8 Plan Implementation

This section of the plan discusses the means and organizational structure by which implementation of the plan's recommended actions will be coordinated, managed, and overseen. It melds implementation of programs and actions with the monitoring and evaluation process. It describes the mechanism that will be used track, evaluate, and report progress. It describes the process for revising the plan's strategies, measures, and actions. It identifies economic factors and an approach for weighing economic considerations in plan implementation. Finally, it identifies partners involved with specific actions.

8.1 Framework

This plan includes strategies, measures, and actions intended to: 1) reverse long term declining trends in salmon and steelhead numbers, 2) provide a trajectory leading to recovery of these species to healthy and harvestable levels within 25 years, and 3) periodically refine recovery efforts with checkpoints and course corrections throughout implementation (Figure 1). Lower Columbia salmon and steelhead populations have declined over decades due to a myriad of human activities. These activities have reduced the number of fish, their distribution, the quality and quantity of their habitat, and their adaptive population characteristics. Today they are threatened with extinction and listed under the federal Endangered Species Act (ESA). The immediate task we face is to halt the further decline of these populations in order to prevent extinction and to reverse the trend in the direction of recovery. The strategies, measures, and actions included in this plan represent the current best scientific estimates of the actions and efforts needed to meet recovery objectives within the prescribed time period. Strategies, measures, and actions will be refined based on new information and observed responses as the recovery effort unfolds.

Significant uncertainties remain with regard to the incremental benefits that can be expected from each specific action as well as the net effect of the prescribed suite of actions over time. At best, existing data, models, and theories can give only a qualified answer to the question of what it will take to recover these fish. The available information and current science is generally effective at identifying the right types of actions needed for recovery. For instance, this plan identifies the relative order of magnitude of impacts on each population from different threat categories and the actions needed to reduce those threats. However, the science is less certain on exactly how much effort will be required in each proposed action to achieve each incremental improvement. Many related actions also result in complex interactions among effects that are difficult to quantitatively predict with certainty.

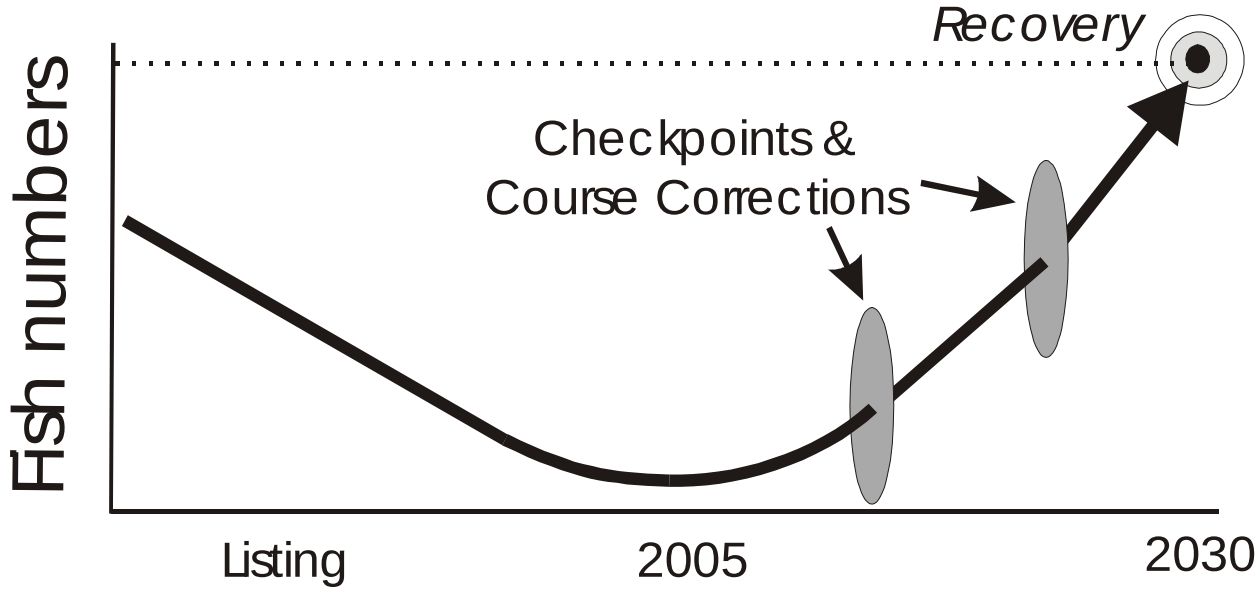

Figure 1. Hypothetical recovery trajectory including stabilization of current populations, reversal of declining trends and checkpoints for course corrections based on monitoring and evaluation.

The acute status of many listed salmon and steelhead populations means that it is not feasible to wait for more data, better models, or more certainty before embarking on a course toward recovery. Further delay is a recipe for irreversible consequences for the remaining lower Columbia salmon and steelhead populations. While current knowledge may not be adequate to categorically guarantee that recovery objectives will be met with the prescribed set of actions, existing information and analyses are adequate to identify the right things to do to set a recovery trajectory and a scale of effort than can reasonably be expected to achieve recovery objectives.

To address uncertainties in the magnitude of effect of any given action and the effort required to achieve a given improvement, this plan identifies recovery actions primarily in terms of directional rather than target outcomes. Directional actions identify the who, what, where, and when to address specific threats. Target outcome actions specify how much effort will be needed and how much improvement occurs as a result of each action. For instance, a directional action might be to use county land use regulations to protect and passively restore significantly areas of riparian zone in high value stream reaches. A target outcome action would further identify that X miles of riparian zone would need to be restored Y% of optimum. In the directional approach, objectives are clearly specified in terms of desired biological outcomes rather than a series of related conditions assumed to be consistent with biological objectives. In the target outcome approach, intermediate conditions provide more specific guidance on what it will take to accomplish the biological objectives. Target outcomes are similar to desired future conditions.

Target outcome and directional definitions of actions each have their limitations. The challenge with the target outcome approach is that existing information is inadequate to confidently identify and defend specific intermediate targets. Specific numbers are likely to be inaccurate and subject to considerable debate. The focus on specific values distracts attention from the activities needed to take substantive steps in the direction of recovery. An exact recipe for recovery also rapidly becomes obsolete or constraining during plan implementation as new information and opportunities come to light. The problem with the directional approach is that it leaves the question of exactly how much effort and improvement in each factor will be required to reach biological objectives unsatisfyingly open-ended. The reality is that directional action definitions must be the default when information is inadequate to accurately define magnitudes of effort and specific conditions that will achieve biological recovery objectives. Directional actions provide guidance on where we need to go from where we are now. We know where we need to go and how to start on the road to recovery. Monitoring and regular progress reviews during plan implementation will provide ample opportunity to refine exactly how much we have to do to get there after we demonstrate that we can take a substantive first step. This directional approach is consistent with other fish and wildlife recovery plans that have been adopted by NOAA Fisheries and the U.S. Fish and Wildlife Service.

Properly Functioning Conditions (PFC) identified by NOAA Fisheries for salmonid stream habitat are one example of a target outcome or desired future condition. In the directional action approach, PFC conditions are used as guidelines for desirable conditions rather than specific objectives. The objective is to make substantive improvements in current habitat conditions in the direction of PFC rather than restoring any given percentage of a subbasin to PFC. Existing information is inadequate to do much more than speculate on how much of a given subbasin would need to be restored to PFC conditions to restore a viable population. Fish population assessments suggest that viable populations can be restored with only a partial restoration of PFC conditions in portions of a subbasin or even habitat improvement that fall short of PFC in substantial portions of a subbasin.

Directional rather than target outcome actions provide maximum flexibility for plan implementers to determine the most effective means of meeting biological objectives rather than artificially constraining those efforts with inaccurate or incomplete intermediate targets.

Uncertainties are further addressed in this plan by: 1) corroborating analyses with the best available science; 2) strong monitoring, evaluation, and adaptive management elements, and 3) a recovery scenario that identifies more than the minimum populations and improvements needed to meet recovery goals. Corroborating analyses verify that strategies, measures, and actions can reasonably be projected to reduce threats to a level where recovery is realistic. Monitoring, evaluation, and adaptive management provides the means to make course corrections during plan implementation if initial assumptions prove to be too liberal or conservative. The recovery scenario includes contingencies that act as safety factors for failures for some populations.

Strategies, measures, and actions will be refined through adaptive management over the course of plan implementation based on the observed response to initial efforts. Initial hypotheses, actions, and efforts can be regarded as the first in a series of successive approximations regarding what it will take to get to recovery. As the plan is implemented, it is likely that uncertainty in initial assumptions will lead to surprises in both directions. Some actions will be more effective and some populations will respond more quickly than initially expected. Other actions or populations will prove less responsive than hoped. Monitoring, evaluation, and adaptive management will provide for capitalizing on successes and opportunities and compensating for disappointments and failures.

Effective adaptive management requires that initial actions are of a magnitude sufficient to produce a measurable response. It also requires monitoring sufficient to detect a response. The strength of the response provides a clear basis for tuning future effort. This truly adaptive management approach contrasts with an alternative approach that involves the successive addition of small scale increments of effort until a response is observed. The truly adaptive approach ensures a quick route to solutions and an effective means of addressing near-term extinction risks. The successive incremental approach postpones identification and implementation of effective recovery efforts and poses unacceptable near-term risks to salmon and steelhead threatened with extinction.

We know that recovery will ultimately be a long journey requiring substantive actions across all categories of limiting factors and threats affecting salmon and steelhead. We know the desired destination and the direction of travel. We are unsure of exactly how much mileage we will get from proposed actions, how much effort will ultimately be required to complete the journey, and the details of every twist and turn of the route. This plan lays out an initial direction, a scale of effort appropriate to the distance of the journey, and a framework for making course corrections along the way.

8.2 Implementation Mechanism

The scale of human activities that limit or threaten salmonids throughout the Washington lower Columbia region is broad and pervasive. Recovery can only be achieved through the combined and coordinated actions of federal and state agencies, tribes, and local governments with the participation of nonprofit organizations, the business sector, and citizens. Collectively, these parties are referred to as implementing partners.

This plan provides a blueprint for recovery. It includes specific actions needed to address all threats and identifies the partners with the authority, jurisdiction, or resources needed to implement each action. The plan does not obligate any party but does establish specific responsibilities for taking actions that have been identified as important to fish recovery. Obligation will come through the commitment of each implementing partner to undertake and complete the actions identified as their responsibility in a timely, sound, and thorough manner. Furthermore, implementation of recovery programs and actions is not a one-time or short-term initiative. Programs and actions put in place early will have to be sustained, evaluated, adjusted, and augmented over the 25-year recovery period.

The plan offers clear guidance for programs and actions that is consistent with achieving recovery. This guidance focuses the efforts of the implementing partners on actions and areas that offer the greatest potential for protecting and recovering salmon and steelhead.

While the ultimate goal of implementation is the recovery of the region's salmon and steelhead, implementation is also intended to afford the implementing partners and the people of the region greater regulatory certainty and efficiency under the ESA. This plan will provide improved context and certainty and a framework for streamlining and prioritizing ESA regulatory assurances. A range of ESA regulatory tools, including ESA section 4(d) limits, section 7 consultations, and section 10 Habitat Conservation Plans, is available to provide assurances, depending on the type of actions and implementing entities. NOAA Fisheries will work with entities interested in obtaining regulatory assurances for implementation of actions in this plan. This recovery plan will also supply technical assessment information that can be used as a shared foundation for some regulatory actions (e.g., as the basis for some Biological Assessments and Biological Opinions). The plan should be used as a collective organizing framework for federal and non-federal programs that are funding recovery actions and as a means to prioritize cost-effective actions and identify additional resources necessary to achieve recovery. In this way, the plan can be expected to serve as a vehicle in securing additional funds or other resources needed for recovery by highlighting priority actions and areas where gaps exist.

8.3 Institutional Structure

As noted above, effective implementation of this plan depends on the combined and coordinated action of federal and state agencies, tribal governments, and local governments with the participation of nonprofit organizations, the business sector, and citizens. Section 8.8 identifies the measures and actions for each implementing party. Six-year implementation plans described in section 8.5 will provide details on the how, when, where, and who of implementation. However, effective regional implementation also requires an institutional structure that effectively links all partners involved. Responsibilities can generally be categorized into three functions: oversight, facilitation/coordination, and implementation. In some cases a single party may fall into two or three function categories. Figure 2 summarizes the key

relationships and partners involved with recovery plan implementation functions for the Washington lower Columbia River.

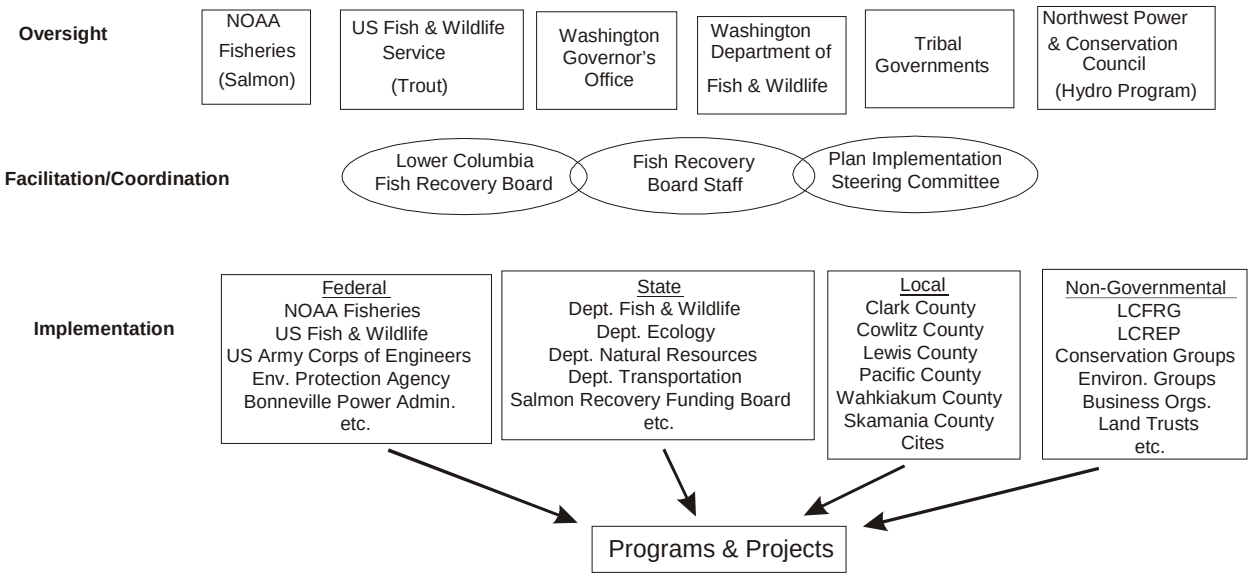

Figure 2. Institutional structure for implementing salmon recovery in Washington Lower Columbia River subbasins.

8.3.1 Oversight Bodies

Key oversight bodies are those entities with specific authority or responsibilities for managing the region's fish and wildlife resources. These include NOAA Fisheries, U.S. Fish and Wildlife Service, the State of Washington, the Cowlitz Tribe, the Yakama Nation, and the Northwest Power and Conservation Council.

- NOAA Fisheries has the primary Federal authority for Endangered Species Act and Sustainable Fisheries Act as they apply to salmon and steelhead.
- The U.S. Fish and Wildlife Service is responsible for Endangered Species Act implementation for bull trout.
- The Washington Governor's Office has the authority to direct and coordinate state agency actions in support of recovery. Washington Department of Fish and Wildlife has management authority for the state's fish and wildlife resources.
- The Cowlitz tribe and Yakama Nation are co-managers of fish resources with the state and federal agencies.
- The Northwest Power and Conservation Council oversees implementation of the program to address Federal Columbia River Power System effects on fish and wildlife.

Other federal, state, and local agencies have oversight responsibilities for water, natural resources, land management, and land use. These agencies are considered implementation partners, since their responsibilities are not specific to fish and wildlife management.

8.3.2 LCFRB Implementation Steering Committee

The Lower Columbia Fish Recovery Board working with a Plan Implementation Steering Committee will facilitate and coordinate efforts of the oversight and implementing partners. The Steering Committee will include representatives of the oversight and a cross-section of implementing partners. Working groups consisting of steering committee members and other implementing partners will be established as needed to address policy or technical issues or to coordinate implementation efforts.

Key functions of the Board and Steering Committee will include:

- Developing and revising a 6-year regional implementation plan;
- Assisting implementation partners develop and implement their individual 6-year implementation plans;
- Preparing and issuing clarifications or interpretations of recovery plan provisions when needed;
- Preparing and issuing revisions or updates to the recovery plan;
- Developing and implementing the regional public education and outreach program;
- Conducting implementation and biological evaluations in accordance with the adaptive management provisions and benchmarks set forth in section 8.4 of this plan.
- Tracking implementation of measures, actions, programs, and projects and issuing annual progress reports;
- Facilitating and assisting partners in resolving technical and policy issues that arise during implementation;
- Facilitating communications and the exchange of information and data among implementation and oversight partners;
- Coordinating the collection, management, synthesis, and evaluation of fish and habitat monitoring results collected by the partners; and
- Developing implementation partnerships and agreements.

8.3.3 Implementing Partners

Recovery actions will be implemented through the programs and projects of numerous federal, state, tribal, and local agencies and nongovernmental entities. Collectively these agencies and entities are referred to as implementing partners. The functions of the implementing partners are:

- Developing and implementing a 6-year plan for their recovery actions;
- Monitoring and reporting their implementation progress to the LCFRB/Steering Committee;
- Advising the LCFRB/Steering Committee of issues or developments affecting progress.

Each partner's specific responsibilities for recovery actions are provided in section 8.8. The 6-year Implementation Schedule submitted by each partner will set forth the tasks and schedule

addressing assigned recovery actions and will document the partner's commitment to fulfilling its implementation responsibilities.

Success in achieving recovery of the region's salmon and steelhead and improving the status of other resident fish and wildlife is dependent on the effectiveness of the partners in undertaking and sustaining the identified recovery actions. The actions identified for each partner are based on the partner's mission, capabilities, responsibilities, authority, and jurisdiction. It is incumbent upon each partner to develop and fully implement programs to address its assigned actions. The programs must be technically sound and adequately funded and staffed. In the case of regulatory programs, agencies must be committed to taking enforcement actions when necessary to achieve the desired outcome. Enforcement authority provides an important incentive for compliance only if it is prudently exercised in pursuing and correcting instances of noncompliance.

In some instances an implementing partner may not have the full or exclusive authority to implement a recovery action. A case in point is the setting of harvest quotas pursuant international treaty provisions. NOAA Fisheries and the Washington Department of Fish and Wildlife are influential participants in this process, but do not control the outcome. In such instances, it is expected that implementing partners sharing an implementation responsibility will cooperate in working to achieve the desired outcome and will raise, support, advocate, and/or put in place those actions in appropriate fora, using whatever authorities or arguments we have available. In order to ensure needed coordination, the Implementation Steering Committee may designate a lead agency in carrying out an implementation action shared by two or more partners. Even where a single implementing partner possesses the authority to fully implement a recovery action, the action is likely to be more effectively implemented with the involvement, agreement, and support of other partners. To achieve this level of cooperation and coordination, implementing partners are requested to identify in their 6-year action schedule interrelationships with other partners that will facilitate, affect, or complement implementation of their recovery actions.

8.4 Implementation Coordination and Administration

8.4.1 Six-Year Action Schedules

To provide an effective basis for the recovery program, action schedules will be prepared showing the tasks, schedules, priorities, and responsibilities for implementation of the recovery actions identified in this plan. Since this recovery program relies on the combined action of federal and state agencies, tribal and local governments, and non-governmental entities, each of these partners will be requested to prepare an implementation schedule for their recovery actions. These individual action schedules will be melded into a regional implementation schedule. New implementation plans will be prepared on 6-year intervals. This cycle will coincide with the with the 6-year adaptive management checkpoints and allows the schedules to incorporate needed changes or modifications stemming from the adaptive management implementation and effectiveness evaluations. Six-year schedules may be revised every 2 years as necessary based on the adaptive management implementation evaluation checkpoint.

Implementing Partner Action Schedules and Commitment

Each implementing partner will be asked to submit a 6-year action schedule and commitment to the LCFRB and Implementation Steering Committee. The schedules prepared by the implementing partners will document their approach and commitment to implementing their

recovery actions. Recovery actions are summarized for each implementing partner in section 8.8. The LCFRB in consultation with the Implementation Steering will develop a detailed template for 6-year schedules and will assist and advise partners, as necessary, in developing their schedule. The LCFRB and the Steering Committee will review the adequacy of the partners' implementation plans in achieving the desired outcome in a timely manner and may request revisions or additional information. In general, each schedule will identify:

- The tasks and schedule for implementing the recovery actions for which the partner is responsible;
- A public education and outreach program consistent with the guidance in section 8.7 of this plan;
- Technical, funding, legal, and/or other constraints or conditions affecting the timeliness or scope implementation;
- The mechanism for monitoring implementation progress;
- Estimated costs and funding sources; and
- Dependencies on or interrelationships with actions by other implementing partners.

Regional Action Schedule

Implementing schedules developed by the partners will be combined into a regional implementation schedule. The LCFRB/Steering Committee will prepare and adopt the regional schedule, in consultation with the implementing partners. In preparing the regional schedule the LCFRB/Steering Committee will review partner implementation schedules and ensure that the actions of the implementing partners are coordinated and/or complement each other and are consistent with the strategies, measures and actions set forth in the recovery plan. The LCFRB/Steering Committee may request revisions to an individual partner's implementation schedule or additional information in order to ensure that the regional schedule sets forth a sound course for recovery. The regional schedule will address regional implementation actions, including monitoring, evaluation, data management, and public education and outreach. Specifically, the schedule will:

- Provide a master list of tasks, schedules and responsible implementing partners;
- Address interdependencies among implementation actions and partners;
- Identify approaches, partnerships, and/or working groups needed to address implementation issues shared by multiple partners;
- Provide the means to facilitate information and data collection, management, and exchange among partners;
- Provide for a regional public education and outreach effort in accordance with the guidance of section 8.7 of this plan and in coordination with related efforts by individual implementing partners;
- Establish a coordinated implementation and biological monitoring program;
- Describe the process, procedures, and protocols for evaluating progress and, as necessary, revising recovery plan strategies, measures, and actions and corresponding implementing tasks and schedules in accordance with the adaptive management measures set forth in section 8.4 of this plan;

- Provide for coordinating implementation with Oregon; and
- Provide estimated costs, identify funding sources; and provide a regional funding strategy.

8.4.2 Interpretation of Recovery Plan

It is likely during the course of implementing the recovery plan that questions will arise that will require interpretation or clarification of the plan goals, objectives, strategies, measures, and actions. Implementing partners may request clarifications of the plan from the Implementation Steering Committee at any time. The Implementation Steering Committee shall be responsible for such interpretations or clarifications. In making interpretations or clarifications, the Committee may consult with federal state or local agencies or the NOAA Fisheries Technical Recovery Team (TRT) as deemed appropriate. The Committee may also establish a working group to advise on policy and/or technical issues that may require clarification.

8.4.3 Revisions to the Plan

The recovery plan will be routinely evaluated and revised as necessary based on the adaptive management process and intervals set forth in section 8.5. However, it may be desirable or necessary to revise the plan between these intervals in order to address issues or new information that may arise during implementation. Such revisions may be needed to clarify provisions of the plan as discussed in section 8.4.2 or to facilitate effective plan implementation. Interim revisions to address or incorporate new information or data may also be warranted in instances where the benefits to recovery efforts are deemed to be sufficiently significant.

The Implementation Steering Committee shall be responsible for coordinating and directing the development, evaluation, approval and issuance of all plan revisions as follows:

- Plan revisions that are editorial in nature and clarify the intent or provisions of the plan and do not materially alter the plan's goals, objectives, strategies, measures, actions, or priorities shall be developed, approved and issued by the Implementation Steering Committee.
- Interim revisions to address or incorporate new information or data and result in substantive changes to the plan's goals, objectives, strategies, measures, actions, or priorities, shall be developed and evaluated by the Implementation Steering Committee in consultation with affected implementing partners and with opportunities for the public participation. The proposed revision will be submitted to NOAA Fisheries and the U.S. Fish and Wildlife Service for concurrence prior to final adoption and issuance.
- Revisions to the plan's goals, objectives, strategies, measures, actions, or priorities arising from the adaptive management process described in section 8.5 shall be developed and evaluated by the Implementation Steering Committee in consultation with affected implementing partners and with opportunities for the public participation. The proposed revision will be submitted to NOAA Fisheries and the U.S. Fish and Wildlife Service for concurrence prior to final adoption and issuance.

The Implementation Steering Committee or an implementing partner may propose plan revisions. The Implementation Steering Committee will establish the procedures necessary to ensure the timely consideration and action on proposed revisions. The Steering Committee may use working groups to assist in the evaluation of policy and technical issues associated with a proposed revision.

8.4.4 Monitoring, Research, and Evaluation

The LCFRB and the Implementation Steering Committee will direct and coordinate the implementation of the monitoring, research and evaluation provisions set forth in Chapter 7 of this plan. The program will also define the procedures and benchmarks for implementing the Adaptive Management Process set forth in section 8.5. The LCFRB and Implementation Steering Committee shall convene and work with a Monitoring, Research, and Evaluation Working Group to develop implementation measures and responsibilities. The Working Group will consist of representatives from federal, state, regional, and local programs engaged in biological and habitat status monitoring, effectiveness monitoring, implementation/compliance monitoring, and biological and habitat research. The working group will prepare and submit to the Implementation Steering Committee recommendations for a Monitoring, Research, and Evaluation Program. Based on Chapter 7 and section 8.5 of this plan, the program shall:

- Validate data needs;
- Develop benchmarks and procedures for evaluating action implementation, action effectiveness, and biological and habitat status as set forth in section 8.5;
- Establish procedures, methods, and protocols for monitoring and research, and data reporting;
- Develop the process, procedures and organizational responsibilities for data management and access;
- Set forth the necessary organizational structure and responsibilities;
- Provide a 6-year monitoring schedule and priorities for incorporation in the 6-year regional implementation plan;
- Identify and prioritize critical uncertainty research needs for the incorporation in the 6-year regional implementation schedule; and
- Identify unfunded monitoring and research needs and proposed or potential funding sources.

The program, when adopted by the Implementation Steering Committee, shall be included in the 6-year regional implementation schedule.

8.4.5 Economic and Cost Considerations

This plan identifies strategies, measures and actions for the recovery of fish populations. The actions have been designed and selected based on their anticipated contribution to the biological objectives set forth in Volume 1, chapter 6. They are heavily based on biological and technical factors, although consideration was also given social, cultural, and general economic factors. Additional consideration of cost and economic factors will play an important function in developing specific implementation mechanisms and actions that are both scientifically sound and politically and fiscally feasible.

To establish an estimate of implementation costs, implementing partners are requested to provide an estimate of the incremental costs associated with the implementation of their recovery actions. Incremental costs are the costs of recovery that will be incurred in addition to costs to their existing programs and activities. Partners are also requested to indicate how they will fund these costs and to identify fiscal constraints that would affect timely or full implementation of their actions. This information will be used along with biological, technical, social, and cultural

considerations to help refine implementation priorities and to develop a regional funding strategy.

Economic analysis will be used to evaluate the positive and negative economic impacts of the overall regional recovery effort and will be compared to the impacts of not proceeding with a recovery effort. The comparison will identify the net cost/benefit to the region. The analysis will be used to assist in making decisions regarding implementation of this plan and, where, appropriate, to help realign recovery improvement increments across affected parties and sectors. Decisions regarding the specifics of plan implementation will take into account the economic and cost considerations but ultimately the overriding goal of this plan is to recover listed stocks. Appendix D explores possible approaches to conducting such an analysis. The specific approach to be used will be developed by the Implementation Steering Committee.

8.4.6 Enforcement of the Plan

This plan is not a regulatory document and is not enforceable. It relies largely on the cooperative efforts and support of federal and state agencies, tribal governments, local governments, businesses, non-profit organizations, and the people of the region. However, while this plan is not a regulatory document, federal, state, and local agencies do have regulatory authority and programs that will play critical role in the implementation of the plan. Enforcement action alone is not a sufficient or effective means to achieve recovery. The plan relies on a variety mechanisms in addition to enforcement to achieve progress toward recovery. These include encouraging voluntary public participation and providing incentives to implement necessary actions. Nevertheless, enforcement mechanisms are an important deterrent to actions detrimental to achieving recovery, if they are prudently and effectively applied. It is expected that agencies with such authority will exercise it as needed to ensure implementation of their recovery responsibilities. This includes enforcement of ESA regulations by NOAA Fisheries and the USFWS.

8.4.7 Schedule for Coordination and Administrative Measures

The schedule for instituting plan implementation coordination and administrative measures is provided in Table 1.

Table 1. Schedule for Coordination and Administrative Measures

COORDINATION/ADMINISTRATIVE MEASURE	TARGET COMPLETION DATE
Organize Implementation Steering Committee	**January 2005**
Complete 6-year Implementation Schedules • Template for Schedules • Implementing Partner Schedules • Regional Schedule	**July 2005** • February 2005 • June 2005 • July 2005
Procedures for Plan Interpretation and Revision	**February 2005**
Monitoring, Research, and Evaluation Program	**June 2005**
Public Education and Outreach Program	**July 2005**

8.5 Adaptive Management Process & Schedule

Adaptive management during plan implementation will be critical to effective implementation of this plan. The directional actions identified in this plan are the substantive steps needed to achieve a positive trajectory for recovery. They are consistent with initial estimates of incremental improvements needed to move populations from their current status to healthy and harvestable levels. Adjustments in direction and effort will be required if initial implementation efforts lag or if benefits are less than hoped. Adjustments will be needed to capitalize on new information, more specific objectives, new developments, and evolving opportunities.

The term "adaptive management" is in wide usage among subbasin planners and has come to denote two very different processes. A broad definition involves course correction during plan implementation based on observed progress and refinements in approach or objectives. An alternative definition involves a specific approach whereby substantive actions are implemented in order to invoke a significant response that provides clear direction for tuning. This contrasts with the sequential implementation of small incremental changes intended to steadily move progress toward the objectives. Substantive actions greatly expedite the process for identifying the sufficiency of plan actions but require significant effort by implementing parties. This plan treats adaptive management consistent with both definitions. It identifies substantive improvement increments in productivity consistent with recovery and specific actions intended to make corresponding reductions in threats. It also includes a process for monitoring and refinement as part of plan implementation.

The adaptive management process for this plan is based on a series of checkpoints, assessments, benchmarks, and decisions (Figure 3). Checkpoints are formal decision points where substantive changes in direction will be considered. Assessments are formal evaluations of progress and results. Benchmarks are standards or criteria that will drive decisions depending on observed progress in implementation effort and effectiveness. Decisions identify refinements in efforts or new directions based on progress relative benchmarks observed at checkpoints.

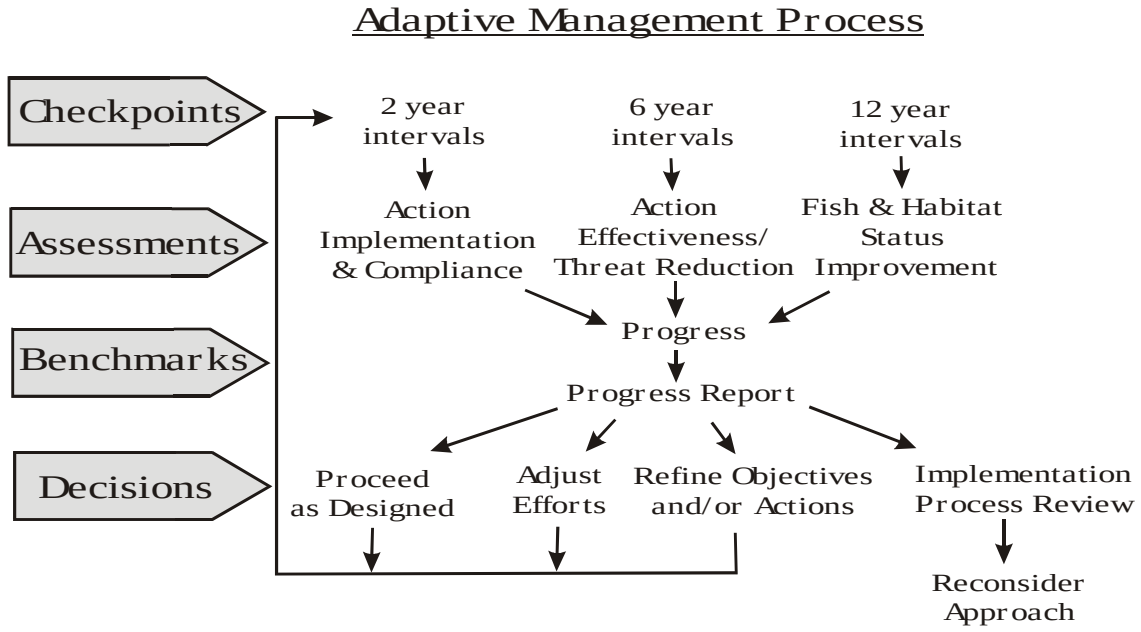

Figure 3. Elements and decision structure for adaptive management process for implementation of Washington lower Columbia River Fish Recovery Plan.

8.5.1 Checkpoints and Assessments

Checkpoints are prescribed at 2-year intervals for evaluation of progress in implementing plan actions, 6-year intervals for evaluation of effects of key actions, and 12-year intervals for evaluating biological and habitat status and response. Implementation progress will evaluated based 6-year implementation plans and the number of scheduled actions implemented and the degree of effort invested in implementation of each action. Action effectiveness will be evaluated based on whether specific habitat, hydropower, hatchery, harvest, and ecological measures and actions produce the desired reduction in threats relative to population productivity improvement targets. Biological status and response will be evaluated based on trends in fish numbers, population characteristics, and habitat conditions. More detail on implementation, action effectiveness, biological status, and habitat status monitoring activities may be found in Chapter 7 of this plan. Summary assessments will be completed at the prescribed intervals although these evaluations may require annual monitoring of key indicators to provide sufficient statistical power to separate trends from normal variability.

Assessments will take the form of written report cards prepared by the LCFRB/Steering Committee in cooperation with oversight and implementing partners (see section 8.3 for more detail on the institutional structure). Report cards at 2-year, 6-year, and 12-year intervals will focus on action implementation, action effectiveness, and fish/habitat status, respectively. When progress falls short of prescribed benchmarks, reports will document actions needed to adjust efforts or refine the approach. Technical and policy considerations and new information providing the basis for these adjustments will be described.

8.5.2 Benchmarks

Benchmarks for action implementation, action effectiveness, and biological and habitat status will provide tracking reference points by which progress toward recovery can be measured. Benchmarks for action implementation will be based on the tasks and schedules identified in the 6-year implementation plans. Since actions vary in the time needed to achieve their desired end result, benchmarks for action effectiveness will be the expected results of the action at the time of the review. Benchmarks for biological and habitat status reviews are based on an assumption of constant incremental annual progress toward achieving the recovery goals by the end of the 25-year planning period.

Implementation benchmarks will be based on the 6-year implementation schedules prepared by the implementing partners. The schedules will identify the tasks and milestones for implementing the actions identified in the plan. Action Implementation Reviews will be conducted every 2 years and will gauge the actual progress made against the milestones in the implementation schedules. Where benchmarks have not been achieved, the reasons will be evaluated and appropriate modifications or revisions to implementation plans will be made. Examples of the general types of questions that would be addressed during an Action Implementation Review are shown in Table 1. The LCFRB/Implementation Steering Committee working with the NOAA Fisheries TRT and the oversight and implementing partners will develop specific benchmarks.

Six-year Action Effectiveness Reviews will focus on determining if a specific action has achieved its objectives or desired outcomes. Since actions achieve their objectives or outcomes over varying timeframes, the review will evaluate whether an action as achieved the results expected during the period of review. Where actions have not achieved the expected results, the

reasons will be evaluated. Plan strategies, measures, and actions and implementation schedules will be revised as necessary to address progress shortfalls. Examples of the general types of questions to be examined during an Action Effectiveness Review are shown in Table 3.

Table 2. Example Action Implementation Review Questions

Action Category	Example Action Implementation Review Questions
Habitat	• Have planned habitat restoration projects been completed on schedule? • Have watershed and habitat protection programs such as stormwater controls, forest and park management plans and road maintenance programs been implemented on schedule? • Have regulatory programs such has land use controls, forest practice rules, and stream flow rules been implemented on schedule?
Hydro	• Have tasks related fish passage been completed on schedule? • Have flow measures been implemented on schedule?
Harvest	• Have harvest management programs needed to protect wild populations been implemented on schedule?
Hatcheries	• Have planned hatchery operational modifications needed to protect wild fish populations been implemented on schedule? • Have tasks associated with planned hatchery operation and facility modifications needed to support reintroduction, supplementation, and augmentation needs been implemented on schedule?
Ecological Interactions	• Have predator control programs been developed, funded, and implemented on schedule?
Monitoring & Research	• Have tasks related to regional biological and habitat monitoring and data management been completed on schedule? • Have planned studies or assessments needed to address critical uncertainties been implemented on schedule?

Table 3. Example Action Effectiveness Review Questions

Action Category	Example Action Effectiveness Review Questions
Habitat	• Have habitat restoration projects achieved the expected improvements in conditions? • Have watershed and habitat protection programs such as storm water controls, forest and park management plans and road maintenance programs achieved the expected reduction in habitat loss or damage? • Have regulatory programs such has land use controls, forest practice rules, and stream flow rules achieved the expected reduction in habitat loss or damage?
Hydro	• Have performance standards for fish passage been achieved? • Have actual flows been within target ranges?
Harvest	• Have harvest impacts been equal to or less than those planned?
Hatcheries	• Have hatchery impacts been reduced to target levels? • Have hatchery operations achieved goals for reintroduction, supplementation, or augmentation?
Ecological Interactions	• Have predator control programs achieved target impact reductions?
Monitoring & Research	• Are needed data being collected and managed according to procedures and protocols? • Have studies adequately addressed targeted critical uncertainties?

Twelve-year biological and habitat status reviews focus the response of wild fish populations and habitat to the actions implemented. Evaluation of biological status will be made on both the individual population and ESU levels based on the NOAA Fisheries TRT recovery criteria. Abundance, productivity, spatial distribution, and diversity will be evaluated to determine if progress is consistent with the planned trajectory for recovery. Improvements in watershed functions and habitat attributes will be examined on a watershed, subwatershed, and reach basis to determine if habitat protection and restoration measures have achieved targeted levels.

8.5.3 Decisions

Decisions at each checkpoint depend on observed progress relative to benchmarks. The following sections show the type of actions that would result from the outcomes of action implementation, action effectiveness, and fish and habitat status reviews.

Table 4. Actions in response to implementation assessment findings.

Review Findings	Action	Review Type
Action Implementation Review		
Progress meets or exceeds benchmarks	Proceed as planned	Policy
Progress falls below benchmarks	Revise Implementation plan or approach	Policy
Action Effectiveness Review		
Effectiveness meets or exceeds benchmarks	Proceed as planned	Technical
Effectiveness falls below benchmarks	Evaluate action and revise strategy, measure and/or action(s). Revise implementation plan.	Technical/Policy
Fish Response & Habitat Status Review		
Fish response and habitat status meet or exceed benchmarks	Proceed as planned.	Technical
Fish response meets or exceeds and habitat status falls below benchmarks.	Evaluate and, as necessary, revise habitat and hydro strategies, measures and actions. Proceed as planned for other harvest and hatcheries. Revise implementation plans.	Technical/Policy
Fish response and habitat status fall below benchmarks	Evaluate and, as necessary, revise strategies, measures and actions for all H's. Revise implementation plans.	Technical/Policy
Fish response falls below and habitat status falls meet or exceed benchmarks	Evaluate and, as necessary, revise hatchery and harvest strategies, measures, and actions. Revise implementation plans.	Technical/Policy

8.6 Public Education and Outreach

The recovery of the region's salmon and steelhead is inherently dependent on the collective actions of the people of the region. Recovery cannot be accomplished through legislation, rules, or money. These are only tools for recovery. It depends on the cumulative efforts of people working as individuals and collectively through and with organizations and governmental entities to achieve a common goal. In this case, the goal is the recovery of salmon and steelhead to healthy, harvestable levels. It must provide for the equitable sharing of burdens and benefits across affected interests. It will require a sustainable balance between the needs of fish and the values and needs of the people. It will require fundamental changes in how we view, care for and manage our fish, steams and watersheds. In short a successful recovery program must work for people and fish. It must be sound biologically and technically feasible. It must also be sensitive and responsive to regional and local cultural, social, and economic values.

In developing this recovery plan, efforts were made to meld biological and technical factors with social values and interests. The planning process was open to the public. Public participation was sought through workshops, meetings, working groups, and public review and comment periods. Copies of working papers and plan drafts were made available. Attempts were made to present technical information and analysis in a clear, understandable, and transparent manner. A careful record was maintained of all comments received and the disposition of each comment was logged and made available to the public.

While these public outreach efforts have helped assure a more balanced and equitable plan, successful implementation of the plan will require broader public awareness, understanding, support, and participation. The public will be an active partner in the implementation of the plan. This section set forth the approach for engaging the public as a partner in recovery efforts.

8.6.1 Goal

It is a goal of public education and outreach to engage the public as an active partner in implementing and sustaining recovery efforts. This goal will be achieved by building public awareness, understanding, and support; and by providing opportunities for participation in all aspects of recovery implementation. The term "public" in intended to be inclusive of individuals, community groups, environmental and conservation organizations, businesses, fishing interests and others with a stake or role in achieving recovery.

Awareness: The public will be made aware of the recovery efforts and informed of the opportunities to become involved.

Understanding: Members of the public will be provided the tools and information needed to effectively support and participate in recovery. Public education and outreach will help people understand why we are attempting to recover salmon and steelhead populations and what actions are required to do so. It will help the public understand the program's goals, objectives, strategies, measures, and actions and supporting the science and policy decisions. It will promote the understanding that recovery is shared responsibility, requiring coordinated and complementary participation at the federal, state, local, and citizen levels. It will assist the public in understanding their role and those of others. It will help members of the public understand how their collective efforts contribute to restoring salmon and steelhead populations to healthy, harvestable levels. Information needs will vary based on location and interests. For

many, a concise overview and summary of the recovery plan will likely suffice. However, some may wish examine the recovery program and its underlying technical basis in more detail. All will want to know how recovery will affect them.

Support and Participation: Support and participation will be achieved by providing the public with opportunities to become involved in recovery efforts. This includes helping to shape implementation efforts. Agencies and governments can do this by engaging the public in developing their implementation plans and actions. Doing so will engender public support and ownership of recovery actions, while also helping to ensure that these actions take into consideration public interests and concerns. Engaging the public in performing specific recovery actions such as habitat restoration projects and monitoring habitat conditions will also further participation and support. Schools and non-profit organizations can further the understanding of recovery concepts and participation in recovery actions through watershed and habitat studies and restoration efforts.

8.6.2 Principles

A) Public Education And Outreach Is A Shared Responsibility. All agencies, governments, and organizations involved in recovery efforts will actively engage in public education and outreach to achieve the needed levels of public awareness, understanding, support, and participation. These efforts will be coordinated to ensure consistency across the entire recovery region.

B) The Public Is A Key Partner In Recovery. Public education and outreach is an ongoing and integrated process that makes the public a key partner in all aspects of recovery, including designing measures and actions, implementing those measures and actions, reviewing the outcome, and, if necessary, adjusting course.

C) Public Education And Outreach Is A Continuing Process. Public education and outreach is not a short-term activity. While it is critical to the initial implementation of recovery strategies, measures and actions, public involvement is equally important to sustaining recovery efforts over the many years needed to achieve healthy harvestable salmon and steelhead populations.

D) Public Information Must Be Timely, Accurate, Relevant, And Consistent. Information is critical to effective public understanding and participation. The public must have access to needed information in time to apply or act on it. To be credible, it must be complete, accurate, and understandable. It must also be relevant to the issue or action being considered and responsive to the public interests involved. Finally, given the numerous parties engaged in the implementation of recovery actions, it must be consistent. Conflicting or inconsistent information will damage public confidence.

E) The Public Will Have Meaningful Opportunities To Participate. The public should be involved from the outset of planning and implementing recovery actions, not after decisions have been made. Public input on or involvement in implementation actions should be encouraged and actively solicited. The public should be advised of how its input shaped the decision made.

F) Public Contributions Should Be Recognized. Public contributions to recovery should be recognized and celebrated within their community and throughout the region. Doing so builds support and encourages broader participation.

8.6.3 Approach

As noted above, public education and outreach is a responsibility shared by all implementing partners. Each implementing partner will have an effective public education and outreach effort tailored to its recovery responsibilities and the needs of its constituency. Each implementing partner will also be able represent the regional recovery effort accurately and consistently and to put its actions in the broader context of the regional effort. While the purpose of these programs is to build awareness, understanding, support and participation, multiple public education and outreach efforts also have the potential to overwhelm and confuse the public and to be needlessly repetitive and wasteful.

The implementation approach relies largely on the individual implementing partners. It also identifies measures and actions to coordinate and integrate these individual efforts into an effective regional public education and outreach effort that will help ensure consistency, avoid redundancy, and leverage efforts and resources.

A regional education and outreach program will be established to support, assist and coordinate the efforts by individual implementing partners. The LCFRB and the Implementation Steering Committee in consultation with the implementing partners will develop the regional program. The program will be incorporated in the 6-year regional implementation plan discussed in section 8.5 of this plan. The program will be consistent with the principles discussed above and will:

- Develop and distribute informational and educational materials explaining the reasons for the recovery effort and the recovery plan's goals, strategies, measures, actions, and priorities.
- Coordinate and facilitate communications and information sharing among agencies, governments, and organizations and with the public. This will include a regional communications network, information clearinghouse, and identification of informational contacts for implementing partners.
- Identify opportunities for and assist implementing partners in integrating or consolidating similar, duplicative, or complementary education and outreach efforts.
- Provide the public with information on implementation actions throughout the region, including notice of opportunities to participate and information sources.
- Provide the public with information on the progress, status, and achievements of recovery actions throughout the region.
- Encourage and assist schools and educational organizations such as conservation districts and WSU cooperative extension to integrate salmon recovery into their environmental, agricultural, watershed, water quality curriculum, and classes. Also support agency, local government, and utility educational programs promoting actions by individuals to protect and conserve water resources.
- Coordinate briefings and presentations to civic, business, trade, environmental, conservation, and fishing organizations on the regional recovery program, actions and progress.
- Establish regional measures to acknowledge and celebrate the contributions of organizations, businesses, and individuals.
- Publicize incentive programs for the protection and restoration of water resources and habitat and encourage landowner participation.

- Encourage business and professional organizations to adopt and promote implementation of best management practices for the protection and restoration of fish and habitat.
- Encourage and assist local or community organizations interested or involved in watershed and habitat protection and restoration.

In concert with the development of the regional recovery public education and outreach plan, the implementing partners will be requested to prepare an education and outreach plan for their implement ting activities. These plans would be an element of the 6-year implementation plan to be prepared by each partner. While public entities are already required by law or rule to have some form of public education and outreach, these plans would help to ensure efforts by the implementing partners are consistent with the principles and regional program discussed above and coordinated with the efforts of other implementing partners.

8.7 Evaluating Plan Sufficiency

Evaluation of the sufficiency of this plan is based on: 1) substantive strategies, measures, an actions that address all current threats to the viability and harvestability of Washington lower Columbia salmon and steelhead populations, 2) incorporation of effective monitoring, evaluation, and adaptive management measures and actions as well as an institutional framework for plan implementation, and 3) assessments confirming that reductions in threats are of an order of magnitude consistent with recovery.

Threats to viability and harvestability include all categories of human activities that impact fish numbers, adaptive population characteristics, and habitats. This plan has treated threats grouped by category including stream habitat, estuary and mainstem habitat, hydropower, harvest, hatcheries, and ecological interactions. These threats are cataloged at length and related to fish limiting factors in Chapter 3 of this plan. Impacts of key factors in each threat category were quantified based on the best available information and in Chapter 5 were related to improvement increments needed to achieve biological objectives. These impacts estimates also provide baseline values for modeled assessments of threats. Detailed strategies, measures, and actions that address each category of threat are described in Chapter 6. Actions for addressing threats are further detailed in subbasin volumes I.A-II.L. All recovery measures are cross-referenced with the threats they address.

Monitoring, evaluation, and adaptive management components of the plan consider whether actions were implemented as designed, actions produce the expected immediate effect, and the net effects of multiple actions produce the desired improvement in fish populations. The recovery actions detailed for each threat provide a checklist for evaluating the scope of plan implementation. Quantitative estimates of the impacts of key threat factors and expected responses projected from fish life cycle and habitat models provide testable hypotheses for the monitoring, evaluation, and adaptive management effort. Monitoring, research, and evaluations measures are described in Chapter 7 and the adaptive management framework for implementation is detailed in Chapter 8.

The immediate test of plan sufficiency is whether current working hypotheses, strategies, measures, and actions provide a plausible scientific basis for reversing decline fish trends and providing a significant trajectory toward recovery. The complex dynamics of biological systems introduce large uncertainty into fine-scale, long-term predictions of response to recovery actions. Existing data, models, and theories are not adequate to categorically prove that a given set of actions will guarantee recovery. No amount of additional research, modeling, and theorizing is

likely to provide an iron-clad projection. Existing information and tools are adequate to evaluate whether proposed actions are of an order of magnitude to significantly reduce threats to the a level where a response in fish populations can feasibly be measured and a trajectory for recovery can be detected.

These assessments will be completed as part of the plan development and implementation process. Assessments will determine whether prescribed actions are sufficient to reverse declining trends in fish numbers and provide a significant trajectory to recovery. Expected responses to recovery actions will be based on: 1) composite effects of target reductions in human impacts in each threat category on fish population trends and extinction risks, and 2) net effects of habitat improvements in subbasins on fish productivity and capacity. Probability life cycle modeling of composite effects will determine whether the combined reduction in impacts in all threat categories can reasonably be expected provide the desired trajectory toward recovery objectives. Habitat modeling will determine whether projected improvements in habitat conditions associated with recovery actions are of the scale necessary to make substantive contributions to the overall recovery effort.

8.8 Measures

Coordination

P.M1. Establish an oversight group for plan implementation (NOAA, USFWS, WDFW, NPCC) and an implementation facilitation and coordination function to be carried out by the LCFRB, LCFRB staff, and a plan implementation steering committee (Section 8.3).

P.M2. Regularly review and revise this plan in a collaborative agency, stakeholder, and public process. Responsible Party: LCFRB/Steering Committee (Sections 8.4.3 and 8.5)

P.M3. Refine draft benchmarks for assessing implementation progress, implementation effectiveness and biological and habitat status. Responsible Party: LCFRB/Steering Committee (Section 8.5)

P.M4. Develop and implement cost and economic analysis methods to assist in decision-making and meet ESA needs. Responsible Parties: LCFRB/Steering Committee and NOAA Fisheries.

P.M5. Develop ESA threats criteria and prioritization for incorporation into the Lower Columbia and domain recovery plans. Relate actions, strategies, and measures to threats. Responsible Parties: LCFRB/Steering Committee and NOAA Fisheries

P.M6. Conduct qualitative evaluation of program sufficiency. Responsible Party: LCFRB/Steering Committee (Sections 8.5 and 8.7)

Explanation: This measure will involve close coordination of work by NOAA Fisheries' science center and the LCFRB staff to develop a systematic approach to modeling effects of actions on fish habitat and watershed processes and use this approach to evaluate alternative restoration scenarios.

P.M7. Coordinate the development of a regional monitoring, research, and evaluation program. Responsible Parties: LCFRB/Steering Committee (Section 8.4.4)

P.M8. Coordinate the development of a regional public education and outreach program. Responsible Parties: LCFRB/Steering Committee. (Section 8.6)

Implementation

P.M9. Develop and periodically update 6-year implementation schedules. Responsible Parties: LCFRB/Steering Committee and implementing partners. (Section 8.4.1)

P.M10. Evaluate whether recovery strategies, measures, and actions are being implemented as planned. Responsible Party: LCFRB/Steering Committee (Section 8.5)

Explanation: This recovery plan describes an ambitious series of strategies, measures, and actions based on the gap between where we are now and where we want to go. The plan will fail at its most fundamental level if these strategies, measures, and actions are not implemented.

P.M11. Refine and reprioritize plan implementation at the programmatic level based on evaluations of implementation and compliance. Responsible Party: LCFRB/Steering Committee (Section 8.5)

Explanation: Plan implementation at the program and project level will be a dynamic process requiring continual adaptation by implementing parties. Plan implementation will also be formally evaluated at intervals as prescribed in the implementation chapter.

P.M12. Prepare written plan implementation progress reports to participating agencies, stakeholders, and the public at 2-year intervals. Responsible Party: LCFRB/Steering Committee (Section 8.5)

Explanation: These include descriptions of refinements based on findings.

Action Effectiveness

P.M13. Evaluate whether specific strategies, measures, and actions are producing the desired effects in each limiting factor/threat category (stream habitat, mainstem/estuary habitat, hydropower, harvest, hatcheries, ecological interactions). Responsible Party: LCFRB/Steering Committee (Section 8.5)

Explanation: Factor-specific responses are based on action effectiveness monitoring. A series of monitoring activities have been identified specific to each limiting factor/threat category to occur at different scales and periods. Evaluations will be ongoing and also incorporated into regular plan-wide reviews.

P.M14. Refine and reprioritize existing recovery strategies, measures, and actions for each limiting factor/threat category based on results of action-effectiveness evaluations. Responsible Party: LCFRB/Steering Committee (Section 8.5)

Explanation: Adjustments in the implementation of related measures can be made as new information is gained on the effects of specific measures and actions. Large-scale adjustments and compensation among measures across limiting factor/threat categories will be considered.

P.M15. Prepare written action effectiveness progress reports to participating agencies, stakeholders, and the public at 6-year intervals. Responsible Party: LCFRB/Steering Committee (Section 8.5)

Explanation: These include descriptions of refinements based on findings.

Fish and Habitat Response

P.M16. Periodically evaluate biological status relative to population and ESU objectives to determine whether necessary improvements are being achieved. Responsible Party: LCFRB/Steering Committee (Section 8.5)

Explanation: The success of the recovery plan will ultimately be determined based on observed response in fish populations across the ESU as well as trends in other fish and wildlife species of interest. Trends will be evaluated on an annual basis with more comprehensive assessments prescribed at 12-year intervals. Evaluations will also consider and correct for confounding effects of regional climate patterns.

P.M17. Periodically evaluate habitat status relative to baseline conditions and benchmarks to determine whether appropriate progress is being made toward desired future conditions. Responsible Party: LCFRB/Steering Committee (Section 8.5)

Explanation: Desired conditions are based on specific objectives identified in subbasin sections of Volume II. The baseline corresponds to conditions at the time of listing and is intended only as a reference point for measuring significant trends. Desired conditions may be similar to the baseline in areas targeted for preservation. Desired conditions will be more suitable for objective species in areas targeted for recovery. Trends will be evaluated on an annual basis with more comprehensive assessments prescribed at 12-year intervals. Evaluations will also consider and correct for confounding effects of regional climate patterns.

P.M18. Refine and reprioritize existing recovery strategies, measures, and actions for each limiting factor/threat category based on results of biological and habitat status evaluations. Responsible Party: LCFRB/Steering Committee (Section 8.5)

Explanation: Adjustments in the implementation of related measures can be made as new information is gained on the observed response. Large-scale adjustments and compensation among measures across limiting factor/threat categories may be considered.

P.M19. Prepare written fish and habitat status reports to participating agencies, stakeholders, and the public at 12-year intervals. Responsible Party: LCFRB/Steering Committee (Section 8.5)

Explanation: The interval coincides with the action effectiveness and implementation reporting requirements. Reports will include descriptions of refinements based on findings.

Adaptive Management

P.M20. Use results of critical uncertainty research to identify new or refine and reprioritize existing recovery strategies, measures, and actions. Responsible Party: LCFRB/Steering Committee (Sections 8.4.4 and 8.5)

Explanation: Adjustments in the implementation of related measures can be made as critical uncertainty research provides new insights. Large-scale adjustments and compensation among measures across limiting factor/threat categories will be considered at intervals as prescribed in the Implementation Chapter.

P.M21. Refine analytical tools and methods to better support adaptive management process. Responsible Parties: LCFRB/Steering Committee, W/LC TRT, NOAA Fisheries (Section 8.5)

Explanation: Evaluations of limiting factors and threats as well as recovery objectives are based on a series of analyses and models. All of these evaluations will be subject to refinements and testing. Considerations related to uncertainties in the various models will be incorporated into the monitoring, evaluation, and adaptive management framework for this plan.

P.M22. Refine biological objectives consistent with recovery as new information becomes available on status and viable population or ESU characteristics. Responsible Party: LCFRB/Steering Committee (Sections 8.4.3 and 8.5)

Explanation: The biological objectives identified in this plan are working hypotheses based on incomplete data and a series of assumptions regarding what constitutes a viable population or ESU. These assumptions were identified as subjects for further evaluation and it is anticipated that substantial advances in understanding will occur as a result of efforts in the lower Columbia recovery domain as well as in other domains across the Pacific Northwest. These advances will inevitably lead to refinements in recovery criteria which will need to be incorporated into the biological objectives of this plan.

P.M23. Periodically evaluate strengths and weaknesses of the available monitoring and research to determine adequacy for assessing progress and identifying appropriate course corrections. Responsible Party: LCFRB/Steering Committee (Section 8.5)

Explanation: The monitoring, research, and evaluations program itself will be subject to regular review and refinement, for instance, in response to available resources for implementation.

P.M24. Identify appropriate alternative approaches and revise priorities for monitoring and research based on results of evaluations. Responsible Party: LCFRB/Steering Committee (Sections 8.4.4 and 8.5)

Explanation: Adjustments in the implementation of related measures can be made as new information is available. Large-scale revisions will be considered at intervals as prescribed in the Implementation Chapter.

8.9 Implementation Actions

The following table organizes by entity the actions for which that entity would be involved in implementation. Because multiple entities are involved in the implementation of certain actions, some actions appear under more than one entity. In some cases, no single entity has full authority to implement an action, and successful implementation will depend on the coordination and cooperation of a number of agencies. In other cases, while one entity may have lead authority and implementation responsibility, effective implementation will depend on the involvement, support, and agreement of a number of agencies. In the process of developing implementation plans, as discussed earlier in this chapter, lead entities will be identified where appropriate for each action.

Entity	Type/Threat	Action	Columbia Mainstem	Estuary Tributaries	Grays/Chinook	Elochoman-Skamakowa	Mill-Germany-Abnthy	Lower Cowlitz	Upper Cowlitz	Toutle	Coweeman	Kalama	Lower NF Lewis	Upper NF Lewis	EF Lewis	Salmon	Washougal	Bonneville Tributaries	Wind	L White Salmon	Upper Gorge
Battleground	Habitat	Expand standards in local land use plans and controls to afford adequate protections of ecologically important areas (i.e. stream channels, riparian zones, floodplains, CMZs, wetlands, unstable geology)													X	X					
Battleground	Habitat	Increase technical assistance to landowners and increase landowner participation in conservation programs that protect and restore habitat and habitat-forming processes. Includes increasing the incentives (financial or otherwise) and enhancing program marketing and outreach													X	X					
Battleground	Habitat	Manage existing and future water supplies consistent with WRIA 27/28 Watershed Management Plan recommendations													X	X					
Battleground	Habitat	Manage future growth and development patterns to ensure the protection of watershed processes. This includes reducing effective impervious surfaces within urban growth boundaries													X	X					
Battleground	Habitat	Prevent floodplain impacts from new development through land use controls and Best Management Practices													X	X					
Battleground	Habitat	Review and adjust operations to ensure compliance with the Endangered Species Act; examples include roads, parks, and weed management													X	X					
BPA	All	Participate in the development and implementation of a coordinated regional monitoring program for action implementation, action effectiveness, and biological and habitat status							X												

Entity	Type/Threat	Action	Columbia Mainstem	Estuary Tributaries	Grays/Chinook	Elochoman-Skamakowa	Mill-Germany-Abnthy	Lower Cowlitz	Upper Cowlitz	Toutle	Coweeman	Kalama	Lower NF Lewis	Upper NF Lewis	EF Lewis	Salmon	Washougal	Bonneville Tributaries	Wind	L White Salmon	Upper Gorge
BPA	Habitat	Initiate habitat restoration and protection projects to mitigate impacts hydroelectric facilities operations							X												
BPA	Habitat	Restore access through the hydropower system for anadromous and resident fish, unless proven to be infeasible or biologically unnecessary							X												
BPA	Hydro	Evaluate and adaptively implement anadromous fish reintroduction upstream of Cowlitz dam and facilities as part of relicensing processes or requirements							X												
BPA/NPCC	All	Participate in the development and implementation of a coordinated regional monitoring program for action implementation, action effectiveness, and biological and habitat status	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
BPA/NPCC	Habitat	Increase funding levels for habitat restoration, preservation, and research projects to help achieve recovery goals	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Camas	Habitat	Develop and implement stormwater management practices needed to protect stream flows and water quality															X				
Camas	Habitat	Expand standards in local land use plans and controls to afford adequate protections of ecologically important areas (i.e. stream channels, riparian zones, floodplains, CMZs, wetlands, unstable geology)															X				
Camas	Habitat	Increase technical assistance to landowners and increase landowner participation in conservation programs that protect and restore habitat and habitat-forming processes. Includes increasing the incentives (financial or															X				

Entity	Type/Threat	Action	Columbia Mainstem	Estuary Tributaries	Grays/Chinook	Elochoman-Skamakowa	Mill-Germany-Abnthy	Lower Cowlitz	Upper Cowlitz	Toutle	Coweeman	Kalama	Lower NF Lewis	Upper NF Lewis	EF Lewis	Salmon	Washougal	Bonneville Tributaries	Wind	L White Salmon	Upper Gorge
		otherwise) and enhancing program marketing and outreach																			
Camas	Habitat	Manage existing and future water supplies consistent with WRIA 27/28 Watershed Management Plan recommendations; Initiate the development and implementation of a regional water source in the Stiegerwald Refuge vicinity															X				
Camas	Habitat	Manage future growth and development patterns to ensure the protection of watershed processes. This includes reducing effective impervious surfaces within urban growth boundaries															X				
Camas	Habitat	Prevent floodplain impacts from new development through land use controls and Best Management Practices															X				
Camas	Habitat	Review and adjust operations to ensure compliance with the Endangered Species Act; examples include roads, parks, and weed management															X				
Castle Rock	Habitat	Expand standards in local land use plans and controls to afford adequate protections of ecologically important areas (i.e. stream channels, riparian zones, floodplains, CMZs, wetlands, unstable geology)						X													
Castle Rock	Habitat	Increase technical assistance to landowners and increase landowner participation in conservation programs that protect and restore habitat and habitat-forming processes. Includes increasing the incentives (financial or otherwise) and enhancing program marketing and outreach						X													

Entity	Type/Threat	Action	Columbia Mainstem	Estuary Tributaries	Grays/Chinook	Elochoman-Skamakowa	Mill-Germany-Abnthy	Lower Cowlitz	Upper Cowlitz	Toutle	Coweeman	Kalama	Lower NF Lewis	Upper NF Lewis	EF Lewis	Salmon	Washougal	Bonneville Tributaries	Wind	L White Salmon	Upper Gorge
Castle Rock	Habitat	Manage existing and future water supplies consistent with WRIA 25/26 Watershed Management Plan recommendations						X													
Castle Rock	Habitat	Manage future growth and development patterns to ensure the protection of watershed processes. This includes reducing effective impervious surfaces within city growth areas						X													
Castle Rock	Habitat	Review and adjust operations to ensure compliance with the Endangered Species Act; examples include roads, parks, and weed management						X													
Cathlamet	Habitat	Expand standards in local land use plans and controls to afford adequate protections of ecologically important areas (i.e. stream channels, riparian zones, floodplains, CMZs, wetlands, unstable geology)				X															
Cathlamet	Habitat	Increase technical assistance to landowners and increase landowner participation in conservation programs that protect and restore habitat and habitat-forming processes. Includes increasing the incentives (financial or otherwise) and enhancing program marketing and outreach				X															
Cathlamet	Habitat	Manage existing and future water supplies consistent with WRIA 25/26 Watershed Management Plan recommendations				X															
Cathlamet	Habitat	Manage future growth and development patterns to ensure the protection of watershed processes. This includes reducing effective impervious surfaces				X															

Entity	Type/Threat	Action	Columbia Mainstem	Estuary Tributaries	Grays/Chinook	Elochoman-Skamakowa	Mill-Germany-Abnthy	Lower Cowlitz	Upper Cowlitz	Toutle	Coweeman	Kalama	Lower NF Lewis	Upper NF Lewis	EF Lewis	Salmon	Washougal	Bonneville Tributaries	Wind	L White Salmon	Upper Gorge
Cathlamet	Habitat	Prevent floodplain impacts from new development through land use controls and Best Management Practices				X															
Cathlamet	Habitat	Review and adjust operations to ensure compliance with the Endangered Species Act; examples include roads, parks, and weed management				X															
Chinook	Habitat	Expand standards in local land use plans and controls to afford adequate protections of ecologically important areas (i.e. stream channels, riparian zones, floodplains, CMZs, wetlands, unstable geology)	X		X																
Chinook	Habitat	Increase technical assistance to landowners and increase landowner participation in conservation programs that protect and restore habitat and habitat-forming processes. Includes increasing the incentives (financial or otherwise) and enhancing program marketing and outreach	X		X																
Chinook	Habitat	Prevent floodplain impacts from new development through land use controls and Best Management Practices	X		X																
Chinook	Habitat	Review and adjust operations to ensure compliance with the Endangered Species Act; examples include roads, parks, and weed management	X		X																
Clark CD	All	Participate in the development and implementation of a coordinated regional monitoring program for action implementation, action effectiveness, and biological and habitat status											X	X	X	X	X				
Clark CD	Habitat	Assess the impact of fish passage barriers throughout the county and											X	X	X	X	X				

Entity	Type/Threat	Action	Columbia Mainstem	Estuary Tributaries	Grays/Chinook	Elochoman-Skamakowa	Mill-Germany-Abnthy	Lower Cowlitz	Upper Cowlitz	Toutle	Coweeman	Kalama	Lower NF Lewis	Upper NF Lewis	EF Lewis	Salmon	Washougal	Bonneville Tributaries	Wind	L White Salmon	Upper Gorge
		restore access to potentially productive habitats																			
Clark CD	Habitat	Create and/or restore lost side-channel/off-channel habitat for salmonids											X	X	X	X	X				
Clark CD	Habitat	Increase technical assistance to landowners and increase landowner participation in conservation programs that protect and restore habitat and habitat-forming processes. Includes increasing the incentives (financial or otherwise) and increasing program marketing and outreach											X	X	X	X	X				
Clark CD	Habitat	Increase the level of implementation of habitat enhancement projects in high priority reaches and subwatersheds. This includes building partnerships, providing incentives to landowners, and increasing funding											X	X	X	X	X				
Clark CD	Habitat	Participate in floodplain restoration projects where feasible along the mainstem and in major tributaries that have experienced channel confinement. Build partnerships with landowners and agencies and provide financial incentives											X	X	X	X	X				
Clark CD	Habitat	Protect and restore native plant communities from the effects of invasive species											X	X	X	X	X				
Clark Co	All	Participate in the development and implementation of a coordinated regional monitoring program for action implementation, action effectiveness, and biological and habitat status.	X										X	X	X	X	X	X			
Clark Co	Habitat	Assess and require upgrade or replacement of on-site sewage systems	X										X	X	X	X	X	X			

Entity	Type/Threat	Action	Columbia Mainstem	Estuary Tributaries	Grays/Chinook	Elochoman-Skamakowa	Mill-Germany-Abnthy	Lower Cowlitz	Upper Cowlitz	Toutle	Coweeman	Kalama	Lower NF Lewis	Upper NF Lewis	EF Lewis	Salmon	Washougal	Bonneville Tributaries	Wind	L White Salmon	Upper Gorge
		that may be contributing to water quality impairment																			
Clark Co	Habitat	Assess the impact of fish passage barriers throughout the County's jurisdiction and restore access to potentially productive habitats	X										X	X	X	X	X	X			
Clark Co	Habitat	Expand standards in local land use plans and controls to afford adequate protections of ecologically important areas (i.e. stream channels, riparian zones, floodplains, CMZs, wetlands, unstable geology)	X										X	X	X	X	X	X			
Clark Co	Habitat	Increase technical assistance to landowners and increase landowner participation in conservation programs that protect and restore habitat and habitat-forming processes. Includes increasing the incentives (financial or otherwise) and enhancing program marketing and outreach	X										X	X	X	X	X	X			
Clark Co	Habitat	Limit intensive recreational use of priority stream reaches during critical fish use periods											X	X	X	X	X	X			
Clark Co	Habitat	Manage future growth and development patterns to ensure the protection of watershed processes. This includes reducing effective impervious surfaces and limiting the conversion of resource lands to developed uses through land use controls and incentives											X	X	X	X	X	X			
Clark Co	Habitat	Prevent floodplain impacts from new development through land use controls and Best Management Practices	X										X	X	X	X	X	X			
Clark Co	Habitat	Review and adjust operations to ensure compliance with the Endangered Species Act; examples include roads,											X	X	X	X	X	X			

Entity	Type/Threat	Action	Columbia Mainstem	Estuary Tributaries	Grays/Chinook	Elochoman-Skamakowa	Mill-Germany-Abnthy	Lower Cowlitz	Upper Cowlitz	Toutle	Coweeman	Kalama	Lower NF Lewis	Upper NF Lewis	EF Lewis	Salmon	Washougal	Bonneville Tributaries	Wind	L White Salmon	Upper Gorge
		parks, and weed management																			
Clark PU	Habitat	Manage existing and future water supplies consistent with WRIA 27/28 Watershed Management Plan recommendations; Initiate the development and implementation of a regional water source for Clark County, including Ridgefield and Battleground													X	X	X				
Conservation Commission	Habitat	Assist in the development and promote the implementation of Best Agricultural Practices for the protection and restoration of watershed functions, riparian conditions, habitat and water quality	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
County Noxious Weed Control Boards	Habitat	Increase education, enforcement, and if necessary, control activities related to tributary noxious instream and riparian plant species	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Cowlitz Co	Estuary	Protect and restore riparian condition and function	X																		
Cowlitz Co	Estuary	Restore connectedness between river and floodplain	X																		
Cowlitz Co	Estuary	Restore tidal swamp and marsh habitat in the estuary and tidal freshwater portion of the lower Columbia River	X																		
Cowlitz Co	Habitat	Assess and require upgrade or replacement of on-site sewage systems that may be contributing to water quality impairment	X				X	X		X	X	X	X	X							
Cowlitz Co	Habitat	Assess the impact of fish passage barriers throughout County and restore access to potentially productive habitats	X				X	X		X	X	X	X	X							
Cowlitz Co	Habitat	Conduct floodplain restoration where feasible along the mainstem and in	X				X	X		X	X	X	X	X							

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		major tributaries that have experienced channel confinement. Build partnerships with landowners and agencies and provide financial incentives																			
Cowlitz Co	Habitat	Expand standards in local land use plans and controls to afford adequate protections of ecologically important areas (i.e. stream channels, riparian zones, floodplains, CMZs, wetlands, unstable geology)	X				X	X		X	X	X	X	X							
Cowlitz Co	Habitat	Increase technical assistance to landowners and increase landowner participation in conservation programs that protect and restore habitat and habitat-forming processes. Includes increasing the incentives (financial or otherwise) and enhancing program marketing and outreach	X				X	X		X	X	X	X	X							
Cowlitz Co	Habitat	Limit intensive recreational use of priority stream reaches during critical fish use periods					X	X		X	X	X	X	X							
Cowlitz Co	Habitat	Manage future growth and development patterns to ensure the protection of watershed processes. This includes reducing effective impervious surfaces and limiting the conversion of resource lands to developed uses through land use controls and incentives	X				X	X		X	X	X	X	X							
Cowlitz Co	Habitat	Prevent floodplain impacts from new development through land use controls and Best Management Practices	X				X	X		X	X	X	X	X							
Cowlitz Co	Habitat	Review and adjust operations to ensure compliance with the Endangered Species Act; examples include roads, parks, and weed management	X				X	X	X	X	X	X	X	X							

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Cowlitz PUD	All	Participate in the development and implementation of a coordinated regional monitoring program for action implementation, action effectiveness, and biological and habitat status											X	X							
Cowlitz PUD	Habitat	Initiate habitat restoration and protection projects to mitigate impacts of hydroelectric facilities												X							
Cowlitz PUD	Habitat	Restore volitional access through the hydropower system for anadromous fish; restore habitat											X	X							
Cowlitz PUD	Hatchery	Reintroduce coho in upper Lewis rivers												X							
Cowlitz PUD	Hatchery	Reintroduce spring Chinook in the Lewis beginning with hatchery supplementation												X							
Cowlitz PUD	Hatchery	Reintroduce winter steelhead in Lewis rivers												X							
Cowlitz PUD	Hydro	Evaluate and adaptively implement anadromous fish reintroduction upstream Lewis River dams as part of relicensing processes or requirements												X							
Cowlitz Tribe	Habitat	Conduct floodplain restoration where feasible along the mainstem and in major tributaries that have experienced channel confinement. Build partnerships with landowners and agencies and provide financial incentives						X	X			X	X	X							
Cowlitz Tribe	Habitat	Increase technical assistance to landowners and increase landowner participation in conservation programs that protect and restore habitat and habitat-forming processes. Includes increasing the incentives (financial or otherwise) and enhancing program marketing and outreach						X	X			X	X	X							

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Cowlitz Tribe	Habitat	Increase the level of implementation of habitat enhancement projects in high priority reaches and subwatersheds. This includes building partnerships, providing incentives to landowners, and increasing funding						X	X			X	X	X							
Cowlitz/ Wahkiakum CD	All	Participate in the development and implementation of a coordinated regional monitoring program for action implementation, action effectiveness, and biological and habitat status			X	X	X	X		X	X	X	X								
Cowlitz/ Wahkiakum CD	Estuary	Protect and restore riparian condition and function	X																		
Cowlitz/ Wahkiakum CD	Habitat	Conduct floodplain restoration where feasible along the mainstem and in major tributaries that have experienced channel confinement. Build partnerships with landowners and agencies and provide financial incentives		X	X	X	X	X		X	X	X	X	X							
Cowlitz/ Wahkiakum CD	Habitat	Create and/or restore lost side-channel/off-channel habitat for salmonids		X	X	X	X	X		X	X	X	X	X							
Cowlitz/ Wahkiakum CD	Habitat	Increase technical assistance to landowners and increase landowner participation in conservation programs that protect and restore habitat and habitat-forming processes. Includes increasing the incentives (financial or otherwise) and enhancing program marketing and outreach		X	X	X	X	X		X	X	X	X	X							
Cowlitz/ Wahkiakum CD	Habitat	Increase the level of implementation of habitat enhancement projects in high priority reaches and subwatersheds. This includes building partnerships, providing incentives to landowners, and		X	X	X	X	X		X	X	X	X	X							

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		increasing funding																			
Cowlitz/ Wahkiakum CD	Habitat	Protect and restore native plant communities from the effects of invasive species		X	X	X	X	X		X	X	X	X	X							
CREST	Estuary	Limit the effects of toxic contaminants on salmonid and wildlife fitness and survival in the Columbia River estuary, lower mainstem, and near shore ocean	X																		
EPA	Estuary	Limit the effects of toxic contaminants on salmonid and wildlife fitness and survival in the Columbia River estuary, lower mainstem, and near shore ocean	X																		
FERC	Habitat	Ensure stream flows in hydro-regulated streams are managed to provide maximum fish habitat use						X					X								
FERC	Habitat	Ensure the terms of relicensing are met over the licensing period						X	X				X	X							
FERC	Habitat	Ensure volitional passage for salmonids and Bull Trout is attained through hydrorelicensing unless shown to be infeasible or biologically unnecessary						X	X				X	X							
FERC	Hydro	Evaluate and adaptively implement anadromous fish reintroduction upstream of Cowlitz and Lewis dams and facilities as part of relicensing processes or requirements							X					X							
Implementing Partners	Monitoring	Closely coordinate Washington lower Columbia River monitoring, research, and evaluation efforts with similar efforts throughout the basin, including prioritization of activities and standardization of data methods.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Implementing Partners	Monitoring	Concentrate a portion of habitat status and action effectiveness monitoring in	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

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		one or more intensively monitored watersheds to optimize opportunities for evaluating linkages between habitat and fish (e.g., Mill/Abernathy/Germany, Kalama, East Fork Lewis, Wind). Consider subbasins containing multiple high priority populations and other ongoing studies such as the SRFB-sponsored Intensively Monitored Watershed project in the Mill, Abernathy, Germany basins..																			
Implementing Partners	Monitoring	Conduct a data management needs assessment and use to develop a data management plan.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Implementing Partners	Monitoring	Conduct comprehensive survey of stream habitat conditions across the Washington lower Columbia Region.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Implementing Partners	Monitoring	Conduct comprehensive survey of water quality and quantity across the Washington lower Columbia Region.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Implementing Partners	Monitoring	Conduct comprehensive survey of watershed conditions and processes across the Washington lower Columbia Region - completed.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Implementing Partners	Monitoring	Conduct periodic censuses of the abundance and distribution of nesting Caspian terns.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Implementing Partners	Monitoring	Conduct periodic censuses of the abundance, distribution, and diet of marine mammals throughout the lower Columbia River mainstem and particularly near Bonneville Dam.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Implementing Partners	Monitoring	Continue to monitor abundance of American shad based on Bonneville Dam counts.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

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Implementing Partners	Monitoring	Maintain a coordinated database of federal, tribal, state, local, and non-governmental programs and projects implemented throughout the recovery region.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Implementing Partners	Monitoring	Maintain consistent regionally-standardized datasets and archive in regional data storage and management facilities (e.g., Pacific State Marine Fisheries Commission StreamNet, Washington Department of Fish and Wildlife SSHIAP, NOAA Fisheries biological datasets).	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Implementing Partners	Monitoring	Monitor adult and juvenile collection, passage, and survival rates at Bonneville Dam.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Implementing Partners	Monitoring	Monitor adult and juvenile collection, passage, and survival rates at Cowlitz, Lewis and Toutle Dams.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Implementing Partners	Monitoring	Monitor and evaluate the establishment of escapement rates through harvest management actions in relation to the nutrient and other ecological value of returning salmon	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Implementing Partners	Monitoring	Monitor annual angler participation, harvest, and exploitation rate in northern pikeminnow management program in Columbia River mainstem.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Implementing Partners	Monitoring	Monitor annual harvest and harvest rates of representative index stocks in in-basin, Columbia River mainstem, and ocean fisheries.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Implementing Partners	Monitoring	Monitor catch and release mortality of wild salmon and steelhead in selective fisheries.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

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Implementing Partners	Monitoring	Monitor distribution/spatial structure of representative populations of Chinook, chum, coho, steelhead and bull trout in each recovery strata.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Implementing Partners	Monitoring	Monitor effects of fish culture practices within the hatchery.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Implementing Partners	Monitoring	Monitor effects of small scale and large scale activities (e.g., channel deepening) that affect habitat.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Implementing Partners	Monitoring	Monitor effects of watershed and stream habitat protection and restoration actions on stream habitat conditions.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Implementing Partners	Monitoring	Monitor in-basin and out-of-basin stray rates of hatchery fish in wild spawning areas relative to hatchery practices.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Implementing Partners	Monitoring	Monitor numbers and performance of hatchery fish returning to hatcheries.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Implementing Partners	Monitoring	Monitor occurrences of new exotic aquatic fishes, invertebrates or plants based on incidental observations during other biological status monitoring, anecdotal reports, and follow-up sampling where appropriate.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Implementing Partners	Monitoring	Monitor relative distribution, abundance, and condition of fish in relation to specific habitat improvements.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Implementing Partners	Monitoring	Monitor the downstream channels of Mayfield, SRS and Merwin Dams for changes in substrate and flow	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Implementing Partners	Monitoring	Monitor the relative abundance, distribution and dewatering of chum and fall Chinook redds in the Bonneville Dam tailrace.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

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Implementing Partners	Monitoring	Monitor trends and variation in annual adult spawning abundance and distribution of representative populations of Chinook, chum, coho, and steelhead in all watersheds.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Implementing Partners	Monitoring	Monitor trends and variation in annual juvenile production of representative populations of Chinook, chum, coho, steelhead and bull trout in each recovery strata.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Implementing Partners	Monitoring	Monitor trends and variation in productivity of representative populations of Chinook, chum, coho, steelhead and bull trout in each recovery strata.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Implementing Partners	Monitoring	Monitor trends in stream habitat conditions through periodic sampling of representative and indicator sites.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Implementing Partners	Monitoring	Monitor trends in water quantity and quality through periodic sampling of representative and indicator sites (includes USGS gauge sites and additional sites).	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Implementing Partners	Monitoring	Monitor trends in watershed conditions and processes through periodic sampling of representative and indicator sites.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Implementing Partners	Monitoring	Produce and distribute regular progress and completion reports for monitoring and research activities.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Implementing Partners	Monitoring	Validate comprehensive survey of watershed conditions and processes with site-specific assessments.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Kalama	Habitat	Develop and implement stormwater management practices needed to protect stream flows and water quality										X									

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Kalama	Habitat	Expand standards in local land use plans and controls to afford adequate protections of ecologically important areas (i.e. stream channels, riparian zones, floodplains, CMZs, wetlands, unstable geology)										X									
Kalama	Habitat	Increase technical assistance to landowners and increase landowner participation in conservation programs that protect and restore habitat and habitat-forming processes. Includes increasing the incentives (financial or otherwise) and enhancing program marketing and outreach										X									
Kalama	Habitat	Manage existing and future water supplies consistent with WRIA 27/28 Watershed Management Plan recommendations										X									
Kalama	Habitat	Manage future growth and development patterns to ensure the protection of watershed processes. This includes reducing effective impervious surfaces										X									
Kalama	Habitat	Prevent floodplain impacts from new development through land use controls and Best Management Practices										X									
Kalama	Habitat	Review and adjust operations to ensure compliance with the Endangered Species Act; examples include roads, parks, and weed management										X									
Kelso	Habitat	Assess the impact of fish passage barriers throughout the City's jurisdiction and restore access to potentially productive habitats						X			X										
Kelso	Habitat	Conduct floodplain restoration where feasible along the mainstem and in						X			X										

Entity	Type/Threat	Action	Columbia Mainstem	Estuary Tributaries	Grays/Chinook	Elochoman-Skamakowa	Mill-Germany-Abnthy	Lower Cowlitz	Upper Cowlitz	Toutle	Coweeman	Kalama	Lower NF Lewis	Upper NF Lewis	EF Lewis	Salmon	Washougal	Bonneville Tributaries	Wind	L White Salmon	Upper Gorge
		major tributaries that have experienced channel confinement. Build partnerships with landowners and agencies and provide financial incentives																			
Kelso	Habitat	Develop and implement stormwater management practices needed to protect stream flows and water quality						X			X										
Kelso	Habitat	Expand standards in local land use plans and controls to afford adequate protections of ecologically important areas (i.e. stream channels, riparian zones, floodplains, CMZs, wetlands, unstable geology)						X			X										
Kelso	Habitat	Increase technical assistance to landowners and increase landowner participation in conservation programs that protect and restore habitat and habitat-forming processes. Includes increasing the incentives (financial or otherwise) and enhancing program marketing and outreach						X			X										
Kelso	Habitat	Manage future growth and development patterns to ensure the protection of watershed processes. This includes reducing effective impervious surfaces						X			X										
Kelso	Habitat	Prevent floodplain impacts from new development through land use controls and Best Management Practices						X			X										
Kelso	Habitat	Review and adjust operations to ensure compliance with the Endangered Species Act; examples include roads, parks, and weed management						X			X										
LCFEG	All	Participate in the development and implementation of a coordinated regional monitoring program for action implementation, action effectiveness,	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	

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		and biological and habitat status																			
LCFEG	Habitat	Assess the impact of fish passage barriers throughout the region and restore access to potentially productive habitats	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
LCFEG	Habitat	Conduct floodplain restoration where feasible along the mainstem and in major tributaries that have experienced channel confinement. Build partnerships with landowners and agencies and provide financial incentives	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
LCFEG	Habitat	Create and/or restore lost side-channel/off-channel habitat for salmonids	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
LCFEG	Habitat	Increase technical assistance to landowners and increase landowner participation in conservation programs that protect and restore habitat and habitat-forming processes. Includes increasing the incentives (financial or otherwise) and increasing program marketing and outreach	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
LCFEG	Habitat	Increase the level of implementation of habitat enhancement projects in high priority reaches and subwatersheds. This includes building partnerships, providing incentives to landowners, and increasing funding	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
LCFEG	Habitat	Proactively conduct floodplain restoration on lands being phased out of agricultural production. Survey landowners, build partnerships, and provide financial incentives	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
LCFEG	Habitat	Protect and restore native plant communities from the effects of	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	

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		invasive species																			
LCFRB	Habitat	Build partnerships with landowners and agencies and provide financial incentives to restore floodplain function	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
LCFRB	Habitat	Increase funding available to purchase easements or property in sensitive areas in order to protect watershed function where existing regulatory programs are inadequate	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
LCFRB	Habitat	Increase implementation of voluntary habitat enhancement projects in high priority reaches and subwatersheds. This includes building partnerships with landowners and agencies and increasing funding	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
LCFRB	Implementation	Establish an oversight group for plan implementation (NOAA, USFWS, WDFW, NPCC) and an implementation facilitation and coordination function to be carried out by the LCFRB, LCFRB staff, and a plan implementation oversight committee.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
LCFRB/RPOC	Implementation	Conduct qualitative evaluation of program sufficiency.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
LCFRB/RPOC	Implementation	Coordinate the development of a regional monitoring, research, and evaluation program.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
LCFRB/RPOC	Implementation	Coordinate the development of a regional public education and outreach program. Committee.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
LCFRB/RPOC	Implementation	Develop and implement cost and economic analysis methods to assist in decision-making and meet ESA needs.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
LCFRB/RPOC	Implementation	Develop and periodically update 6-year	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Entity	Type/Threat	Action	Columbia Mainstem	Estuary Tributaries	Grays/Chinook	Elochoman-Skamakowa	Mill-Germany-Abnthy	Lower Cowlitz	Upper Cowlitz	Toutle	Coweeman	Kalama	Lower NF Lewis	Upper NF Lewis	EF Lewis	Salmon	Washougal	Bonneville Tributaries	Wind	L White Salmon	Upper Gorge
		implementation schedules.																			
LCFRB/RPOC	Implementation	Develop ESA threats criteria and prioritization for incorporation into the Lower Columbia and domain recovery plans. Relate actions, strategies, and measures to threats.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
LCFRB/RPOC	Implementation	Evaluate whether recovery strategies, measures, and actions are being implemented as planned.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
LCFRB/RPOC	Implementation	Evaluate whether specific strategies, measures, and actions are producing the desired effects in each limiting factor/threat category (stream habitat, mainstem/estuary habitat, hydropower, harvest, hatcheries, ecological interactions).	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
LCFRB/RPOC	Implementation	Identify appropriate alternative approaches and revise priorities for monitoring and research based on results of evaluations.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
LCFRB/RPOC	Implementation	Periodically evaluate biological status relative to population and ESU objectives to determine whether necessary improvements are being achieved.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
LCFRB/RPOC	Implementation	Periodically evaluate habitat status relative to baseline conditions and benchmarks to determine whether appropriate progress is being made toward desired future conditions.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
LCFRB/RPOC	Implementation	Periodically evaluate strengths and weaknesses of the available monitoring and research to determine adequacy for assessing progress and identifying appropriate course corrections.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

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LCFRB/RPOC	Implementation	Prepare written action effectiveness progress reports to participating agencies, stakeholders, and the public at 6-year intervals.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
LCFRB/RPOC	Implementation	Prepare written fish and habitat status reports to participating agencies, stakeholders, and the public at 12-year intervals.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
LCFRB/RPOC	Implementation	Prepare written plan implementation progress reports to participating agencies, stakeholders, and the public at 2-year intervals.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
LCFRB/RPOC	Implementation	Refine analytical tools and methods to better support adaptive management process.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
LCFRB/RPOC	Implementation	Refine and reprioritize existing recovery strategies, measures, and actions for each limiting factor/threat category based on results of action-effectiveness evaluations.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
LCFRB/RPOC	Implementation	Refine and reprioritize existing recovery strategies, measures, and actions for each limiting factor/threat category based on results of biological and habitat status evaluations.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
LCFRB/RPOC	Implementation	Refine and reprioritize plan implementation at the programmatic level based on evaluations of implementation and compliance.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
LCFRB/RPOC	Implementation	Refine biological objectives consistent with recovery as new information becomes available on status and viable population or ESU characteristics.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
LCFRB/RPOC	Implementation	Refine draft benchmarks for assessing implementation progress,	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

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		implementation effectiveness and biological and habitat status.																			
LCFRB/RPOC	Implementation	Regularly review and revise this plan in a collaborative agency, stakeholder, and public process. Responsible Party: LCFRB and Recovery Plan Oversight Committee (RPOC)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
LCFRB/RPOC	Implementation	Use results of critical uncertainty research to identify new or refine and reprioritize existing recovery strategies, measures, and actions.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
LCREP	All	Participate in the development and implementation of a coordinated regional monitoring program for action implementation, action effectiveness, and biological and habitat status	X	X																	
LCREP	Estuary	Improve understanding of interrelationships among fish, wildlife, and limiting habitat conditions in the estuary and lower mainstem	X																		
Lewis CD	All	Participate in the development and implementation of a coordinated regional monitoring program for action implementation, action effectiveness, and biological and habitat status						X	X												
Lewis CD	Habitat	Conduct floodplain restoration where feasible along the mainstem and in major tributaries that have experienced channel confinement. Build partnerships with landowners and agencies and provide financial incentives						X	X												
Lewis CD	Habitat	Create and/or restore lost side-channel/off-channel habitat for salmonids						X	X												
Lewis CD	Habitat	Increase technical assistance to						X	X												

Entity	Type/Threat	Action	Columbia Mainstem	Estuary Tributaries	Grays/Chinook	Elochoman-Skamakowa	Mill-Germany-Abnthy	Lower Cowlitz	Upper Cowlitz	Toutle	Coweeman	Kalama	Lower NF Lewis	Upper NF Lewis	EF Lewis	Salmon	Washougal	Bonneville Tributaries	Wind	L White Salmon	Upper Gorge
		landowners and increase landowner participation in conservation programs that protect and restore habitat and habitat-forming processes. Includes increasing the incentives (financial or otherwise) and increasing program marketing and outreach																			
Lewis CD	Habitat	Increase the level of implementation of habitat enhancement projects in high priority reaches and subwatersheds. This includes building partnerships, providing incentives to landowners, and increasing funding						X	X												
Lewis CD	Habitat	Protect and restore native plant communities from the effects of invasive species						X	X												
Lewis Co	Habitat	Assess the impact of fish passage barriers throughout the County jurisdiction and restore access to potentially productive habitats						X	X												
Lewis Co	Habitat	Expand standards in local land use plans and controls to afford adequate protections of ecologically important areas (i.e. stream channels, riparian zones, floodplains, CMZs, wetlands, unstable geology)						X	X												
Lewis Co	Habitat	Increase technical assistance to landowners and increase landowner participation in conservation programs that protect and restore habitat and habitat-forming processes. Includes increasing the incentives (financial or otherwise) and increasing program marketing and outreach						X	X												
Lewis Co	Habitat	Manage existing and future water supplies consistent with WRIA 25/26						X	X												

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		Watershed Management Plan recommendations																			
Lewis Co	Habitat	Manage future growth and development patterns to ensure the protection of watershed processes. This includes reducing effective impervious surfaces and limiting the conversion of resource lands to developed uses through land use controls and incentives						X	X												
Lewis Co	Habitat	Prevent floodplain impacts from new development through land use controls and Best Management Practices						X	X												
Lewis Co	Habitat	Review and adjust operations to ensure compliance with the Endangered Species Act; examples include roads, parks, and weed management						X	X												
Lewis Health Districts	Habitat	Assess and require upgrade or replacement of on-site sewage systems that may be contributing to water quality impairment						X	X												
Longview	Habitat	Develop and implement stormwater management practices needed to protect stream flows and water quality	X					X													
Longview	Habitat	Expand standards in local land use plans and controls to afford adequate protections of ecologically important areas (i.e. stream channels, riparian zones, floodplains, CMZs, wetlands, unstable geology)	X					X													
Longview	Habitat	Implement the recommendations of the WRIA 25/26 Watershed Planning Unit regarding water quality						X													
Longview	Habitat	Increase technical assistance to landowners and increase landowner participation in conservation programs	X					X													

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		that protect and restore habitat and habitat-forming processes. Includes increasing the incentives (financial or otherwise) and increasing program marketing and outreach																			
Longview	Habitat	Manage future growth and development patterns to ensure the protection of watershed processes. This includes reducing effective impervious surfaces	X					X													
Longview	Habitat	Prevent floodplain impacts from new development through land use controls and Best Management Practices	X					X													
Longview	Habitat	Review and adjust operations to ensure compliance with the Endangered Species Act; examples include roads, parks, and weed management	X					X													
Morton	Habitat	Expand standards in local land use plans and controls to afford adequate protections of ecologically important areas (i.e. stream channels, riparian zones, floodplains, CMZs, wetlands, unstable geology)							X												
Morton	Habitat	Increase technical assistance to landowners and increase landowner participation in conservation programs that protect and restore habitat and habitat-forming processes. Includes increasing the incentives (financial or otherwise) and increasing program marketing and outreach							X												
Morton	Habitat	Manage future growth and development patterns to ensure the protection of watershed processes. This includes reducing effective impervious surfaces							X												
Morton	Habitat	Review and adjust operations to ensure compliance with the Endangered							X												

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		Species Act; examples include roads, parks, and weed management																			
Mossyrock	Habitat	Expand standards in local land use plans and controls to afford adequate protections of ecologically important areas (i.e. stream channels, riparian zones, floodplains, CMZs, wetlands, unstable geology)							X												
Mossyrock	Habitat	Increase technical assistance to landowners and increase landowner participation in conservation programs that protect and restore habitat and habitat-forming processes. Includes increasing the incentives (financial or otherwise) and increasing program marketing and outreach							X												
Mossyrock	Habitat	Manage future growth and development patterns to ensure the protection of watershed processes. This includes reducing effective impervious surfaces							X												
Mossyrock	Habitat	Review and adjust operations to ensure compliance with the Endangered Species Act; examples include roads, parks, and weed management							X												
NOAA	All	Develop appropriate ESA assurances for entities implementing actions of the Lower Columbia Fish Recovery Plan	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
NOAA	All	Participate in the development and implementation of a coordinated regional monitoring program for action implementation, action effectiveness, and biological and habitat status	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
NOAA	All	Utilize the Lower Columbia Fish Recovery Plan as a basis for enforcement actions	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

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NOAA	All	Utilize the Lower Columbia Fish Recovery Plan as a basis for its section 7 consultations and its section 4 and 10 permits	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
NOAA	Ecol	Coordinate with the LCFRB and other relevant agencies on the development and implementation of a plan to manage predation by marine mammals such as seals and sea lions, where increased predation poses significant risks to salmon recovery and management is consistent predator population viability	X																		
NOAA	Ecol	Evaluate positive and negative impacts of American shad on salmon, sturgeon, and other species as well as the feasibility and advisability of shad management measures	X																		
NOAA	Estuary	Improve understanding of interrelationships among fish, wildlife, and limiting habitat conditions in the estuary and lower mainstem	X																		
NOAA	Estuary	Increase tagging and other marking studies to determine the origin, estuarine habitat use, survival, and migration patterns of various salmonid populations	X																		
NOAA	Habitat	Monitor, evaluate, and enforce the Stordahl Habitat Conservation Plan													X						
NOAA	Harvest	Address technical and policy issues regarding mass marking and help develop programs to mark and monitor recovery of fall Chinook in fisheries and escapement	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
NOAA	Harvest	Conduct periodic reviews of fall Chinook harvest relative to habitat productivity and capacity to assure		X	X	X	X	X		X	X	X			X	X	X	X	X	X	

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		harvest objectives are synchronized with habitat changes																			
NOAA	Harvest	Consider and expressely evaluate sliding scale harvest based on annual abundance indicators for naturally-spawning Columbia River coho		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
NOAA	Harvest	Consider and expressly evaluate the potential for a sliding scale harvest plan based on annual abundance indicators for tule fall Chinook		X	X	X	X	X		X	X	X			X	X	X	X	X	X	
NOAA	Harvest	Consider recovery goals for lower Columbia salmon and steelhead populations as identified in the Lower Columbia Recovery Plan in annual fishery management processes	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
NOAA	Harvest	Continue to monitor Columbia River selective fisheries and provide estimates of impacts to naturally produced lower Columbia spring Chinook							X			X		X							
NOAA	Harvest	Develop a basin wide fish marking plan for hatchery tule fall Chinook that is adequate for monitoring interception rates in specific fisheries, tributary harvest management, and monitoring escapement of naturally-spawning fish		X	X	X	X	X		X	X	X			X	X	X	X	X	X	
NOAA	Harvest	Develop a mass marking plan for hatchery tule Chinook for tributary harvest management and for naturally-spawning escapement monitoring		X	X	X	X	X		X	X	X			X	X	X	X	X	X	
NOAA	Harvest	Ensure that scientific review of Lower Columbia Recovery Plan harvest objectives and current ESA management objectives will occur as part of the process in the above fishery forums	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
NOAA	Harvest	Improve tools to monitor and evaluate		X	X	X	X	X		X	X	X			X	X	X	X	X	X	

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		fishery catch to assure impacts to naturally-spawning fall Chinook are maintained within agreed limits																			
NOAA	Harvest	Maintain selective sport fisheries in Ocean, Columbia River, and tributaries and monitor naturally-spawning coho stock impacts	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
NOAA	Harvest	Manage Columbia River commercial fisheries by time, area, and gear to target hatchery fish and minimize impacts to naturally spawning spring chinook							X			X		X							
NOAA	Harvest	Manage Columbia River commercial fisheries managed by time, area, and gear to target on hatchery fish and minimize impacts to naturally-spawning coho	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
NOAA	Harvest	Manage Columbia River commercial fisheries managed by time, area, and gear to target on hatchery fish and minimize impacts to naturally-spawning steelhead	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
NOAA	Harvest	Manage ocean, Columbia River, and tributary fisheries to meet the spawning escapement goal for lower Columbia bright fall Chinook							X			X		X							
NOAA	Harvest	Research and employ best available technology to reduce incidental mortality of non-target fish in selective fisheries	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
NOAA	Harvest	Review and evaluate the harvest management strategy developed for protection of naturally-spawning Clackamas late coho to also protect naturally-spawning Washington late coho	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Entity	Type/Threat	Action	Columbia Mainstem	Estuary Tributaries	Grays/Chinook	Elochoman-Skamakowa	Mill-Germany-Abnthy	Lower Cowlitz	Upper Cowlitz	Toutle	Coweeman	Kalama	Lower NF Lewis	Upper NF Lewis	EF Lewis	Salmon	Washougal	Bonneville Tributaries	Wind	L White Salmon	Upper Gorge
NOAA	Harvest	Review of NOAA Fisheries' recovery exploitation rate of fall Chinook tules and update risk assessment to include more tule populations		X	X	X	X	X		X	X	X			X	X	X	X	X	X	
NOAA	Harvest	Revise or adjust ESA Fishery Management Plans for lower Columbia ESUs as needed to support the Lower Columbia Recovery goals and priorities	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
NOAA	Harvest	Seek commitment from agencies and tribes in the Pacific Fisheries Management Council, North of Falcon, and Columbia River Compact processes to specifically manage annually for lower Columbia naturally-spawning tule fall Chinook and to establish a collaborative US policy position for the international table at the Pacific Salmon Commission		X	X	X	X	X		X	X	X			X	X	X	X	X	X	
NOAA	Harvest	Seek to maintain and/or establish adequate resources, priorities, regulatory frameworks, and coordination mechanisms for effective enforcement of fishery rules and regulations for the protection of fish and wildlife resources	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
NOAA	Harvest	Work through U.S. v. Oregon and with Columbia River treaty Indian tribes to develop harvest plans for Wind River summer steelhead																	X		
NOAA	Hatchery	Assist in the design hatchery programs to be consistent with region-wide recovery and the ecological context of the watershed, including the characteristics of the habitat and the natural fish populations	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
NOAA	Hatchery	Develop criteria for appropriate integration of hatchery and natural	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

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		populations																			
NOAA	Hatchery	Develop marking programs to assure that hatchery-produced fish to assure they are identifiable for harvest management and escapement accounting	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
NOAA	Hatchery	Document and formalize hatchery operations through the use of the existing Hatchery Genetic Management Planning (HGMP) process	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
NOAA	Hatchery	Guide the configuration of hatchery programs with appropriate reform recommendations identified in the Northwest Power and Planning Council's Artificial Production Review and Evaluation (APRE), the Benefit-Risk procedure developed by WDFW, and other tools	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
NOAA	Hatchery	Promote public education concerning the role of hatcheries in the protection of natural populations	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
NOAA	Hatchery	Promote region-wide recovery by using hatcheries as tools for supplementation and recovery in appropriate watersheds	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
NOAA	Hatchery	Seek flexibility in current funding to assure hatcheries have the resources to achieve complementary harvest and natural production objectives	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
NOAA	Hatchery	Use adaptive management to ensure that hatchery programs to respond to new knowledge of how to further protect and enhance natural production and improve operational efficiencies	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
NOAA	Hydro	Establish an allocation of water within the annual water budget for the Columbia River Basin that simulates	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

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		peak seasonal discharge, increases the variability of flows during periods of salmonid emigration, and restores tidal channel complexity in the estuary																			
NOAA	Hydro	Evaluate and adaptively implement anadromous fish reintroduction upstream of Cowlitz and Lewis dams and facilities as part of relicensing processes or requirements							X					X							
NOAA	Hydro	Monitor and notify FERC of significant license violations, enforce terms and conditions of section 7 consultations on FERC relicensing agreements, and encourage implementation of section 7 conservation recommendations on FERC relicensing agreements						X	X				X	X							
NOAA	Implementation	Develop and implement cost and economic analysis methods to assist in decision-making and meet ESA needs.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
NOAA	Implementation	Develop ESA threats criteria and prioritization for incorporation into the Lower Columbia and domain recovery plans. Relate actions, strategies, and measures to threats.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
NOAA	Implementation	Refine analytical tools and methods to better support adaptive management process.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Non Government Organizations	Estuary	Restore connectedness between river and floodplain	X																		
Non Government Organizations	Estuary	Restore tidal swamp and marsh habitat in the estuary and tidal freshwater portion of the lower Columbia River	X																		
Non Government Organizations	Habitat	Conduct floodplain restoration where feasible along the mainstem and in major tributaries that have experienced	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

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		channel confinement. Build partnerships with landowners and agencies and provide financial incentives																			
Non Government Organizations	Habitat	Create and/or restore lost side-channel/off-channel habitat for salmonids	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Non Government Organizations	Habitat	Develop partnerships to help increase funding for purchase easements or property in sensitive areas to protect watershed function where existing regulatory programs are inadequate	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Non Government Organizations	Habitat	Increase the level of implementation of habitat enhancement projects in high priority reaches and subwatersheds. This includes building partnerships, providing incentives to landowners, and increasing funding	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Non Government Organizations	Habitat	Proactively conduct floodplain restoration on lands being phased out of agricultural production. Survey landowners, build partnerships, and provide financial incentives	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Non Government Organizations	Hatchery	Continue to enhance Chum enhancement at Grays and Chinook hatcheries			X																
NPCC/BPA	Ecol	Continue to manage the northern pikeminnow fishery to help offset increased predation on salmon that resulted from habitat alteration	X																		
NPCC/BPA	Ecol	Evaluate positive and negative impacts of American shad on salmon, sturgeon, and other species as well as the feasibility and advisability of shad management measures	X																		
NPCC/BPA	Estuary	Improve understanding of	X																		

Entity	Type/Threat	Action	Columbia Mainstem	Estuary Tributaries	Grays/Chinook	Elochoman-Skamakowa	Mill-Germany-Abnthy	Lower Cowlitz	Upper Cowlitz	Toutle	Coweeman	Kalama	Lower NF Lewis	Upper NF Lewis	EF Lewis	Salmon	Washougal	Bonneville Tributaries	Wind	L White Salmon	Upper Gorge
		interrelationships among fish, wildlife, and limiting habitat conditions in the estuary and lower mainstem																			
NPCC/BPA	Estuary	Protect and restore riparian condition and function	X																		
NPCC/BPA	Estuary	Restore or mitigate for impaired sediment delivery processes and conditions affecting the Columbia River estuary and lower mainstem	X																		
NPCC/BPA	Hydro	Establish an allocation of water within the annual water budget for the Columbia River Basin that simulates peak seasonal discharge, increases the variability of flows during periods of salmonid emigration, and restores tidal channel complexity in the estuary	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X			
NPCC/BPA	Hydro	Maintain adequate water flows in Bonneville Dam tailrace and downstream habitats throughout salmon migration, incubation and rearing periods	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
NPCC/BPA	Hydro	Maintain and operate effective juvenile and adult passage facilities (including facilities, flow, and spill) at Bonneville Dam and tributary dams when populations are reestablished	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
NRCS	Estuary	Protect and restore riparian condition and function	X																		
NRCS	Habitat	Increase technical assistance to landowners and increase landowner participation in conservation programs that protect and restore habitat and habitat-forming processes. Includes increasing incentives (financial or otherwise) and increasing program	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Entity	Type/Threat	Action	Columbia Mainstem	Estuary Tributaries	Grays/Chinook	Elochoman-Skamakowa	Mill-Germany-Abnthy	Lower Cowlitz	Upper Cowlitz	Toutle	Coweeman	Kalama	Lower NF Lewis	Upper NF Lewis	EF Lewis	Salmon	Washougal	Bonneville Tributaries	Wind	L White Salmon	Upper Gorge
		marketing and outreach																			
NRCS	Habitat	Maintain and expand agriculture protection and restoration programs implemented through conservation districts in the region	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Pacific CD	All	Participate in the development and implementation of a coordinated regional monitoring program for action implementation, action effectiveness, and biological and habitat status		X	X	X															
Pacific CD	Estuary	Protect and restore riparian condition and function	X																		
Pacific CD	Habitat	Create and/or restore lost side-channel/off-channel habitat for salmonids		X	X	X															
Pacific CD	Habitat	Increase technical assistance to landowners and increase landowner participation in conservation programs that protect and restore habitat and habitat-forming processes. Includes increasing the incentives (financial or otherwise) and increasing program marketing and outreach		X	X	X															
Pacific CD	Habitat	Increase the level of implementation of habitat enhancement projects in high priority reaches and subwatersheds. This includes building partnerships, providing incentives to landowners, and increasing funding		X	X	X															
Pacific CD	Habitat	Protect and restore native plant communities from the effects of invasive species		X	X	X															
Pacific Co	Estuary	Protect and restore riparian condition and function	X																		

Entity	Type/Threat	Action	Columbia Mainstem	Estuary Tributaries	Grays/Chinook	Elochoman-Skamakowa	Mill-Germany-Abnthy	Lower Cowlitz	Upper Cowlitz	Toutle	Coweeman	Kalama	Lower NF Lewis	Upper NF Lewis	EF Lewis	Salmon	Washougal	Bonneville Tributaries	Wind	L White Salmon	Upper Gorge
Pacific Co	Estuary	Restore connectedness between river and floodplain	X																		
Pacific Co	Estuary	Restore tidal swamp and marsh habitat in the estuary and tidal freshwater portion of the lower Columbia River	X																		
Pacific Co	Habitat	Assess the impact of fish passage barriers throughout the county and restore access to potentially productive habitats		X	X	X															
Pacific Co	Habitat	Expand standards in local land use plans and controls to afford adequate protections of ecologically important areas (i.e. stream channels, riparian zones, floodplains, CMZs, wetlands, unstable geology)	X	X	X	X															
Pacific Co	Habitat	Increase technical assistance to landowners and increase landowner participation in conservation programs that protect and restore habitat and habitat-forming processes. Includes increasing the incentives (financial or otherwise) and increasing program marketing and outreach		X	X	X			X												
Pacific Co	Habitat	Manage future growth and development patterns to ensure the protection of watershed processes. This includes reducing effective impervious surfaces and limiting the conversion of resource lands to developed uses through land use controls and incentives		X	X	X															
Pacific Co	Habitat	Prevent floodplain impacts from new development through land use controls and Best Management Practices		X	X	X															
Pacific Co	Habitat	Review and adjust operations to ensure compliance with the Endangered		X	X	X															

Entity	Type/Threat	Action	Columbia Mainstem	Estuary Tributaries	Grays/Chinook	Elochoman-Skamakowa	Mill-Germany-Abnthy	Lower Cowlitz	Upper Cowlitz	Toutle	Coweeman	Kalama	Lower NF Lewis	Upper NF Lewis	EF Lewis	Salmon	Washougal	Bonneville Tributaries	Wind	L White Salmon	Upper Gorge
		Species Act; examples include roads, parks, and weed management																			
Pacific Co Health Districts	Habitat	Assess and require upgrade or replacement of on-site sewage systems that may be contributing to water quality impairment		X	X	X															
PacifiCorp	All	Participate in the development and implementation of a coordinated regional monitoring program for action implementation, action effectiveness, and biological and habitat status											X	X							
PacifiCorp	Habitat	Initiate habitat restoration and protection projects to mitigate impacts of hydroelectric facilities											X	X							
PacifiCorp	Habitat	Manage regulated stream flows in the NF Lewis to maximize fish habitat use											X								
PacifiCorp	Habitat	Restore volitional access through the hydropower system for anadromous and resident fish, unless proven to be infeasible or biologically unnecessary											X	X							
PacifiCorp	Hatchery	Reintroduce coho in upper Lewis river												X							
PacifiCorp	Hatchery	Reintroduce spring Chinook in the Lewis beginning with hatchery supplementation												X							
PacifiCorp	Hatchery	Reintroduce winter steelhead in Lewis river												X							
PacifiCorp	Hydro	Evaluate and adaptively implement anadromous fish reintroduction upstream of the Lewis dams and facilities as part of relicensing processes or requirements												X							
PacifiCorp	Hydro	Operate the tributary hydro systems to provide appropriate flows for salmon spawning and rearing habitat in the											X								

Entity	Type/Threat	Action	Columbia Mainstem	Estuary Tributaries	Grays/Chinook	Elochoman-Skamakowa	Mill-Germany-Abnthy	Lower Cowlitz	Upper Cowlitz	Toutle	Coweeman	Kalama	Lower NF Lewis	Upper NF Lewis	EF Lewis	Salmon	Washougal	Bonneville Tributaries	Wind	L White Salmon	Upper Gorge
		areas downstream of the hydrosystem																			
Port of Camas/Washougal	Habitat	Develop and implement stormwater management practices needed to protect stream flows and water quality	X														X				
Port of Kalama	Habitat	Conduct floodplain restoration where feasible along the mainstem and in major tributaries that have experienced channel confinement. Build partnerships with landowners and agencies and provide financial incentives	X									X									
Port of Kalama	Habitat	Develop and implement stormwater management practices needed to protect stream flows and water quality	X									X									
Port of Longview	Habitat	Develop and implement stormwater management practices needed to protect stream flows and water quality	X					X													
Port of Vancouver	Habitat	Conduct floodplain restoration where feasible along the mainstem and in major tributaries that have experienced channel confinement	X													X					
Port of Vancouver	Habitat	Develop and implement stormwater management practices needed to protect stream flows and water quality	X													X					
Port of Vancouver	Habitat	Work with federal, state, and local agencies to equitably resolve groundwater quality issues in the Vancouver Lake Lowlands related to a regional water source for Clark County														X					
PSMFC	Ecol	Continue to manage the northern pikeminnow fishery to help offset increased predation on salmon that resulted from habitat alteration	X																		
Skamania Co	Habitat	Assess the impact of fish passage barriers throughout the county and												X			X	X	X	X	X

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		restore access to potentially productive habitats																			
Skamania Co	Habitat	Expand standards in local land use plans and controls to afford adequate protections of ecologically important areas (i.e. stream channels, riparian zones, floodplains, CMZs, wetlands, unstable geology)												X			X	X	X	X	X
Skamania Co	Habitat	Increase technical assistance to landowners and increase landowner participation in conservation programs that protect and restore habitat and habitat-forming processes. Includes increasing the incentives (financial or otherwise) and increasing program marketing and outreach												X			X	X	X	X	X
Skamania Co	Habitat	Manage existing and future water supplies consistent with WRIA 27/28 Watershed Management Plan recommendations												X			X	X			
Skamania Co	Habitat	Manage future growth and development patterns to ensure the protection of watershed processes. This includes reducing effective impervious surfaces and limiting the conversion of resource lands to developed uses through land use controls and incentives												X			X	X	X	X	X
Skamania Co	Habitat	Prevent floodplain impacts from new development through land use controls and Best Management Practices	X											X			X	X	X	X	X
Skamania Co	Habitat	Review and adjust operations to ensure compliance with the Endangered Species Act; examples include roads, parks, and weed management												X			X	X	X	X	X
Skamania Health	Habitat	Assess and require upgrade or replacement of on-site sewage systems												X			X	X	X	X	

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Districts		that may be contributing to water quality impairment																			
SRFB	All	Participate in the development and implementation of a coordinated regional monitoring program for action implementation, action effectiveness, and biological and habitat status	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
SRFB	Habitat	Increase funding levels for habitat restoration, preservation, and research projects to help achieve recovery goals. Evaluate the use block grants to LCFRB to fund projects consistent with recovery plan and the Salmon Recovery Act	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
State Noxious Weed Control Board	Habitat	Increase funding and technical assistance to county noxious weed control boards for improve their effectiveness	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
State Parks	Habitat	Limit intensive recreational use of priority stream reaches during critical fish use periods													X			X			
Tacoma Power	All	Participate in the development and implementation of a coordinated regional monitoring program for action implementation, action effectiveness, and biological and habitat status						X	X												
Tacoma Power	Habitat	Initiate habitat restoration and protection projects to mitigate impacts of hydroelectric facilities						X	X												
Tacoma Power	Habitat	Manage regulated stream flows in the Cowlitz Subbasin to maximize fish habitat use						X													
Tacoma Power	Habitat	Restore volitional access through the hydropower system for anadromous fish; restore habitat						X	X												

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Tacoma Power	Hatchery	Reintroduce coho in upper Cowlitz							X												
Tacoma Power	Hatchery	Reintroduce spring Chinook in upper Cowlitz							X												
Tacoma Power	Hatchery	Reintroduce winter steelhead in upper Cowlitz							X												
Tacoma Power	Hydro	Evaluate and adaptively implement anadromous fish reintroduction upstream of Cowlitz dam and facilities as part of relicensing processes or requirements							X												
Tacoma Power	Hydro	Operate the tributary hydro systems to provide appropriate flows for salmon spawning and rearing habitat in the areas downstream of the hydrosystem						X													
Tribes	Harvest	Address technical and policy issues regarding mass marking and help develop programs to mark and monitor recovery of fall Chinook in fisheries and escapement	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Tribes	Harvest	Develop a basin wide fish marking plan for hatchery tule fall Chinook that is adequate for monitoring interception rates in specific fisheries, tributary harvest management, and monitoring escapement of naturally-spawning fish		X	X	X	X	X		X	X	X			X	X	X	X	X	X	
Tribes	Harvest	Improve tools to monitor and evaluate fishery catch to assure impacts to naturally-spawning fall Chinook are maintained within agreed limits		X	X	X	X	X		X	X	X			X	X	X	X	X	X	
Tribes	Harvest	Seek commitment from agencies and tribes in the Pacific Fisheries Management Council, North of Falcon, and Columbia River Compact processes to specifically manage annually for lower Columbi naturally-spawning tule		X	X	X	X	X		X	X	X			X	X	X	X	X	X	

Entity	Type/Threat	Action	Columbia Mainstem	Estuary Tributaries	Grays/Chinook	Elochoman-Skamakowa	Mill-Germany-Abnthy	Lower Cowlitz	Upper Cowlitz	Toutle	Coweeman	Kalama	Lower NF Lewis	Upper NF Lewis	EF Lewis	Salmon	Washougal	Bonneville Tributaries	Wind	L White Salmon	Upper Gorge
		fall Chinook and to establish a collaborative US policy position for the international table at the Pacific Salmon Commission																			
Tribes	Harvest	Work through U.S. v. Oregon and with Columbia River treaty Indian tribes to develop harvest plans for Wind River summer steelhead																	X		
Underwood CD	All	Participate in the development and implementation of a coordinated regional monitoring program for action implementation, action effectiveness, and biological and habitat status															X	X	X	X	X
Underwood CD	Habitat	Conduct floodplain restoration where feasible along the mainstem and in major tributaries that have experienced channel confinement. Build partnerships with landowners and agencies and provide financial incentives															X	X	X	X	X
Underwood CD	Habitat	Create and/or restore lost side-channel/off-channel habitat for salmonids															X	X	X	X	X
Underwood CD	Habitat	Increase technical assistance to landowners and increase landowner participation in conservation programs that protect and restore habitat and habitat-forming processes. Includes increasing the incentives (financial or otherwise) and increasing program marketing and outreach															X	X	X	X	X
Underwood CD	Habitat	Increase the level of implementation of habitat enhancement projects in high priority reaches and subwatersheds. This includes building partnerships, providing incentives to landowners, and increasing funding															X	X	X	X	X

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Underwood CD	Habitat	Protect and restore native plant communities from the effects of invasive species															X	X	X	X	X
USACE	All	Participate in the development and implementation of a coordinated regional monitoring program for action implementation, action effectiveness, and biological and habitat status	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
USACE	Estuary	Mitigate channel dredge activities in the Columbia River estuary and lower mainstem that reduce salmon population resilience and inhibits recovery	X																		
USACE	Estuary	Restore or mitigate for impaired sediment delivery processes and conditions affecting the Columbia River estuary and lower mainstem	X																		
USACE	Estuary	Restore tidal swamp and marsh habitat in the estuary and tidal freshwater portion of the lower Columbia River	X																		
USACE	Habitat	Address fish passage and sediment issues at the Sediment Retention Structure on the NF Toutle								X											
USACE	Habitat	Conduct floodplain restoration where feasible along the mainstem and in major tributaries that have experienced channel confinement. Build partnerships with landowners and agencies and provide financial incentives	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
USACE	Habitat	Proactively conduct floodplain restoration on lands being phased out of agricultural production. Survey landowners, build partnerships, and provide financial incentives	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
USACE	Hydro	Establish an allocation of water within the annual water budget for the	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

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		Columbia River Basin that simulates peak seasonal discharge, increases the variability of flows during periods of salmonid emigration, and restores tidal channel complexity in the estuary																			
USACE	Hydro	Maintain adequate water flows in Bonneville Dam tailrace and downstream habitats throughout salmon migration, incubation and rearing periods	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
USACE	Hydro	Maintain and operate effective juvenile and adult passage facilities (including facilities, flow, and spill) at Bonneville Dam to support chum reestablishment																X			
USFS	Habitat	Assess the impact of fish passage barriers throughout the Gifford Pinchot NF and restore access to potentially productive habitats							X	X	X	X	X	X	X	X	X	X	X	X	X
USFS	Habitat	Manage federal forest lands to protect and restore watershed processes and habitat conditions							X	X	X	X	X	X	X	X	X	X	X	X	X
USFWS	All	Participate in the development and implementation of a coordinated regional monitoring program for action implementation, action effectiveness, and biological and habitat status	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
USFWS	Ecol	Continue to manage predation by avian predators, such as Caspian Terns, to avoid large increases in salmon predation while also protecting the viability of predator populations	X																		
USFWS	Ecol	Establish a moratorium on intentional introductions of aquatic species and importation of high-risk species	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
USFWS	Ecol	Evaluate positive and negative impacts	X																		

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		of American shad on salmon, sturgeon, and other species as well as the feasibility and advisability of shad management measures																			
USFWS	Ecol	Implement regulatory, control, and education measures to prevent additional species invasions	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
USFWS	Ecol	Take proactive steps to control or reduce the impacts of introduced, invasive, or exotic species	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
USFWS	Estuary	Limit the effects of toxic contaminants on salmonid and wildlife fitness and survival in the Columbia River estuary, lower mainstem, and near shore ocean	X																		
USFWS	Habitat	Identify and initiate habitat restoration projects in Stiegerwald and other wildlife refuges consistent with goals in the salmon recovery plan															X	X			
USFWS	Habitat	Implement existing restoration, protection, and education USFWS programs in the lower Columbia region	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
USFWS	Habitat	Monitor and enforce NF Lewis relicensing agreements relative to passage for Bull Trout and habitat restoration requirements											X	X							
USFWS	Habitat	Monitor, evaluate, and enforce the Stordahl Habitat Conservation Plan													X						
USFWS	Harvest	Address technical and policy issues regarding mass marking and help develop programs to mark and monitor recovery of fall Chinook in fisheries and escapement	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
USFWS	Harvest	Develop a basin wide fish marking plan for hatchery tule fall Chinook that is		X	X	X	X	X		X	X	X			X	X	X	X	X	X	

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		adequate for monitoring interception rates in specific fisheries, tributary harvest management, and monitoring escapement of naturally-spawning fish																			
USFWS	Harvest	Maintain selective sport fisheries in Ocean, Columbia River, and tributaries and monitor naturally-spawning coho stock impacts	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
USFWS	Harvest	Seek commitment from agencies and tribes in the Pacific Fisheries Management Council, North of Falcon, and Columbia River Compact processes to specifically manage annually for lower Columbi naturally-spawning tule fall Chinook and to establish a collaborative US policy position for the international table at the Pacific Salmon Commission		X	X	X	X	X		X	X	X			X	X	X	X	X	X	
USFWS	Harvest	Work through U.S. v. Oregon and with Columbia River treaty Indian tribes to develop harvest plans for Wind River summer steelhead																	X		
USFWS	Hatchery	Assess the risks and benefits posed by artificial production programs using WDFW's Benefit-Risk Assessment Procedure (BRAP)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
USFWS	Hatchery	Assist in the design hatchery programs to be consistent with region-wide recovery and the ecological context of the watershed, including the characteristics of the habitat and the natural fish populations	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
USFWS	Hatchery	Develop additional supplementation programs for chum	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
USFWS	Hatchery	Develop and apply hatchery brood stock	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

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		watershed transfer policies for chum																			
USFWS	Hatchery	Develop and apply hatchery brood stock watershed transfer policies for spring Chinook							X			X		X							
USFWS	Hatchery	Develop and apply hatchery brood stock watershed transfer policies for steelhead	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
USFWS	Hatchery	Develop coho transfer policies as local brood stock is developed	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
USFWS	Hatchery	Develop criteria for appropriate integration of hatchery and natural populations	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
USFWS	Hatchery	Develop criteria for appropriate mix of first generation hatchery spawners and naturally-spawning spawners for each population with hatchery and naturally-spawning fall Chinook production, and reduce first generation spawners as appropriate		X	X	X	X	X		X	X	X	X		X	X	X	X	X	X	
USFWS	Hatchery	Develop hatchery supplementation programs for coho	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
USFWS	Hatchery	Develop local brood stocks for coho	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
USFWS	Hatchery	Develop marking programs to assure that hatchery-produced fish to assure they are identifiable for harvest management and escapement accounting	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
USFWS	Hatchery	Develop plans for future hatchery programs relationship with reestablished natural-origin spring Chinook populations, including integrated and segregated options.							X			X		X							
USFWS	Hatchery	Document and formalize hatchery operations through the use of the existing Hatchery Genetic Management Planning (HGMP) process	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

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USFWS	Hatchery	Establish naturally-spawning production sanctuary areas to be used for coho indicator stock programs	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
USFWS	Hatchery	Guide the configuration of hatchery programs with appropriate reform recommendations identified in the Northwest Power and Planning Council's Artificial Production Review and Evaluation (APRE), the Benefit-Risk procedure developed by WDFW, and other tools	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
USFWS	Hatchery	Hatchery brood stock watershed transfer policies for chum	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
USFWS	Hatchery	Mark coho hatchery harvest production	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
USFWS	Hatchery	Mark hatchery fall Chinook fish in priority watersheds to promote fishery utilization, facilitate the utilization of natural-origin fish in integrated programs, and enumerate hatchery fish in natural spawning areas		X	X	X	X	X		X	X	X	X		X	X	X	X	X	X	
USFWS	Hatchery	Mark spring chinook hatchery production for identification and harvest							X			X		X							
USFWS	Hatchery	Operate hatcheries to promote region-wide recovery through the application of appropriate risk containment measures for: 1) hatchery origin adults returning to natural spawning areas, 2) release of hatchery juveniles, 3) handling of natural origin adults at hatchery facilities, 4) water quality and effective disease control, and 5) mixed stock fisheries	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
USFWS	Hatchery	Promote public education concerning the role of hatcheries in the protection of natural populations	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Entity	Type/Threat	Action	Columbia Mainstem	Estuary Tributaries	Grays/Chinook	Elochoman-Skamakowa	Mill-Germany-Abnthy	Lower Cowlitz	Upper Cowlitz	Toutle	Coweeman	Kalama	Lower NF Lewis	Upper NF Lewis	EF Lewis	Salmon	Washougal	Bonneville Tributaries	Wind	L White Salmon	Upper Gorge
USFWS	Hatchery	Promote region-wide recovery by using hatcheries as tools for supplementation and recovery in appropriate watersheds	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
USFWS	Hatchery	Seek flexibility in current funding to assure hatcheries have the resources to achieve complementary harvest and natural production objectives	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
USFWS	Hatchery	Use adaptive management to ensure that hatchery programs to respond to new knowledge of how to further protect and enhance natural production and improve operational efficiencies	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
USFWS	Hatchery	Use DNA data to select appropriate brood stock for chum	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
USFWS	Hatchery	Use fall chinook juvenile release strategies to minimize naturally-spawning fish interactions		X	X	X	X	X		X	X	X	X		X	X	X	X	X	X	
USFWS	Hatchery	Use hatcheries for chum enhancement and risk management in the lower Columbia River Gorge																	X	X	X
USFWS	Hatchery	Use hatchery operation strategies to protect Lewis naturally-spawning fall Chinook											X								
USFWS	Hatchery	Use hatchery releases of fall Chinook in watersheds without hatchery programs only occur if necessary for recovery of the natural population		X	X	X	X	X		X	X	X	X		X	X	X	X	X	X	
USFWS	Hatchery	Use juvenile release strategies of spring Chinook to minimize impacts to naturally-spawning populations							X			X		X							
USFWS	Hatchery	Use juvenile release strategies to minimize interaction with naturally-spawning coho.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
USFWS	Hatchery	Use of hatcheries for chum enhancement	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

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		and risk management																			
USFWS	Hatchery	Use only local watershed fall Chinook broodstock only in hatchery programs		X	X	X	X	X		X	X	X	X		X	X	X	X	X	X	
USFWS	Hatchery	Utilize facilities for spring Chinook reintroduction efforts							X			X		X							
USGS	All	Participate in the development and implementation of a coordinated regional monitoring program for action implementation, action effectiveness, and biological and habitat status	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Vancouver	Habitat	Develop and implement stormwater management practices needed to protect stream flows and water quality	X													X	X				
Vancouver	Habitat	Expand standards in local land use plans and controls to afford adequate protections of ecologically important areas (i.e. stream channels, riparian zones, floodplains, CMZs, wetlands, unstable geology)	X													X	X				
Vancouver	Habitat	Increase technical assistance to landowners and increase landowner participation in conservation programs that protect and restore habitat and habitat-forming processes. Includes increasing the incentives (financial or otherwise) and increasing program marketing and outreach	X													X	X				
Vancouver	Habitat	Limit intensive recreational use of priority stream reaches during critical fish use periods														X	X				
Vancouver	Habitat	Manage existing and future water supplies consistent with WRIA 27/28 Watershed Management Plan recommendations; Participate in the development and implementation of a														X	X				

Entity	Type/Threat	Action	Columbia Mainstem	Estuary Tributaries	Grays/Chinook	Elochoman-Skamakowa	Mill-Germany-Abnthy	Lower Cowlitz	Upper Cowlitz	Toutle	Coweeman	Kalama	Lower NF Lewis	Upper NF Lewis	EF Lewis	Salmon	Washougal	Bonneville Tributaries	Wind	L White Salmon	Upper Gorge
		regional water source for residents, businesses, and industries within its Urban Growth Boundary																			
Vancouver	Habitat	Manage future growth and development patterns to ensure the protection of watershed processes. This includes reducing effective impervious surfaces within urban growth boundaries	X													X	X				
Vancouver	Habitat	Prevent floodplain impacts from new development through land use controls and Best Management Practices	X													X	X				
Vancouver	Habitat	Review and adjust operations to ensure compliance with the Endangered Species Act; examples include roads, parks, and weed management	X													X	X				
WADA	Habitat	Assist in the development and promote the implementation of Best Agricultural Practices for the protection and restoration of watershed functions, riparian conditions, habitat and water quality	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
WADA	Habitat	Build upon existing efforts to implement regulatory controls relating to Best Management Practices for agriculture	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Wahkiakum Co	Estuary	Protect and restore riparian condition and function	X																		
Wahkiakum Co	Estuary	Restore connectedness between river and floodplain	X																		
Wahkiakum Co	Estuary	Restore tidal swamp and marsh habitat in the estuary and tidal freshwater portion of the lower Columbia River	X																		
Wahkiakum Co	Habitat	Assess the impact of fish passage barriers throughout the County and restore access to potentially productive			X	X	X														

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		habitats																			
Wahkiakum Co	Habitat	Expand standards in local land use plans and controls to afford adequate protections of ecologically important areas (i.e. stream channels, riparian zones, floodplains, CMZs, wetlands, unstable geology)	X		X	X	X														
Wahkiakum Co	Habitat	Increase technical assistance to landowners and increase landowner participation in conservation programs that protect and restore habitat and habitat-forming processes. Includes increasing the incentives (financial or otherwise) and increasing program marketing and outreach	X	X	X	X	X														
Wahkiakum Co	Habitat	Manage future growth and development patterns to ensure the protection of watershed processes. This includes reducing effective impervious surfaces and limiting the conversion of resource lands to developed uses through land use controls and incentives	X		X	X	X														
Wahkiakum Co	Habitat	Prevent floodplain impacts from new development through land use controls and Best Management Practices	X		X	X	X														
Wahkiakum Co	Habitat	Review and adjust operations to ensure compliance with the Endangered Species Act; examples include roads, parks, and weed management	X		X	X	X										X	X			
Wahkiakum Health Districts	Habitat	Assess and require upgrade or replacement of on-site sewage systems that may be contributing to water quality impairment	X		X	X	X														
Washougal	Habitat	Develop and implement stormwater management practices needed to protect	X														X				

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		stream flows and water quality																			
Washougal	Habitat	Expand standards in local land use plans and controls to afford adequate protections of ecologically important areas (i.e. stream channels, riparian zones, floodplains, CMZs, wetlands, unstable geology)	X														X				
Washougal	Habitat	Increase technical assistance to landowners and increase landowner participation in conservation programs that protect and restore habitat and habitat-forming processes. Includes increasing the incentives (financial or otherwise) and increasing program marketing and outreach	X														X				
Washougal	Habitat	Manage existing and future water supplies consistent with WRIA 27/28 Watershed Management Plan recommendations															X				
Washougal	Habitat	Manage future growth and development patterns to ensure the protection of watershed processes. This includes reducing effective impervious surfaces	X														X				
Washougal	Habitat	Prevent floodplain impacts from new development through land use controls and Best Management Practices	X														X				
Washougal	Habitat	Review and adjust operations to ensure compliance with the Endangered Species Act; examples include roads, parks, and weed management	X														X				
WDFW	All	Participate in the development and implementation of a coordinated regional monitoring program for action implementation, action effectiveness, and biological and habitat status	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

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WDFW	Ecol	Consider ecological functions of salmon, including nutrients in establishing escapement goals		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
WDFW	Ecol	Continue to manage predation by avian predators, such as Caspian Terns, to avoid large increases in salmon predation while also protecting the viability of predator populations	X																		
WDFW	Ecol	Continue to manage the northern pikeminnow fishery to help offset increased predation on salmon that resulted from habitat alteration	X																		
WDFW	Ecol	Establish a moratorium on intentional introductions of aquatic species and importation of high-risk species	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
WDFW	Ecol	Evaluate positive and negative impacts of American shad on salmon, sturgeon, and other species as well as the feasibility and advisability of shad management measures	X																		
WDFW	Ecol	Experimentally evaluate nutrient enrichment programs (LLT) and risks using fish from hatcheries or suitable analogs.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
WDFW	Ecol	Implement regulatory, control, and education measures to prevent additional species invasions	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
WDFW	Ecol	Manage established populations of introduced gamefish to limit or reduce significant predation or competition risks to salmon, and to optimize fishery benefits within these constraints	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
WDFW	Ecol	Take proactive steps to control or reduce the impacts of introduced, invasive, or exotic species	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

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WDFW	Estuary	Improve understanding of interrelationships among fish, wildlife, and limiting habitat conditions in the estuary and lower mainstem	X																		
WDFW	Estuary	Increase tagging and other marking studies to determine the origin, estuarine habitat use, survival, and migration patterns of various salmonid populations	X																		
WDFW	Habitat	Assess the impact of fish passage barriers throughout the region and restore access to potentially productive habitats on WDFW lands. Track the location of barriers on SalmonScape	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
WDFW	Habitat	Assist in evaluation and solution of fish passage and sediment issues at the Sediment Retention Structure on the NF Toutle								X											
WDFW	Habitat	Conduct floodplain restoration where feasible along the mainstem and in major tributaries that have experienced channel confinement. Build partnerships with landowners and agencies and provide financial incentives	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
WDFW	Habitat	Create and/or restore lost side-channel/off-channel habitat for salmonids	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
WDFW	Habitat	Increase funding available to purchase easements or property in sensitive areas in order to protect watershed function where existing programs are inadequate	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
WDFW	Habitat	Increase technical assistance to landowners and increase landowner participation in conservation programs that protect and restore habitat and habitat-forming processes. Includes	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

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		increasing incentives (financial or otherwise) and increasing program marketing and outreach																			
WDFW	Habitat	Increase the level of implementation of habitat enhancement projects in high priority reaches and subwatersheds. This includes building partnerships, providing incentives to landowners, and increasing funding	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
WDFW	Habitat	Monitor and enforce fish harrassment laws throughout the region	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
WDFW	Habitat	Monitor and evaluate hydroelectric licensing for volitional passage, hatchery, and habitat milestones to ensure compliance						X	X				X	X							
WDFW	Habitat	Monitor and evaluate hydro-regulated stream flows in the NF Lewis and Cowlitz Subbasins						X					X								
WDFW	Habitat	Proactively conduct floodplain restoration on lands being phased out of agricultural production. Survey landowners, build partnerships, and provide financial incentives	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
WDFW	Habitat	Provide techical assistance to Ecology relative to instream flow rule-making consistent with recommendations of the WRIA 25/26 and WRIA 27/28 Planning Units		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X			
WDFW	Harvest	Address technical and policy issues regarding mass marking and help develop programs to mark and monitor recovery of fall Chinook in fisheries and escapement	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
WDFW	Harvest	Columbia River Compact agencies will evaluate effectiveness of the current	X	X	X	X	X	X			X	X	X		X	X	X	X			

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		time and area management strategy for chum salmon protection in the commercial fishery																			
WDFW	Harvest	Conduct periodic reviews of fall Chinook harvest relative to habitat productivity and capacity to assure harvest objectives are synchronized with habitat changes		X	X	X	X	X		X	X	X	X		X	X	X	X	X	X	
WDFW	Harvest	Consider and expressely evaluate sliding scale harvest based on annual abundance indicators for naturally-spawning Columbia River coho		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
WDFW	Harvest	Consider and expressly evaluate the potential for a sliding scale harvest plan based on annual abundance indicators for tule fall Chinook		X	X	X	X	X		X	X	X			X	X	X	X	X	X	
WDFW	Harvest	Consider recovery goals for lower Columbia salmon and steelhead populations as identified in the Lower Columbia Recovery Plan in annual fishery management processes	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
WDFW	Harvest	Continue to improve gear and regulations to minimize incidental impacts to naturally-spawning steelhead	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
WDFW	Harvest	Continue to monitor Columbia River selective fisheries and provide estimates of impacts to naturally produced lower Columbia spring Chinook							X			X		X							
WDFW	Harvest	Develop a basin wide fish marking plan for hatchery tule fall Chinook that is adequate for monitoring interception rates in specific fisheries, tributary harvest management, and monitoring escapement of naturally-spawning fish		X	X	X	X	X		X	X	X			X	X	X	X	X	X	
WDFW	Harvest	Develop a lower Columbia naturally-							X			X		X							

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		spawning spring Chinook harvest rate plan for management of Columbia River fisheries at such time as significant populations are re-established																			
WDFW	Harvest	Develop a mass marking plan for hatchery tule Chinook for tributary harvest management and for naturally-spawning escapement monitoring		X	X	X	X	X		X	X	X			X	X	X	X	X	X	
WDFW	Harvest	Develop a more detailed process for in-season monitoring of stock specific harvest of fall Chinook in the Columbia River		X	X	X	X	X		X	X	X	X		X	X	X	X	X	X	
WDFW	Harvest	Develop gear and handling techniques, as well as regulatory options in both commercial and sport fisheries, to minimize selective fishery impacts to naturally-spawning spring Chinook.							X			X		X							
WDFW	Harvest	Develop more specific chum management details for pre-season and in-season management of the late fall commercial fishery	X	X	X	X	X	X			X	X	X		X	X	X	X			
WDFW	Harvest	Ensure that scientific review of Lower Columbia Recovery Plan harvest objectives and current ESA management objectives will occur as part of the process in the above fishery forums	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
WDFW	Harvest	Establish specific naturally-spawning steelhead encounter triggers for in-season Columbia River fishery adjustments needed to support lower Columbia recovery goals and strategies	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
WDFW	Harvest	Improve tools to monitor and evaluate fishery catch to assure impacts to naturally-spawning fall Chinook are maintained within agreed limits		X	X	X	X	X		X	X	X	X		X	X	X	X	X	X	

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WDFW	Harvest	Maintain selective sport fisheries in ocean, Columbia River, and tributaries and monitor naturally-spawning stock impacts	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
WDFW	Harvest	Manage Columbia River commercial fisheries by time, area, and gear to target hatchery fish and minimize impacts to naturally spawning spring chinook							X			X		X							
WDFW	Harvest	Manage Columbia River commercial fisheries managed by time, area, and gear to target on hatchery fish and minimize impacts to naturally-spawning coho	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
WDFW	Harvest	Manage Columbia River commercial fisheries managed by time, area, and gear to target on hatchery fish and minimize impacts to naturally-spawning steelhead	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
WDFW	Harvest	Manage ocean, Columbia River, and tributary fisheries to meet the spawning escapement goal for lower Columbia bright fall Chinook											X								
WDFW	Harvest	Monitor and evaluate commercial and sport impacts to naturally-spawning steelhead in salmon and hatchery steelhead target fisheries	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
WDFW	Harvest	Monitor and evaluate handling mortality impacts to released naturally-spawning spring Chinook in Columbia River fisheries							X			X		X							
WDFW	Harvest	Monitor chum handle rate in tributary winter steelhead and late coho sport fisheries	X	X	X	X	X	X			X	X	X		X	X	X	X			
WDFW	Harvest	Monitor naturally-spawning steelhead handle rate in tributary salmon and	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

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		steelhead fisheries																			
WDFW	Harvest	Research and employ best available technology to reduce incidental mortality of non-target fish in selective fisheries	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
WDFW	Harvest	Review and evaluate the harvest management strategy developed for protection of naturally-spawning Clackamas late coho to also protect naturally-spawning Washington late coho	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
WDFW	Harvest	Review of NOAA Fisheries' recovery exploitation rate of fall Chinook tules and update risk assessment to include more tule populations		X	X	X	X	X		X	X	X			X	X	X	X	X	X	
WDFW	Harvest	Revise or adjust ESA Fishery Management Plans for lower Columbia ESUs as needed to support the Lower Columbia Recovery goals and priorities	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
WDFW	Harvest	Seek commitment from agencies and tribes in the Pacific Fisheries Management Council, North of Falcon, and Columbia River Compact processes to specifically manage annually for lower Columbi naturally-spawning tule fall Chinook and to establish a collaborative US policy position for the international table at the Pacific Salmon Commission		X	X	X	X	X		X	X	X			X	X	X	X	X	X	
WDFW	Harvest	Seek to maintain and/or establish adequate resources, priorities, regulatory frameworks, and coordination mechanisms for effective enforcement of fishery rules and regulations for the protection of fish and wildlife resources	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

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WDFW	Harvest	Work through U.S. v. Oregon and with Columbia River treaty Indian tribes to develop harvest plans for Wind River summer steelhead																	X		
WDFW	Hatchery	Assess the risks and benefits posed by artificial production programs using WDFW's Benefit-Risk Assessment Procedure (BRAP)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
WDFW	Hatchery	Assist in the design hatchery programs to be consistent with region-wide recovery and the ecological context of the watershed, including the characteristics of the habitat and the natural fish populations	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
WDFW	Hatchery	Continue to enhance Chum enhancement at Grays and Chinook hatcheries			X																
WDFW	Hatchery	Develop additional supplementation programs for chum	X	X	X	X	X	X			X	X	X		X	X	X	X	X	X	X
WDFW	Hatchery	Develop and apply hatchery brood stock watershed transfer policies for chum	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
WDFW	Hatchery	Develop and apply hatchery brood stock watershed transfer policies for spring Chinook							X			X		X							
WDFW	Hatchery	Develop and apply hatchery brood stock watershed transfer policies for steelhead	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
WDFW	Hatchery	Develop coho transfer policies as local brood stock is developed	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
WDFW	Hatchery	Develop criteria for appropriate integration of hatchery and natural populations	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
WDFW	Hatchery	Develop criteria for appropriate mix of first generation hatchery spawners and naturally-spawning spawners for each		X	X	X	X	X		X	X	X	X		X	X	X	X	X	X	

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		population with hatchery and naturally-spawning fall Chinook production, and reduce first generation spawners as appropriate																			
WDFW	Hatchery	Develop hatchery supplementation programs for coho	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
WDFW	Hatchery	Develop local brood stocks for coho	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
WDFW	Hatchery	Develop marking programs to assure that hatchery-produced fish to assure they are identifiable for harvest management and escapement accounting	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
WDFW	Hatchery	Develop plans for future hatchery programs relationship with reestablished natural-origin spring Chinook populations, including integrated and segregated options							X			X		X							
WDFW	Hatchery	Document and formalize hatchery operations through the use of the existing Hatchery Genetic Management Planning (HGMP) process	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
WDFW	Hatchery	Establish naturally-spawning production sanctuary areas to be used for coho indicator stock programs	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
WDFW	Hatchery	Guide the configuration of hatchery programs with appropriate reform recommendations identified in the Northwest Power and Planning Council's Artificial Production Review and Evaluation (APRE), the Benefit-Risk procedure developed by WDFW, and other tools	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
WDFW	Hatchery	Hatchery brood stock watershed transfer policies for chum	X	X	X	X	X	X			X	X	X		X	X	X	X	X	X	X
WDFW	Hatchery	Hatchery brood stock watershed transfer	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

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		policies for steelhead																			
WDFW	Hatchery	Late winter steelhead brood stock development at Elochoman, Cowlitz, Kalama, and Lewis hatcheries				X		X				X	X								
WDFW	Hatchery	Mark coho hatchery harvest production	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
WDFW	Hatchery	Mark hatchery fall Chinook fish in priority watersheds to promote fishery utilization, facilitate the utilization of natural-origin fish in integrated programs, and enumerate hatchery fish in natural spawning areas		X	X	X	X	X		X	X	X	X		X	X	X	X	X	X	
WDFW	Hatchery	Mark spring chinook hatchery production for identification and harvest							X			X		X							
WDFW	Hatchery	Mark steelhead harvest production	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
WDFW	Hatchery	Maximize harvest and removal of non-local summer and early winter steelhead						X	X								X				
WDFW	Hatchery	Operate hatcheries to promote region-wide recovery through the application of appropriate risk containment measures for: 1) hatchery origin adults returning to natural spawning areas, 2) release of hatchery juveniles, 3) handling of natural origin adults at hatchery facilities, 4) water quality and effective disease control, and 5) mixed stock fisheries	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
WDFW	Hatchery	Promote public education concerning the role of hatcheries in the protection of natural populations	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
WDFW	Hatchery	Promote region-wide recovery by using hatcheries as tools for supplementation and recovery in appropriate watersheds	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
WDFW	Hatchery	Reintroduce coho in upper Cowlitz and upper Lewis rivers							X					X							

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WDFW	Hatchery	Reintroduce spring Chinook in upper Cowlitz and Lewis beginning with hatchery supplementation							X					X							
WDFW	Hatchery	Reintroduce winter steelhead in upper Cowlitz and Lewis rivers							X					X							
WDFW	Hatchery	Seek flexibility in current funding to assure hatcheries have the resources to achieve complementary harvest and natural production objectives	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
WDFW	Hatchery	Use adaptive management to ensure that hatchery programs to respond to new knowledge of how to further protect and enhance natural production and improve operational efficiencies	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
WDFW	Hatchery	Use complementary conservation/harvest programs with local steelhead stocks	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
WDFW	Hatchery	Use DNA data to select appropriate brood stock for chum	X	X	X	X	X	X			X	X	X		X	X	X	X	X	X	X
WDFW	Hatchery	Use fall chinook juvenile release strategies to minimize naturally-spawning fish interactions		X	X	X	X	X		X	X	X	X		X	X	X	X	X	X	
WDFW	Hatchery	Use hatcheries for chum enhancement and risk management in the lower Columbia River Gorge																	X	X	X
WDFW	Hatchery	Use hatchery operation strategies to protect Lewis naturally-spawning fall Chinook											X	X							
WDFW	Hatchery	Use hatchery releases of fall Chinook in watersheds without hatchery programs only occur if necessary for recovery of the natural population		X	X	X	X	X		X	X	X	X		X	X	X	X	X	X	
WDFW	Hatchery	Use juvenile release strategies of spring Chinook to minimize impacts to							X			X		X							

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		naturally-spawning populations																			
WDFW	Hatchery	Use juvenile release strategies to minimize impacts to naturally-spawning for steelhead.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
WDFW	Hatchery	Use juvenile release strategies to minimize interaction with naturally-spawning coho.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
WDFW	Hatchery	Use of hatcheries for chum enhancement and risk management		X	X	X	X	X			X	X	X		X	X	X	X	X	X	X
WDFW	Hatchery	Use only local watershed fall Chinook broodstock only in hatchery programs		X	X	X	X	X		X	X	X	X		X	X	X	X	X	X	
WDFW	Hatchery	Utilize facilities for spring Chinook reintroduction efforts							X			X		X							
WDFW	Hydro	Evaluate and adaptively implement anadromous fish reintroduction upstream of Cowlitz and Lewis dams and facilities as part of relicensing processes or requirements						X	X				X	X							
WDNR	All	Participate in the development and implementation of a coordinated regional monitoring program for action implementation, action effectiveness, and biological and habitat status	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
WDNR	Habitat	Assess the impact of fish passage barriers throughout the region and restore access to potentially productive habitats		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
WDNR	Habitat	Conduct forest practices on state lands in accordance with the Habitat Conservation Plan in order to afford protections to riparian areas, sediment processes, runoff processes, water quality, and access to habitats		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
WDNR	Habitat	Fully implement and enforce the Forest		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

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		Practices Rules (FPRs) on private timber lands in order to afford protections to riparian areas, sediment processes, runoff processes, water quality, and access to habitats																			
WDNR	Habitat	Increase technical assistance to landowners and increase landowner participation in conservation programs that protect and restore habitat and habitat-forming processes. Includes increasing incentives (financial or otherwise) and increasing program marketing and outreach		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
WDNR	Habitat	Increase technical support and funding to small forest landowners faced with implementation of Forest Practices Rules to ensure full and timely compliance with regulations		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
WDOE	All	Participate in the development and implementation of a coordinated regional monitoring program for action implementation, action effectiveness, and biological and habitat status	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
WDOE	Estuary	Limit the effects of toxic contaminants on salmonid and wildlife fitness and survival in the Columbia River estuary, lower mainstem, and near shore ocean	X																		
WDOE	Habitat	Assist in the development and promote the implementation of Best Agricultural Practices for the protection and restoration of watershed functions, riparian conditions, habitat and water quality	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
WDOE	Habitat	Assist local governments in protecting floodplains from future development through development of Best	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

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		Management Practices guidelines																			
WDOE	Habitat	Implement priorities of the Watershed Planning Unit regarding TMDLs			X	X	X	X	X	X	X	X	X	X	X	X	X	X			
WDOE	Habitat	Initiate instream flow rule-making in the lower Columbia region consistent with recommendations from the WRIA 25/26 and WRIA 27/28 Planning Units		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
WDOE	Habitat	Expand standards in local land use plans and controls to afford adequate protections of ecologically important areas (i.e. stream channels, riparian zones, floodplains, CMZs, wetlands, unstable geology)						X								X	X	X			
WDOE	Habitat	Monitor and enforce stream flows in hydro-regulated streams to ensure critical components of natural flow regimes						X					X								
Winlock	Habitat	Expand standards in local land use plans and controls to afford adequate protections of ecologically important areas (i.e. stream channels, riparian zones, floodplains, CMZs, wetlands, unstable geology)						X													
Winlock	Habitat	Increase technical assistance to landowners and increase landowner participation in conservation programs that protect and restore habitat and habitat-forming processes. Includes increasing the incentives (financial or otherwise) and increasing program marketing and outreach						X													
Winlock	Habitat	Manage existing and future water supplies consistent with WRIA 25/26 Watershed Management Plan recommendations						X													

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Winlock	Habitat	Manage future growth and development patterns to ensure the protection of watershed processes. This includes reducing effective impervious surfaces						X													
Winlock	Habitat	Prevent floodplain impacts from new development through land use controls and Best Management Practices						X													
Winlock	Habitat	Review and adjust operations to ensure compliance with the Endangered Species Act; examples include roads, parks, and weed management						X													
Woodland	Habitat	Assess the impact of fish passage barriers within the City's jurisdiction and restore access to potentially productive habitats											X								
Woodland	Habitat	Develop and implement stormwater management practices needed to protect stream flows and water quality											X								
Woodland	Habitat	Expand standards in local land use plans and controls to afford adequate protections of ecologically important areas (i.e. stream channels, riparian zones, floodplains, CMZs, wetlands, unstable geology)											X								
Woodland	Habitat	Implement the recommendations of the Watershed Planning Unit regarding water quality											X								
Woodland	Habitat	Increase technical assistance to landowners and increase landowner participation in conservation programs that protect and restore habitat and habitat-forming processes. Includes increasing the incentives (financial or otherwise) and increasing program marketing and outreach											X								

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Woodland	Habitat	Manage future growth and development patterns to ensure the protection of watershed processes. This includes reducing effective impervious surfaces											X								
Woodland	Habitat	Prevent floodplain impacts from new development through land use controls and Best Management Practices											X								
Woodland	Habitat	Review and adjust operations to ensure compliance with the Endangered Species Act; examples include roads, parks, and weed management											X								
WRIA 25/26 Planning Unit	Habitat	Implement recommendations of the WRIA 25/26 Planning Unit through identification of funding, coordination, and monitoring of progress			X	X	X	X	X	X											
WRIA 27/28 Planning Unit	Habitat	Implement recommendations of the WRIA 27/28 Planning Units through identification of funding, coordination, and monitoring of progress									X	X	X	X	X	X	X	X			
WSDOT	Habitat	Assess the impact of fish passage barriers throughout the region and restore access to potentially productive habitats	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
WSDOT	Habitat	Fully implement the Environmental Mitigation Program consistent with the lower Columbia salmon recovery plan	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Yakama Nation	Habitat	Increase technical assistance to landowners and increase landowner participation in conservation programs that protect and restore habitat and habitat-forming processes. Includes increasing incentives (financial or otherwise) and increasing program marketing and outreach							X					X					X	X	X
Yakama Nation	Habitat	Increase the level of implementation of							X					X					X	X	X

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		habitat enhancement projects in high priority reaches and subwatersheds. This includes building partnerships, providing incentives to landowners, and increasing funding																			