans and programs in order to assist timely implementation. A detailed NMFS and Action Agency work plan and budget for full implementation of a basin-wide status monitoring program during 2004 should be completed by September 2003. This work plan should identify the roles and responsibilities of each agency.</p> <p>This Action requires the Action Agencies and NMFS to work within regional processes and congressional appropriations to provide the appropriate level of FCRPS funding for a program to acquire and digitize aerial or satellite imagery of the entire Columbia basin once every 3-5 years. Although this Action does not specifically state the first year of the 3-5 year cycle, Appendix F states that NMFS expects a coordinated program to be defined and underway by 2003. This Action does not appear to be on schedule. The 2002 IP (p. 39) proposes to work with other regional entities and provide technical assistance and cost sharing for development of a regionally coordinated plan for aerial and satellite imagery data. NMFS and the Action Agencies must agree upon a means of funding implementation, once the plan is completed. Completion of the plan by 2003 and collection of at least one cycle of images prior to 2005 will be necessary to evaluate biological performance standards in 2005 and 2008. NMFS will work with the Action Agencies to develop a detailed work plan for developing the imagery program by 2003. This work plan should identify the roles and responsibilities of each agency. This may require targeted solicitations by the Action Agencies.</p>

RPA Action	Description	Expectation for 2002	Finding	Proposed Implementation/ Comments
182	The Action Agencies and NMFS shall work within regional priorities and congressional appropriations processes to establish and provide the appropriate level of FCRPS funding for studies to determine the reproductive success of hatchery fish relative to wild fish. At a minimum, two to four studies shall be conducted in each ESU. The Action Agencies shall work with the Technical Recovery Teams to identify the most appropriate populations or stocks for these studies no later than 2002. Studies will begin no later than 2003.	Identify, working with the TRT, the most appropriate populations or stocks for the studies in 2002 and make sufficient progress so that priority studies will be initiated by 2003.	Modification requires resolution	This Action requires that the Action Agencies and NMFS work within regional processes and congressional appropriations to provide an appropriate level of funding for 2-4 studies per ESU by 2003 to determine the reproductive success of hatchery fish relative to wild fish. Based on the 2001 Progress Report and the 2002 IP, this action will be underway by 2003, and the Mainstem/System-wide solicitation will draw attention to this Action as one for which proposals are of high priority. However, it is unlikely that the scope will be sufficient to encompass 2-4 studies per ESU by 2003. Implementation of this Action will be necessary to evaluate biological performance standards in 2005 and 2008. NMFS and the Action Agencies should ensure that a sufficiently distributed group of studies is underway by 2003, which may require additional targeted solicitations. NMFS will participate in development of solicitations and other technical issues related to implementing this Action. The specific approach to implementation of this action may be influenced by NMFS' reinitiated status reviews for some ESUs.

RPA Action	Description	Expectation for 2002	Finding	Proposed Implementation/ Comments
183	Initiate at least three tier 3 studies (each necessarily comprising several sites) within each ESU (a single action may affect more than one ESU). In addition, at least two studies focusing on each major management action must take place within the Columbia River basin. The Action Agencies shall work with NMFS and the Technical Recovery Teams to identify key studies in the 1-year plan. Those studies will be implemented no later than 2003.	Sufficient progress in 2002 to ensure that priority studies will be initiated by the 2003 mid-point review.	Modification requires resolution	<p>The Action Agencies are expected to initiate at least three tier 3 effectiveness monitoring studies within each ESU and at least two studies affecting each major management action must be implemented no later than 2003. No specific studies are identified in the 2002 Plan and, to date, no studies fully meeting the intent of this Action have been funded. (See Brown [2001, 2002] "gaps" letters from NMFS to BPA and the Council regarding the scope of proposals submitted for the Gorge, Plateau, Blue Mountain, and Mountain Snake provinces).</p> <p>Supplemental information provided by BPA indicates progress in trying to address this shortcoming, including development of project guidelines, identification of this Action as a funding priority for the Mainstem/System-wide Province, and identification of some Tier 3 planning for the John Day basin. However, no explicit process for funding/coordinating the projects has been established; therefore, it is very unlikely that monitoring efforts will begin under Action 183 prior to the 2003 midterm review. Implementation of this Action will be necessary to evaluate biological performance standards in 2005 and 2008. NMFS recommends that the Action Agencies ensure that the full complement of Action 183 projects be underway by 2003. A first step is completion in 2002 of a fully developed plan for coordinating the funding of province-level Actions with the 183 monitoring program. This plan should explicitly include the participation of CBFWA and the Council. NMFS will actively participate in development of project criteria and proposal review to assist timely implementation.</p>

RPA Action	Description	Expectation for 2002	Finding	Proposed Implementation/ Comments
184	The Action Agencies and NMFS shall work within regional prioritization and congressional appropriation processes to establish and provide the appropriate level of FCRPS funding for a hatchery research, monitoring, and evaluation program consisting of studies to determine whether hatchery reforms reduce the risk of extinction for Columbia River basin salmonids and whether conservation hatcheries contribute to recovery.	Sufficient progress in 2002 to ensure that priority studies will be identified or initiated by the 2003 mid-point review.	Modification requires resolution	<p>This action requires the Action Agencies and NMFS to work within regional processes and through congressional appropriations to provide an appropriate level of FCRPS funding for hatchery RM&E, studies to evaluate the ability of conservation hatcheries to contribute to recovery, and evaluation of hatchery reforms. Appendix F indicates NMFS' expectation that priority studies be identified and underway by 2003. The 2002 IP does not identify a specific research program for hatcheries, but instead indicates adventitious funding of projects potentially related to this Action through the provincial review process (p. 40). The lack of a coordinated program or a method of determining the cumulative impacts of scattered hatchery RM&E projects on evaluation of hatchery reforms and conservation hatchery effectiveness is an issue that must be addressed promptly if the objectives of this action are to be adequately met. Implementation of this Action will be necessary to evaluate biological performance standards in 2005 and 2008.</p> <p>To improve this effort, NMFS recommends that the Action Agencies develop a more comprehensive hatchery RM&E plan, which indicates how each of the individually-funded projects will contribute to an evaluation of the effectiveness of conservation hatcheries and hatchery reforms. NMFS also recommends formation of a hatchery technical workgroup within the Federal RM&E Implementation Planning workgroup to deal with this issue. NMFS will actively participate in this process to assist timely implementation.</p>
185	The Action Agencies shall continue to fund and expand, as appropriate, fish marking and recapturing programs aimed at defining juvenile migrant survival for both transported and nontransported migrants and adult returns for both groups. These studies shall also compare the SARs of transported and nontransported fish to calculate the differential delayed mortality (D), if any, of transported fish.	Sufficient progress in 2002 to ensure that expanded studies will be underway by the 2003 mid-point review.	Implementation as expected	Studies are underway and will continue in 2002.

RPA Action	Description	Expectation for 2002	Finding	Proposed Implementation/ Comments
186	The Action Agencies and NMFS shall work within the annual planning and congressional appropriation processes to establish and provide the appropriate level of FCRPS funding for comparative evaluations of the behavior and survival of transported and downstream migrants to determine whether causes of D can be identified for the reach between Bonneville Dam and the mouth of the Columbia River.	Sufficient progress in 2002 to ensure that studies will be underway by the 2003 mid-point review.	Implementation as expected	Studies are underway and will continue in 2002.
187	The Action Agencies and NMFS shall work within the annual planning and congressional appropriation processes to establish and provide the appropriate level of FCRPS funding for studies and analyses to evaluate relationships between ocean entry timing and SARs for transported and downstream migrants.	Continue existing studies; solicit additional work in 2002	Modification requires resolution	This Action requires the Action Agencies and NMFS to work within the annual planning and congressional appropriation processes to provide the appropriate level of FCRPS funding for studies to analyze and evaluate relationships between ocean entry timing and SARs for transported and downstream migrants. The Progress Report and 2002 IP describe several studies that describe this relationship. Additional studies are needed to evaluate explanatory factors (such as ocean plume conditions), as described in the narrative associated with Action 187. Appendix F indicates that NMFS expects studies to be underway by 2002. Implementation of this Action will be necessary to evaluate biological performance standards in 2005 and 2008. NMFS recommends that the Action Agencies work cooperatively with NMFS through the RM&E Hydro technical workgroup to develop a research plan that specifically addresses explanatory factors by September, 2002. Implementation of the missing components should begin no later than the spring of 2003 and be fully implemented no later than the spring of 2004.
188	The Action Agencies and NMFS shall work within the annual planning and congressional appropriation processes to establish and provide the appropriate level of FCRPS funding for studies of PIT-tagged wild stocks from the lower river streams. The studies shall be used to contrast stock productivity and hydrosystem effects.	Sufficient progress in 2002 to ensure that studies will be underway by the 2003 mid-point review.	Implementation as expected	A March 29, 2002, Action Agency transmittal (Fisher 2002) indicates that BPA is attempting to fund a study to address this question, but has been having difficulty getting a proposal for a well-defined study. BPA anticipates funding a project through the Mainstem/System-wide provincial solicitation. NMFS' finding is predicated on the success in 2002 of BPA's solicitation. NMFS will cooperate with the Action Agencies in this endeavor.

RPA Action	Description	Expectation for 2002	Finding	Proposed Implementation/ Comments
189	The Action Agencies and NMFS shall work within the annual planning and congressional appropriation processes to establish and provide the appropriate level of FCRPS funding for studies to investigate the causes of discrepancies in adult return rates for juvenile salmonids that have different passage histories through the hydrosystem.	Continue existing studies and begin additional studies prior to 2003 check-in.	Implementation as expected	Some studies underway; additional studies to be funded through Mainstem/System-wide Province in 2002
190	The Action Agencies shall continue to fund studies that monitor survival, growth, and other early life history attributes of Snake River wild juvenile fall chinook.	Continue existing studies	No schedule, implementation underway	Fall chinook studies will continue in 2002
191	The Action Agencies shall continue to implement adult salmonid counting programs at FCRPS dams, but shall improve the reporting of these counts.	Continue counts in 2002	Implementation as expected	Action Agencies propose to continue adult counting programs.
192	As set out in Action 50 (Section 9.6.1.3.4), BPA and the Corps shall install necessary adult PIT-tag detectors at appropriate FCRPS projects before the expected return of adult salmon from the 2001 juvenile outmigration. These adult PIT-tag detectors shall be used as needed for calculating transport benefits, conversion rates, and SARs for listed salmon and steelhead.	Determine if the adult PIT-tag detectors already installed at FCRPS projects are adequate for the Opinion research before the expected return of adult salmon from the 2001 juvenile outmigration.	Implementation as expected	Detectors have been installed at Bonneville and McNary Dam and are being tested in 2002.
193	The Action Agencies shall investigate state-of-the-art, novel fish detection and tagging techniques for use, if warranted, in long-term research, monitoring, and evaluation efforts.	Sufficient progress in 2002 to ensure that study plans will be under development or implemented by the 2003 mid-point review.	Implementation as expected	Two BPA projects are being funded in 2002 to evaluate new marking techniques and small stream PIT-tag detection.
194	The Action Agencies and NMFS shall work within the annual planning and congressional appropriation processes to establish and provide the appropriate level of FCRPS funding for studies to develop a physical model of the lower Columbia River and plume. This model will characterize potential changes to estuarine habitat associated with modified hydrosystem flows and the effects of altered flows where they meet the California Current to form the Columbia River plume.	Sufficient progress in 2002 to ensure that study plans will be under development or implemented by the 2003 mid-point review.	Implementation as expected	Implementation Plan (p. 40) proposes to initiate development of a physical model of the lower Columbia River estuary and plume in 2002.

RPA Action	Description	Expectation for 2002	Finding	Proposed Implementation/ Comments
195	The Action Agencies shall investigate and partition the causes of mortality below Bonneville Dam after juvenile salmonid passage through the FCRPS.	Sufficient progress in 2002 to ensure that this action is being implemented by the 2003 mid-point review.	Implementation as expected	This Action requires the Action Agencies to investigate and partition the causes of mortality below Bonneville Dam. Appendix F indicates that NMFS expects study plans to be under development or implementation by 2003. The 2002 IP indicates unspecified work on this Action in 2002 (p. 41). Additional information provided by the Action Agencies indicates that two research programs are underway to evaluate survival as a result of hydro related actions. Significant progress was made in 2001 and is ongoing in 2002 as part of the Corps CRFM program: 1) EST-P-01, Study to estimate salmonid survival through the Columbia River Estuary using acoustic tags; and 2) BPS-00-10, Evaluation of delayed mortality of juvenile salmonids in the near ocean environment following passage through the Columbia River Hydrosystem. Information provided to NMFS by the Action Agencies indicates that a Request for Proposals through the Mainstem/System-wide Province will ensure that additional relevant research gets underway in 2002. NMFS' finding for this RPA Action is predicated upon the success of BPA's solicitation in 2002 so that additional work can be initiated by 2003.

RPA Action	Description	Expectation for 2002	Finding	Proposed Implementation/ Comments
196	The Action Agencies and NMFS shall work within the annual planning and congressional appropriation processes to establish and provide the appropriate level of FCRPS funding for studies to develop an understanding of juvenile and adult salmon use of the Columbia River estuary. These studies support the actions to develop criteria for estuarine restoration (Action 158), restoration planning (Action 159), and implementation (Action 160) in Section 9.6.2.2.	Sufficient progress in 2002 to ensure that this action is being implemented by the 2003 mid-point review.	Modification requires resolution	This Action requires the Action Agencies and NMFS to work within the annual planning and congressional appropriation processes to provide the appropriate level of FCRPS funding for studies to understand juvenile and adult use of the Columbia River estuary. Appendix F indicates that NMFS expects studies to be underway by 2003. Juvenile studies are currently underway and proposed for continuation in the 2002 IP. At this time, adult studies are neither underway or proposed. Implementation of this Action will be necessary to evaluate biological performance standards in 2005 and 2008. NMFS recommends that the Action Agencies and NMFS solicit projects to specifically address the adult component of this Action prior to 2003. This should be coordinated with other estuary and mainstem research.
197	The Action Agencies and NMFS shall work within the annual planning and congressional appropriation processes to establish and provide the appropriate level of FCRPS funding for studies to develop an understanding of juvenile and adult salmon use of the Columbia River plume.	Sufficient progress in 2002 to ensure that this action is being implemented by the 2003 mid-point review.	Modification requires resolution	This Action requires the Action Agencies and NMFS to work within the annual planning processes to provide an appropriate level of FCRPS funding for studies to understand juvenile and adult use of the Columbia River plume. Appendix F indicates that NMFS expects studies to be underway by 2003. Juvenile studies are currently underway and proposed for continuation in the 2002 IP. At this time, adult studies are neither underway or proposed. Implementation of this Action will be necessary to evaluate biological performance standards in 2005 and 2008. NMFS recommends that the Action Agencies and NMFS solicit projects to specifically address the adult component of this Action prior to 2003. This should be coordinated with other estuary and system-wide research.

RPA Action	Description	Expectation for 2002	Finding	Proposed Implementation/ Comments
198	The Action Agencies, in coordination with NMFS, USFWS, and other Federal agencies, NWPPC, states, and Tribes, shall develop a common data management system for fish populations, water quality, and habitat data.	Sufficient progress in 2002 to ensure that this action is being implemented by the 2003 mid-point review.	Modification requires resolution	<p>This Action requires the Action Agencies, in coordination with NMFS, USFWS, other Federal agencies, Council, states, and Tribes to develop a common data management system for fish populations, water quality, and habitat data. Appendix F indicates that NMFS expects this Action to be implemented by 2003. The 2002 IP proposes to provide technical assistance and cost sharing with NMFS to develop a regionally-coordinated plan for implementation of a data-support system (p. 39). The Action Agencies' March 29, 2002, transmittal (Fisher 2002) describes the BPA contracts to conduct a survey of regional information needs, hire a data coordinator, and develop data collection protocols, which are precursors to developing a coordinated database. The Corps is also creating a regional water quality database that will be compatible with databases of other entities. Given that the preliminary steps necessary for funding in 2002 will not be completed until 2003, it is unlikely that the full scope of this RPA will be implemented by 2003. Implementation of this Action will be necessary to evaluate biological performance standards in 2005 and 2008.</p> <p>NMFS recommends that the Action Agencies continue to work cooperatively with the Council and the agencies named in the FCRPS Opinion (including NMFS) to develop a plan that addresses the critical aspects of this Action (including allocation of funding responsibility) by October, 2002. The full plan development should be complete no later than April of 2003. The plan should be fully implemented no later than the spring of 2005. The plan should include coordination with, and potential modification to, current data bases being funded by BPA through the Fish and Wildlife Program, as well as other regional resources.</p>

RPA Action	Description	Expectation for 2002	Finding	Proposed Implementation/ Comments
199	The Action Agencies shall implement the specific research/monitoring actions outlined in Appendix H.	Implement specified research in 2002	Implementation as expected	Projects described in Appendix H, which are permitted under ESA Section 10, are being implemented in 2002.
