Response to Public Comments Received regarding the Middle Columbia River Steelhead Distinct Population Segment ESA Recovery Plan and Its Appendices (the Management Unit Plans)

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Introduction

The Middle Columbia River Steelhead Distinct Population Segment ESA Recovery Plan (Recovery Plan) is the product of a four-year regional collaborative process involving Federal, state, Tribal, and local entities and a wide variety of stakeholders. The Recovery Plan is based upon the work of a regional team of scientists (the Interior Columbia Technical Recovery Team [ICTRT]) convened by NMFS and four regional recovery plans (the management unit plans) developed by local and regional planners to cover the entire range of the Middle Columbia River steelhead, anadromous fish that spawn in tributaries on both the Oregon and Washington sides of the Columbia River. The management unit plans, in turn, are based on the subbasin plans developed under the Northwest Power and Conservation Council's Fish and Wildlife Program.

The Draft Recovery Plan went through repeated reviews and revisions in response to comments from both the scientific team and the Middle Columbia Recovery Forum (Mid-C Forum), a group convened by NMFS to provide input on the development of the Recovery Plan. Participants in the Mid-C Forum include the Oregon Department of Fish and Wildlife (ODFW), Washington Department of Fish and Wildlife (WDFW), the Yakama Nation, Confederated Tribes of the Warm Springs Indian Reservation, Confederated Tribes of the Umatilla Indian Reservation, Washington Governor's Salmon Recovery Office, Oregon Governor's Natural Resources Office, Snake River Salmon Recovery Board, Yakima Basin Fish and Wildlife Recovery Board, US Bureau of Reclamation (BOR), US Fish and Wildlife Service (USFWS), US Forest Service (USFS), US Army Corps of Engineers (COE), Klickitat County, and NMFS Northwest Region. The Draft Recovery Plan, including the four management unit plans and two scientific reports (McClure et al. 2003; ICTRT 2007) that provide the scientific basis for the Recovery Plan, was made available for public review as a Proposed Recovery Plan. NMFS revised the Proposed Recovery Plan in response to public comments, including comments from the ICTRT as peer reviewers.

NMFS received 38 comment letters by mail, fax, or email on the Recovery Plan from a variety of sources, including local, state, and Federal government entities, tribes, nonprofit organizations and interest groups, and interested individuals. Public hearings were held between November 18 and December 11, 2008, in eight locations in Washington and Oregon. All comments were transcribed. Comments received dealt with the DPS plan and the individual management unit plans.

NMFS reviewed all comments received for substantive issues and new information, and addresses as many of them as practicable in the following summary. NMFS has revised the Recovery Plan as appropriate, and the management unit leads have revised their respective plans. Given limited staff and budget and the breadth, depth, and detail of the comments, it was not possible to respond individually to all. For readers' convenience we have assigned comments to major issue categories and, where possible, have combined similar comments into single comments and

responses. Detailed editorial comments or minor corrections are not addressed here but were considered and acted upon as appropriate. The revised Recovery Plan is now the final plan; the ESA Recovery Plan for Middle Columbia River steelhead is available at the following website: http://www.nwr.noaa.gov/Salmon-Recovery-Planning/Recovery-Domains/Interior-Columbia/Mid-Columbia/Mid-Col-Plan.cfm

NMFS acknowledges the high quality of the comments and the great care with which so many individuals and organizations responded to the Recovery Plan. Steelhead and salmon are important to the people of the Pacific Northwest, and NMFS recognizes that public participation is essential to the task of protecting this precious natural resource. Most commenters offered praise and support for implementation of the Recovery Plan along with detailed and thoughtful critiques. The Recovery Plan is the product of four years of work on the part of numerous state, Tribal, local, and Federal organizations and individuals throughout the Middle Columbia region, supported by funding from state and Federal sources through the Northwest Power and Conservation Council, the Salmon Recovery Funding Board, [WHAT ELSE?] and additional funding from local jurisdictions. As such, the Recovery Plan is a remarkable public achievement, and NMFS intends to move forward to the long-term collaboration that will be necessary to implement it.

Many organizations and agencies offered support to implement the Recovery Plan, including finding and securing funding, collaborating on local projects, further research and development of innovative strategies, defining incentives for private and public landowners, participating in the adaptive management process, and many other aspects of the effort that will be required. NMFS welcomes these offers and commitments and looks forward to working with the organizations and individuals involved.

References cited:

Interior Columbia Technical Recovery Team (ICTRT). 2007 Viability Criteria for Application to Interior Columbia Basin Salmonid ESUs. Review draft March 2007. Available at: http://www.nwfsc.noaa.gov/trt/trt_viability.cfm

McClure, M. M., E. E. Holmes, B. L. Sanderson, and C. E. Jordan. 2003. A large-scale, multi-species status assessment: Anadromous salmonids in the Columbia River basin. Ecol. Appl. 13(4):964–989.

I. Middle Columbia River Steelhead DPS Plan

General Comments

1. Comment: NMFS is currently evaluating the reintroduced steelhead population above the Pelton Round Butte dam complex under section 10(j) of the ESA. This should be discussed in the Plan.

***Response**:* As the commenter describes, NMFS is currently developing rulemaking under ESA Section 10(j) to designate steelhead reintroduced above the Pelton Round Butte dam complex as an experimental population. This would provide ESA coverage from take liability for lawful actions during the time frame identified in the rulemaking. There will be a public process associated with the proposed rule, including the opportunity for public comment. NMFS will evaluate section 10(j) designations as an option on a case-by-case basis when and if reintroductions occur in other systems.

2. Comments: NMFS is asked to edit the recovery plan to acknowledge that actions to meet section 7(a)(1) of the ESA should not be described as Federal action agency "obligations" since actions under section 7(a)(1) are discretionary.

***Response**:* The language in Section 7(a)(1) of the ESA uses the term "shall" to define Federal action agencies' responsibilities to use their authorities, in coordination with NMFS, to carry out programs for the conservation of endangered and threatened species. NMFS interprets this language as a positive "obligation" of Federal action agencies. Conservation is defined as the use of any and all methods and procedures to bring the listed species to the point that measures pursuant to the ESA are no longer necessary (i.e., they are recovered). We agree that any specific recommendations that NMFS may make to the Federal action agency to carry out this statutory obligation are discretionary, as compared to mandatory measures we may provide in consultations to avoid jeopardy or minimize incidental take pursuant to Section 7(a)(2). While we encourage Federal action agencies to help fulfill their section 7(a)(1) obligation by proactively implementing recovery plans, we have revised the language in the recovery plan to differentiate between the 7(a)(1) and 7(A)(2) requirements for specific actions, as suggested in the comments.

3. Comment: NMFS is asked to work with the U.S. Forest Service (FS) and the Bureau of Land Management (BLM) to develop streamlined ESA section 7(a)(2) consultation procedures to implement recovery strategies and management actions in the Recovery Plan.

***Response**:* NMFS agrees and will continue to work with the FS and BLM as they implement actions in this recovery plan to determine whether there are categories of recovery actions not previously included in programmatic

consultations that may be eligible for consideration in future programmatic consultations. NMFS spent considerable effort to cooperatively develop a regional programmatic consultation for aquatic restoration actions proposed by the FS and BLM. A primary goal for this effort was to identify as many types of restoration actions as possible for inclusion in the programmatic biological opinion, recognizing that some types of restoration actions are not appropriately addressed programmatically. This aquatic restoration programmatic biological opinion is still actively in use in the region (Bureau of Land Management 2007). Recovery actions identified in recovery plans are not described in sufficient detail for the recovery plan to serve as the Section 7(a)(2) consultation document, nor are there statutory or regulatory provisions to waive consultation for recovery actions.

4. Comment: Recovery plans are not considered as a source of "expectations" or "goals" in section 7 consultations.

***Response**:* In this context, NMFS does not mean that the recovery plan sets goals and expectations for a specific action undergoing consultation. NMFS intends for goals and expectations identified in a recovery plan for moving a species towards recovery to potentially serve multiple useful roles in consultations. The NMFS NWR developed an interim guidance document describing the many ways that recovery plans may be integrated into section 7 project consultations. This document describes a number of ways that expectations and goals from the recovery plan (e.g., limiting factors, viability criteria, recovery scenarios) may be considered in section 7 consultations. For example:

- Limiting factors. Consultation documents can consider how a proposed action is likely to affect the limiting factors identified in the recovery plan. Would the effects of the proposed action tend to exacerbate, alleviate, or have no effect on the limiting factors?
- Species viability. Consultation documents may evaluate how a proposed action is likely to affect the species' likelihood of meeting its abundance, productivity, spatial structure, and diversity criteria.
- Recovery actions. Consultation documents may discuss a proposed action's relationship to strategies and actions identified for in the recovery plan. Would the proposed action affect opportunities to implement recovery actions identified in the plan for this species?
- Avoiding jeopardy. If a proposed action is found to jeopardize listed species or adversely modify critical habitat, recovery plans may provide actions that, if included in an RPA, would allow the proposed action to proceed without jeopardizing the species or adversely modifying critical habitat.
- Avoiding Incidental Take. If a proposed action is found to cause incidental take and recovery plans recommend actions that could contribute to avoiding or minimizing take, those actions may be included as reasonable and prudent measures and terms and conditions.

5. Comment: Clarification offered on how action effects on populations are considered in consultation documents: Consultation documents are required to determine the effect of an action on individuals of a population and their analysis is limited to the action area, not the entire area occupied by a population.

***Response**:* NMFS appreciates the clarification, and revised the document accordingly, i.e., added the words "individuals of" before "populations" in the relevant passage and also confirmed that the effects are pertinent to the action area.

6. Comment: Delete the section on how NMFS intends to use the Plan.

***Response**:* NMFS believes this section is useful and has kept it in the final Plan with minor modifications.

7. Comment: Note that the September 24, 2008, Federal Register Notice and the proposed Mid C DPS Plan do not identify whether NMFS has sought independent peer review of the draft recovery plan during the review and comment period.

***Response**:* The Interior Columbia Technical Recovery Team submitted comments on the Proposed Plan as peer reviewers. NMFS addressed these comments in this Response to Comments published on the NMFS Northwest Region website, and also made additions and revisions to the plan as appropriate in response to this review. Language to that effect has been added to the Executive Summary and main body of document.

8. Comment: The commenter is concerned that NMFS has revised recovery plans without describing out-of-subbasin threats (e.g., hatcheries, harvest, and hydro-power) with the same level of detail or with as strong an emphasis as for threats within tributary habitat.

***Response**:* NMFS has, since publication of the Proposed Plan, strengthened discussions of out-of-subbasin limiting factors and the strategies and actions to address them.

9. Comment: Will NMFS incorporate into the final DPS Plan the actions contained in the Hydro Module (which summarizes actions in the FCRPS Biological Opinion), the Hatchery Scientific Review Group's (HSRG) work, and hatchery management plans? Also, the additional hydro actions proposed by the State of Oregon in its dissenting view are confusing to the reader.

***Response**:* The FCRPS actions contained in the Biological Opinion (and Hydro Module) and actions identified by HSRG or hatchery management plans are incorporated by reference in the recovery plan; thus, they are part of the Plan.

NMFS regrets any confusion that may be generated by the addition of the actions proposed by the State of Oregon in its dissenting view; however, since

the Recovery Plan is intended to represent consensus among the participants, it is important to be transparent where the entities are in disagreement.

10. Comment: Because most of the Middle Columbia steelhead region is privately owned (64 percent), the actions of individuals on their land and codes/ordinances promoting conservation by cities and counties should not be discounted. In the face of population growth and development pressures, demand for water and desires to increase commodity production from the land, private landowners, communities, and counties must make a significant contribution to the recovery of Mid-C steelhead. This need should be acknowledged in the recovery plan.

***Response**:* NMFS agrees. The following sentence has been added to the introduction of the Executive Summary and the main body of the document:

"While Federal, state, and tribal entities can make major contributions to the recovery of Middle Columbia steelhead, the actions of individuals on their land, as well as city and county codes and ordinances promoting conservation, are also essential."

11. Comment: The DPS Plan lacks benchmarks or specific targets to gauge progress toward meeting viability criteria or recovery objectives. In addition, the plan does not identify alternatives if recommended measures are not working.

***Response**:* NMFS agrees that it would be useful if the DPS Plan contained benchmarks or specific targets to gauge progress toward meeting objectives. Chapter 10 of the DPS Plan calls for research, monitoring, and evaluation (RM&E) plans specific to each management unit to answer questions pertaining to progress toward recovery. The Middle Columbia science team under the Middle Columbia implementation organizational structure will be challenged with this effort when they have been formed.

At this time, the Plan does not recommend alternatives if measures are not working. However, NMFS plans to develop an adaptive management framework to guide changes in direction in response to RM&E results. The adaptive management plan will be developed after the DPS Plan has been finalized and when a science team has been established.

12. Comment: Is there a centralized document that identifies and prioritizes all existing barriers and blockages (culverts, dams, diversions) throughout the range of the DPS?

***Response**:* At this time NMFS is not aware of any centralized document; however, WDFW and ODFW should be the best sources of information for their respective states.

13. Comment: The Plan should include a life cycle mortality index for steelhead. The index would include such factors as dam and reservoir mortality, predation, fishing, prespawning mortality, and ocean survival.

> ***Response**:* A life cycle mortality index was used in Chapter 9 to evaluate the potential effects of proposed recovery actions on the abundance and productivity of Middle Columbia steelhead. EDT (Ecosystem Diagnosis and Treatment) and AHA (All-H Analyzer) models were used to estimate survival in the various life stages from juvenile to adult.

14. Comment: While the Plan is thorough and well written, nearly identical conclusions and recommendations were reached in planning efforts in previous decades, yet implementation has been slow. Because of that history, the commenter believes consensus-building efforts are important.

> ***Response**:* NMFS agrees that previous planning efforts focused on many of the same limiting factors and resulted in conclusions similar to this recovery plan. In fact, a key approach used to develop this Plan was to build on previous information and incorporate new science when available, such as the new technical approach developed by the Interior Columbia Technical Recovery Team (ICTRT). This Plan, however, differs from previous planning efforts in the Middle Columbia in that it focuses exclusively on developing recovery strategies and actions for the threatened Middle Columbia steelhead.
>
> NMFS also agrees that consensus building is critical to recovery of Middle Columbia steelhead. The DPS Plan is based on local recovery plans developed by regional or local planning groups, primarily through consensus building processes. Information from those local plans was integrated into a DPS-wide recovery plan. We believe that implementation of recovery actions is more likely if the plans use strategies and actions derived at the local level.

15. Comment: The plan should address the impact of plan implementation on other species such as bass and native bull trout. The commenter asked: By focusing on enhancement for steelhead, will these species be further reduced?

> ***Response**:* Chapter 7.4.4 of the Plan addresses the control of predation on juvenile steelhead by piscivorous fish, such as bass and northern pikeminnow, and supports the Independent Scientific Advisory Board (ISAB) recommendation to urge the state agencies to relax (or eliminate) fishing regulations that may be enhancing populations of non-native species. However, the ISAB report also states that maintaining and restoring habitat is actually the best strategy. "When native species are provided with habitat for which they are best adapted, they have an improved chance of out-competing or persisting with non-native species" (ISAB 2008). NMFS does support the reduction of populations of bass and other non-native species to enhance steelhead, but also supports improving habitat to allow natural processes to work.

The USFWS is responsible for developing a recovery plan for bull trout, which are also listed in the Middle Columbia region. The probability of interaction between bull trout and steelhead is high, particularly because there are migrant stocks of bull trout in the region. However, bull trout and steelhead evolved together in the Columbia Basin, and their niches are sufficiently segregated to prevent one species from driving the other to extinction.

16. Comment: The plan should develop methods for rewarding restoration efforts and improved fish production in smaller management units.

***Response**:* NMFS welcomes suggestions on methods for rewarding restoration efforts resulting in improved fish production in management units, but cautions that this could not result in delisting part of a DPS. NMFS can only legally delist the listed unit, which is the DPS.

17. Comment: More consideration and restoration effort should be given to predation, ocean conditions, and harvest.

***Response**:* Recovery of Mid Columbia steelhead will address these important issues. Extensive research on predation and efforts to control predators have been underway in the Columbia Basin for decades. Predator control has included targeted sports fisheries for northern pikeminnow, habitat alterations to reduce tern and cormorant nesting, avian control measures at dams, and lethal and non-lethal marine mammal predation control efforts. The FCRPS BiOp and the Estuary Module (73 FR 161, January 2, 2008), both of which are part of this recovery plan, provide extensive evaluations of these issues as threats and limiting factors as well as specific strategies and actions for both monitoring and addressing these threats.

Furthermore, the most recent *U.S. v. Oregon* agreement on harvest for 2008-2018 will maintain current low impacts on Middle Columbia steelhead in the lower mainstem and treaty mainstem fisheries (See also response to Comments 21 and 22.)

Finally, the commenter was also concerned that consideration be given to ocean conditions. NMFS agrees that this is a very important issue. NMFS recognizes that ocean conditions have had a large impact on adult return rates; for this reason, the analysis of "gaps" between current status and recovery and analysis of the potential effects of proposed recovery actions (Chapter 9) included a range of ocean conditions.

NMFS has clarified the predation and harvest strategies and actions being implemented through a variety of forums (e.g., FCRPS action agencies and *U.S. v. Oregon* parties) in sections 7.4.4 and 7.4.5 of the DPS plan.

18. Comment: An extension of the public comment period was requested in response to statements in the plan that NMFS and ODFW intend to work with local

communities to create a "shared vision" of conservation and broad-sense recovery. The commenters asked for more time so that more of the John Day community could attend meetings and comment.

***Response**:* NMFS and the Oregon Department of Fish and Wildlife (ODFW) responded to each commenter, informing them that, although the public comment period would not be extended, further meetings would be held to during the Plan revision period. NMFS and ODFW met with the commenters to understand the issues they raised and to seek agreement on how the Plan could be revised to address their concerns. Based on follow-up meetings with commenters, the Oregon management unit plan was revised or new text added as appropriate to address these public concerns.

19. Comment: NMFS should integrate more thoroughly the management objectives of this plan with the natural resource objectives of other state and federal agencies to avoid a recovery plan that too narrowly focuses on the needs of just one species and, as a result, at times unnecessarily compromises the needs of other important species, habitats, and resource users.

***Response**:* Section 4(f) of the Endangered Species Act requires that NMFS adopt a recovery plan for each ESA-listed species. Therefore, recovery plans have to be focused on the recovery of one or more listed species. However, the purpose of the ESA, stated in section 2 of the Act, is to provide means whereby the ecosystems upon which these species depend may be conserved. NMFS takes this mandate for an ecosystem approach seriously and the recovery strategies are designed for this purpose. Furthermore, this Plan is built from MU plans that the lead stakeholders designed to meet not only the ESA requirements, but also additional purposes. This Plan was developed in close coordination with state and Federal agencies and land managers over several years to ensure that, where applicable, the Plan is consistent with and complementary to other agency objectives that support steelhead recovery. This Plan references numerous policies and management objectives of other agencies, and includes the actions of relevant agencies to comprehensively address recovery actions for all life stages of steelhead. For example, best management practices from several agencies are used as recovery actions in the Plan. In fact, the steelhead recovery actions identified in this Plan support the conservation of numerous species and habitat other species also depend upon in addition to steelhead.

20. Comment: How will new revisions and mandates by Judge Redden be incorporated into this recovery plan?

***Response**:* Judge Redden's rulings pertain to NMFS' biological opinion (BiOp) on the Federal Columbia River Power System (FCRPS) management actions to be taken by the Bonneville Power Administration, U.S Bureau of Reclamation, and U.S. Army Corps of Engineers (the "action agencies"). The FCRPS BiOp has a number of components that will be included in the recovery plan. The recovery

plan, through its "hydro module," describes potential survival improvements as a result of FCRPS BiOp actions. Also, the final recovery plan will incorporate the FCRPS BiOp actions as important recovery strategies and actions. To the degree that future decisions by Judge Redden result in changed assumptions and/or an amended set of actions, the recovery plan may be updated accordingly.

Harvest

21. Comment: Will harvest management decisions made in the *U.S. v. Oregon* process consider impacts on listed populations.

Response*: U.S. v. Oregon* is the result of the Federal government intervening in Federal court to protect tribal treaty reserved fishing rights in the Columbia Basin, and a 10-year agreement (through 2017) is now in place to govern mainstem Columbia River fishing. Harvest impact is limited to ESA incidental mortality limits set by NMFS. Within these ESA limits, the states and tribes negotiate how harvest will be allocated, with the objective being to balance the catch between them. All of the fisheries are abundance based with higher harvest rates allowed as ESA-listed adult returns increase.

There is a standing technical committee, the TAC (Technical Advisory Committee), to help monitor the fisheries. The TAC, using models, develops pre-season estimates of adult returns, updates these estimates in-season based on dam counts, and monitors the fisheries in season. The fisheries (both state and tribal) are adjusted based on the in-season run forecasts to stay within the ESA impact limits. Most of the time the fisheries take less than the ESA impact limit. The states provide real time updates of the fisheries, accessible to the public via the Internet, during periods of fishing. There is usually a post-season review of the fishery.

To summarize, NMFS sets ESA limits; the states and tribes negotiate how the harvest will be allocated, with the objective being to balance the catch between them.

22. Comment: More detail is needed in the plan on whether harvest and the hatchery production system currently relied upon to support harvest are impeding recovery of the DPS and its component populations. If so, NMFS should call for a re-evaluation of escapement and harvest goals to ensure that the targets are designed to support recovery of the population and sustainability of any harvest program.

Response*:* More detailed information on tributary harvest management and treaty tribal harvest related to ocean impacts has been added to the DPS Plan. The Plan describes the actions that are proposed or ongoing to evaluate whether harvest and hatchery programs are impeding the recovery of the Middle Columbia River steelhead DPS. Section 7.1.6 of the DPS recovery plan

describes the harvest actions to maintain the low fisheries impacts, including management actions by the parties to the *U.S. v. Oregon* agreement, and by the individual states through their Fisheries Management and Evaluation Plans. In addition to the management actions, the DPS Plan includes monitoring and evaluation to reduce uncertainties concerning fisheries impacts on the steelhead.

Section 7.1.4 of the DPS Plan describes the actions that are ongoing or have been recently completed to evaluate hatchery impacts, including work on the Mitchell Act Environmental Impact Statement, the USFWS Hatchery Review Team, Interior Columbia River Technical Review Team, and the Hatchery Scientific Review Group. Information and recommendations developed by these efforts and by others will be considered as NMFS conducts an assessment as part of the ESA consultation process for all hatchery programs in the Middle Columbia River steelhead DPS. The scheduling of the consultation process is required under Hatchery Action RPA 39 of the FCRPS Biological Opinion. Furthermore, hatchery Action RPA 39 requires the evaluation of all of the Federally funded hatchery programs in the Columbia River Basin, including those that contribute hatchery strays that affect Middle Columbia River steelhead populations.

23. Comment: There appears to be a double standard when comparing harvest and hatchery goals with natural escapement goals: Fisheries are sometimes restricted to allow hatcheries to get their brood stock requirement, but fisheries are not restricted to meet natural escapement requirements.

***Response**:* In many fisheries, natural escapement goals do restrict harvest. For example, the escapement goal for wild upriver bright fall Chinook returning to the Hanford Reach has limited fisheries in the ocean and mainstem Columbia River. Another example is Lewis River bright fall Chinook; ocean, mainstem and tributary fisheries are managed to meet the escapement goal in the Lewis River basin. The management unit recovery plans now provide natural escapement goals that were not available in the past for listed populations, and it is expected that these escapement goals will influence harvest management.

24. Comment: Rather than assuming harvest is not a limiting factor on wild steelhead recovery, harvest should be studied and evaluated. The 12 percent harvest impact on Klickitat River steelhead referred to in the plan should be considered a potential limiting factor.

***Response**:* NMFS agrees with the commenter that harvest should continue to be studied and evaluated, although we disagree that harvest is a limiting factor for wild steelhead recovery. The Klickitat Recovery Plan, in Section 5.3, describes the reasoning behind the determination that the harvest rate for Klickitat and Deschutes River summer steelhead, which may exceed 12 percent, is not a key limiting factor.

Section 8.5.4 of the Oregon Steelhead Plan summarizes a modeling study conducted by Chilcote (2001) to evaluate the effect of harvest levels on the survival of 27 Oregon steelhead populations. The model looked at a range of fisheries mortalities from 0 to 75 percent. The results were stated in terms of the probability of population extinction in 50 years at each mortality rate. For most populations, the modeling suggested that the probability of extinction was essentially zero as long as fisheries mortality rates remained less than 30 percent. However, there was significant variation between populations. The probability of extinction increased dramatically as mortality rates became greater than 40 percent. Furthermore, once the probability of extinction increased beyond 0.05, the transition to an extinction probability of 1.00 was very rapid. In other words, once mortality rates increase sufficiently to cause the probability of extinction to exceed 0.05, any additional mortality would cause a rapid increase in the likelihood of extinction. Because the transition from low to high risk happens rapidly, there is little room for error (in the model or the measurements of mortality rates).

To address this concern, ODFW generally manages steelhead fisheries not to exceed a maximum fisheries mortality rate of 20 percent, but it is more conservative when warranted. NMFS (2008b) estimated that for most populations in the MCR Steelhead ESU, harvest impacts from Columbia River tribal and non-tribal fisheries have averaged 8.23 percent for the period from 1998-2007 and are expected to remain at this level (NMFS 2008b, Table 8.8.8.8-1). The combined tributary and mainstem impacts for Klickitat summer steelhead (the highest harvest impact for all MCR steelhead populations) is 14.53 percent of the wild run. This impact is still below the 20 percent fisheries mortality rate identified by Chilcote (2001) and is considered conservative because it assumes a 63 percent wild steelhead encounter rate in the Klickitat River, with a 10 percent catch and release mortality, and because the population is exposed to only part of the tribal mainstem fisheries.

25. Comment: Gill nets should not be allowed in the river, in favor of more selective harvest methods.

***Response**:* The commenter's concern is focused on tribal fisheries in the mainstem Columbia River. The Columbia River Treaty Tribes preserved, and the courts have upheld, their rights to harvest salmon and steelhead. NMFS has defined the total allowable harvest mortality on listed fish. The Tribes, as part of their sovereign rights, can choose the methods of harvest.

26. Comment: There should be fair rules for both sports and commercial fishing. Sportsmen practice catch and release, the commenter said: Why should commercial fishers be allowed to keep unmarked steelhead?

***Response**:* NMFS commercial fishers are not allowed to keep unmarked steelhead. Non-tribal commercial fishers have not been permitted to retain

steelhead since 1975; only tribal fishers can retain steelhead. NMFS (2008b) estimated that for most populations in the MCR Steelhead DPS, harvest impacts from Columbia River tribal and non-tribal fisheries have averaged 8.23 percent for the period from 1998-2007 and are expected to remain at this level (NMFS 2008b, Table 8.8.8.8-1).

27. Comment: The plan should address improving the recreational and commercial fishery in the John Day basin, not just delisting.

***Response**:* NMFS agrees with the commenter that a long-term goal would be to improve recreational and commercial fisheries. When delisting goals or broad-sense recovery goals are achieved, consumptive fisheries on wild steelhead may be possible. For example, this has occurred for the coho fisheries on Siltcoos and Tahkenitch lakes on the Oregon Coast. *(http://www.nwr.noaa.gov/Salmon-Harvest-Hatcheries/State-Tribal-Management/FMEP-OC-Coho.cfm).*

Furthermore, broad-sense recovery goals that go beyond those needed for delisting are designed to allow for meaningful harvest by treaty and non-treaty fishermen (see Sections 5.1 and 5.2 of the Oregon Steelhead Plan). Because of the importance of recreational fisheries, the USFWS and NMFS jointly issued the "Policy for Conserving Species Listed or Proposed for Listing Under the Endangered Species Act While Providing and Enhancing Recreational Fisheries Opportunities" on June 3, 1996 (61 FR 27978), which was issued pursuant to Presidential Executive order 12962, issued on June 7, 1995. That order requires Federal agencies, to the extent permitted by law, and where practical and in cooperation with States and Tribes, to improve the quality, function, sustainable productivity, and distribution of aquatic resources for increased recreational fishing opportunity. Among other actions, the order requires all Federal agencies to aggressively work to promote compatibility and reduce conflict between administration of the ESA and recreational fisheries.

28. Comment: Harvest of listed steelhead should be banned.

***Response**:* NMFS does not agree that harvest of listed steelhead should be banned, because studies indicate that harvest, as presently managed, is not limiting wild steelhead recovery. Section 8.5.4 of the Oregon Steelhead Plan includes a modeling study conducted by Chilcote (2001) that evaluated the effect of harvest levels on the survival of 27 Oregon steelhead populations. The model looked at a range of fisheries mortalities from 0 to 75 percent. The results were stated in terms of the probability of population extinction in 50 years at each mortality rate. For most populations, the modeling suggested that the probability of extinction was essentially zero as long as fisheries mortality rates remained less than 30 percent. However, there was significant variation between populations. The probability of extinction increased dramatically as mortality rates became greater than 40 percent. Furthermore, once the probability of extinction increased beyond 0.05, the transition to an extinction

probability of 1.00 was very rapid. In other words, once mortality rates increase sufficiently to cause the probability of extinction to exceed 0.05, any additional mortality would cause a rapid increase in the likelihood of extinction. Because the transition from low to high risk happens rapidly, there is little room for error (in the model or the measurements of mortality rates).

To address this concern, ODFW generally manages steelhead fisheries not to exceed a maximum fisheries mortality rate of 20 percent, but it is more conservative when warranted. NMFS (2008b) estimated that for most populations in the MCR Steelhead DPS, harvest impacts from Columbia River tribal and non-tribal fisheries have averaged 8.23 percent for the period from 1998-2007 and are expected to remain at this level (NMFS 2008b, Table 8.8.8.8-1).

29. Comment: How could harvest be considered only a secondary threat on steelhead populations, when it is actually incompletely monitored? This commenter applied the same logic to predation and suggested that management actions addressing both harvest and predation should be higher priorities.

***Response**:* The DPS Plan describes in Section 6.3.7 the reasons why NMFS and the co-managers believe that harvest is a secondary threat on MCR steelhead populations. This information is reiterated in NMFS' response to Comment 28. Section 7.1.6 of the DPS Plan describes the harvest actions that are expected to improve monitoring and evaluation to reduce uncertainties concerning fisheries impacts on Middle Columbia River steelhead. These actions include creel surveys and other methods to quantify impacts in the more popular fisheries; in-basin monitoring of escapement from ocean to tributaries and onto the spawning grounds; and monitoring to verify the applicability of aggregate impact rates on mainstem fisheries on specific populations. A specific example where monitoring is expected to improve is in the Klickitat River basin, where remodeling at the Lyle Falls Fishway will improve estimates of steelhead escapement, the proportion of hatchery and wild steelhead, and in-basin harvest rates.

30. Comment: Selective fisheries should be required for any commercial harvest on steelhead to protect the few remaining wild stocks, as is already required for sports fisheries.

***Response**:* NMFS agrees with the comment that applying selective fisheries to commercial fisheries would protect those few steelhead that are currently affected by the fisheries. Since 1975, non-tribal gillnet fisheries have been required to release all steelhead caught. WDFW has proposed, as part of its Conservation and Sustainable Fisheries Plan, to work with lower Columbia River commercial fishers to develop live-catch harvest methods that can be used to replace current commercial gill-net fisheries (WDFW 2008). The Colville Tribe in the Upper Columbia River is also investigating the use of other gear to

live-capture non-listed summer Chinook returning to the Columbia River above Wells Dam. The development of new gear may be applicable to other fisheries that currently harvest natural-origin steelhead. The Colville Tribal proposal is described in the Colville Fish and Wildlife Resource Management Plan (Colville 2006) (See objective AFG-4.O1.s-4: "Develop live-capture gear and methodologies for selective tribal fisheries that can potentially protect natural-origin fish while consumptively harvesting hatchery-origin fish").

Hatcheries

31. Comment: When hatcheries are identified as having a negative impact on the wild population, they should be reduced or modified to allow natural populations to rebound and expand.

***Response**:* NMFS agrees with the commenter that when hatcheries are identified as having a negative impact on the wild population, the program should be reduced or modified to allow natural populations to rebound and expand. NMFS will be conducting assessments as part of the ESA consultation process for all hatchery programs that affect the MCR steelhead DPS, including the upriver programs that result in strays into Middle Columbia River steelhead spawning habitat. The schedule for this consultation process is required under Hatchery Action RPA 39 of the FCRPS Biological Opinion. The consultation(s) will use recent work by the HSRG, Interior Columbia River Technical Recovery Team, and others to evaluate all the hatchery programs that are within, or that affect, the MCR steelhead DPS.

32. Comment: The Plan should aggressively identify some of the corrective actions required of hatchery operations to help guide HGMP and other hatchery review processes. The plan should point out that transportation is one of the potential underlying causes of hatchery fish straying into middle Columbia tributaries.

***Response**:* NMFS agrees with the comment that clearly defined hatchery actions and measures to minimize impacts from hatchery operations need to be identified. NMFS will be conducting an assessment as part of an ESA consultation process for all hatchery programs in the MCR steelhead DPS. The scheduling of this consultation process is required under Hatchery Action RPA 39 of the FCRPS Biological Opinion. The consultation will consider the work by the HSRG, Interior Columbia River Technical Recovery Team, and others to evaluate hatchery programs within the MCR steelhead DPS or that affect the DPS.

NMFS does not necessarily agree that the transportation of Snake River steelhead juveniles is an underlying cause of straying into the Middle Columbia River tributaries. However, this issue was identified as an action under the Hatchery Strategy in the Oregon Management Unit recovery plan (Section

9.7.1), which proposed to reduce the number of Snake River hatchery steelhead smolts transported at Lower Granite and Little Goose dams.

33. Comment: The Plan should recommend that hatchery production facilities have a plan to reduce output as natural production begins to recover.

***Response**:* NMFS agrees that in the long term, as natural populations approach their broad-sense recovery goals, hatchery production levels should be reevaluated and decreased if appropriate. This question will be addressed in subsequent status reviews.

34. Comment: More segregation of hatchery fish is needed and could be done by clearly marking all releases for harvest and constructing exclusion weirs on spawning tributaries.

***Response**:* NMFS agrees with the strategies of marking hatchery fish when they are being produced for harvest and segregating them from naturally spawning populations when they are not intended to supplement the natural population. The Oregon Steelhead Plan addresses this in Section 9.7.1, as part of the "Strategy to reduce the uncertainty of origin of hatchery strays and increase ability to recognize hatchery-origin fish," with actions to increase the proportion of hatchery steelhead with CWTs (coded wire tags) so that the source of stray hatchery steelhead can be identified, and to mark all hatchery steelhead releases. NMFS also agrees that other strategies to control the escapement of hatchery fish on the spawning grounds should be considered (e.g., weirs).

35. Comment: The Yakima plan identifies a potential role for supplementation; however, a growing body of evidence indicates that use of hatchery programs to rebuild depressed wild runs may be counterproductive, as the introduction of hatchery fish can result in both genetic and ecological effects on the wild populations, reducing any productive benefit that additional abundance would otherwise allow.

***Response**:* NMFS agrees with the commenter that the introduction of hatchery fish can result in both genetic and ecological effects on the wild populations, but believes these effects can be minimized with a properly designed and implemented supplementation program. The impacts on wild populations from hatchery fish are greatly influenced by the hatchery program and how it is operated. The Yakima proposal is an opportunity to evaluate a conservation-oriented program of short duration and its potential to increase abundance and support the recovery of the upper Yakima summer steelhead. The proposed steelhead program will also complement the evaluations of spring Chinook supplementation and coho reintroduction that are ongoing in the Yakima River Basin.

36. Comment: The Plan needs to evaluate the impact of stray hatchery steelhead in each subbasin and recommend a solution. It is not enough to use recreational fisheries as a means to control stray steelhead; the numbers in some years are very large, and fishing is a relatively ineffective tool for their removal. The hatchery stray problem is exacerbated by the Columbia basin transportation program and by not marking all hatchery steelhead.

***Response**:* NMFS agrees that the impact of stray hatchery steelhead needs to be evaluated. The Oregon Management Unit Recovery Plan includes in Section 9.7.1, as part of the "Strategy to reduce the uncertainty of origin of hatchery strays and increase ability to recognize hatchery-origin fish," actions to increase the proportion of hatchery steelhead with CWTs so that the source of stray hatchery steelhead can be identified, and to mark all hatchery steelhead releases. As stated by the commenter, fisheries may not be effective in removing enough stray hatchery steelhead so the strategy in Section 9.7.1 also includes proposals to weir some tributaries to remove hatchery steelhead and to monitor others to determine if weirs are needed.

NMFS does not necessarily agree that the transportation of Snake River steelhead juveniles is an underlying cause of straying into the MCR tributaries. However, this issue was identified as one of the Out-of-Basin Research, Monitoring and Evaluation Need (see Section 12.4.2) in the Oregon Management Unit Recovery Plan and as an action under the Hatchery strategy that proposes to reduce the number of Snake River hatchery steelhead smolts transported from Lower Granite and Little Goose dams (see section 9.7.1).

37. Comment: Although the Oregon Steelhead Recovery Plan as well as the Mid-C Steelhead DPS plan describe the threat posed to several populations by out-of-DPS hatchery strays and identify Snake River hatchery fish as the primary source of the spawning strays, the DPS plan does not appear to link its proposed actions to actions in the Snake River recovery plan, which is also under development. Commenters recommend that language be included to describe the linkage between these plans with respect to this threat and to reiterate the threat's significance. They also recommend that the DPS plan propose reducing the total number of smolt releases for those hatcheries with fish known to stray, as an interim measure while other hatchery actions are being developed.

***Response**:* More information has been added to the DPS plan's Chapters 6 and 7 regarding the source of out-of-DPS hatchery strays and actions to reduce their effects on threatened populations. Also, NMFS and the affected parties have already begun the process of revising and/or updating the Hatchery and Genetic Management Plans (HGMPs) in the Snake Basin that are causing the problem. The Snake River recovery plan will address this issue as well. The hatcheries will be regulated, however, through the HGMP and NEPA processes already underway pursuant to the requirements of the FCRPS biological opinion's reasonable and prudent alternative. With regard to adding a proposal in the

plan to reduce the total number of smolt releases from hatcheries that are the source of the strays, NMFS has included reducing the strays as a general strategy; the details need to be worked out in a regional process. The HGMP and *U.S. v. Oregon* processes are the forums in which to consider the specific action of reducing releases of smolts.

38. Comment: Given the incomplete assessment of the HSRG recommendations for developing hatchery supplementation programs, should they all be accepted? The HSRG does not address the emerging issues of ecological impacts from naturally spawning hatchery fish and hatchery releases. These effects include competition for rearing space, food resources, predator attraction, disease transfer, and predation on native fish.

***Response**:* NMFS will be considering the HSRG recommendations along with other information when evaluating hatchery programs. NMFS supports the overall approach taken by the HSRG in their evaluation of hatchery programs in the Columbia River basin. NMFS agrees with the commenter that there are potentially significant emerging issues of ecological impacts in the tributary habitats from naturally spawning hatchery fish and hatchery releases. NMFS will be conducting an assessment of these issues as part of the ESA consultation process for all hatchery programs in the MCR steelhead DPS. The schedule for this consultation process is required under Hatchery Action RPA number 39 of the FCRPS Biological Opinion. The consultation will consider the work by the HSRG, as well as the Interior Columbia River Technical Recovery Team and others, to evaluate all the hatchery programs within the MCR steelhead DPS.

Furthermore, there are emerging issues of ecological impacts in the estuary. In the Columbia River estuary, limiting factors such as off-channel habitat availability, competition with native and exotic fish for food and space, disease and predation by piscivorous fish and native birds may in part be manifestations of density dependence. Density dependence refers to changes in the size of a population that are themselves a result of the size of the population, such as when a population declines because it has exceeded the amount of resources available to support it. Density-dependent mortality can occur through several mechanisms, such as direct competition for limited food and habitat and changes in the foraging activity of predators. With salmon and steelhead, density-dependent mortality can occur at any stage in the animal's life cycle and may be exacerbated by the introduction of and/or cumulative effects of large numbers of hatchery fish released over a relatively short period of time.

How much density-dependent mortality is taking place in the estuary compared to the ocean is unclear. There is some evidence that density-dependent mortality is occurring in the open ocean. For example, during years when salmon are especially numerous in the ocean, their growth rates are reduced (Peterman 1984 as cited in Ford 2007). One study found that, during years

when nearshore ocean productivity was low, survival of wild Snake River Chinook decreased as releases of hatchery Chinook increased (Levin et al. 2001 as cited in Ford 2007). However, another study found no connection between ocean conditions and density-dependent mortality, which appeared to be occurring among wild Snake River Chinook as hatchery steelhead were released (Levin and Williams 2002 as cited in Ford 2007). The authors suggested that the apparent density-dependent mortality could be better explained by interactions in the tributaries or estuary than by interactions in the ocean.

There is growing awareness among scientists studying the Columbia River estuary that mechanisms related to density dependence may limit salmon and steelhead while they are using estuary and plume habitats. Scientists studying Skagit River fall Chinook have documented density dependence-related mortality as a result of loss of habitat in the Skagit estuary and believe that such mortality can be attributed to a 75 percent loss of tidal delta estuarine habitat (Beamer et al. 2005). With similar habitat losses in the Columbia River estuary, it is possible that too many fish are competing for limited habitat and associated resources in the estuary at key times, and that the resulting stressors translate into reduced salmonid survival. NOAA/NMFS's Northwest Fisheries Science Center currently is investigating potential density-dependent mortality in the estuary. The Mainstem Lower Columbia River and Columbia River Estuary Subbasin Plan raised the specter of density dependence in the estuary and recommended continued research to analyze conditions there (Northwest Power and Conservation Council 2004). Thus, although the occurrence of density dependence-related mortality in the Columbia River estuary has not been proven, given the dramatic changes in habitat opportunity and capacity in the estuary over the last 200 years, it is likely that some of the mortality associated with the limiting factors described in this chapter is related to increased density of juveniles in the estuary. Consistent with this concern, NMFS, Salmon Recovery Division and the Northwest Fisheries Science Center are planning to initiate a number of approaches to better define and describe the scientific uncertainty associated with ecological interactions of hatchery origin salmon on natural origin.

39. Comment: Straying cannot be eliminated and "any fish, stray or not, is a good fish."

***Response**:* NMFS agrees that some straying is part of the natural life history of steelhead. However, a growing body of scientific literature points to increased risks to natural populations from excess hatchery steelhead straying resulting from some hatchery programs. The Oregon Management Unit Recovery Plan includes in Section 9.7.1, as part of the "Strategy to reduce the uncertainty of origin of hatchery strays and increase ability to recognize hatchery-origin fish," actions to increase the proportion of hatchery steelhead with CWTs so that the source of stray hatchery steelhead can be identified, and to mark all hatchery steelhead releases. As stated by the commenter, fisheries may not be effective in

removing enough stray hatchery steelhead so the strategy in Section 9.7.1 also includes proposals to weir some tributaries to remove hatchery steelhead and to monitor others to determine if weirs are needed.

40. Comment: The use of hatchery fish to supplement natural populations is problematic: artificial propagation does not contribute to increased natural productivity needed for viability and appears, in most cases, to erode productivity of wild populations. Another comment said that in considering recovery options, an objective assessment of potential risks should be undertaken and management techniques requiring less intervention should be evaluated before initiating artificial propagation.

***Response**:* NMFS agrees with the need to be cautious when using the hatchery tool to help sustain and rebuild natural populations. Hatchery fish can provide a buffer when a natural population is at low abundance as a result of other factors. Risks to the natural population increase the longer hatchery fish are used to supplement a natural population. The decision to use the hatchery tool needs to be informed by the overall risks to the population from all sectors.

41. Comment: The commenter believes that all the steelhead currently in the John Day river system are the progeny of ODFW hatchery plantings in the 1960s, and thus recommends hatchery supplementation for faster population recovery.

***Response**:* There is no indication that the wild steelhead are the progeny of hatchery outplants in the 1960s. Significant numbers of adult (native) steelhead were documented before the hatchery plantings, and a very limited number of hatchery steelhead were released in the John Day Basin, although rainbow trout have been released in larger numbers. Further, most of the steelhead releases were fry or eggs, which survive poorly. There were no documented returns from the limited number of steelhead releases. Genetics data show significant between-population variation among the five John Day steelhead populations. Such variation indicates that the populations were not derived from a recent common ancestry.

Hatchery supplementation is not recommended for the John Day Basin for three principal reasons:

a. The John Day Basin is designated as a wild fish management basin, one of only a few in the entire Columbia River Basin.

b. John Day Basin steelhead populations are among the most abundant and productive in the Columbia River Basin. Juvenile *O. mykiss* rearing densities throughout the basin are high.

c. ODFW believes that hatchery supplementation has not been demonstrated to be an effective means of enhancing natural production and that it has

been demonstrated to have negative long-term effects on natural productivity.

While NMFS agrees with ODFW's position as it applies specifically to the John Day populations, there are other circumstances in which a careful approach to supplementation to assist weak natural production may be warranted. The long-term benefits and risks of supplementation continue to be evaluated

42. Comment: Additional high priority actions are needed to achieve a "viable" or "highly viable" status capable of supporting some level of terminal sport harvest in the Yakima basin. The primary suggestion was the initiation of an integrated hatchery supplementation program focusing on one or more of the four populations as the key to accelerating recovery of natural-origin steelhead and for providing the opportunity to have a mark-selective terminal sport fishery. Skepticism was expressed that the Upper Yakima population would approach the 1,500 fish abundance threshold in the absence of a hatchery supplementation program.

***Response**:* NMFS agrees that there are significant uncertainties about the likely rate of recovery for the Upper Yakima population. However, NMFS is confident that the delisting goal (10 year geomean of 500 fish, plus meeting of additional productivity and distribution goals) is realistic and achievable. The short-term and long-term recovery goals are more challenging, and will require the use of adaptive management to assess both the appropriateness of the goals set and the rate of progress towards achieving them.

Basinwide Action #7 in the Yakima MU Plan calls for evaluating the potential for, and, if appropriate, implementing a targeted supplementation program specifically designed to improve viable salmonid population (VSP) parameters for Yakima steelhead populations. Any such program would need to be carefully designed and monitored to ensure that it contributes to recovery goals; supporting recreational harvests in the near future should be a goal only insofar as it can be done in manner that does not negatively affect prospects for recovery of wild steelhead in the Yakima Basin.

Kelts

43. Comment: The Plan should consider the value of steelhead kelts for increasing reproductive capacity, genetic variability, and contribution to smolt yield in low run years. The natural rates of repeat spawning in the Mid-Columbia should be assessed, and spawning success and genetic impact of repeat spawning should be evaluated. If supported by study, measures should be developed to help improve conditions for kelts across all subpopulations. In addition, the Plan should provide measures to compensate for mortality from angling and dam passage.

***Response**:* NMFS believes that the plan does identify the importance of kelts; see, for example, the description of the kelt program in the Yakima basin, which is being expanded to other basins. Options are being explored, from long-term rearing/rehab to transportation downstream (see Hatch et al. 2008). NMFS also agrees that the contribution of kelts to steelhead population diversity and productivity should be evaluated. Toward this end, RPA No. 33 in the FCRPS Biological Opinion requires the Action Agencies to develop and implement a Kelt Management Plan. The plan will focus primarily on Snake River steelhead kelts. The action requires an evaluation of the plan; this evaluation could be expanded to benefit MCR steelhead and/or complement the CRITFC program for kelts (Hatch et al. 2008). Reference to the requirement to develop and implement a kelt management plan has been added to Section 7.1.3.1 (Impaired Fish Passage in Mainstem Columbia River) of the DPS Plan.

Hydro – Mainstem Columbia

44. Comment: The Plan relies on the BiOp for hydro actions, but the BiOp is currently being litigated. The commenter asked how this Plan will be modified following a court decision and to what extent NMFS considered the public comments and concerns related to the inadequacy of the 2008 BiOp when electing to use it as a basis for the Plan.

***Response**:* The commenter points out that the extent of the mainstem hydro operation changes supported by the Plan are still unknown, since a final decision in Federal District Court has not yet been provided. The Plan acknowledges this problem in Chapter 7.1.3.1, and further states that "the plan for current mainstem hydro operations, as summarized in the Hydro Module, and further improvements for fish survival that may result from the ongoing FCRPS collaborative process, represent the hydropower recovery strategy…" NMFS recognizes that the FCRPS litigation process is controversial, but NMFS is bound by the decisions of the court. The recovery plan incorporates by reference whatever decisions come from this legal process.

45. Comment: Ocean mortality and tracking of outgoing smolts to see where they are lost should receive more study.

***Response**:* NMFS agrees. More data are needed on this phase of the life cycle. Language was added in the DPS plan to address this critical uncertainty. Additional research needs to be done to obtain better estimates of ocean mortality. Two new sections have been added to the DPS Plan: 10.3 Critical Uncertainties and 10.4 Important Data Gaps.

Tributary Habitat

46. Comment: Few cold water refuges for steelhead remain in the lower John Day basin. Sometimes fish returning in early summer start up the river in the cool water of a summer storm but are killed when warm temperatures return. The commenter recommended an aggressive plan to rehabilitate habitat in the lower tributaries to improve water temperatures.

***Response**:* NMFS agrees. The Plan identifies elevated water temperature as one of several primary limiting factors for steelhead in the lower John Day River mainstem. In addition, recovery actions identified for the lower John Day mainstem include a broad suite of actions addressing each recovery strategy, including actions to restore riparian conditions, improve large wood recruitment, and improve degraded water quality and maintain unimpaired water quality.

47. Comment: Cottonwoods need to be reintroduced to the riparian zone in the John Day basin .

***Response**:* The Oregon Steelhead Plan's Strategy No. 5, Restore Riparian Condition, for the John Day basin includes recovery actions to restore natural riparian vegetative communities, including vegetative planting. Cottonwood reintroduction may be included as part of this action where appropriate.

48. Comment: The plan is overly dependent on habitat improvement in the John Day Basin; the emphasis should be shifted to supplementation, predator control, fire management related to water quality, and artificial weir log removal.

***Response**:* The Plan identifies a broad range of recovery strategies and actions to address all limiting factors identified for the John Day Basin. Habitat improvement is just one of many recovery strategies and actions addressing the full range of limiting factors throughout the steelhead life cycle. Therefore, the Plan provides a balanced approach to identifying numerous recovery actions that can be implemented with the John Day basin, as well as out-of-basin actions. For example, the Plan includes predator control actions in the mainstem and estuary, fire management actions for upland habitat and removal of passage barriers in the tributaries. NMFS does not agree that there should be a shift to supplementation as part of the recovery strategy. The John Day is designated as a wild fish management basin, one of a few in the entire Columbia Basin.

49. Comment: In the John Day basin, when streams are fenced off against livestock, hardpan develops in the streambed. Also, ungulate streambed disturbance is vital for creating loose gravel for spawning beds.

***Response**:* NMFS respectfully disagrees with this comment. The burden of scientific study of watershed and streambed process indicates that cattle

moving through the riparian area and through the streambed do not restore stream and sediment processes. The Plan identifies agriculture and grazing practices as primary threats to the John Day MPG. This includes the impacts from livestock entering streams and causing streambed disturbance. One goal of the Plan is to restore stream processes, including the natural movement of gravel and sediment within the watershed. The Plan identifies numerous recovery actions to address this threat, including developing grazing strategies that promote riparian recovery, riparian corridor fencing, and removal of riparian grazing.

50. Comment: The Plan ignores significant habitat improvements in the John Day basin, most of them made, according to one commenter, without a recovery plan and without the help of state or Federal fish agencies. The commenters asserted that the fact that the John Day basin has the best run of MCR steelhead in the DPS is due to efforts of local people who know and understand the John Day Basin.

***Response**:* NMF acknowledges the important habitat restoration work that has been carried out in the John Day basin and commends landowners for their leadership and dedication to habitat restoration. This important work has benefited steelhead and the ecosystems numerous species depend upon. Chapter 9 of the Oregon Steelhead Plan describes the program sufficiency, together with current and near-term efforts for each recovery strategy in the John Day basin. The DPS Plan assesses each MPG's viability status. The John Day MPG's overall status is not viable. The North Fork population is highly viable; however all of the other John Day River populations are below viable status. Therefore, overall viability improvements are still needed and actions still need to be carried out to address existing limiting factors.

51. Comment: The Oregon management unit plan's discussion of forest health and its relevance for steelhead recovery should be strengthened, particularly with respect to management to prevent catastrophic wildfires. The plan should address impacts that result from catastrophic fire, such as significant sediment loads that flush into streams and harm fish spawning and overall survival. The plan should list forest conditions as a primary limiting factor for the John Day MPG.

***Response**:* The Oregon management unit plan does include substantive actions and information regarding forest health for all fish populations and also identifies forest health as an emerging threat. Specifically, forest health issues are included in the Limiting Factors and Threats section 8.2 and in Appendix J: *Fuels Treatment as an Action Contributing to Recovery of ESA-listed Anadromous Salmonids*. These forest health-related sections were developed in close cooperation with the Oregon Department of Forestry and the U.S. Forest Service. Based on the plan's limiting factors analysis, forest conditions are not a primary limiting factor for the John Day MPG, but it has been identified as an emerging threat.

Livestock

52. Comment: The commenter strongly supports the emphasis in the DPS plan on the recovery of aquatic habitat. The impact of commercial livestock on sensitive steelhead spawning reaches is a concern; however, fencing as a primary tool for livestock management is inadequate. Fencing is a temporary fix and difficult to maintain in the long term. Commenter recommended managing herds as a whole with constant movement ensured by a dedicated rider.

***Response**:* NMFS agrees that improperly managed livestock grazing can severely reduce steelhead habitat quality. NMFS also agrees that improperly constructed and/or poorly maintained fences will not effectively control livestock. NMFS further agrees that active livestock herding and tending is also an effective technique to reduce damage of grazing to steelhead habitats. However, NMFS is aware that such techniques are relatively unpopular with livestock producers because of high labor costs. Because fencing costs are typically born by the public, livestock owners generally find fencing to be a more palatable means of limiting livestock access to streams. Furthermore, despite the maintenance issues with fences, they are a generally reliable means of livestock control.

53. Comment: The plan should address how ESA regulation may affect Federal grazing allotments, which are an important component of agricultural operations in the upper John Day basin.

***Response**:* This Plan identifies limiting factors, recovery strategies and recovery actions at the population, watershed and reach scale. The Plan cannot address individual land use actions on the landscape, which may require detailed site-specific analyses such as Federal grazing allotment considerations. These are important issues that are best analyzed and decided in the context of other ESA decision-making and permitting forums such as ESA Section 7 consultations or Section 10 habitat conservation plans.

54. Comment: Reducing grazing on public forest lands results in higher fire hazard and that logging and grazing should be re-established to control the fuel load.

***Response**:* NMFS disagrees that reducing grazing would necessarily increase the risk of wildfire. To the contrary, throughout much of the MCR steelhead DPS range, improperly managed grazing has increased the risk of wildfire by displacing native grasses with cool season grasses such as cheat that are dormant and highly flammable during the summer months. That said, NMFS agrees with responders' implied point that properly managed grazing can be used as a tool to achieve forest health and salmonid habitat objectives. NMFS also agrees that forest health plays a major role in determining the health of steelhead habitat and accordingly works closely with state and Federal land

managers to enable management practices that reduce the risk of catastrophic wildfire.

55. Comment: Fishing, predation, and catastrophic wildfires are far more likely to adversely impact steelhead recovery efforts than cattle grazing as it is currently managed; the plan also lacks information on local watershed conditions. The commenter would like the opportunity to explore with NMFS scientists physical or biological factors in the John Day River Basin that might substantially mitigate or alter the need for land use restrictions to protect steelhead, depending on local or site-specific circumstances.

***Response**:* By its nature and scope, the Oregon Steelhead Recovery Plan does not provide site-specific information about individual land use practices or analyze specific land use actions. It may provide a context for these actions, but additional site-specific information will still be needed for individual land use reviews. The Plan describes limiting factors and the actions needed to recover the species. Reach scale actions are identified and prioritized. The commenter is correct that limiting factors such as main stem hydro impacts, ocean conditions and hatchery strays pose a greater overall relative risk to steelhead than cattle grazing.

Regarding fishery impacts, NMFS recommends that the commenter review section 8.5.4 of the Oregon Steelhead Recovery Plan for a detailed discussion of why harvest is not considered a limiting factor. This section describes the modeling that was conducted by Chilcote (2001) that evaluated the effect harvest levels on the survival of 27 Oregon steelhead populations. The model looked at a range of fisheries mortalities from 0 to 75 percent. The results were stated in terms of the probability of population extinction in 50 years at each mortality rate. For most populations, the modeling suggested that the probability of extinction was essentially zero as long as fisheries mortality rates remained less than 30 percent. However there was significant variation between populations. The probability of extinction increased dramatically as mortality rates became greater than 40 percent. Furthermore, once the probability of extinction increased beyond 0.05, the transition to an extinction probability of 1.00 was very rapid. In other words, once mortality rates increase sufficiently to cause the probability of extinction to exceed 0.05, any additional mortality would cause a rapid increase in the likelihood of extinction. Because the transition from low to high risk happens rapidly, there is little room for error (in the model or the measurements of mortality rates). To address this concern, ODFW generally manages steelhead fisheries not to exceed a maximum fisheries mortality rate of to 20 percent, but it is more conservative when warranted. NMFS (2008) estimated that for most populations in the MCR Steelhead ESU harvest impacts from Columbia River tribal and non-tribal fisheries has averaged 8.23 percent for the period from 1998-2007 and is expected to remain at this level (Table 8.8.8.8-1).

The Oregon Steelhead Plan addresses forest health issues in Section 8.2 and Appendix J. Forest health is also identified as an emerging threat. Additional text was added to the Oregon Steelhead Plan to describe how active forest health treatment can also help steelhead, based on local conditions.

Mainstem Columbia River

56. Comment: Only a few sentences in the entire DPS Plan were devoted to habitat conditions in the mainstem Columbia River, beyond fish passage. No actions are recommended to address protection or enhancement of Columbia River nearshore (freshwater) or cold water refugia habitats.

***Response**:* NMFS understands that the commenter is referring to mainstem habitat areas not already addressed as part of mitigating actual dam operations. NMFS agrees that there is a need to assess restoration and protection opportunities and potential benefits from nearshore habitat or cold water refugia. Currently, data on these areas is limited. The DPS Plan has been revised to include such an assessment as a DPS-level strategy.

That said, estuary and mainstem habitat below Bonneville Dam are covered in Sections 6 and 7 of the DPS Plan, which incorporate the Columbia River Estuary Recovery Plan Module's description of threats and primary limiting factors in the mainstem Columbia River below Bonneville Dam. Section 7 of the Plan incorporates specific Estuary Module strategies and actions to address the threats and limiting factors that are priorities for recovery.

57. Comment: Reinstituting spring juvenile fish transportation from McNary Dam would result in a significant reduction in mortality. Also, information on migration timing and survival through the lower river and out into the ocean could be obtained by using the Kintama Research's acoustic tracking system.

***Response**:* The 2008 BiOp eliminated the use of transportation at McNary Dam for spring migrants in all but the worst flow conditions (expected to occur in less than one out of 70 years). This is because, while direct survival (about 98 percent) of juveniles transported to below Bonneville Dam is much higher than that of inriver migrants (roughly 50 to 80 percent); the smolt to adult returns of the inriver migrants are typically equal to or higher than those of transported fish. Thus, there does not appear to be a substantial or consistent benefit of transport under most river conditions for spring migrating salmon or steelhead at McNary Dam. In fact, elimination of spring transport was decided well before the 2008 BiOp. McNary spring transport was evaluated partly in response to RPA 45 in the 2000 FCRPS BiOp. The results did not indicate a clear benefit (as also described above) which led to this action not being included in the Action Agencies' Proposed Action for the 2004 FCRPS BiOp.

The 2008 BiOp (RPA 55) requires the Action Agencies to "Investigate Hydro Critical Uncertainties and Investigate New Technologies," including post-Bonneville Dam survival rates. While the Kintama Research's acoustic tracking system has demonstrated that some detections can be obtained through this methodology, NMFS has concerns with respect to how well the tagged fish represent the behavior and survival of the migrating juveniles. This is, in part, because acoustically tagged fish 1) appear to suffer greater mortalities over time than do untagged fish; 2) are typically larger than migrants in the run at large; and 3) are likely to have modified behaviors—compared to untagged or smaller migrants in the run at large. However, resources will continue to be targeted at developing smaller tags, which will reduce tagging effects and increase the applicability of the information obtained from tagged fish to the behaviors and survival of juvenile migrants through the estuary and ocean.

Predation

58. Comment: The Plan contained very little information about predation within the tributaries. Also, only the Columbia offers a reward on pikeminnows.

***Response**:* NMFS agrees that tributary predation could be a significant concern. NMFS supports a reward fishery in the tributaries, similar to that funded by BPA on Columbia pikeminnow in the mainstem, to help protect outmigrating juveniles. NMFS supports the ISAB's recommendation to the Council to urge state agencies to relax or eliminate fishing regulations that actually protect or enhance populations of introduced predators. However, NMFS also notes the ISAB's conclusion, as summarized in Chapter 7 of the DPS plan, that methods of controlling non-native piscivores have not been sufficient, and that maintaining and restoring habitat is the key strategy that enables native species to persist in habitat for which they are best adapted. Readers are encouraged to refer to each of the management unit plans for descriptions of predation issues in the tributaries. Also see response to Comment 61.

Added to the DPS Plan Section 7.4.4 more specific strategies and actions to address non-native predators. These include encouraging reward fisheries on non-native predators, encouraging the states to relax regulations that enhance non-native species that prey on threatened and endangered salmonids, and promoting healthy tributary ecosystems as the foundation for reducing non-native predation on listed salmonids.

59. Comment: NMFS needs to be more specific about how to reduce predation by pinnipeds, cormorants, and terns and needs to consider lethal methods.

***Response**:* NMFS agrees and has added more detail on these subjects. The DPS plan states in Section 6.3.5.1 "In March 2008, NMFS granted the request of the states of Oregon, Washington, and Idaho to lethally remove problem California sea lions" and "NOAA has authorized the states to remove as many as 85

animals annually…" Concern with the predation impacts of double-crested cormorants and terns is described in Section 6.3.5.2, as is a statement supporting the need to review all alternatives for the reduction of their abundance in the Columbia River estuary. Section 7.1.5.1 of the DPS Plan summarizes the actions in the FCRPS Biological Opinion and the Estuary Module for reducing predation by terns and cormorants. For example, the FCRPS biological opinion calls for further reduction in bird habitat on East Sand Island. Section 7.1.7 of the DPS Plan also provides a selection of some of the specific Estuary Module actions beneficial to steelhead, which include specific actions addressing pinnipeds, cormorants, and terns.

60. Comment: The plan should include more on the relationship of bull trout and steelhead and how to protect both, given that bull trout are predators of steelhead.

***Response**:* NMFS agrees that bull trout are predators of steelhead. However, even though there is overlap in their freshwater rearing area, including the mainstem Columbia, the population of bull trout is depressed and probably does not constitute a major predator to steelhead. To further address this question, NMFS would support research on the predator/prey relationship between bull trout and steelhead.

61. Comment: A program in the mainstem Columbia basin targets the native pikeminnow (a salmonid predator), while protecting introduced species like bass, walleye, and channel catfish as game fish.

***Response**:* NMFS is also concerned about the abundance of non-native predators such as bass. In Section 7.4.4 of the DPS plan, NMFS summarizes the results of the ISAB report, which urges the state agencies to eliminate fishing regulations that enhance the non-native piscivorous fish populations. NMFS will add this as a specific action to the recovery plan. In addition, NMFS supports the recommendations in the Yakima Steelhead Plan for research and monitoring to track trends in predator populations, understand their impacts on steelhead, and develop appropriate management techniques to reduce predation. See Response to Comment 58.

Reintroduction of Extirpated Populations

62. Comment: Restoring passage at Pelton Round Butte Dam on the Deschutes and habitat restoration and passage after removal of Condit Dam on the White Salmon are important to steelhead recovery.

***Response**:* NMFS agrees with the comment. The Plan includes fish passage facilities at Pelton Round Butte dam and reintroducing steelhead to the upper Deschutes River basin. The White Salmon Plan's recovery strategy contains two key parts: (1) a plan for reintroducing naturally produced steelhead into

historical habitat after the removal of Condit Dam, and (2) improving and increasing freshwater habitat for steelhead production in the watershed.

63. Comment: The local community in Morrow County will support restoring a sustainable summer steelhead run to the Willow Creek subbasin, if NMFS and ODFW support the plan and if access to funding is available, this commenter contended.

***Response**:* Willow Creek is one of three extirpated populations in the Middle Columbia Steelhead DPS. Section 1.5 of the Oregon Steelhead Plan identifies broad sense recovery goals that include the recovery objective of having the extirpated Willow Creek population restored in a manner that engages landowner cooperation in the reintroduction. NMFS and ODFW will work with the local community and interest groups to identify funding opportunities to implement reintroduction activities.

Landowner Concerns

64. Comment: The Oregon Steelhead Plan includes a goal of ensuring that there will be no regulation or ESA liability for impacts on reintroduced populations until they are self-sustaining. This commenter noted that regulation or restriction may be necessary to protect the fish so that they can become self-sustaining and suggested that Section 10 of the ESA provides a great opportunity for private landowner protection through development and approval of Habitat Conservation Plans.

***Response**:* Reintroduced steelhead are listed under the ESA as part of the Mid-Columbia steelhead DPS and therefore, section 4(d) take prohibitions apply to these fish. NMFS is working with stakeholders and local governments in the upper Deschutes River basin to educate land owners and local jurisdictions about how to avoid take of newly introduced listed steelhead. NMFS is also exploring possibilities for designating steelhead introduced above Pelton Round Butte as an experimental population. In addition, several irrigation districts in the upper basin have initiated an ESA section 10 habitat conservation plan for ESA coverage of their actions.

65. Comment: The plan should fairly and equitably examine the financial and management strain that it puts on landowners to make sure it is workable and fairly distributed.

***Response**:* The ESA requires that NMFS identify the time required and the cost to carry out the measures needed to achieve the Plan's goals. The Plan, however, is voluntary. Individuals or entities are not required to implement the recovery actions. NMFS and ODFW have sought to involve all relevant parties in developing the Plan so that there is wide support, local ownership and coordination to implement recovery actions. Financial resources will be needed

to implement recovery actions. Landowners and other stakeholders should not be burdened by implementation costs. Funding partnerships and incentives for landowners will be key to effectively implement recovery actions.

66. Comment: The extent of local efforts to improve steelhead habitat is not recognized in the Plan. This commenter also wrote that the plan will bring serious harm to agriculture.

***Response**:* NMFS recognizes the importance of the time and commitment citizens make to steelhead recovery. Section 1.5 of the DPS Plan acknowledges the conservation efforts already underway throughout the region and this important recovery work makes the possibility of near term future delisting a strong possibility. The Plan, however, is a voluntary road map for steelhead recovery and because it is non-regulatory, no one is required to carry out the actions identified in the Plan. The actions in the Plan were developed through a multi-year process with diverse stakeholders, including representatives of the agriculture community. Recovery actions were developed with these stakeholders and the goal is to recover steelhead in the context of local working economies, including agriculture. Financial resources will be sought and incentives used to implement recovery actions.

Climate Change

67. Comment: The Plan should provide more specific direction regarding how watersheds should be managed to mitigate impacts from climate change and help this DPS survive in the face of a warming climate.

***Response**:* NMFS believes that all of the strategies proposed in Chapter 7 of the DPS Plan do address potential impacts from climate change. As stated in Section 6.3.8, climate change may affect steelhead more than other salmonids because of their long rearing period in freshwater. This possibility further reinforces the importance of achieving survival improvements throughout the entire steelhead life cycle, as well as the importance of maintaining habitat diversity. The DPS Plan's recovery strategies in relation to climate change are further bolstered by the 2007 report on climate change submitted to the NPPC by the Independent Scientific Advisory Board. More extensive reference to this report and its recommendations has been added to Section 7.1.8 of the DPS Plan.

68. Comment: The White Salmon Recovery Plan should acknowledge the significant role the White Salmon River may play in maintaining instream flows that may be critical to steelhead recovery in relation to future climate change. Recent research has shown that rivers that are predominantly fed with groundwater, such as the White Salmon River, will see a less pronounced reduction in summer flows and will therefore provide more resilient habitat for salmonids. The White Salmon River has been identified as one of the critical rivers

in the Cascades for providing stable year-round instream flows. See Pacific Northwest Research Station Science Findings (October 2007).

***Response**:* The October 2007 Pacific Northwest Research Station Science Findings report interviews Gordon Grant, a research hydrologist with the PNW Research Station in Corvallis, Oregon. The report states, "The volume of water stored in permeable lava flows in the Cascades is seven times that stored as snow." Grant identified the White Salmon River as being a groundwater-fed river that will have less pronounced reduction in summer flows. NMFS is very concerned with climate change and the impact on river flows and acknowledges that the White Salmon may be one those basins that continue to have exceptional salmonid production potential in the face of climate change.

Because the White Salmon Recovery Plan also is intended to support reintroduction of threatened Lower Columbia River coho and Chinook, NMFS has decided, for the sake of an ecosystem approach, to finalize the White Salmon plan as part of the Lower Columbia Recovery Domain planning effort. NMFS will include this valid point in the White Salmon Recovery Plan, which will address multiple species and is expected to be available as a draft in 2010.

Definition of DPS, MPGs, Populations – What Should Be Included

69. Comment: Mill Creek, 4 miles west of Fifteenmile Creek, should be included in the Plan as it has wild winter steelhead similar to those in Fifteenmile Creek.

***Response**:* Steelhead in Mill Creek, Mosier Creek, and Chenoweth Creek are part of the Fifteenmile Creek population. There are a significant number of priority protection and restoration actions proposed in the Oregon Steelhead Plan's Chapter 9, Fifteenmile Creek population tributary habitat action table, for Mill Creek. These priority habitat actions reflect the plan's recognition of the importance of the Mill Creek watershed.

70. Comment: Hood River should be included in the Mid-Columbia plan.

***Response**:* NOAA Technical Memorandum NMFS-NWFSC-73 provides the biological background for placing the Hood River steelhead population in the Lower Columbia DPS. The Lower Columbia Technical Recovery Team used several criteria, including geographic location and genetic distinctness, for making their recommendation.

71. Comment: What is the scientific rationale for lumping John Day in with the other management areas? NMFS should consider a separate listing status for the John Day Basin.

***Response**:* The ESA requires NMFS to list and delist species at the evolutionarily significant unit (ESU) or distinct population segment (DPS). Section 2.2

describes the DPS' biological structure. The John Day MPG is one of four MPGs making up the Mid-Columbia steelhead DPS. This DPS structure determines why the John Day MPG is included with the other MPGs. There is currently no precedence for NMFS to list or delist subunits of a DPS. One potential opportunity to explore with NMFS is to provide incentives and recognition for the important recovery work that is taking place in the John Day basin.

All-H Analysis

72. Comment: The All-H analysis in the plan is actually related mainly to habitat without sufficient consideration of disease and hydropower impacts.

***Response**:* Section 9 describes the models used to estimate the effects of actions within different sectors on steelhead abundance and productivity. As described in Section 9.1.2, the AHA model was used to estimate the effects of actions within tributary habitat, harvest, hatcheries, hydro, predation, and the estuary on the abundance and productivity of steelhead populations within the Mid-Columbia DPS. In addition, various ocean conditions were included in the models. Tables in Section 9 identify the benefits associated not only for habitat, but also for hydro, predation, estuary, harvest and ocean conditions. The tables were set up this way so the reader could easily identify the projected effects of actions within different sectors. "Disease" was not included in modeling because mortality associated with disease is not projected to increase from baseline conditions (i.e., disease was not identified as a primary limiting factor; see Section 6.3.5.5). Furthermore, actions intended to improve hatchery programs should also reduce the potential incidence of disease within wild steelhead populations.

73. Comment: The All-H analysis in the Oregon Steelhead Plan is based on questionable assumptions and should be improved before it can be useful for management for recovery.

***Response**:* NMFS disagrees. The plan and Appendix H describe the assumptions, methods, and analyses used to determine the potential effects of proposed recovery actions on the abundance and productivity of Middle Columbia River steelhead. Oregon's Independent Multidisciplinary Science Team (IMST) and the Interior Columbia Technical Recovery Team reviewed this analysis and found the methods to be reasonable and technically sound. The expected benefits of the proposed actions as identified in the All-H analysis will be monitored and evaluated over time to determine whether the actions are providing the benefits anticipated in the All-H analysis. Recovery actions can be adjusted through adaptive management as monitoring results are evaluated.

Monitoring and Adaptive Management

74. Comment: Critical uncertainties must be acknowledged and thoroughly addressed in the Monitoring and Adaptive Management plans that are to be developed after the Plan's adoption. In addition, monitoring should include resident trout populations, not just sampling of migrating juveniles or migrating adults.

***Response**:* NMFS agrees that critical uncertainties should be clearly defined and addressed in monitoring and adaptive management plans. The Oregon Steelhead Plan contains the identification of critical uncertainties that currently limit the ability to make informed management decisions. The Oregon Steelhead Plan then developed RM&E objectives from those critical uncertainties. We anticipate a similar approach to be used in the remainder of the Middle Columbia DPS management units. Resident trout populations should be monitored when there is a question on the overlap with steelhead viability parameters. The concern and monitoring needs are greatest in areas supporting large rainbow trout populations.

75. Comment: Chapter 11 of the DPS plan should further emphasize the importance of funding for monitoring VSP parameters of the four Yakima steelhead populations. This commenter believes the best option for estimating population abundance/productivity is to use genetic stock identification (GSI) methodologies, then sample tissue of migrating smolts.

***Response**:* NMFS agrees that securing funding to improve our ability to monitor VSP parameters will be an important part of implementing and tracking steelhead recovery. The Yakima Basin Fish & Wildlife Recovery Board (the Board) is currently working with partners in the basin to identify gaps in existing VSP monitoring efforts and develop proposals for monitoring initiatives to fill those gaps. This work will be incorporated into a Research, Monitoring and Evaluation (RM&E) supplement to the Yakima Steelhead Recovery Plan, to be released in 2009-10. The Board is actively working with funding entities to secure funding for priority monitoring actions. To date $90,000 has been secured to further development of genetic stock identification for Yakima steelhead populations, and continuing this work will be one of the key priorities identified in the RM&E supplement.

76. Comment: How will the relationship of Federal actions to the RM&E plan factor into an effect determination under ESA section 7, 10 or 4(d)?

***Response**:* The subject language to which the commenter refers does not say it "factors into an effect determination." Rather, the DPS plan states that NMFS will "...emphasize recovery plan information in ESA section 7(a)(2) consultations, section 10 permit development, and application of the section 4(d) rule by considering . . . " then the Plan provides bullets of numerous

considerations, including, "...the relation of the action to the research monitoring and evaluation plan for the affected species." The point here is that all actions permitted by the ESA include monitoring, and such monitoring should inform and be consistent with the monitoring and evaluation plan for the listed species.

Implementation

77. Comment: What is the relationship between the "Fish Accords" and the Middle Columbia River steelhead recovery plan?

***Response**:* The DPS plan Chapter 11, Implementation, has been updated to include the following information about the Fish Accords.

The Fish Accords consist of three Memorandums of Agreement (MOAs) entered into between the Federal Columbia River Power System (FCRPS) action agencies (Bonneville Power Administration, U.S. Army Corps of Engineers and the Bureau of Reclamation), four tribes, and one state. The most relevant MOA to the Middle Columbia River steelhead is with the Columbia River Inter-Tribal Fish Commission and the three treaty fishing tribes, Confederated Tribes of the Umatilla Indian Reservation; Confederated Tribes of the Warm Springs Reservation; and Confederated Tribes and Bands of the Yakama Nation. The MOAs are 10-year action agency commitments for projects to benefit fish affected by the FCRPS, with a focus on ESA-listed fish. The projects will be reviewed through the Northwest Power Act processes for implementing the Fish and Wildlife Program, administered by the Northwest Power and Conservation Council.

NMFS and the MU stakeholders view the MOAs as they do other significant funding sources, such as the Pacific Coast Salmon Recovery Fund (PCSRF). It is critical that these funds are targeted to priority recovery plan actions and that the reporting systems for implementing these actions will contribute to ESA recovery plan reporting overall. It will be an important task for the Mid-C Forum, the parties to the Accords, and the Northwest Power and Conservation Council to ensure that these funds and actions are part of recovery plan implementation and reporting.

78. Comment: Explain the relationship between the Northwest Power and Conservation Council's (Council) Fish and Wildlife Program and the Middle Columbia River steelhead recovery plan.

***Response**:* The Fish and Wildlife Program is funded by the Bonneville Power Administration (BPA) and administered by the Council. BPA will be implementing both its FCRPS Biological Opinion obligations and its Fish Accord obligations through this program. The Program will also fund actions that go beyond the scope of the FCRPS Biological Opinion and the Accords. The Council

implements its Program according to subbasin management plans that guide review and funding recommendations. The subbasin management plans were developed in 2000. NMFS has encouraged all recovery planning in the Columbia Basin to build upon the Council's subbasin plans. In its 2009 Program, the Council recognized that the recovery planning work in the Columbia Basin has continued and will initiate an effort in 2009 to update subbasin management plans so that relevant portions of recovery plans can be considered. NMFS and the Forum intend to participate in the subbasin plan update to ensure that the appropriate strategies and actions in the Middle Columbia River steelhead recovery plan are incorporated into the Council's updated subbasin management plans.

Costs

79. Comment: The plan is too expensive and should have a cost/benefit analysis. With a cost of $500 million and a goal of 15,000 fish, the plan proposes to spend over $30,000 per fish to achieve delisting—not a realistic value proposition.

***Response**:* The ESA requires that recovery plans identify the cost to recover a listed species. However, cost/benefit analyses are not required. NMFS agrees that significant resources will be needed to recover Middle Columbia River steelhead; yet recovery of the species will provide economic, ecological, cultural, and numerous other benefits, many of which are difficult to quantify. It should be noted that the reference to the 15,000 fish is for annual abundance, while the $500 million is the expense over a 30-50 year timeframe. Cost per fish over 50 years is far less than $30,000.

80. Comment: The Plan does not address social and economic impacts and will create serious economic and social hardship with no measurable benefits to ESA listed species.

***Response**:* The ESA requires that a recovery plan for a listed species include measurable criteria that will determine when the species can be delisted, site-specific actions to achieve the recovery plans' goals, and time and cost to carry out these measures. Therefore, based on the ESA, a recovery plan focuses on specific listed species and not on the social and economic impacts of implementing the recovery plan. In addition, recovery plans are voluntary and non-regulatory so that citizens are not required to carry out actions identified in the Plan. We recognize, however, that a recovery plan will only be successful and fully implemented with the support of local communities, agencies and relevant stakeholders. Therefore, partnerships will be formed and funding sought to implement recovery actions so that no sector of society is bearing an unreasonable burden to implement the Plan. Through the Plan's All-H analysis we know the proposed actions will benefit steelhead. The Plan's adaptive management plan will allow actions to be adjusted over time as needed to recover steelhead.

II. Interior Columbia Technical Recovery Team Comments

1. Comment: The current status chapter should include spatial structure and diversity (SS/D) status of the DPS. The Gaps chapter should restate the need to also consider SS/D factors, not just abundance and productivity that elevate the risk of populations.

> ***Response****:* A new section on spatial structure and diversity has been added to Chapter 4, Current Status Assessment of DPS. A summary of that information has been added to Chapter 5, the "Gap" between Current and Desired Status.

2. Comment: The DPS plan should more specifically describe high priority threats that must be addressed for each population. The specific threats that are identified in the MU Plans and highlighted in Sections 6.3 and 6.4 of the DPS Plan should be incorporated into the Threats Criteria. Incorporating more specific criteria relative to threats would give regional managers a clear picture of desired levels of reduction to target in their strategies. In the cases where targets have been established it would be beneficial to use the targets in the criteria to help guide the future threats status assessments.

> ***Response****:* NMFS agrees that more specific and measurable threats criteria are highly desirable. NMFS deeply appreciates that regional managers would like to have clear, specifically defined targets for reducing threats, and accordingly a clear path to delisting. Building adaptive management into the recovery plan is an appropriate response to the scientific uncertainties that remain. Research, monitoring, and evaluation (RM&E) are necessary for adaptive management.
>
> The threats criteria listed in the DPS plan for each of the relevant listing/delisting factors are intended to help recovery planners formulate appropriate RM&E to ensure that information is available to help determine whether the underlying causes of decline have been addressed and mitigated before a species is considered for delisting. NMFS intends that the appropriate metrics will be developed in the cooperative process of local and regional implementation, and fed back into adaptive management for steelhead recovery. In some cases, metrics or targets in certain categories have already been established by NMFS or by management unit planners and approved by NMFS. These will become part of the RM& E plan that will be developed after the DPS plan has been approved (see Chapter 10 of this Plan).

3. Comment: The plans should address the question of effectiveness of recovery actions—with empirical examples demonstrating effectiveness or description of effectiveness of similar types of actions.

> ***Response****:* Section 10 indicates that a more detailed and specific RM&E implementation plan will be established after the recovery plans are finalized.

The plans will include status and trend monitoring for all statutory listing factors, implementation and compliance monitoring, and effectiveness monitoring. In addition, the plan will include a section on how the data will be managed and curated. An adaptive management plan will also be developed that helps track the effectiveness of the recovery plan.

4. Comment: The DPS plan should discuss how the various harvest planning forums can be linked with the proposed Mid-C planning forum and should identify what entity should be responsible for reporting on current harvest impacts and tracking answers to key monitoring/evaluation questions regarding harvest impacts that relate directly to recovery strategies.

***Response**:* NMFS agrees that the Mid-C planning forum should closely track the decisions of harvest managers, especially seasons and harvest impacts on Middle Columbia steelhead adopted in *U.S. v Oregon*. The Middle Columbia forum will determine how to address this issue when their implementation meetings begin in 2010.

5. Comment: In Chapter 11 of the DPS plan, responsibilities should be outlined for updating the Mid-C Forum on progress on hatchery issues relevant to recovery strategies.

***Response**:* Section 11.1.1 describes the functional topics of the Mid- C Forum and how subgroups might be established to track progress of policy issues, including hatchery issues. NMFS agrees with the commenter that the Mid-C Forum should be updated on hatchery actions and will work to ensure this happens in a manner that is appropriate and constructive for all involved and affected entities. For instance, NMFS will be conducting an assessment as part of the ESA consultation process for all hatchery programs in the MCR steelhead DPS. The scheduling of this consultation process is required under Hatchery Action RPA number 39 of the FCRPS Biological Opinion. NMFS added similar clarifying language to Chapter 11.

6. Comment: The summary on page 9-2 of the DPS plan of model results relative to ICTRT viability criteria should be expanded to make it clear that the projections are a function of the input information and key assumptions regarding the translation of actions into habitat changes, habitat/life stage survival relationships, and population dynamics. While this type of modeling can provide valuable insights into the potential response to recovery actions, the dependence of the projected responses on inputs should be explicitly recognized, the ICTRT said. Furthermore, pages 9-3/9-4 should have more explicit description of differences in inputs from the Oregon and Washington plans.

***Response**:* Text was added to Section 9 (page 9-2) indicating that the projections from the models were a function of the input information and key assumptions. With regard to the last comment (last sentence), Section 9.1.1 and

9.1.2 are simply summaries of the modeling approaches used in Washington and Oregon. The sections highlight the major differences in the approaches between the two states. More detailed information can be reviewed in the specific Recovery Plans for the different areas. These are referenced in the two sections.

7. Comment: The DPS Plan could be improved by providing more detail from the individual management plans to summarize the current state of RM&E, key data gaps across the DPS, and any currently identified strategies to fill these gaps. The ICTRT suggested that the DPS Plan should contain at least enough detail to identify major data deficiencies at the DPS and MPG level, such as provided in the ICTRT (2007) viability criteria document.

***Response**:* Once the Recovery Plans are finalized, the RM&E plans will be fully developed. Development of the RM&E plans is a large effort requiring extensive input from local biologists. These biologists will help identify current monitoring efforts and key data gaps. At this time, Section 10 provides a simple framework for developing the RM&E plans.

8. Comment: The ICTRT suggested building in milestones for completing specific elements of the RM& E plan during the first 5-year review cycles, and referred to the Draft Puget Sound Monitoring and Adaptive Management Plan for examples.

***Response**:* A more detailed and specific RM&E implementation plan will be established after the recovery plans are finalized. The plans will include status and trend monitoring for all statutory listing factors, implementation and compliance monitoring, and effectiveness monitoring. An adaptive management plan will also be developed that helps track the effectiveness of the recovery plan. The adaptive management plan will be consistent with other plans, such as the Upper Columbia and Puget Sound plans, and will identify milestones and recovery targets.

ICTRT Comments on Washington Gorge Plans

9. Comment: Recognizing that a formal regional planning process has not been formed for the Gorge Management Unit, it would be desirable to incorporate, either directly into the Klickitat and Rock Creek plans or into the implementation plan (after such a planning process is formed), an explicit rationale for the levels of habitat change being targeted through the restoration action strategies. [At that time] the Gorge plans should be updated to describe the tributary habitat actions identified in the FCRPS Biological Opinion, relating those actions to the priority categories and reaches. Assumptions regarding the extent and effectiveness of the proposed actions in changing habitat conditions should be clearly documented. Whatever modeling approach is used, the key assumptions that drive the translation of the projected habitat changes into improvements in steelhead productivity or capacity should also be described.

***Response**:* As more specific implementation strategies are developed for Klickitat and Rock Creek, NMFS will work with co-managers and stakeholders to express the intended results of those strategies in terms of habitat change. Assumptions relating the expected changes in habitat to projected survival or capacity improvements for each population will also be documented.

ICTRT Comments on Klickitat Plan

10. Comment: The draft Klickitat Plan descriptions of current abundance information in Section 4.1.1 and attachment IV should be updated to include more recent information on abundance derived from mark recapture studies. That information is summarized in the ICTRT current status review for the population.

***Response**:* NMFS has revised Sections 4.1.1 and 4.1.2 to reflect the ICTRT's 2009 updated information on abundance derived from mark recapture studies. Appendix IV was retained since it represents the longer trend information that was used in Section 2.

11. Comment: The harvest rate estimates in the Klickitat plan are misleading and should be explained and recalculated.

***Response**:* NMFS agrees, and this section has been updated. Also see Sections 5.3 and 5.4.

12. Comment: Reference to a study of hatchery and wild interactions (Weber and Fausch 2003) on p. 43 should be re-worded to make it clear that the paper is a synthesis of studies in many drainages, not including the Klickitat River.

***Response**:* The paragraph has been re-worded to make it clear that the Weber and Fausch 2003 paper is a synthesis of studies in many drainages, not including the Klickitat River.

III. Management Unit Plans—Appendices A-E

A. Oregon Steelhead Recovery Plan

General Comments

1. Comment: The Oregon Steelhead Recovery Plan is a comprehensive, science-based recovery plan.

> ***Response****:* ODFW acknowledges this comment and notes that the Plan would not be possible without the dedication, involvement and expertise of the Sounding Board members, Recovery Planning Team, Management Action Teams and consultants. ODFW would also like to thank the Interior Columbia Technical Recovery Team who developed the technical population and viability documents, and the NMFS economist who helped to develop the cost estimates used in the Plan.

2. Comment: It is important for ODFW to adopt as state policy the delisting goal and criteria in Section 5.1, p. 5-1 of the Oregon Steelhead Recovery Plan. This passage defines delisting criteria and the viability criteria defined by the ICTRT as synonymous. This commenter also urged ODFW to adopt by rule the recovery objectives on ps. 5-18 and 5-19.

> ***Response****:* Comment noted. The ESA delisting goal and criteria are used by NMFS in its role to list and delist species under the ESA. The State of Oregon does not have this authority under the ESA. The Plan is voluntary and non-regulatory, providing a framework and road map of voluntary actions that may be carried out to recover steelhead. Similarly, the recovery objectives provide the goals and context for the plan. However, the State of Oregon will adopt elements of the Oregon Steelhead Plan as rule and will consider the commenter's request in rule making.

John Day Basin Comments

3. Comment: Despite progress in habitat improvements in the John Day basin, with many costs borne by private landowners, the John Day steelhead MPG cannot be delisted until the rest of the DPS "catches up."

> ***Response****:* Based on the ESA, NMFS can only delist steelhead by the distinct population segment designation (DPS) for which it was listed. As stated in the response to Comment 71, the John Day MPG still needs improvements in viability even though important advancements have been made through landowner restoration work. Recovery actions are being implemented across the DPS and this DPS has strong potential for future delisting based on improvements to viability. NMFS and ODFW will work with landowners and

stakeholders provide incentives for restoration work and identify ways to recognize the important recovery work that has been carried out over the years.

4. Comment: The John Day basin should be set apart and monitored separately from other Mid-Columbia units.

***Response**:* DPS-wide monitoring and adaptive management are essential to understanding how steelhead respond to recovery actions and to track changes in viability status over time. Oregon will implement monitoring in coordination with other Management Units, the Mid-C Forum's technical science team, and NMFS. Monitoring will still be carried out at the local level in the John Day basin, yet it is essential that local monitoring is coordinated DPS-wide so that data on the status of the DPS are available for the 5-year DPS status reviews conducted by NMFS.

5. Comment: Because streams in the John Day basin historically were poisoned with rotenone are any native fish are left in the basin?

***Response**:* It is correct that past management practices to control non-native species and remove large wood from the stream channels have negatively impacted stream structure and the composition of native fish found in the John Day basin. Despite these and other past practices, however, native fish still thrive in the basin and the Recovery Plan describes the current status of ESA-listed steelhead and the actions needed to recover the species and restore ecological processes.

6. Comment: The plan did not mention a strategy to improve water flows in the John Day basin, but flows are critical to steelhead in that area.

***Response**:* NMFS and ODFW agree that adequate instream water flows are critical to steelhead survival and eventual recovery. The Oregon Steelhead Recovery Plan identifies inadequate stream flow as a habitat-related limiting factor. In addition, Section 9 of the Oregon plan identifies two strategies and related recovery actions for these strategies to address low flow and the water quality consequences of low flows:

- Strategy 6: Restore natural hydrograph to provide sufficient flow during critical periods; and
- Strategy 7: Improve degraded water quality and maintain unimpaired water quality.

7. Comment: recommended a fish trap, much like Shearer's Falls at Tumwater, to select out hatchery strays in the John Day tributaries.

***Response**:* Comment noted and the Tumwater site will be evaluated. If a fish ladder is available at Tumwater Falls then the option to install a trap similar to the one at Shearer's Falls may be possible. However, the trap at Shearer's Falls

is currently used only for enumeration and is not being used to remove hatchery steelhead. There is a proposal in the Recovery Plan that if other measures fail to reduce the number of hatchery steelhead in the Deschutes River, the trap at Shearer's Falls could be used to remove hatchery steelhead.

8. Comment: Ranchers in the John Day basin have paid an extremely heavy financial cost for riparian recovery for steelhead, yet there are still not enough fish. This commenter wondered whether the impact of riparian conditions on fish recovery has been overestimated, and suggested that NMFS needs to re-examine ocean conditions, predators, lower river conditions, and everything else that impacts the fish once they leave the upper, middle, and mainstem John Day.

***Response**:* NMFS and ODFW commend landowners for their leadership and commitment to steelhead recovery as evidenced by the recovery actions they have implemented over the years. These actions have greatly benefited steelhead and stream health. The Plan describes the full suite of limiting factors affecting steelhead across the full life cycle of the fish, both within basin and out-of-basin. The Plan addresses ocean conditions, predators, stream flow, and all other limiting factors and threats affecting the species. A comprehensive set of recovery actions to be implemented in the tributaries is described, as well as out-of-basin actions that are included in the Estuary Module referenced in the Plan. All actions will be evaluated over time and adjusted as needed through adaptive management to improve steelhead status.

B. Washington Gorge-Klickitat River Steelhead Recovery Plan

(ICTRT Comments on the Washington Gorge and Klickitat River Steelhead Recovery Plan are included in Part II, ICTRT Comments.)

1. Comment: The Klickitat Plan does not meet Office of Management and Budget guidelines for information disseminated by Federal agencies. The commenter maintains that many statements of fact are unsupported, that some of the cited documents are not publicly available, and some refer to documents such as NPCC 2004 (Klickitat Subbasin Plan), which themselves contain unsupported statements. The commenter asserts that the plan should be rewritten to meet OMB standards of transparency of data and methods. The commenter had particular problems with Chapters 2 and 5, Appendix II, and Section 6.2, priority geographic areas, stating that the definition of priority geographic areas was based on EDT modeling efforts that are not available to the public. The commenter believes that this section violates OMB requirements for transparency, data quality, and reporting of sources of error. Furthermore, the information contained in Appendix II does not adequately document this effort; that the OMB requires that information used on efforts such as this be based on transparent data with documentation sufficient to allow independent replication of the study; and that the OMB also requires that error sources affecting data quality should be identified and disclosed to users.

> ***Response**:* Section 515 of the Treasury and General Governmental Appropriations Act for Fiscal Year 2001 is called the Data Quality Act, also known as the Information Quality Act (IQA). The Data Quality Act requires that Natural Resource Plans, such as ESA recovery plans, be based on the best available information and be presented in an accurate, clear, complete and unbiased manner. For each recovery plan, NMFS completes a Pre-Dissemination Review and documentation (PDRF) that documents the utility, integrity, and objectivity of the information in the recovery plan is available upon request. Each proposed recovery plan is also peer reviewed. The PDRF for the Middle Columbia Steelhead Recovery Plan is available upon request. NMFS has reviewed these and other public comments and has updated the document, checked and clarified its sources, and added information from newly published documents.
>
> NMFS has made every effort to ensure that the information in this recovery plan is transparent, useful and replicable. We understand that in the past, some sources, such as model runs, have been difficult to access. However, those problems have been remedied for all sources of information cited in this final plan. NMFS has updated the document with available published information. Where published information was not available to support statements in the document, the statements were either deleted or restated as hypothetical information.

2. Comment: The document failed to incorporate the available data concerning limiting factors and instead relied upon unsupported statements. The comment states that the document should use the existing data to discuss what is known and what is unknown regarding limiting factors and should discuss sources of error. The document should also include actions to fill the data gaps identified, based on the discussion of the current state of knowledge in the basin**.**

> ***Response****:* NMFS has updated the document, including information not available at the time the Plan was drafted, as well as other published sources. Where additional data were available to address potential limiting factors, those data were incorporated into the document. Where published information was not available to support statements in the document, the statements were either deleted or restated as hypothetical. A strategy and actions for additional work to verify and refine factors limiting the population has been added. Furthermore, an outcome of effectiveness monitoring will be evaluations of what actions are working and what is not in improving survival.

3. Comment: The commenter expressed concern about how the recovery plan will be used (e.g., "provide a context for regulatory decisions") and particularly urged differentiation of the actions required to attain the goals under the ESA and those that go beyond the requirements of ESA ("broad sense" goals).

> ***Response****:* The primary goal of the DPS-level Middle Columbia River Steelhead Recovery Plan is for the steelhead DPS to become viable and able to be delisted. Recovery goals that are incorporated into the locally developed 'management unit' recovery plans may include other "broad sense" goals to address, for example, other legislative mandates or social, economic, and ecological values that may exceed the minimum necessary to delist the DPS. Delisting criteria must meet the ESA requirements, while broad sense goals may exceed ESA requirements.
>
> As noted in Section 3.1 of the Klickitat Plan, the primary goal for the Klickitat steelhead population is to be restored to viable status and thus to support recovery of the Mid-Columbia steelhead DPS. A viable salmonid population is defined as an independent population that has negligible risk of extinction over a 100-year time frame (McElhany et al. 2000).
>
> The Yakama Nation has proposed the achievement of "highly viable" status, which corresponds to a one percent risk of extinction in a 100-year period, as a broad sense goal for the Klickitat steelhead population. Achieving highly viable status for the population would provide for long-term, sustainable harvest and other social, cultural, and ceremonial needs, although it would likely exceed the minimum necessary to support delisting the DPS. If a local, collaborative Washington Gorge Recovery Board is formed, it may choose to accept or revise this goal or define others.

At this point, it is not possible to draw a "bright line" between the level of effort or specific actions that will provide for ESA recovery as opposed to broad sense recovery. The recovery actions are designed to work synergistically to improve survival throughout the species' life cycle, from egg to smolt to returning adult. Monitoring, research, and adaptive management are essential as a part of any salmonid recovery plan. Monitoring results will indicate progress or the need for rethinking and adjusting our methods. The biological response ultimately will indicate whether the steelhead have surpassed ESA recovery targets and are heading toward broad sense recovery.

4.Comment: Swale Creek is a minor, not a major, tributary to the Klickitat River. Estimated mean annual flow for Swale Creek is 44 cfs (Aspect 2007). For comparison, mean annual flow in the Klickitat River over the period of record for the USGS station at Pitt (which is downstream of Swale Creek) is 1,604 cfs (WPN and Aspect 2005a). Swale Creek surface water flows to the Klickitat are limited to approximately November through April or May, and the Swale Creek subbasin contributes negligible ground water to the Klickitat due to the geologic conditions in the basin.

***Response*:** Comment noted. The MaSAs and MiSAs were developed using a modeling exercise that factored in several physical parameters. The effort was completed on a regional scale and therefore may not have incorporated all available information regarding production potential at the local scale. Prior to the next update of the recovery plan, the MaSAs and MiSAs will be re-evaluated, incorporating new significant local information including unusual flow patterns and previously unidentified barriers.

5. Comment: Add the Little Klickitat Falls (RM 6.1) to this discussion since it is larger than Lyle Falls (even before Lyle Falls was altered to facilitate fish passage) and significantly restricts fish movement into the Little Klickitat River.

***Response*:** NMFS agrees that Little Klickitat Falls is important to address because it significantly restricts movement into the Upper Little Klickitat MaSA. Klickitat Falls is now included in Section 2.3.4, Migration Barriers, of the Klickitat Plan.

6. Comment: The citation, Conley 2006b, for the figures**,** Figures 2-4 and 2-5 in Section 2.3.1, does not contain any data; it is a summary of accomplishments for the year. The commenter requested an accurate reference for the data depicted in this figure and suggested USGS website, Ecology website, and/or WPN and Aspect 2005a.

***Response*:** NMFS revised Figure 2-4 based on data available from the USGS and has provided the appropriate citation for the information.

7. Comment: Delete the statement in Section 2.3.1 that "changes in watershed conditions and groundwater withdrawals in some streams may have reduced

summer flows and shortened flow duration," and also delete a similar statement in Section 2.3.3. The commenter asserts that this statement is unsupported and speculative, and cites Washington Department of Ecology's groundwater well database (see interactive well log map at: http://apps.ecy.wa.gov/welllog/MapSearch/viewer.htm?&FASTSTART=YES&SESSIONID=852104219) as showing that there are no groundwater wells located in or near the White Creek drainage, and only two domestic wells in Canyon Creek basin and two in Beaks Canyon basin. The commenter concluded that the effect of groundwater withdrawals on stream flow in the tributaries has not been assessed, except for Swale Creek (see Aspect 2007 regarding Swale Creek).

> ***Response*:** NMFS has revised Sections 2.3.1 and 2.3.3 of the Klickitat Plan based on recommended and currently available data.

8. Comment: The results of the Inter-Fluve study (2002) cited in Section 2.3.2 of the plan, which was based on a regional hydrograph, might be inaccurate. Inter-Fluve 2002 assumed that the regional hydrographs were applicable in Swale Creek. Due to an unusual geologic formation (see Aspect 2007), the regional hydrographs that assume a substantial groundwater contribution to late-season flows are not applicable to Swale Creek. As described in Aspect (2007), the collective information for Swale Creek indicates that the Warwick Fault restricts discharge of groundwater from Swale Valley into the Swale Canyon, except in the lowest reaches of the canyon where the fault is west of it. Even without the fault barrier limiting discharge into the canyon, groundwater provides insufficient base flow to sustain flow in that portion of the creek, whether in late spring (prior to start of irrigation pumping in Swale Valley) or in September. The limited groundwater discharge appears to sustain isolated pools in the lowermost canyon throughout the late season. The lack of groundwater discharge observed year-round (i.e., prior to onset of irrigation pumping) indicates that the limited groundwater contribution to base flow in Swale Canyon is the natural hydrogeologic condition.

> ***Response*:** NMFS welcomes this further information concerning the hydrogeologic condition in Swale Creek and has added it to the more detailed discussion of Swale Creek in Section 5.2.2, with appropriate citations. NMFS retained the Inter-Fluve citation in Section 2.3.2 and the associated statement that Swale Creek has the potential to provide viable habitat for anadromous salmonids if the channel is restored and perennial water enhanced.

9. Comment: The following statement in Section 2.3.3 is speculative: "Loss of beaver in the subbasin has contributed to the drying and loss of some wetland and riparian habitats." The commenter stated that no assessment has been done of the effects of reduced beaver populations on riparian function, but it would be reasonable to assume that riparian function has improved as a result.

> ***Response*:** Because NMFS is not aware of a study specifically enumerating beaver populations in the Klickitat subbasin, the statement has been revised to

read "may have." However, scientific literature on the effects of beaver activities in other watersheds and their eradication throughout the West is sufficient to support the inference that loss of beaver would be deleterious to the Klickitat watershed.

10. Comment: This sentence in Section 2.3.3 should be deleted unless some support can be provided for it: "Loss of wetlands in some tributaries, possibly in conjunction with groundwater withdrawals, may have diminished wetlands…recharge capability."

***Response*:** NMFS revised the sentence to better reflect uncertainty and added USGS citations concerning studies in other basins that indicate that surface irrigation can increase recharge over predevelopment conditions, depending on the scale of the irrigation and other variables.

11. Comment: What is the source of the information in Section 2.6, Table 2.1 of regarding the rate of harvest of wild fish? On an earlier page, the text stated that the efficiency of the adult trap was not yet known. If the efficiency of the trap is unknown, then the population size is unknown. If the population size is unknown, the percentage of the wild run that is harvested cannot be estimated. The source of the information, the assumptions, and methods used to complete the estimates need to be presented, the commenter said.

***Response*:** There is a citation in Table 2.1 for the source of the harvest data. The harvest rate for the 2005-06 and 2006-07 return years is based on the estimated abundance of wild steelhead and harvest below Lyle Falls, as described in Appendix IV. A reference to Appendix IV has been added after the harvest estimates. The efficiency of the Lyle Falls traps was not known before 2005. Beginning with the 2005-06 return year, mark-recapture studies have been completed annually and more accurate estimates of wild steelhead abundance have been produced (see Appendix IV). With the new, more accurate estimates of wild steelhead abundance, a more accurate estimate of harvest can be made (see text in last paragraph of Section 2.6). The mark-recapture estimates will also provide more accurate estimates of escapement than have been available in the past, and have shown that escapements have exceeded the minimum abundance threshold of 1,000 adults averaging over 1,400 in the last two years (see Appendix IV).

12. Comment: Updated information on Klickitat population size and ratio of hatchery to wild fish should be provided in the plan. Specifically, the data collected at the adult trap at Lyle Falls should be reported together with estimates of population size.

***Response*:** Where appropriate, the updated population estimates have been incorporated into Section 4.

13. Comment: In Section 4.1.2, the Plan text states, "the analysis assumed that the upper mainstem Klickitat watershed was once a highly productive steelhead spawning area." This is not a good assumption, and for information to the contrary, the commenter cited the Washington Department of Fisheries' report for a survey conducted above Castile Falls in 1957 (prior to construction of a fishway): Stream Appraisal of Klickitat River Above Castile Falls, July 25-26, 1997 (LeMier E. et al 1957). The commenter went on to say that Upper Little Klickitat should not be a MaSA because passage over the falls is very rare, and that furthermore, Swale Creek should not be considered a MiSA because it contains only 3.1 miles of spawning habitat – the rest of the channel is bedrock dominated and all but the lower 3.1 miles go dry in summer. Therefore, the comment stated, Figure 4-2 substantially overestimates the historical contribution of the upper mainstem; the number should be near 0. The commenter argues that since the fish passage improvements were made, the area above Castile Falls represents an increase in the Klickitat Basin's carrying capacity and an enhancement of spatial structure for steelhead over historical conditions.

> ***Response*:** The MaSAs and MiSAs were developed using intrinsic potential analysis, which factored in several physical parameters. The effort was completed on a regional scale and likely did not incorporate all available information regarding intrinsic habitat potential at the local scale. Within the Klickitat Basin, passage into two MaSAs (upper Little Klickitat and West Fork Klickitat) and one MiSA (Surveyor's Creek) is blocked near the mouth or lower point of the MaSA/MiSA. Unusual flow conditions also affect the intrinsic habitat potential of other spawning areas. The MaSAs and MiSAs may be re-evaluated during plan implementation and updates can be made, considering local data such as unusual flow patterns and previously unidentified barriers.

14. Comment: Although the terms "limiting factors" and "threats" are defined in the first paragraph of Section 5, the term "limiting factors" is frequently misused. According to the comment, in many cases throughout the Pacific Northwest, the actual limiting factors are poorly understood. There has been insufficient research in many of the salmonid basins in the Pacific Northwest to adequately identify and characterize the factor(s) limiting basin populations. In lieu of that information, this document and many others substitute a listing of all factors that could be limiting populations and, unfortunately, usually include all sources potentially affecting that list of potential limiting factors in the discussion. This trend is a major disservice to quality, reliability, and credibility of aquatic science in the region. As the ISAB suggested in its review of the estuary module, when specific limiting factors are not known, they should be listed as potential limiting factors rather than be stated as known facts (ISAB 2008).

> ***Response*:** NMFS agrees that there are some inconsistencies in the use of the terms "limiting factors" and "threats." NMFS has used the best available information to refine the limiting factors. The list of limiting factors is based on a substantial body of research on salmonids, local field data and field

observations, and the considered opinions of regional experts. These are implicitly hypothetical statements, made with the expectation that by taking action in the face of some degree of scientific uncertainty, monitoring the results, continuing to conduct research to resolve the uncertainties, and adapting our management actions in response, the state of our knowledge will improve and so will the survival of these fish, although not necessarily in a directly parallel process. Additionally, NMFS recognizes that sufficient information to fully determine limiting factors in the Klickitat population is not available. NMFS has modified the language in Section 5 to more consistently reflect the hypothetical nature of the discussion and to incorporate more published information, where available, to support the discussion. Research, monitoring and evaluation in the implementation phase of the Plan will be structured to continue refining knowledge of the limiting factors, their causes, and the biological response to proposed actions.

15. Comment: A discussion of the proportion of hatchery vs. natural-origin steelhead spawning in the Klickitat River (Section 5.1 of the Klickitat Plan) should use more recent data.

***Response*:** The ICTRT used the best data available to them at the time of their analysis, which led to the conclusion that hatchery steelhead contributed more than 5 percent to the naturally spawning steelhead in the Klickitat River subbasin. This information was included to provide a context for the ICTRT conclusion and to contrast with newer information that is provided by Narum et al. (2006) in the following paragraph. However, NMFS updated the information regarding the percentage of returning natural origin steelhead in that paragraph. The new information reflects the proportion of the returning adults of natural origin that passed through the Lyle Falls adult fishway trap during 2005, 2007, 2008, and early 2009.

16. Comment: Section 5.2 has many fatal flaws and should be revised using existing information where available to discuss what is and is not known regarding limiting factors within the freshwater habitat.

•Most of the statements are unsupported and many cannot be supported with existing data/information. Statements of hypothesis are acceptable if the text clearly indicates they are hypothetical and also discusses alternate hypotheses.

•The text fails to incorporate existing information.

•The text suggests that all of the potential limiting factors are actually limiting the population. Since the limiting factors in this population have not been evaluated, the text needs to be modified to reflect the speculative nature of the information.

•Some of the sections claim to be based on an EDT model. The model is not available for review; hence the requirements for transparency are violated.

Paragraph one of Section 5.2 uses the term "primary limiting factors," for the MaSAs and MiSAs. The commenter suggested replacing "primary" with "potential," and acknowledging that the actual limiting factor is unknown.

> ***Response*:** NMFS acknowledges that there were some difficulties accessing the EDT model runs referenced in the proposed recovery plan. The 2005 EDT model run referenced in the recovery plan is now available at http://edt.jonesandstokes.com/sponsors/show_sponsor.jsp?sponsor_id=10. However, the data on the Jones & Stokes' website are from 2006 and lack fish population information needed to run the model for the Klickitat basin. The information on the website does not document the source of the data provided in the database. Because of this, NMFS obtained Yakama Nation Fisheries publications, WRIA 31 Watershed assessment and planning documents, and other information pertinent to the habitat conditions in the basin, and revised the recovery plan accordingly. NMFS also added available data on spawning gravel and temperature, as well as information on known passage barriers. In addition, NMFS has referred to limiting factors in some respects as potential in recognition that our knowledge is not absolutely certain. However there is information available now that supports the limiting factors described and that warrants taking actions to address them. NMFS supports further work to verify and refine limiting factors. Such additional work is both identified as a strategy and is also an expected outcome from effectiveness monitoring

17. Comment: The majority of Section 5.2.1, Middle Mainstem Major Spawning Area (MaSA), addresses the tributary habitat, while little discussion of the middle mainstem is included. This section of the mainstem is in nearly pristine condition with little land use and the text should reflect this. The primary limiting factors should be listed as unknown since they have not been assessed.

> ***Response***: NMFS revised the text in Section 5.2.1 to list "potential" limiting factors. NMFS also added additional available information, including a discussion of the mainstem habitats.

18. Comment: Section 5.2.1 ,Lower Mainstem MaSA, contained no citations and identified several documents that could be used to address the lower mainstem major spawning area.

> ***Response***: NMFS reviewed the recommended literature and incorporated the information into the section as appropriate.

19. Comment: In Section 5.2.1, Lower Mainstem MaSA, the primary limiting factor(s) in this reach have not been assessed and therefore the list of limiting factors should be changed to "unknown**."**

> ***Response***: NMFS disagrees with the statement that the list of limiting factors is "unknown." As previously stated, the list of limiting factors is based on best

professional judgment and will be evaluated and verified through research, monitoring and evaluation.

20. Comment: Delete the following sentence in Section 5.2.1, Lower Mainstem MaSA: "There is the potential for habitat fragmentation in this MaSA due to subdivision, land-clearing, and development." The commenter stated that any land development must meet County regulations, including substantial setbacks.

Response: NMFS acknowledges that county regulations must be met, which reduces the potential for habitat fragmentation, and notes that under the Klickitat County Shorelines Master Plan, variances can be obtained in extraordinary circumstances if the public interest suffers no substantial effect (see Appendix III). "Protection of the highest quality habitats through conservation easements if threatened" is listed as a key action in Table 6-1, "Recovery Strategies and Actions."

21. Comment: This section 5.2.1 on the Upper Little Klickitat MSA should be deleted because there is no probability that the upper Little Klickitat ever supported substantial spawning. According to the commenter, local experts generally agree that passage over the falls occurs rarely during high water years. Even at high water, only a few fish make it past the falls.

Response: The Upper Little Klickitat is within the known distribution of steelhead. The MaSAs and MiSAs were developed using intrinsic potential analysis, which was based on a number of physical parameters, and which assumed that the habitat upstream of the falls was fully accessible. NMFS has modified the text to include a discussion of the limited passage over the Little Klickitat falls into the spawning area.

22. Comment: Section 5.2.1, West Fork Klickitat MSA, contained no citations to support the text.

Response: NMFS reviewed the available information regarding the spawning area and revised the section accordingly, with appropriate citations, to reflect the available information.

23. Comment: In Section 5.2.2 Swale Creek MiSA (Minor Spawning Area), the limiting factors in this basin have not been thoroughly assessed but are likely naturally occurring lack of flow and high water temperatures (WPN and Aspect 2004; Aspect Consulting 2007). Habitat in the basin is limited to the lower 3.1 miles (WPN and Aspect 2004), while the rest of the reach is scoured bedrock and goes dry in summer.

Response: NMFS has reviewed the recommended documents and has modified Section 5.2.2 based on the information contained in those documents, with appropriate citation.

24. Comment: The references to the 1998 water quality assessment (303d list) in Section 5.2.2 Minor Spawning Areas, Lower Little Klickitat are out of date, and need to be updated to refer to the most recent assessment, see http://www.ecy.wa.gov/programs/wq/303d/2002/2002-index.html. Furthermore, the limiting factors in the lower Little Klickitat River have not been assessed and the list of limiting factors should therefore be changed to "unknown," particularly since this text is not supported by any references.

> ***Response***: NMFS has updated the information regarding 303(d) listings based on the most current Washington State Water Quality Assessment. Based on this comment and others, NMFS obtained and reviewed the existing information regarding the Lower Little Klickitat MiSA. As a result of this review, NMFS retained the original list of "potential" limiting factors. As stated previously, the list of limiting factors is based on the best available information and professional judgment and will be evaluated and verified through research, monitoring and evaluation. Also see response to Comment 19.

25. Comment: This section 5.3 Tributary Harvest Management should include a discussion of the effects of treaty harvest of 3.5 to 10 percent per year. The Plan also should discuss the cumulative effects of all the fisheries (2 percent sport, 3.5 to 10 percent in the Klickitat, 10 percent in the Columbia comes to greater than 20 percent of the wild fish caught annually.) How is this harvest impacting recovery?

> ***Response*:** Sections 5.3 and 5.4 include discussions of the overall fisheries impacts from all of the fisheries (Columbia River mainstem and tributary). In Section 5.3, there is a description of the modeling that was conducted by Chilcote (2001) that evaluated the effect of harvest levels on the survival of 27 Oregon steelhead populations. The model looked at a range of fisheries mortalities from 0 percent to 75 percent. The results were stated in terms of the probability of population extinction in 50 years at each mortality rate. For most populations, the modeling suggested that the probability of extinction was essentially zero as long as fisheries mortality rates remained less than 30 percent. However there was significant variation between populations. The probability of extinction increased dramatically as mortality rates became greater than 40 percent. Furthermore, once the probability of extinction increased beyond 0.05, the transition to an extinction probability of 1.00 was very rapid. In other words, once mortality rates increase sufficiently to cause the probability of extinction to exceed 0.05, any additional mortality would cause a rapid increase in the likelihood of extinction. Because the transition from low to high risk happens rapidly, there is little room for error (in the model or the measurements of mortality rates). To address this concern, WDFW generally manages steelhead fisheries not to exceed a maximum fisheries mortality rate of to 20 percent, but it is more conservative when warranted. NMFS (2008) estimated that for most populations in the MCR Steelhead DPS, harvest impacts from Columbia River tribal and non-tribal fisheries have averaged 8.23 percent for the period from 1998-2007 and are expected to

remain at this level (Table 8.8.8.8-1). The combined tributary and mainstem impacts for Klickitat summer (the highest harvest impact for all MCR steelhead populations) are 14.53 percent of the wild run. This impact is still below the 20 percent fisheries mortality rate identified by Chilcote (2001) and is considered conservative because it assumes a 63 percent wild steelhead encounter rate Klickitat River, a 10 percent catch and release mortality, and because the population is exposed to only part of the tribal mainstem fisheries.

Monitoring at Lyle Falls to estimate natural-origin and hatchery steelhead abundance as well as monitoring of catch by WDFW and the Yakama Nation will assist in verifying these estimates.

26. Comment: The limiting factors analysis needs to be substantially revised and improved according to procedures described in the research literature such as Curtiss, 1979; Everest and Sedell 1984; Reeves et al 1989; Reeves et al 1991; Bisson 1992. The limiting factors analysis in the proposed Klickitat recovery plan does not meet this standard. The commenter believes that it is essential to fill the data gaps first before defining recovery actions, and that time and money will be saved by doing so**.**

***Response*:** NMFS believes that sufficient information is available on salmonid habitat in general and the Klickitat subbasin in particular to design recovery actions supported by a research, monitoring and evaluation program and the adaptive management process.

27. Comment: The introduction to Section 6 assigns high priority to addressing the factors that resulted in the moderate risk rating, but the sections following do not include actions to address those factors. Specifically, there is no action related to assessing population size and productivity and the assessment of hatchery interactions is given just a small mention. The majority of the action items are focused on habitat improvements,

***Response*:** NMFS has revised the section to provide a more detailed treatment of the suite of actions necessary to address the factors that led to the ICTRT's moderate risk rating. In doing so, NMFS also reorganized the section to clarify and emphasize the strategies and actions necessary to address those factors.

28. Comment: The impacts of coho and other introduced species (Table 6.1) currently spawning naturally in the basin should be assessed and a program to control those impacts, if needed, should be added to this discussion.

***Response*:** Minimizing the adverse impacts of large-scale hatchery releases of coho and fall Chinook is a strategy identified in Section 6.1. NMFS agrees that actions are needed to assess and monitor the impacts. A new section has been added that addresses data gaps. Since the major data gaps include assessments of hatchery impacts on natural steelhead production, two of the strategies previous contained in the section on hatchery strategies were moved into the

new section. The new section also contains a strategy to assess the effects of coho and fall Chinook (both introduced) on the steelhead population.

29. Comment: In Table 6.7, Restore altered hydrographs to enhance instream flows during critical periods**,** delete the action to "obtain instream flow right for the mainstem Klickitat," on the grounds that there has not been a statistically significant trend in Klickitat River mean annual flow or mean annual low flow over the period of record (WPN and Aspect 2005a).

Response: NMFS recognizes that a wide range of actions may be utilized to address stream flow in the basin. The strategies have been reworked to address high priority actions, with a focus on filling data gaps, identifying actions that have a reasonable probability of improving streamflow, and implementing those actions. The action in question is retained in Table 6-5.

30. Comment: "[S]hort-term fertilization of stream with carcasses" would likely cause water quality problems; therefore, delete or restate this action as a possibility to evaluate. (In Table 6-8, Restore degraded water quality, including water temperatures.)

***Response*:** NMFS recognizes that a wide range of actions may be utilized to address water quality in the basin. The action addressed by the comment is retained in Table 6-6.

31. Comment: The table of strategies and actions, Table 6.1, should include monitoring and assessment of the impacts of harvest on recovery rate rather than assuming that the current harvest of over 15 percent to over 20 percent of the fish annually is low impact.

Response: NMFS relies on annual monitoring of harvest in all of the fisheries. As described in Sections 5.3 and 5.4, harvest impacts are at levels that are not expected to adversely impact the viability of the steelhead population in the Klickitat River (see also NMFS 2008).

32. Comment: Include an assessment of the impacts of stocking non-native species as a priority in Strategy 2 on minimizing adverse impacts from hatcheries.

***Response*:** NMFS agrees with the comment that impacts from the release of non-native species should be assessed. This assessment has already been started, as described under Strategy 2. Furthermore, assessment work has already been completed though the HSRG and the development of the Klickitat River Fisheries Master Plan. NMFS will also do an assessment as part of the ESA consultation process for all hatchery programs in the MCR steelhead DPS that is required under Hatchery Action RPA 39 of the FCRPS Biological Opinion. A new strategy has been added to this Plan to determine the effects of coho and fall Chinook on the steelhead population. The table has been modified; the source of the information has been clarified.

33. Comment: Table 6.1, Strategy 5, involves transferring existing *U.S. v. Oregon* production of fall Chinook and coho from the Klickitat Hatchery to a new facility 26 river miles downstream. These fish will not necessarily restrict their spawning range to the lower river but will in fact compete with steelhead. If hatchery coho and Chinook are to be released into the river, a program (e.g. liberalized coho and fall Chinook fishing regulations) needs to be developed that will stop these fish from spawning naturally in the river.

> ***Response*:** NMFS does not support the commenter's concern regarding the movement of coho and fall Chinook production to a facility lower in the basin at Wahkiacus, because coho and fall Chinook do not compete with steelhead for spawning habitat. Coho and fall Chinook spawn in the fall, whereas steelhead spawn in the later winter and spring. By moving the releases downstream and away from the primary spawning and rearing tributaries any adverse interactions between juvenile steelhead and hatchery juveniles can be minimized. Releasing the coho and fall Chinook in the lower river is expected to concentrate returning adults to the river below the hatchery and thus allow for improved tribal and recreational harvests. When hatchery returns are expected that exceed broodstock escapement goals for the Klickitat basin, the harvest managers can increase bag limits for hatchery coho and fall Chinook through emergency regulations.

34. Comment: Delete "changes in land use laws and ordinances, or obtaining instream flow rights for the mainstem Klickitat" in Section 6.2's second bullet. Existing land use laws and ordinances are adequate, and mainstem Klickitat stream flow is normative, demonstrating no statistically significant trend in mean annual flow or mean annual low flow over the period of record for the flow gauge near Pitt (WPN and Aspect 2005a).

> ***Response***: The section has been revised, and the language the commenter refers to now appears as follows:
>
> Protection and maintenance of existing high quality habitats is a broad, economical approach to species recovery. Many objectives are likely to be met through habitat protection and the associated natural recovery of upland and riparian areas. Protection and maintenance includes compliance with existing rules and regulations, such as the State Forest Practices Act, Klickitat County Shorelines Master Plan and Critical Areas Ordinance, and other state and county regulations designed to protect aquatic habitat. Protection may also incorporate a wide range of voluntary actions such as fencing riparian areas, participation in the various agricultural land reserve programs, and voluntarily implementing programs that help to avoid impacts to aquatic resources. Land acquisitions, easements, cooperative agreements, and protective land designations can also be used to facilitate high quality habitat protection.

However, obtaining instream flow rights for the mainstem Klickitat has been retained as an option in Table 6-5.

35. Comment: The references to timber related threats do not pertain to State and private lands, which are already covered under the State's forest practices rules, and suggested this should be explicitly stated in the document.

Response: Forest practices on state and private lands are covered under a Habitat Conservation Plan. Forest practices on the Yakama Reservation are managed according to the Yakama Nation Forest Plan, which designates the Klickitat watershed a canyon "management emphasis area," in which no timber harvest is planned. The table refers generically to timber, grazing, and agricultural activities and lists actions that are, for the most part, included in what would be called "best management practices." See also response to Comment 36.

36. Comment: WDNR lands should not be designated as natural areas, because these lands are subject to an HCP that NMFS has accepted, and therefore NMFS may not call for a level of protection beyond the HCP. (See Table 6.3, Action a.)

***Response*:** The DNR HCP does not cover DNR-managed lands east of the Cascade crest. However, DNR forest lands are managed according to Washington State Forest Practices Rules, which are the subject of a separate HCP. It is important to note that the purposes of an HCP and a recovery plan are not identical. To qualify for an HCP, the associated habitat-affecting actions must be determined to minimize the take of ESA-listed animals to an extent that does not jeopardize the likelihood of recovery of that animal. A recovery plan includes a delineation of a set of strategies that are likely to achieve recovery of that animal. It may be desirable to bring certain lands to a very high standard of habitat quality in order to achieve recovery of the animal without requiring that all lands be managed to benefit the ESA-listed animal.

37. Comment: The commenter is unaware of any groundwater development in some of the highest priority areas identified in Table 6-5 (Action c), and asserts that there has not been a statistically significant decline in mean annual flow or mean annual low flow in the mainstem Klickitat over the nearly 100-year period of record (WPN and Aspect 2005a).

Response: NMFS acknowledges that updates of the information presented in the tables based on data sources not originally incorporated in the development of the strategies and actions is likely needed. NMFS has clarified the sources of the information and the purpose of the tables.

38. Comment: "[A]ltered flow regimes" and "withdrawals" are not potential limiting factors in this area; define "withdrawals," whether quantity of water withdrawals or inadequate screening on water diversions**.** (See Table 6.5, formerly Table 6.6)

***Response*:** NMFS has modified the table to clarify that the actions address potential limiting factors. NMFS acknowledges that updates of the information presented in the tables based on data sources not originally incorporated in the development of the strategies and actions is likely needed. NMFS has clarified the sources of the information and the purpose of the content of the tables.

39. Comment: Regarding Table 6.6, clarify the meaning of "altered food web."

Response: A food web is a complex of interrelated food chains in an ecological community. An altered food web is a set of interrelated food chains that have been disrupted or modified by natural or manmade causes.

40. Comment: Appendix D suggests there is uncertainty regarding the magnitude of the harvest of the naturally spawning steelhead originating in the Klickitat River. Add a second strategy to Section 6.3 for improved monitoring and reporting of harvest.

***Response*:** NMFS interprets that the commenter was referring to Appendix IV in the Draft Recovery Plan for the Klickitat River and agrees that actions should be taken to improve monitoring and reporting of harvest. Actions described in Section 8.5 will improve estimates of the wild steelhead abundance; these estimates are necessary to estimate harvest impacts. As indicated in Table IV-1, retention of wild steelhead in the tribal fisheries has declined as more tribal members return wild fish to the river even though they are not required by Tribal regulations (see Section 5.3). A second bullet has been added to Section 6.3 to further address the need for additional monitoring and reporting of harvest.

41. Comment: In Section 7.2, the costs associated with this plan are exorbitant, primarily because they are based on a faulty analysis of limiting factors, and because the actions may be oriented more toward broad sense goals than ESA recovery. The commenter asserts that the Klickitat steelhead population is likely to meet the viability criteria for abundance and productivity specified in the DPS plan, once additional years of monitoring are available, and that the population likely exceeds spatial structure criteria given the improvements in fish passage at Castile Falls. The remaining problem is in the diversity criterion and the impacts of hatchery steelhead that need to be assessed and, as appropriate, addressed.

***Response*:** NMFS has expanded the actions needed to address hatchery effects on steelhead. NMFS has included the population estimates for 2006 and 2007, which averaged greater than 1400 fish. Continued monitoring of the population size is needed to determine if the population is currently meeting the viability criterion for abundance. Estimates of productivity are not yet available.

42. Comment: In Section 8.1, delete the reference to EDT and AHA.

***Response*:** NMFS has modified the sentence to read "Various research and monitoring efforts require comprehensive empirical monitoring data on fish populations and habitat to identify appropriate project actions and strategies, select suitable sites and priority locations for actions, populate habitat/production capacity modeling efforts (such as Ecosystem Diagnosis and Treatment [EDT], All H Analyzer [AHA]), or other appropriate models, and inform adaptive management for the salmonid recovery plan."

43. Comment: Include a path to a delisting decision in diagram (Figure) 8.1.

***Response*:** Figure 8.1, Listing Status Decision Framework, is an explicit illustration of the information NMFS needs for species status reviews.

44. Comment: In Section 8.3, add the following items to the list of research needs: determination of limiting factors; competition between steelhead and hatchery releases of non-native species, including any portion of the non-native species currently spawning naturally in the basin.

***Response*:** Further identification of limiting factors is included as part of the RM& E and adaptive management plan that will be developed after the Plan is adopted. An assessment of competition between steelhead and hatchery releases of non-native species has been added to the document.

45. Comment: Use Klickitat County's recommendations regarding monitoring to contribute to development of the RM&E Plan.

***Response*:** NMFS has added Klickitat County's monitoring recommendations to Section 8.4.

46. Comment: Add the following activities to the list in Section 8.4 of current monitoring and research programs (note: WRIA 30 Implementing Governments are state and local agencies tasked with implementing the WRIA 30 watershed management plan; the Governor has designated Ecology to represent state agencies [e.g., WDNR, WDFW, WDOH]):

- Water quality (numerous parameters including temperature) monitoring by WRIA 30 Implementing Governments (City of Goldendale, Central Klickitat Conservation District (CKCD), Washington Department of Ecology (Ecology)) and the Klickitat County Health Department
- Flow monitoring by the USGS and WRIA 30 Implementing Governments (Ecology, City of Goldendale, CKCD, Klickitat County)
- Snow monitoring by NRCS and WRIA 30 Implementing Governments (Klickitat County, Ecology, the City of Goldendale, and CKCD) (SNOTEL station was installed in Simcoe Mts. this year)

- The entire TFW adaptive management program (which addresses private and state timberlands)
- Riparian assessment and monitoring vegetation in floodplain in Swale and Little Klickitat Basin by WRIA 30 Implementing Governments (Klickitat County, CKCD) (assessments and vegetation monitoring to be established this year)
- Groundwater monitoring and assessment of groundwater, WRIA 30 Implementing Governments (Klickitat County, Ecology, City of Goldendale)
- Water well database maintained by Ecology
- Sport fishing monitoring by Washington Department of Fish and Wildlife (WDFW)
- Habitat project tracking with public access via Habitat Work Schedule web portal by Klickitat Lead Entity and WDFW

Response: NMFS has added the requested monitoring activities to Section 8.4.

47. Comment: The primary objectives listed in Section 8.5 should include an assessment of the effects of the Klickitat hatchery programs on listed species, since that is one of the key questions driving the current risk determination.

Response: Additional strategies have been added to the plan to better address the issue. NMFS believes that the monitoring and evaluation activities proposed in the plan, as modified, are adequate to do the assessment.

48. Comment: The WRIA 30 watershed planning activities include monitoring and evaluation, and that a paragraph should be added to Section 8.5 on WRIA 30 Implementing Governments' involvement in RM&E.

***Response*:** NMFS has added the list of monitoring and research needs that are identified in the WRIA 30 watershed plan to Section 8.4. Section 8.5 does not identify any parties that will be conducting future monitoring and research.

49. Comment: The barrier at RM 0.32 on Major Creek appears to be significant. (See Appendix I.)

***Response*:** There are apparently two waterfalls near the mouth of Major Creek. Since Major Creek is not considered to be either a major or minor spawning area according to the criteria established by the ICTRT, the information provided by the Yakama Nation on Major Creek was not incorporated into the Klickitat Plan, but rather placed in an Appendix.

50. Comment: Appendix I, Section 4 should be retitled "Potential Limiting Factor**s."**

***Response*:** The section was retitled.

51. Comment: Change "Implementing Entities" to "Potential Implementing Entities" on Table I-1 and add state and local agencies (which would include Ecology, WDFW, the County, Conservation District) to the list.

> ***Response*:** "Implementing Entities" has been changed to "Potential Implementing Entities" on Table I-1. State and local agencies (Ecology, WDFW, the County, Conservation District) were added to the list, and an estimated cost was provided.

52. Comment: Appendix II should be entitled "POTENTIAL Limiting Factors and Threats Identified by Yakama Nation Fisheries." The commenter asked what the purpose of the appendix was and how it would be used during implementation of the Plan.

> ***Response*:** The list was re-titled as "potential limiting factors….". The information in Appendix II serves as detailed background information on potential limiting factors as identified by the Yakama Nation.

53. Comment: Some of the actions listed in Appendix III have been completed and the appendix needs to be updated the reflect that.

> ***Response***: NMFS has updated Appendix III, where more current information was available.

54. Comment: The information in the subsection on Shoreline Development Regulations, pgs. 159-160, is misleading and should be deleted in favor of the subsection on pgs. 156-157.

> ***Response*:** NMFS has updated Appendix III, where more current information was available.

C. Washington Gorge-Rock Creek Steelhead Recovery Plan

1. Comment: The executive summary needs to be updated to reflect any changes made in the body of the document in response to comments.

***Response*:** The executive summary has been updated as appropriate.

2. Comment: A commenter provided several data sources on summer water temperatures not previously included.

Response: NMFS incorporated information from, and references to, the sources.

3. Comment: By listing aspects of habitat that are not, by definition, limiting factors, the limiting factors discussion in the Rock Creek recovery plan is muddled. For example, the commenter said that "degraded riparian function and condition" are not limiting factors, although conditions such as high water temperature, lack of pools, or lack of food that can be caused by or related to degraded riparian function could be limiting factors. This commenter went on to say that there are insufficient data to determine limiting factors for Rock Creek steelhead; more study is necessary; and the plan should be revised accordingly. "The recovery plan should use the existing data to discuss what is known and what is unknown regarding limiting factors and should discuss sources of error."

Response: NMFS recognizes that there are multiple definitions of the concept of "limiting factor" in use in the Pacific Northwest. The Plan uses a broad definition that is commonly found in the scientific literature on salmonids. NMFS believes existing information and analyses are adequate to suggest a recovery trajectory and a scale of effort that can reasonably be expected to achieve the recovery goal for the Rock Creek steelhead population. Although some published and unpublished data are available, some disagreement also exists among regional experts concerning limiting factors and threats for the Rock Creek population. A collaborative approach to further research will help to resolve these disagreements.

4. Comment: Habitat in the Rock Creek subbasin is generally in good condition according to a study not available at the time the recovery plan was proposed by NMFS for public comment September 24, 2008 (Glass 2009). This commenter argued that anthropogenic causes have not substantially affected sediment routing, channel structure and complexity, or floodplain function and channel migration processes, and asked for data and/or references to support statements to the contrary.

Response: NMFS has reviewed the document referenced in the comment and has updated the discussion in the Plan with information from this source. Regarding sediment, the Glass 2009 finding of generally low levels of fine

sediments in spawning gravel was cited. However, as stated in the plan, several types of historical and/or current land use practices (including timber harvest, agricultural irrigation and grazing, road, bridges, dikes and culverts) typically do affect sediment, channel structure, and floodplain, and these effects are well documented in the scientific literature. The extent to which current conditions differ from historical conditions is arguable, given the lack of baseline data. NMFS believes that existing information and analyses are adequate to suggest a recovery trajectory and a scale of effort that can reasonably be expected to achieve the recovery goal for the Rock Creek steelhead population. NMFS also supports further collaborative assessment of limiting factors and their causes, whether natural or anthropogenic, as an appropriate part of ongoing research, monitoring and evaluation to support adaptive management of the actions taken to improve habitat.

5. Comment: Riparian condition in the Rock Creek subbasin is not degraded, as stated in the plan, Chapter 5, and executive summary. Rather, this commenter suggested, "riparian condition has been improving since 1938, presumably due to fire exclusion," citing a study not found in the recovery plan, Aspect Consulting, 2005, Rock Creek Water Quality Report, WRIA 31, prepared by Aspect Consulting for WRIA 31 Planning Unit.

Response: NMFS believes that degraded riparian condition is a limiting factor. However, NMFS has reviewed the suggested references and has added language that reflects the increase in valley bottom vegetation.

6. Comment: Evidence indicates that the natural hydrograph in the Rock Creek subbasin is not altered and that there is very limited development and water use within the Rock Creek subbasin. For example, the WRIA 31 Level 1 Watershed Assessment estimated that the current net groundwater recharge (accounting for groundwater withdrawal and return flow) within the Rock Creek subbasin has been reduced by less than 0.5 percent relative to the predevelopment condition (Table 3-26 in Aspect Consulting and WPN 2004).

Response: NMFS has reviewed this and other documents cited in comments. NMFS has revised the Plan to reflect the provided information. However, the loss of riparian vegetation, instream habitat complexity and diversity, and floodplain connectivity in some reaches because of grazing, roads, and/or other land uses can increase the intensity of flows in some parts of the drainage and can also contribute to low flows at other times. The additional information is valuable but does not necessarily support a definitive conclusion regarding anthropogenic effects.

7. Comment: Since the food web in this area has not been assessed, "altered food web" is not an appropriate limiting factor.

***Response*:** NMFS has revised the discussion of this subject in the Plan, as follows: Changes in the hydrological regime and riparian conditions affect the food web and thus increase competition among species. Macroinvertebrates can be produced in reduced quantities where there are poorly functioning hyporheic zones, diminished pool and riparian presence, and a lack of stream structure. However, to date, there has been no assessment of food production or competition for food in the Rock Creek subbasin.

8. Comment: Although high water temperature and summer low flows in the Rock Creek subbasin are probably limiting factors for steelhead, the weight of evidence suggests that summer flows and water temperatures are largely natural. The commenter considers the best available synthesis of data on Rock Creek water temperature to be found in the Rock Creek Water Quality Report, WRIA 31. This report was based on work by Aspect Consulting for WRIA 31 Planning Unit, June 22, 2005, and, secondarily, the Level 1 Watershed Assessment WRIA 31 (Rock-Glade Watershed) prepared for the WRIA 31 Planning Unit Aspect Consulting and Watershed Professionals Network, November 12, 2004. These sources are available on the Klickitat County website at:
http://klickitatcounty.org/Planning/ContentROne.asp?fContentIdSelected=%2D722357635&fCategoryIdSelected=%2D69392916&fX=X

Response: NMFS reviewed the suggested literature and revised the document to reflect the information, as appropriate.

9. Comment: In the Executive Summary, the source and accuracy of redd survey data are in question, because of the lack of accurate citations or citations of Yakama Nation Fisheries' documents that may not be publicly available.

Response: NMFS modified the text in question to reflect updated information and additional references.

10. Comment: The "limiting factors" identified in this subsection are a mix of *potential* limiting factors and threats. They are theoretical and should be stated as such.

***Response*:** A statement at the beginning of Chapter 5, Limiting Factors and Threats, acknowledges that in the scientific study of salmonids, limiting factors statements are nearly always hypothetical. (A counter example would be a streambed that is dry for its entire length, year-round – unquestionably a limitation on steelhead spawning.) For steelhead and other salmonids, survival to reproduce depends on a complex, interacting system of environmental conditions, with different conditions needed for each life stage. Data on a full range of potential limiting factors is rarely available at the reach level or the population level. As a result, the identification of limiting factors for salmonids often includes elements based on scientific literature, inference, and expert opinion. For these reasons, adaptive management is essential. NMFS maintains

that by taking action in the face of some degree of scientific uncertainty, monitoring the results, continuing to conduct research to resolve the uncertainties, and adapting our management actions in response, the state of our knowledge will improve and so will the survival of the fish, although not necessarily in a directly parallel process.

11. Comment: In the Executive Summary, Table E-1, given that the factor(s) limiting the population are unknown, the recovery actions may not be needed. The factors resulting in the high risk rating for the population (lack of information regarding abundance and productivity) should be addressed first.

Response: NMFS acknowledges that the information regarding limiting factors is sparse in the basin. NMFS has revised the recovery strategy to put more emphasis on filling data gaps. The actions previously identified remain in the document but are now recognized as actions that should be prioritized in the collaboratively developed implementation phase of the recovery plan.

12. Comment: The evidence for winter-run steelhead in Rock Creek is questionable. The fish entering the river in the fall after the flows return may be winter fish but also could be summer steelhead that hold in the Columbia waiting for cooler temperatures. This commenter suggested citing *Oncorhynchus mykiss: Assessment of Washington State's Anadromous Populations and Programs*, WDFW, July 21, 2006, in which, in Table 6-12, the pre-settlement and current distribution of winter steelhead in Rock Creek is reported as "0."

***Response*:** NMFS thanks the commenter for the citation but suggests that a final determination should be made based on genetic samples collected from adult steelhead returning to the basin. Genetic samples would provide definitive data on whether or not the steelhead in Rock Creek are more related to winter or to summer steelhead populations. In Section 8.3.2 of the final Plan, this research is listed as one of the types of study that should be considered and prioritized in the RM&E plan.

13. Comment: The commenter expressed concern regarding how the recovery plan will be used to "provide a context for regulatory decisions." (See Section 1.3.) Since the objectives of a recovery plan may include both recovery of steelhead under the ESA and larger "broad-sense" goals that go beyond ESA requirements, the plan should discuss how Federal and non-Federal jurisdictions are to distinguish between actions for ESA recovery and actions addressing broad-sense goals.

***Response*:** Regarding use of the recovery plan: Recovery plans are not regulatory in and of themselves. They have been described as voluntary to stakeholders who are concerned about the potential impact of recovery plans on their lives and livelihood. The plans do, however, provide roadmaps for recovery and ultimate delisting, which is a regulatory decision, and also provide useful context for other regulatory decisions. The all-H nature of salmon and

steelhead recovery plans means that implementation will affect the missions of all NWR divisions and NWFSC salmon programs. Recovery plans will function as a guide to NMFS staff when evaluating proposed actions and making decisions in regulatory processes. For all consultations, recovery plans will be used as a reference for context and goals. In this manner, NMFS will emphasize recovery plan information in ESA section 7 (a) (2) consultations, section 10 permit development, and application of the section 4(d) rule by considering:

- The importance of affected population(s) to listed species viability
- The importance of the action area to affected populations and species viability
- The relation of the action to recovery strategies and management actions
- The relation of the action to the research, monitoring, and evaluation plan for the affected species

Regarding distinguishing between actions for ESA recovery and actions addressing broad-sense goals (see also Comment 18):

In most cases, NMFS cannot define the bright line between the level of effort or specific actions that will provide for ESA recovery as opposed to broad-sense recovery. The DPS plan and attendant management unit plans provide recovery strategies and actions that are prioritized in both time and space with the goal of first achieving ESA recovery. The recovery actions are designed to work synergistically to improve survival throughout the species' life cycle, from egg to smolt to returning adult. All ESA recovery plans include and require monitoring. Monitoring results will inform us of the progress the species has made toward ESA recovery and ultimately will inform us if we have started to surpass ESA recovery targets and are heading toward also achieving broad-sense recovery.

14. Comment: The Rock Creek recovery plan does not meet Office of Management and Budget guidelines for information disseminated by Federal agencies. Many statements of fact are unsupported; some of the cited documents are not publicly available; and some refer to documents such as NPCC 2004 (Lower Mid-Columbia Mainstem Subbasin Plan), which themselves contain unsupported statements. The commenter said much of the recovery plan needs to be rewritten to reflect what is currently known and what is unknown. It should include steps to be taken to attain information, interpret information, and develop a recovery strategy that is drawn upon existing information. It should include an adaptive action designed to update the recovery strategy as additional information is gained.

***Response*:** Upon review of the record regarding the development of this plan, it has become apparent that the commenter has made several attempts to correct the information. NMFS has incorporated additional information and analysis into the Rock Creek recovery plan to address this concern. Section 515 of the Treasury and General Governmental Appropriations Act for Fiscal Year 2001 is called the Data Quality Act, also known as the Information Quality Act (IQA). The Data Quality Act requires that Natural Resource Plans, such as ESA recovery

plans, be based on the best available information and be presented in an accurate, clear, complete and unbiased manner. For each recovery plan, NMFS completes a Pre-Dissemination Review and documentation (PDRF) that documents the utility, integrity, and objectivity of the information in the recovery plan. Each proposed recovery plan is also peer reviewed. The PDRF for the Middle Columbia Steelhead Recovery Plan is available upon request.

NMFS has made every effort to ensure that the information in this recovery plan is transparent, useful and replicable. We understand that in the past, some sources, such as model runs, have been difficult to access. However, those problems have been remedied for all sources of information cited in this final plan. NMFS has updated the document with available published information.

15. Comment: Section 2.3.2 Hydrology cites "YN Fisheries 2006" several times, including in Figure 2-5, but the citation is not in the References. The commenter asked if this document is publicly available and suggested that the plan should cite Aspect Consulting and WPN 2004, which has been reviewed and accepted by Washington State Department of Ecology and other members of the WRIA 31 Planning Unit, adding that it is the best available science regarding basin hydrology.

***Response*:** NMFS has reviewed the recommended sources of information and has updated the discussion with citations and information from the recommended documents.

16. Comment: Regarding Section 2.2, development within the floodplain of the lower alluvial sections (totaling roughly 10 to 12 miles in length) of Rock Creek is very sparse. The commenter noted that NMFS can verify the level of development in the lower alluvial sections of Rock Creek using the map with aerial photo layer on Klickitat County's web site at: http://klickitatcounty.org/Road/ContentROne.asp?fContentIdSelected=455695186&fCategoryIdSelected=948111261 . The map can also be queried to see if any improvements have been made on individual land parcels.

***Response*:** NMFS has revised Section 2.2 to indicate that little development has occurred in the floodplain of the lower alluvial sections of Rock Creek, and has added the Internet address of Klickitat County's interactive map with aerial photograph and parcel information.

17. Comment: Proposed actions of the recovery plan pertaining to increasing summer flows in Rock Creek are more accurately called "enhancement" rather than "restoration" of the natural condition. In discussion of the Rock Creek hydrograph, the commenter suggested that average flows during the dry months should also be described (e.g., excluding 1965, flows during August, September, and October were zero over the USGS period of monitoring; see Section 3.1.1 of Aspect Consulting and WPN 2004). The commenter proposed that the available information indicates this intermittent hydrology is the "normative" condition for Rock Creek and is a primary

reason for elevated summer water temperatures and poor rearing habitat in the lower portions of the basin.

***Response*:** NMFS has reviewed the recommended documents and updated the section to include information from the recommended sources. NMFS also added information from the Washington Department of Ecology regarding recently collected stream flow data.

18. Comment: Regarding Section 2.3.2, Eastern Klickitat Conservation District (EKCD) has also collected spot measurements of stream discharge at various locations in Rock Creek subbasin (refer to Table 4-5 of Aspect Consulting and WPN 2004).

***Response*:** NMFS revised Section 2.3.2 to include EKCD flow measurements. NMFS also added information on flow monitoring by the Washington Department of Ecology.

19. Comment: The plan in Section 2.3.3 should reference Ecology's 2002/2004 integrated water quality assessment, finalized in 2005, after preparation of Aspect Consulting and WPN 2004. In Ecology's final 2002/2004 assessment, the only listing for Rock Creek is the Category 5 water temperature in the upper reach. Also, the commenter suggested adding to the Ehinger (1996) summary, the more recent analysis indicating that the total areal extent of vegetation across the Rock Creek valley floor (from mouth to Bickelton Highway) has increased since 1938 (date of earliest aerial photo used in the assessment), presumably due to fire exclusion, which includes an increase of 10 percent between 1996 and 2002 (Aspect 2005).

***Response*:** Although NMFS agrees with the commenter that the information contained in the paragraph regarding 303(d) listings was out of date, NMFS elected to use the recently released 2008 Washington Water Quality Assessment (http://www.ecy.wa.gov/programs/wq/303d/2008/index.html) rather than the older 2002/2004 information suggested in the comment. NMFS has reviewed the recommended sources of information and has included summaries of that information in Section 2.3.3.

20. Comment: When the Yakama Nation plans to conduct habitat surveys (see Section 2.3), it should also recognize that Klickitat County has implemented a study of habitat condition in Rock Creek and Columbia River tributary streams to the east of Rock Creek (WPN 2008). Data collection is largely complete (additional sampling is scheduled for 2009) and data are currently being analyzed. This information will contribute significantly to the understanding of current habitat conditions, limiting factors, and anthropogenic effects on fish habitat.

***Response*:** NMFS learned that the referenced habitat study has been completed (Glass 2009). NMFS has reviewed that document and has incorporated information from the study where appropriate into Section 2.4. NMFS encourages collaborative research and monitoring in the region.

21. Comment: The commenter questioned the documentation for the discussion of steelhead life history characteristics in Rock Creek (see pg. 38). The comment stated that the citation, NPCC 2004, does not contain any information that supports the discussion. If published data for Rock Creek is not available, the plan should discuss the time to emergence generally for the Mid-Columbia, cite that source of data, and drop the reference to Rock Creek.

> ***Response*:** At the time of the initial drafting of this recovery plan, the subbasin plan (NPCC 2004) was one of only a few resources available and was used as the 'building block' for recovery plans in the Columbia Basin. NMFS agrees that the data identified by NPCC (2004) need to be published so that the source information can be reviewed. Given the lack of specific information for the Rock Creek subbasin, NMFS modified the language in the last paragraph on page 38 to reflect what is generally known regarding Middle Columbia River steelhead life history.

22. Comment: The commenter questioned the documentation for steelhead abundance estimates in Section 2.4, because the estimates seem to be based on sources not publicly available.

> ***Response*:** NMFS has updated Section 2.4 with information provided in Glass 2009.

23. Comment: Steelhead have not been observed *throughout* the Rock Creek subbasin (pg. 39). NPCC 2004, which was cited, does not support this discussion.

> ***Response*:** Glass (2009) provides substantial information on abundance and distribution. NMFS has updated the section with that information.

24. Comment: The commenter expressed concern that citations to Yakama Nation Fisheries are not in the References section of the plan and may not be publicly available.

> ***Response*:** NMFS has been unable to identify published sources to support the citations.

25. Comment: In Section 3.1, it implies that "broad-sense goals" have not been identified, yet the third paragraph in this section goes on to discuss the values and visions incorporated into the "broad-sense goals" which suggests that those broad-sense goals *have* been identified. If they have, they need to be explicitly identified and the source of those goals needs to be discussed.

> ***Response*:** In the final Plan, NMFS has clarified the fact that broad-sense goals have not been formally proposed for the Rock Creek subbasin. NMFS supports the formation of a Washington Gorge Area Regional Board, which could coordinate implementation of the Plan and define broad-sense goals for the

Rock Creek subbasin and other areas within the Washington Gorge Management Unit by a collaborative process among stakeholders.

26. Comment: In Section 3.2.2, the goals for the Rock Creek population productivity are defined in relation to a 1 percent risk of extinction, not the 5 percent risk the ICTRT defined as the goal for the Rock Creek population. The language needs to be modified to reflect the 5 percent goal. Any actions that may have been incorporated into the Rock Creek plan as a result of consideration of a 1 percent goal need to be removed from the document.

***Response*:** NMFS revised Chapter 3 to clarify low, moderate, and high risk levels for abundance and productivity, as defined by the ICTRT (2007), and specified that moderate risk is the level set as the goal for the Rock Creek population according to the recovery "scenario" for the Cascades Eastern Slope Tributaries MPG.

27. Comment: The ICTRT designated Rock Creek at high risk due to a lack of information and the naturally simple spatial structure of the basin. However, the redd surveys completed by the Yakama Nation Fisheries suggest the population is likely greater than 500 fish (potentially much greater since only a small portion of the area was sampled), which would reduce the risk rating. The latter redd surveys are not publicly available; hence, the commenter concluded that obtaining and reporting abundance and productivity data should be a top priority.

***Response*:** NMFS agrees. Obtaining and reporting abundance and productivity data is a top priority in the recovery strategy.

28. Comment: "The list of limiting factors [Chapter 5] for the Rock Creek steelhead population… is based on a substantial body of research on salmonids, local field data and field observations, and the considered opinions of regional experts." In fact, very little local field data or published information is available for the Rock Creek steelhead population. The comment cites preliminary results of a habitat study conducted by Klickitat County (WPN 2008), which were not available at the time the draft recovery plan was written, and, the commenter indicates that no other published information is available for the basin. Therefore, the commenter maintains that the source for limiting factors for Rock Creek steelhead is limited to "the considered opinions of regional experts," and states that the first sentence should be modified to reflect the actual sources of information and the "regional experts" should be identified.

***Response*:** The information in the referenced study has been incorporated into the recovery plan.

29. Comment: An evaluation of the limiting factors should be conducted before taking action, rather than proceeding on the basis of the information currently available and adjusting management in response to the results of monitoring and evaluation. The commenter believes that further initial study would reduce the

overall cost of recovery and would speed the recovery process by allowing actions to be focused on specific situations known to be affecting the population.

> ***Response***: NMFS believes that there are actions that can be implemented immediately that can be reasonably assured to result in improved habitat conditions.

30. Comment: In Section 5.2, please change "other [land]uses contribute to habitat problems" to "other uses may contribute to habitat problems." The comment indicated that the actual effects of these uses have not been evaluated, and therefore the statement is hypothetical.

> ***Response***: NMFS has used the word "may" more liberally. Other changes were made to indicate the tentative nature of statements regarding the specific effects of land use in the Rock Creek subbasin.

31. Comment: For Section 5.1, NPCC 2004 is not a good source of information, misused the concept of limiting factors, and was largely based on unpublished information that fails the tests of transparency and replicability. The EDT analysis is not published. The input data for the EDT model is available on the Jones and Stokes website (http://edt.jonesandstokes.com/) and should be cited if the EDT model information is used in the plan. The source of the information used in that model is not documented; hence, the information fails the test of transparency and replicability. Data that has recently become available (WPN 2008) indicates that many of the assumptions that went into the EDT model were incorrect. As a result, the model inputs or model results should not be used to support the recovery plan. The last sentence of the paragraph cites NPCC 2004 as a source; however, the orthophotos, field observations, and unpublished data are not documented in NPCC 2004. The commenter concludes that the citation should be dropped.

> ***Response*:** NMFS has made only minor changes to the original text but has added additional information drawing upon the suggested references. The commenter is correct that the EDT analysis for Rock Creek was not completed in time for citation in the subbasin plan (NPCC 2004). The input data for the model is now available to the public on the Jones and Stokes website, as cited in the comment.

32. Comment: There is little if any evidence to suggest that the current hydrologic condition—particularly low summer flows—or summer high water temperatures are substantively altered from the natural condition. (See Section 5.1 Altered Natural Hydrograph.) The paragraph should be rewritten using recommended sources (Aspect and WPN 2004, Aspect 2005) and identifying data gaps.

> ***Response***: NMFS has reviewed the recommended materials. Although the original language is largely unchanged, additional information drawn from the commenter's recommended sources has been added to the text.

33. Comment: The information on 303(d) listings in this paragraph needs correction. Rock Creek is listed on the 2002/2004 water quality assessment as Category 5 (requires a TMDL) only for temperature. It is not listed as Category 4c or 4b for temperature, habitat, or any parameter. See Ecology website: http://apps.ecy.wa.gov/wats/WATSQBEHome.asp The reference (Aspect Consulting and WPN 2004) was written before the 2002/2004 303(d) list/water quality assessment was finalized, which is noted in the document. At one point during compilation of the list, there was a proposed Category 4c habitat listing but the information supporting the proposal failed data quality requirements. Please report information on conformance with water quality standards based on the final EPA approved assessment, which is at the website given above.

> ***Response***: The EPA has recently approved a new 303(d) list (as of January 29, 2009). NMFS updated Section 5.1 to reflect the most recent information provided on the Washington Department of Ecology's water quality website.

34. Comment: The limiting factors listed in Section 5.1 such as degraded riparian function and condition, altered sediment routing, reduced channel structure and complexity, etc. are not limiting factors but possible causes of actual limiting factors such as water temperature, lack of pools, or lack of food. The commenter offered additional sources of information concerning habitat conditions in the Rock Creek watershed and said the entire section should be rewritten.

> ***Response***: In most cases, NMFS has elected to keep the original language in the text, recognizing that there is some inconsistency in how the term "limiting factors" is used. Additional information drawn from the commenter's recommended sources has been added to the text.

35. Comment: The following information should be added to Section 5.1: Ehinger 1996 does report that riparian vegetation cover was more than 10 percent below target for Eastern Washington Class A streams. However, the 2005 temperature study indicates that the total areal extent of vegetation across the Rock Creek valley floor has been increasing (from mouth to 1.1 miles above Bickelton Highway) since 1938 (date of earliest photograph analyzed), and that it increased 10 percent between 1996 and 2002 (Aspect 2005). While the latter study did not evaluate streamside vegetation explicitly, its results indicate that the overall extent of vegetation across the Rock Creek valley has increased dramatically over the past 65 years. It is also documented that the stream channel in the lower basin changes course frequently, which is a natural condition limiting the chance for establishment of streamside vegetation in those reaches.

> ***Response***: NMFS has reviewed the recommended materials. Although the original language is largely unchanged, additional information drawn from the commenter's recommended sources has been added to the text.

36. Comment: No assessment of the factors limiting production in the basin has been completed. Klickitat County's habitat study will likely inform this issue in the future. There is no information available regarding long-term trends in habitat quality. No assessment of the effects of land use on habitat has been completed. Hence, the information in these sentences cannot be substantiated. YN Fisheries 2006 is not cited in the references and does not appear to be available.

> ***Response***: NMFS has reviewed the available materials. Although the original language is largely unchanged, additional information regarding the uncertainty on this matter has been incorporated into this section, as well as information drawn from the commenter's recommended sources.

37. Comment: Regarding Chapter 5, predation by exotics is likely occurring in the inundated mile and to a lesser degree upstream (exotics are also limited by the lack of water). Predation (and competition) has not been quantified; hence the commenter does not know if it is a limiting factor. The paragraph should state this. The comment recommends evaluating predation risk in Rock Creek. Steelhead in the lower sections of Rock Creek might migrate downstream to the reach inundated by the John Day Pool at an early age to rear due to the low flow and high water temperatures. If so, smallmouth bass might be a problem for small steelhead; see Fritts A.L. and Pearsons T.N. 2006. *Effects of Predation by Nonnative Smallmouth Bass on Native Salmonid Prey: the Role of Predator and Prey Size.* Transactions of the American Fisheries Society. Available on YKFP website: http://ykfp.org/publications/SpeciesInteractions/Fritts%20and%20Pearsons%202006.pdf

> ***Response*:** Current information indicates that predation by exotics and native piscivorous fish may be an important factor affecting listed salmonid species in the mainstem Columbia and tributaries (ISAB 2008), although specific information on Rock Creek is sparse; hence, the section was modified to indicate the effects on the Rock Creek population are presently unknown. Evaluation of predation risks is listed as a research need in Section 8.3.2 of the final Plan. The subject is discussed further in Section 6.3.5.3 of the Middle Columbia River Steelhead DPS Plan.

38. Comment: The commenter reiterates that existing evidence suggests that flow and water temperature have not been changed significantly by anthropogenic actions, and recommends rewriting the discussion in Section 5.1. Logging on state and private lands has not been allowed in riparian areas along fish bearing streams since 1972. Based on review of historical aerial photos (Aspect 2005) and GLO notes documenting the predevelopment condition (Aspect and WPN 2004), the broad, braided channel condition in Rock Creek's lower reaches appears to be the natural geomorphic condition.

> ***Response*:** NMFS has reviewed the recommended information and has incorporated additional discussion into the section.

39. The commenter trusts NMFS will be revising the Estuary Module to address the ISAB's criticisms, some of which (e.g., lack of understanding of limiting factors and lack of citations) are relevant to the Rock Creek recovery plan.

***Response*:** NMFS is presently reviewing and responding to comments, including the ISAB's comments, and anticipates a final Estuary Module in 2010.

40. Comment: Section 5.3 and Table 5.2 mention comparing dam count disparities to abundance estimates for the tributaries, but the reader is not told what the tributary abundance estimates are, much less where they come from and how uncertain they are. The commenter requests a discussion of the inaccuracies in the counts (uncertainty of measurement) and a better discussion of out-of-basin effects.

***Response*:** NMFS has revised and updated the discussions of abundance.

41. Comment: The year-round fishery for walleye, bass, channel catfish, and other game fish in the inundated area of Rock Creek is a good thing, but opening the basin at any time for trout and steelhead fishing (recreational or any other type of fishing) probably deserves review.

***Response*:** NMFS believes that the harvest management proposed in Section 6.1.4 of the final Plan is protective of wild steelhead in Rock Creek. As stated in Section 5.3, Tributary Harvest, only adipose fin-clipped steelhead may be retained; adult steelhead are not present in the basin when fisheries can occur; and the trout fisheries are expected to have a limited impact.

42. Comment: In regard to Table E-1 of the Executive Summary, the commenter asked the meaning of the phrase, "Improve quality of harvest and natural-origin fish," and asked how this would be a strategy that will lead to ESA recovery. The commenter further stated that a harvest-related strategy should include monitoring and reporting of harvest of Rock Creek steelhead.

Response: NMFS agrees that the recovery strategy should include monitoring and reporting on harvest, and it now does. The USGS and the YKFP are planning to monitor juvenile production and continue to conduct spawner surveys in Rock Creek (Bill Sharp, pers. comm. 2009) and these activities will provide baseline information needed to evaluate harvest impacts. The phrase, "improve quality of harvest," is no longer in the recovery strategy. NMFS expects that any actions that improve watershed processes and stream habitat conditions are likely to improve abundance and productivity of natural-origin fish; however, regulation of harvest is a separate question.

Regarding the relationship of harvest opportunities to ESA recovery: NMFS states in Chapter 1 of the Plan that the primary purpose of a recovery plan is to identify actions that will restore threatened and endangered species to the point that they no longer need ESA protection. However, in the case of listed

salmon and steelhead, considerations in addition to the ESA are also important. Middle Columbia River steelhead and all of the other listed ESUs have historically been harvested, and there is a strong public interest in restoring them to meaningful harvestable status. As also described in Chapter 1, NMFS has Federal treaty and trust responsibilities to the Indian Tribes in the Columbia River. It is NMFS policy that recovery of salmonid populations must achieve two goals: (1) the recovery and delisting of salmonids listed under the provisions of the ESA, and (2) the restoration of the meaningful exercise of tribal fishing rights.

Due to the importance of recreational fisheries, the USFWS and NMFS jointly issued the "The Policy for Conserving Species Listed or Proposed for Listing Under the Endangered Species Act While Providing and Enhancing Recreational Fisheries Opportunities" on June 3, 1996 (61 FR 27978), which was issued pursuant to the Presidential Executive order 12962, issued on June 7, 1995. That order requires Federal agencies, to the extent permitted by law, and where practical and in cooperation with States and Tribes, to improve the quality, function, sustainable productivity, and distribution of aquatic resources for increased recreational fishing opportunity. Among other actions, the order requires all Federal agencies to aggressively work to promote compatibility and reduce conflict between administration of the ESA and recreational fisheries.

43. Comment: Section 5.3 states that some minor tribal harvest occurs, but it is considered insignificant. What is the reported tribal harvest? Documentation should be provided. Otherwise, state that the influence of the tribal harvest is unknown. This section on harvest needs to be revised. Also, the citation "YN pers. Comm. 2006" is not in the References chapter; the citation should specifically indicate who communicated this information.

Response: NMFS has revised and updated this section and added the citation to the reference list.

44. Comment: According to the draft Mid-Columbia River Steelhead Recovery Plan, the harvest rate for the Mid-C steelhead in the Columbia River was 65 percent prior to 1975. This should be reported in the Rock Creek plan, with citation of the original source of the information. What is the estimated harvest rate for Rock Creek steelhead?

Response: Section 6.3.7.2 in the DPS plan discusses estimated harvest rates on steelhead in the mainstem Columbia. In context, the referenced statement is the following: "Harvest rates on the Middle Columbia steelhead DPS in the past, e.g. prior to 1975, were estimated at 65 percent in fisheries occurring in the Columbia River. Current rates are much lower. There has been no direct freshwater non-tribal harvest on wild steelhead from the Middle Columbia DPS since 1992, when the last wild fish catch and release regulations on these populations became effective." The paragraph goes on to examine in detail the

sources of information and methods for estimating current incidental bycatch, catch-and-release mortality, and tribal harvest. In the final Rock Creek Plan, a more detailed summary estimate is given of harvest impacts on Middle Columbia steelhead that likely apply to the Rock Creek area, as follows:

Without more data on Rock Creek steelhead abundance, and without targeted tagging of Rock Creek fish, the percentage of Rock Creek steelhead that are harvested in the Columbia River cannot be specifically calculated. However, it may be inferred that Rock Creek steelhead are subject to the same relatively low overall harvest rate estimated for other Middle Columbia steelhead. Washington Department of Fish and Wildlife (2008) estimates that in 2002, tributary fisheries in the Rock Creek area affected about 1 percent of the adult steelhead and less than 1 percent of the juvenile steelhead. Mainstem non-treaty commercial and recreational fisheries have an estimated impact of 1.6 percent of the A-run Middle Columbia steelhead (NMFS 2008a), and mainstem treaty fisheries have an estimate 6.64 percent impact (NMFS 2008a) for an overall estimated harvest impact of less than 10.24 percent.

45. Comment: Per the plan, non-tribal fisheries have been prohibited in the Columbia River since 1975. This section could include a short discussion of historical effects of the non-tribal fishery, but since the bulk of this section addresses the tribal fisheries, the section should be renamed "Columbia River Mainstem Tribal Fisheries."

Response: NMFS has revised and clarified the discussions of harvest in the Plan.

46. Comment: The effects of predation by introduced species may be one of the larger factors affecting the size of the steelhead population. The commenter recommended that the issue be discussed further.

Response: The Middle Columbia River Steelhead Recovery Plan (the DPS plan) covers this subject in more detail in Section 6.3.5.3. A brief summary of the issue has been added to Section 5.1 of the Rock Creek Plan.

47. Comment: The strategy and actions should incorporate the actions specified in the WRIA 31 Watershed Management Plan. The commenter also requested that speculative assumptions be removed or modified and that this section distinguish between actions required for ESA recovery and actions that focus on the broad-sense goals.

***Response*:** Several related comments discussed the lack of available information regarding limiting factors and noted that actions related to needed research, monitoring, and evaluation were largely missing from Section 6 of the Draft Rock Creek Recovery Plan. In order to address these interrelated comments, NMFS reviewed the WRIA 31 Watershed Management Plan (Aspect 2008) as well as the recently completed WRIA 31 Instream Habitat Assessment (Glass 2009) and revised the discussions of limiting factors and recovery actions

considerably in response to the commenter's concerns. However, as stated in the response to Comment 13, in most cases, NMFS cannot define the bright line between the level of effort or specific actions that will provide for ESA recovery as opposed to broad-sense recovery. The recovery strategy and actions are designed to improve habitat conditions, put the population on a trajectory toward "maintained" or moderate risk status, and establish or coordinate the research and monitoring that will be needed to support adaptive management for the future.

48. Comment: Tables 6.1 through 6.10 should be updated to reflect the comments provided on the text and the other tables in Chapter 6.

***Response*:** NMFS has revised text and tables substantially.

49. Comment: The word "Restore" should be globally replaced with "Improve" in the strategies listed in the plan. The comment maintains that it is speculative to suggest that the current condition in the Rock Creek basin is degraded from a normative condition.

***Response*:** NMFS has replaced "restore'' with "improve" where deemed appropriate.

50. Comment: Strategy 5 on p. 72, "Restore degraded upland processes to minimize unnatural rates of erosion and runoff," is unnecessary because sediment inputs from anthropogenic sources are likely insignificant. Actions related to this strategy should be removed.

***Response*:** NMFS respectfully disagrees with the comment and did not remove the actions associated with the strategy but did change "restore" to "address." NMFS also has emphasized the importance of regional collaboration to implement the recovery strategy and prioritize actions.

51. Comment: Strategy 6 on pg. 72 to restore channel structure and complexity is unnecessary, although further review of existing data may identify localized areas where improvements could be attained.

***Response*:** NMFS respectfully disagrees with the comment and did not remove the actions associated with the strategy. However, NMFS has emphasized the importance of regional collaboration to implement the recovery strategy and prioritize actions.

52. Comment: Strategy 7 on pg. 72 should be to enhance instream flow rather than "Restore natural hydrograph."

***Response*:** That strategy now reads, "Improve instream flow."

53. Comment: The review of currently available information as preparation to define strategies and actions for the Rock Creek subbasin did not include several important documents, such as Aspect and WPN 2004, Aspect 2005a, and Aspect 2005b.

***Response*:** NMFS recognizes this oversight, has reviewed the recommended documents, and incorporated the pertinent information into Chapters 5 and 6.

54. Comment: Delete Tables 6-2 through 6-9 because they are not based on all the available information. Currently available information not referenced includes Aspect and WPN 2008 and the WRIA 31 Watershed Management Plan. Recognizing the ESA requirement of site-specific actions for recovery plans, the commenter requests that the plan explicitly state that it will be revised on the basis of further study to fill data gaps.

***Response*:** In the final plan, the tables of strategies and actions were combined into one single table. Information from the recommended and recently published sources was integrated into the document. The plan now emphasizes the importance of further study to fill data gaps as well as the importance of regional collaboration to implement the recovery strategy and prioritize actions.

55. Comment: If the plan emphasized filling data gaps before implementing actions, many of the projects for Strategies 6 and 7 could be avoided, therefore reducing costs. The cost of assessing limiting factors and determining current status of the steelhead population should be added to the table. Unnecessary actions and their associated costs should be deleted.

***Response*:** NMFS has clarified the purpose of the extensive list of habitat actions and costs in Chapter 7. NMFS, in coordination with the Yakama Nation, developed cost estimates for a range of habitat improvement/restoration actions that may be necessary to address limiting factors and improve viability of the Rock Creek steelhead population. This list can be refined and prioritized in the implementation process. Costs associated with actions that may be required, depending upon the results of research and studies, remain in the document unchanged with one exception: NMFS noted and corrected a mathematical error on the cost for fencing the lower reach of Rock Creek. The costs of RM&E have not been included in the plan in the expectation that these costs will be more appropriately developed as part of a collaboratively designed RM&E plan.

56. Comment: Delete reference to EDT and AHA models in Chapter 8, page 89, first paragraph, since local groups may find other approaches for assessing habitat limiting factors and basin productivity.

***Response*:** NMFS has modified the sentence to read as follows: "Comprehensive, empirical monitoring data on fish populations and habitat are needed to

identify appropriate projects and locations, populate habitat/production capacity modeling efforts (such as EDT, AHA, or other appropriate models), and inform adaptive management for the salmonid recovery plan."

57. Comment: The WRIA 31 Watershed Management Plan incorporates the development of a monitoring and research program. The commenter recommended that the WRIA 31 implementing governments (which include Klickitat County, Benton County, EKCD, and state agencies as represented by Ecology) should be added to Chapter 8.

***Response*:** NMFS has added the WRIA 31 implementing governments to Chapter 8, along with an emphasis on the importance of regional collaboration and coordination on designing and conducting RM&E.

58. Comment: Two ongoing projects should be added to Section 8.4, Existing Monitoring and Research. EKCD has grant funding to develop and support implementation of grazing BMPs, plant riparian vegetation, install fencing, support no-till farming, and monitor stream temperature and flow. Klickitat County has grant funding and is implementing fish habitat surveys in WRIA 31.

***Response*:** The Conservation District actions were already included in Section 8.4. NMFS added the habitat study to Section 8.4.

59. Comment: A sentence in Section 8.6 of the proposed plan reads: "It may be appropriate to incorporate data management with the Yakima Klickitat Fisheries Project and other regional programs to provide easy comparison with existing large datasets within the DPS." Change the sentence as follows: "It may be appropriate to incorporate data management with the Yakima Klickitat Fisheries Project, the WRIA 31 Watershed Management Plan implementation (and the WRIA 31 implementing governments), and other regional programs…"

***Response*:** NMFS made the change suggested.

60. Comment: Why doesn't Figure 8-1, Listing Status Decision Framework, show a pathway to delisting?

***Response*:** The purpose of the Listing Status Decision Framework is to illustrate in systematic, logical steps, the information NMFS needs to evaluate species status for the purpose of making a listing/delisting decision. The purpose of a recovery plan is to describe a pathway to delisting, i.e. a strategy and site-specific actions that, if implemented, should allow the species to meet the biological criteria and threats criteria required by the ESA. The delisting decision itself, however, is a NMFS determination.

61. Comment: Several of the references listed in Chapter 9 were not cited in the document and several references cited in the document were not on the list.

***Response*:** NMFS has crosschecked the references and has revised the list as appropriate.

Comments on Appendix I: Eastern Tributaries in Washington Gorge Management Unit

62. Comment: Tributaries east of Rock Creek and west of the Yakima basin were "tacked on" to the Rock Creek plan as an appendix. This is confusing. The final Plan should include a more organized approach for addressing these tributaries.

Response: There is very little information available about the small eastern Washington tributaries the commenter refers to. Although some stakeholders in the region would like to know more about them, NMFS considers them lower priority at this time than restoring the core populations. These drainages do not have enough historical habitat potential to sustain minimum numbers of spawners over a long time. If there are steelhead present, which has not been established in all cases, the ICTRT believes that the long-term occupancy of these small, relatively isolated streams probably depends on straying from a variety of areas, with the nearest upstream population likely being the largest contributor of strays. For that reason, the ICTRT included Alder Creek, Glade Creek, and Fourmile Canyon in the Umatilla population, and by the same logic inferred that steelhead (if any) in Chapman Creek, Wood Gulch, Pine Creek, and Old Lady Canyon historically could have been related to the now-extinct Willow Creek population. It is unlikely that any current production in those small tributaries on the Washington side reflects Willow Creek. It is much more likely that any current production in those streams is either ephemeral, or linked with a currently producing upstream tributary (e.g., the Umatilla), or the result of straying from other extant steelhead populations/hatchery programs. NMFS has included a summary of the available information as an Appendix to the Rock Creek Plan simply to acknowledge that they are part of the Washington Gorge Management Unit and that some insight into these areas might be useful to scientists and stakeholders at some future time.

63. Comment: NMFS should re-evaluate tributaries east of Rock Creek and include them with the Gorge tributaries as opposed to their current inclusion with Willow Creek. In addition, Alder and Glade creeks were left out of the recovery plans altogether.

***Response*:** See Response to Comment 62.

64. Comment: There are many unsupported statements throughout Appendix I. NMFS should either provide citations to the source of the information or delete the statements and acknowledge that information on the subject is not available.

Response: The draft of Appendix I was based on unpublished field observations provided by Yakama Nation Fisheries staff. Several comments on the Rock Creek Plan identified a recently completed study (Glass 2009) that provides quantified information on steelhead distribution and habitat condition in Rock Creek and the eastern tributaries addressed in this appendix. NMFS updated the text with this new information.

65. Comment: Habitat intrinsic potential for steelhead has been overestimated in the following watersheds: Old Lady Canyon, Alder Creek, Glade Creek, and Fourmile Creek. The ICTRT should reconsider these areas in light of information available in the Level I Watershed Assessment for WRIA 31 (Aspect and WPN 2004). The commenter further stated that Figure Ap1-5 overestimates intrinsic potential for Chapman Creek and Pine Creek.

Response: The ICTRT will take this information into consideration during the next update of intrinsic habitat potential.

66. Comment: The quality of the data represented in Figures ApI-6 through ApI-9 is problematic, because of questions regarding access, and whether the source, YN Fisheries 2007, has been made available to the public.

Response: The source cited on the figure is not publicly available. The figures have been deleted. Several comments on the Plan identified a recently completed study that provides quantified information on steelhead distribution and habitat condition in the eastern tributaries addressed in this appendix. NMFS updated the text with this new information.

67. Comment: A citation for the statement, "Biologists have observed fry in the vicinity of these springs even when streams are intermittent or subsurface during summer months" is needed. The commenter stated that a biologist from Watershed Professionals Network observed fry in isolated pools in early summer but also noted that these same fry were dead by late summer. Most of these areas become lethal in summer temperatures.

Response: Several comments on the Plan identified a recently completed study that provides quantified information on steelhead distribution and habitat condition in the eastern Washington tributaries. NMFS updated the text with this new information.

68. Comment: Although this paragraph concerns the effects of grazing on riparian habitat in the lower alluvial reaches of "all" streams, there is actually little to no grazing along the lower reaches of Alder Creek, Glade Creek, and Fourmile Creek. During the field surveys of 2008, cattle damage was noted in several locations in Wood Gulch (and other drainages) (WPN 2008). Fires have had a greater effect on riparian vegetation in Wood Gulch.

Response: NMFS has reviewed the cited reference (which was a preliminary draft) and the draft and final document summarizing the cited study. The final document contains quantified information on steelhead distribution and habitat condition in the eastern tributaries addressed in this appendix. NMFS updated the text with this new information.

69. Comment: New information regarding designation of streams into water quality classes (e.g., Class A) should be referenced in the plan, i.e. the *Glade-Fourmile Subbasin Water Quality Study Report (*Aspect Consulting 2005b), which is available on the Klickitat County website at: http://klickitatcounty.org/Planning/ContentROne.asp?fContentIdSelected=%2D722357635&fCategoryIdSelected=%2D69392916.

Response: NMFS reviewed the cited reference and revised the text accordingly.

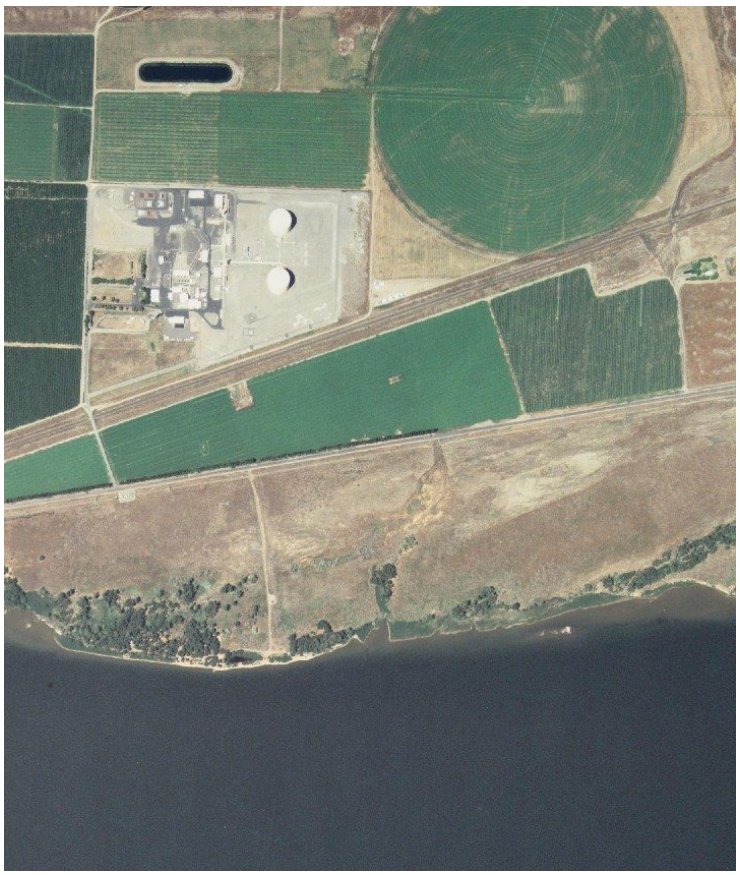
70. Comment: The statement "Under normal precipitation conditions, nearly 100 percent of the flow in Glade Creek comes from baseflow (groundwater discharge), except during spring runoff and peak stream discharges after storm events (Garrigues 1996)" is potentially misleading in that it may imply the late-season groundwater discharge is natural. Groundwater discharge sustaining late-season stream flows in Glade Creek is nearly completely a result of irrigation return flow that has infiltrated into the shallow unconsolidated material through which the stream incises, as Garrigues (1996) concluded for their late-season stream flow measurements. It is highly probable there would be no late-season flow in Glade Creek in the absence of local irrigation.

Response: Comments on the Plan identified a document that also addresses the eastern tributaries. The document includes a discussion of flow and irrigation influences on flow. NMFS has reviewed that document and has also reviewed Garrigues (1996). NMFS updated the text as appropriate.

71. Comment: Previously, C. Dugger reported fish up to RM 0.3 in Chapman Creek (Aspect Consulting and WPN 2004). The SR 14 crossing needs attention but is not a barrier. A natural (water velocity) barrier possibly exists at RM 0.3. This potential barrier will be evaluated as part of the Klickitat County WRIA 31 habitat study.

Response: NMFS updated the information on fish distribution and barriers in Chapman Creek based on the information contained in the cited study.

72. Comment: A photo of Fourmile Canyon (pg. 118) is provided to illustrate the following point: Like Glade Creek, any late-season flows in Fourmile Canyon are solely the result of irrigation return flows. When sampled in September 2004 and March 2005, surface water in Fourmile Canyon had comparable temperatures and considerably lower nitrate concentrations than observed in Glade Creek (Aspect Consulting 2005b). The adjacent photo is a 1:12,500 aerial photo of the lower end of Fourmile Canyon. The commenter said it can be seen that "the creek functionally does not exist in the lower reaches," and states that Fourmile canyon should be removed from this document.



Response: NMFS disagrees that Fourmile Canyon should be removed from the document. Fourmile Canyon was specifically identified by the ICTRT as potentially containing steelhead habitat. NMFS reviewed photographs and the referenced document, and modified the text to reflect the information provided.

73. Comment: According to local residents, surface flows in the lower basin of Wood Gulch occur only during snow melt; at all other times flow is subsurface, although water daylights occasionally in small pools. Numerous fires in Wood Gulch have impacted riparian vegetation (WPN 2008).

Response: NMFS has reviewed the cited reference (which was a preliminary draft) and the final document (Glass 2009) and has included the new information in the final Appendix.

74. Comment: Regarding Chapman Creek, culverts under Highway 14 are not functioning properly and flow from the stream moves through the road fill. This presents a barrier to upstream movement of fish. Therefore, the statement that live steelhead and redds were observed up to RM 3.5 seems odd; maybe large trout were present. There is a natural barrier located roughly ½ to ¾ miles upstream of the lower East Road Bridge, which blocks upstream passage of fish (Jim Wright, personal communication, June 2004); hence the upstream extent of steelhead distribution would be limited to the lower 6 miles of the creek if the culvert at

Highway 14 was functioning properly. The map of steelhead distribution and the discussion needs to be modified to reflect the known condition.

Response: NMFS revised the text to reflect the new information.

75. Comment: The following information should be added to Appendix II: "Klickitat County has been awarded a grant to evaluate habitat quality and quantity in Rock Creek and the tributaries to the each [sic] within WRIA 31. Data regarding fish distribution and habitat abundance and quality has been collected throughout Rock Creek, Chapman Creek, Wood Gulch, and Pine Creek. The lack of habitat in Old Lady Canyon has also been documented. Additional data collection will occur in spring of 2009. Data analysis will be completed in 2009. A memo summarizing the preliminary data has been developed (WPN 2008). This study will include development of estimates of carrying capacity for several of the streams and identification of factors limiting fish production. The results of the study are expected to greatly expand upon the current understanding of habitat quantity and quality and will provide valuable information regarding the types and locations of projects that are likely to have the greatest benefit to steelhead."

***Response*:** NMFS revised Appendix II to provide updated information on watershed planning based on the Aspect and APN 2009 WRIA 31 Instream Habitat Assessment. NMFS also used data from the instream habitat assessment to revise other sections (as appropriate) of the Rock Creek recovery plan.

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Ehinger, W. 1996. Evaluation of High Temperature in Rock Creek (Klickitat County). Washington State Department of Ecology Report #96-308. February 1996.

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ISAB (Independent Scientific Advisory Board). 2008. Review of the estuary recovery module. ISAB 2008-2.

Sharp, W., Yakama Nation Fisheries, pers. comm. 2009

Washington Department of Fish and Wildlife (WDFW). 2008. Fisheries Management and Evaluation Plan. Mid-Columbia River Region. Prepared by Washington Department of Fish and Wildlife. April 7, 2008. Olympia, WA.

Wright, Jim, personal communication, June 2004

D. Southeast Washington Steelhead Recovery Plan

1. Comment: Make organizational changes to the Southeast Washington Management Unit plan, highlighting the need to incorporate spatial structure and life history diversity criteria.

> ***Response***: The MU plan was finished before the final ICTRT spatial structure and diversity criteria became available. The MU plan will be revised based on this new information by December 2010.

2. Comment: The statement in the DPS plan that Bennington Dam is a significant fish passage obstruction is questionable: there is no data to substantiate that judgment. On the other hand, the commenter stated that the Mill Creek channel through Walla Walla *is* a major limiting factor for MCR steelhead, and the DPS plan should address how it can be improved.

> ***Response***:
>
> (a) Bennington Dam, east of the City of Walla Walla on Mill Creek, a tributary of the Walla Walla River, was without fish passage until the 1980s. Subsequent improvements provide only partial passage, and Bennington Dam remains a significant passage obstruction that affects Walla Walla River steelhead.
>
> (b) A Mill Creek Working Group was established in 2002 for the purpose of identifying a management recommendation for Mill Creek as it pertains to passage and rearing habitat. The committee recommended an assessment be conducted to inventory barriers, develop passage designs, and prioritize or sequence which barriers to improve first. The Snake River Salmon Recovery Board approved this proposal and the SRFB funded it. Four projects (two sills and two flume transitions) are submitted for funding consideration and implementation in 2010. In 2008, the Walla Walla County Conservation District and partners completed the Gose Street passage project as the first step to provide passage in the Mill Creek channel through Walla Walla.

3. Comment: The Walla Walla steelhead population, particularly the near-extirpated Mill Creek run, would benefit from a limited supplementation action in combination with aggressive habitat improvements.

Response: The recommended strategy to "implement a limited supplementation action in Mill Creek" will be evaluated in the context of ongoing co-manager hatchery planning efforts. For instance, co-managers (states and tribes) will develop a regional steelhead management plan this year that will include the Walla Walla, Mill Creek, and Touchet watersheds. The Board will not take a specific position until this is done. The Board is hopeful that a combination of ongoing aggressive habitat and passage improvements and limited supplementation will proceed.

E. Yakima Basin Steelhead Recovery Plan

1. Comment: Additional high priority actions are needed to achieve a "viable" or "highly viable" status capable of supporting some level of terminal sport harvest in the Yakima basin. The initiation of an integrated hatchery supplementation program focusing on one or more of the four populations is the key to accelerating recovery of natural-origin steelhead and providing the opportunity for a mark-selective terminal sport fishery. The commenter was skeptical that the Upper Yakima population would approach the 1,500 fish abundance threshold in the absence of a hatchery supplementation program.

> ***Response***: The Yakima Basin Fish & Wildlife Recovery Board (YBFWRB) agrees that there are significant uncertainties about the likely rate of recovery for the Upper Yakima population. The Board is confident that the delisting goal (10 year geomean of 500 fish, plus meeting of additional productivity and distribution goals) is realistic and achievable. The short-term and long-term recovery goals are more challenging, and will require the use of adaptive management to assess both the appropriateness of the goals set and the rate of progress towards achieving them.
>
> Basinwide Action #7 requires evaluating the potential for and, if appropriate, implementing a targeted supplementation program specifically designed to improve VSP parameters for Yakima steelhead populations. Any such program would need to be carefully designed and monitored to ensure that it contributes to recovery goals. Supporting recreational harvests in the near future should be a goal only insofar as it can be done in manner that does not negatively affect prospects for recovery of wild steelhead in the Yakima Basin.

2. Comment: Chapter 11 of the DPS plan should further emphasize the importance of funding for monitoring VSP parameters of the four Yakima MPG populations. This commenter believes the best option for estimating population abundance/productivity is to use genetic stock identification (GSI) methodologies, then sample tissue of migrating smolts.

> ***Response***: The Yakima Basin Fish & Wildlife Recovery Board agrees that securing funding to improve our ability to monitor VSP parameters will be an important part of implementing and tracking steelhead recovery. The Board is currently working with partners in the basin to identify gaps in existing VSP monitoring efforts and develop proposals for monitoring initiatives that fill those gaps. This work will be incorporated into a Research, Monitoring and Evaluation (RME) supplement to the Yakima Steelhead Recovery Plan, to be released in 2009-10. We are actively working with funding entities to secure funding for priority monitoring actions. To date $90,000 has been secured to further development of genetic stock identification for Yakima steelhead populations, and continuing this work will be one of the key priorities identified in the RME supplement.

3. Comment: The Yakima plan could reduce the level of uncertainty associated with recovery strategies by expanding the discussion of current abundance to consider redd counts, dam counts, and the results of radio-tracking studies.

> ***Response***: The Yakima Basin Fish & Wildlife Recovery Board is currently developing a detailed evaluation of current and potential abundance monitoring efforts. This document will become part of the RME supplement to the Yakima Steelhead Recovery Plan that is due to be released in 2009-10. It will identify specific steps to be taken to reduce uncertainties in population-level abundance estimates.

4. Comment: Four related comments: (1) The Yakima plan could reduce the level of uncertainty associated with recovery strategies by adding an appendix describing both the quantitative estimates for concluding that these actions can meet or approach viability objectives and the potential quantitative effects of the actions.

(2) No quantitative estimates of fish benefits from specific recovery actions are provided. Until the entire suite of actions is completed, managers will not know if their efforts have increased Yakima steelhead viability by the expected amount.

(3) The recovery plan provides delisting, short term, and long term recovery goals but does not appear to partition the scope of actions necessary to achieve the various levels of recovery. The commenter would like to see a list of prioritized actions and the expected short-term and long-term benefits of each action to the population.

(4) The Yakima and Gorge MU plans should give specific objectives or goals for future desired condition of environmental attributes that are considered limiting, similar to the southeast Washington and Oregon recovery plans.

> ***Combined Response***: At this time we do not have the level of detailed information needed to make quantitative predictions about the benefits of specific actions and the exact suite of actions that will be required to meet recovery goals. The Yakima Basin Fish & Wildlife Recovery Board and its partners will be developed some of this detail as part of a regularly updated implementation schedule that identifies and prioritizes specific steps needed to implement the recovery actions in the Yakima Steelhead Recovery Plan. This process will focus on identifying specific habitat goals and tracking progress towards meeting them. However, our ability to predict and model outcomes of proposed recovery actions is inherently limited and actions in the Yakima Basin are only part of the overall recovery effort. Significant survival improvements in the Columbia and ocean could mean that a fairly limited suite of actions in the Yakima Basin could achieve recovery goals; on the other hand, degradation or no improvement outside the basin could make recovery impossible even with the full suite of actions in the Yakima Plan. Evaluating the effectiveness of implemented recovery actions requires a rigorous and quantitative approach to

adaptive management as priority actions are being implemented. Adaptive management might indicate that some or all of the sets of recovery goals can be met with less than the full suite of proposed actions. While planners deem it unlikely based on current knowledge, they also realize that the proposed actions could be insufficient to achieve some of the recovery goals. Actual implementation efforts will have to be adjusted over time based on monitoring results. Detailed recommendations on implementing a strong adaptive management process will be included in the RME supplement to the Yakima Steelhead Recovery Plan that is currently being developed by the Yakima Basin Fish & Wildlife Recovery Board. Sections 5.3 and 6.3 have been updated to provide more detail on the role of implementation scheduling and adaptive management in determining specific habitat goals and the benefits and sufficiency of recovery actions. NMFS and the Board encourage commenters to participate in the development of the RME supplement and the ongoing maintenance of the implementation schedule.

5. Comment: A carrying-capacity-based approach in the Yakima Basin in areas that already have current or historical evidence of steelhead spawning may be preferable to the Intrinsic Potential approach of the ICTRT (Interior Columbia Technical Recovery Team).

Response: The ICTRT developed the habitat intrinsic potential (HIP) analysis as a relatively coarse-scale tool that could be applied across potential natural production areas across the Interior Columbia basin using existing data. The results were used by the ICTRT to generally assign populations to relatively broad size categories and to identify contiguous reaches with significant amounts of potentially high quality habitat within populations. The concept of following up the TRT HIP results with a more detailed assessment of current and potential historical conditions is a logical next step in evaluating restoration/protection options. The draft Yakima Steelhead Recovery Plan used results from the ICTRT HIP analysis in several ways, consistent with the ICTRTs recommendations for the analysis (e.g., ICTRT 2007).

6. Comment: A series of points regarding the use and utility of the HIP analysis are made. The suggestion that the analysis should be followed up by on-the-ground efforts "...in areas with high IP values..." is a reasonable next step in recovery planning.

The commenter went on to suggest that "...steelhead carrying capacity estimates should be filtered by documentation of juvenile *O. mykiss* presence."

Response: This point appears to confuse an assessment of current production with an analysis of the historical potential of a given stream reach. One of the intended uses of the ICTRT analysis was to contrast current vs. historical distribution across major spawning/rearing areas within a population. That contrast between potential for anadromous production under historical

conditions with current production is an important perspective for recovery planning. Using the HIP results as a starting point, the ICTRT encourages considering additional information or more specific modeling to evaluate whether natural conditions may have limited or precluded sustainable production of anadromous *O. mykiss*, especially where the model identifies large continuous reaches.

The commenter continued, suggesting that HIP results should be tempered by flow conditions and downstream migrant survival conditions.

Response: Clearly these factors could play a role in defining both historical and current production potential in a given reach. As noted above, it is important not to confuse current limited production capacity with historical potential. Consistent with the approaches in other Interior MU plans, the Yakima Plan uses the HIP analysis as a tool for characterizing large-scale historical patterns in production potential to contrast against current production or production potential. These contrasts provide objective starting points for assessing population viability using the ICTRT criteria as well as for more detailed analyses aimed at targeting effective recovery actions.

7. Comment: The allocation of Prosser Dam counts to individual populations is based on an assumed population distribution that may have changed since the time of the NMFS 1989-92 radio-tagging study. Since the tagging study, the commenter pointed out, there has been a strong correlation between Prosser Dam count and the annual abundance data for the Upper Yakima but poor correlation with Satus and Toppenish Creek redd counts, perhaps as a result of weak redd counting data.

Response: The Yakima Basin Fish & Wildlife Recovery Board agrees, and the plan acknowledges, that currently available approaches to allocating ladder counts to specific populations lack certainty (see Section 7.1.1). The Board is currently developing a detailed evaluation of current and potential abundance monitoring efforts. This document will become part of the RME supplement to the Yakima Steelhead Recovery Plan that is due to be released in 2009-10. It will identify specific steps to be taken to reduce uncertainties in population-level abundance estimates. The limited correlation between dam counts and tributary redd counts needs to be further reviewed; while some of the discrepancies may be due to the challenges of determining abundance and trend from redd data, others appear to represent actual year-to-year changes in the distribution of spawners within the basin (e.g., the increase in redd counts in Toppenish Creek relative to Satus Creek).

8. Comment: Data for the upper Yakima steelhead population is lacking, and lower basin populations (Satus and Toppenish Creeks) have better documentation of steelhead abundance and distribution because of the Tribe's research program.

Response: While it is certainly true that the wealth of long–term data available from the Yakama Nation's programs in the Satus and Toppenish watersheds is unequalled elsewhere in the basin, there is a significant body of information on the Upper Yakima population. Ladder counts at Roza Dam provide data on steelhead abundance, with some data going back to 1940. More detailed data have been available since the Roza fish trap was completed in 1988, including counts, physical measurements and scale and genetic samples. The 2002 to 2006 radio tracking study (Karp, Larrick et al. 2009) provides excellent information on the migratory behavior and spawning locations of the majority of steelhead in the Upper Yakima population. Future needs for monitoring and research for all four populations are being determined as part of developing the Research, Monitoring and Evaluation (RME) supplement to the Yakima Steelhead Recovery Plan, to be released in 2009-10.

9. Comment: The Plan should provide the various ICTRT recovery thresholds for ESA purposes, but ultimately focus on recovery goals specific to the Yakima Basin, perhaps by setting independent goals based on local knowledge, current recovery efforts, and known steelhead abundance and distribution.

Response: The Yakima Basin Fish & Wildlife Recovery Board believes that the delisting, short-term, and long-term goals identified in Chapter 4 of the Yakima Steelhead Recovery Plan do this. These goals will be adjusted over the course of recovery implementation based on local knowledge and the results of monitoring incorporated into an adaptive management program.

10. Comment: The recovery board made a questionable decision when following ICTRT guidelines to strive for a "maintenance standard" for the Toppenish population and a "viable standard" for the Naches population. The Toppenish subbasin is one of the largest producers of steelhead relative to its watershed area and likely houses some of the best opportunities to develop a highly viable population.

Response: The ICTRT's recovery criteria require that at least one of the two "large" populations in the Yakima MPG reach viable status (ICTRT 2007). Recovery planners identified the Naches population as more likely than the Upper Yakima population to achieve viable status in the short term (see Section 4.1.1). Since the Toppenish population is a small population, it cannot be substituted for the Naches population and still meet the ICTRT's criteria. The plan acknowledges that alternate recovery scenarios exist (e.g., the Toppenish population achieving viable or highly viable status sooner than the Satus population). Exceeding viable status for all populations is the ultimate goal of the Yakima Plan.

11. Comment: The Yakima Plan overstates the potential benefits of passage facilities that would allow migration above the upper Yakima and Naches Basin reservoirs.

With the exception of run-of-the-river dams, steelhead populations are not found above large lakes and reservoirs in the upper reaches of inland river basins.

> ***Response***: The Yakima Steelhead Recovery Plan acknowledges that there are uncertainties regarding the potential use of areas above Yakima Project storage reservoirs (see Section 4.3.7) and notes that recovery may be possible without fish passage into the reservoirs. While existing examples of significant steelhead runs above large lakes are limited to coastal settings, the generally depressed nature of steelhead stocks in those areas of the inland Columbia Basin with accessible large lakes mean that their current absence is a poor indicator of historical or potential conditions. The Board also notes that passage at the storage dams could increase genetic interchange between diverse native life histories of *O. mykiss*, and would provide access to headwater habitats that may become increasingly significant for the anadromous life history in the face of climate change. The Board anticipates that the current effort to restore passage at Cle Elum Dam and Bumping dams is likely to proceed based on the benefits to all anadromous species and bull trout. This project should include an evaluation of the degree to which steelhead colonize in upstream habitats. This will allow a more informed assessment of the benefits to steelhead of passage into the remaining storage dams.

12. Comment: While agreeing with the "high risk" rating of the Upper Yakima population, the commenter suggested that the Naches population is in better shape and should be changed to "maintained" viability status. Escapement is probably much higher than indicated by redd counts in the Naches, and its spawning/rearing tributaries are not blocked or impeded by man-made barriers to the extent found in tributaries to the Upper Yakima.

> ***Response***: NMFS agrees that the Naches population is in better shape than the Upper Yakima population, for the reasons noted by the commenter. However, the ICTRT still classified it as high risk based on the criteria laid out by the ICTRT (ICTRT 2007) and the data compiled in the Naches stock status assessment (ICTRT In press). As noted in other responses, partners in the basin are working to improve our ability to estimate population-specific abundances. It is possible that improved estimates would support reclassifying the Naches population as "maintained." This re-evaluation would occur as part of NMFS' 5-year status review.

13. Comment: The methodology for determining the 25,000-75,000 range for the historical Yakima Basin steelhead population was unclear. Other methods, including EDT (Ecosystem Diagnosis and Treatment), the intrinsic potential analysis, and others produced different estimates. Accordingly, the appropriate range would be 15,000-55,000.

Response: As noted in the plan, EDT does not currently model the influence of resident *O. mykiss*. However, as is also noted in Section 2.4.1, the EDT "historic" estimate is actually a hybrid scenario that represents presumed historic habitat conditions within the Yakima Basin and current-day conditions in the Columbia River and the ocean. Modeling the higher survival rates likely associated with historic Columbia and ocean conditions would lead to significantly higher historic population estimates. How that would be offset by adjustments to incorporate the influence of resident *O. mykiss* is unknown. All efforts to model historic abundance are inherently limited, and the range presented in the plan is not intended to provide specific management objectives. For these, see Chapter 4, Recovery Goals and Criteria, of the Yakima Steelhead Plan.

14. Comment: If Yakima Basin steelhead numbers had declined by 90 percent by the turn of the century then they likely numbered in the range of 2,000 to 6,000, given the previous estimates of historic population size. Given recent returns in the 2,000 4,000 range, declines since that time may not be great and, using the lower estimates of historic abundance, no declines may have occurred.

Response: The estimates of 90 percent decline are general; no specific estimates are available for steelhead. In recent years, steelhead numbers have not been constant, and significant declines (and increases) have occurred in the last 30 years. There was a significant decline from the 1980s to the period from 1990 to 1999, when runs dropped as low as 450 fish, and only exceeded 1,000 fish in 3 of the 10 years. While numbers have improved in the last decade, only 6 of the 10 years between 1999 and 2008 were above the 2,000 minimum cited, and only a single year (2002) has surpassed 4,000 fish. To state that no declines have occurred since 1900 ignores the complex trends of recent years.

15. Comment: The discussion regarding flows and the sources of low flows associated with the Roza and Chandler power plants is confusing.

Response: The plan has been updated to clarify that these comments apply to all the sources of low flows noted.

16. Comment: The citation for the effect of the change in flows with flip flop on invertebrates should be included.

Response: A citation to Arango 2001 has been added.

17. Comment: Eitemiller et al. 2002 should be included as a citation regarding Yakima River Basin floodplains.

Response: Citation added.

18. Comment: What data were used to determine water temperatures under "natural flow" conditions?

Response: The referent to this comment is unclear, as no reference is made to natural flow conditions in this section.

19. Comment: The noted variation in entry times during years of higher and cooler runoff makes it unclear that the selection pressure has been "strong," since some portion of the population(s) continues to enter early when conditions are conducive even after over 100 years of flow manipulation.

Response: The Yakima Basin Fish & Wildlife Recovery Board agrees that there are uncertainties regarding the extent of selective pressures; the text now indicates the lack of certainty regarding selective pressures on migration timing and life histories.

20. Comment: The plan should state that steelhead smolts do not seem susceptible to bass predation.

Response: This is now noted in both places in the Limiting Factors chapter where bass predation is mentioned.

21. Comment: The extent to which the impaired passage identified in limiting factors for the Lower Yakima Mainstem is in fact significant to steelhead is questionable.

Response: The Yakima Basin Fish & Wildlife Recovery Board agrees that there are many uncertainties regarding the impacts of diversion structures and associated bypasses on outmigrating smolts, as noted in Section 7.2.3. However, as highlighted in modeling of flow impacts on fish populations done as part of the Yakima Basin Storage Study, even relatively minor rates of mortality at individual structures have the potential to aggregate into significant impacts on outmigrating smolts. The Board encourages BOR and its partners to work to better characterize and, if warranted, address these impacts.

22. Comment: The data on smolt delay at Roza is primarily from hatchery spring Chinook and little, if any, data is available concerning steelhead smolts.

Response: A footnote has been added to Section 3.3.6 to indicate that while empirical data is primarily available for hatchery Chinook smolt passage, the same conditions are usually encountered by outmigrating steelhead.

23. Comment: Little actual data exists to confirm the assumption about ladder and dam operations at Roza Dam prior to power plant construction. The DART database does include counts of coho made during the period of interest that extend into November. Since the trap used to make those counts was at the top of the ladder, at least in those years, it was operating past mid-October.

Response: The language in section 3.3.6 has been edited to indicate that the duration of low-pool operations varied year to year. Roza passage timing in Section 3.3.6 was updated as well.

24. Comment: The data from the DART data base from 1959 through 2003 should be refined to include only those years and months when counts were actually being made. The database for this period "seems to reflect a lack of counts rather than a lack of passage. In many of those years no anadromous fish were recorded passing Roza, which seems wrong particularly with respect to spring Chinook."

Response: The language in Section 3.3.6 now explains that between 1999 and 2009, 20 percent of the run past Roza Dam were counted between November 1 and March 15; full counts were made throughout this period. Also, the discussion of Roza passage timing in Section 3.3.6 was updated to address the comment about spring Chinook.

25. Comment: During May and most of June, releases from the reservoirs are actually less than inflow as the reservoirs are still refilling. If high flows have the effects outlined in this section, then flows during May and June should have the opposite effect.

Response: Section 3.3.6 on altered streamflows now clarifies the timing and potential impacts of reservoir filling and summer water delivery.

26. Comment: In the Supplemental Comprehensive Analysis of the Federal Columbia River Power System (NOAA 2008), the mainstem reservoirs can both heat up and cool off the river.

Response: In Section 3.4.2, "increase" changed to "affect."

27. Comment: How does the delisting threshold number for Upper Yakima relate to the viability analysis shown in Figure 2.15? Are the 500 fish shown in Table 4.1 the maintenance level?

Response: The 500 fish geomean is the minimum threshold for a large population to meet the ICTRT maintenance standards, as noted in the footnote to Section 4.1.1.

28. Comment: From Section 4.3.11, the commenter concluded that both Taneum and Manastash are expected to be consistent producers of steelhead if access is improved and inquired: "Since the Plan concludes that the factors contributing to the production of the anadromous life form as opposed to the resident life form are largely unknown, what is this conclusion based on?"

Response: Other tributaries with similar conditions (e.g., Swauk Creek and the Teanaway system) have consistently produced steelhead; in addition recent

modeling efforts by Cramer Fish Sciences also conclude that Taneum Creek and similar tributary areas are likely to support some level of anadromy.

29. Comment: Basinwide Action #1 suggests that assessment of effects to water supply and flooding should be done and there should be no effect on water supply and few impacts with respect to flooding. This action should be modified to simply indicate that analyses need to be done.

Response: The action now recommends analyses to indicate whether real benefits to fish can be achieved with minimal impact to flood and water supply objectives.

30. Comment: In Basinwide Action #2, add BPA to the partners list and as an agency involved in previous screening work.

Response: BPA added.

31. Comment: In Lower Mainstem Action #3, expand partner list to include those managing the listed sites that are not BOR diversions.

Response: Irrigators, Wapato Irrigation Project, and Sunnyside Valley Irrigation District added.

32. Comment: In regard to Lower Mainstem Action #5, the Storage Alliance is not responsible for assessing storage options; that has been BOR and Ecology (Washington Department of Ecology). Some of the costs of any new storage options would likely be assigned to Fisheries and some of that to Steelhead. Some estimate of steelhead costs should be possible.

Response: The Storage Alliance is not mentioned in the text you reference; however, Ecology has been added to the list of partners. Current discussions about feasible storage options are not developed enough to provide cost estimates at this time. The ongoing YRBWEP work group may produce cost estimates.

33. Comment: The completion of the Sulphur Creek Wasteway barrier should be mentioned in Lower Mainstem Action #8.

Response: The action was updated accordingly.

34. Comment: What role would BOR play in Naches Action #6? The structures identified for modification in Naches Action #6 are not BOR facilities.

Response: The BOR is responsible for operations of the fish ladder and screens at Nelson/Cowiche Dam. While not a lead for this action, it may need to be involved at some level.

35. Comment: BOR should be listed as a partner in Naches Action #21, because the YTID (Yakima Tieton Irrigation District) canal that may be used as part of the project is a BOR-owned facility.

Response: BOR added to Naches Action #21.

36. Comment: The fact that the winter flow setting below Rimrock Dam was modified in 2008 was not mentioned.

Response: Naches Action #30 updated accordingly.

37. Comment: Construction to modify spill gates at Roza Dam is scheduled to begin in 2009.

Response: Upper Yakima Action #1 updated.

38. Comment: The cost derivation for Upper Yakima Action #2 was unclear. The $160K estimate was for the current subordination/tucking effort that is required in some years. Since BOR has not agreed with the proposal, it should likely be moved to "moderate" with respect to Implementation Likelihood.

Response: The Implementation Likelihood changed to "moderate."

39. Comment: In Upper Yakima Action #4, YRBWEP (Yakima River Basin Water Enhancement Project) should be replaced with BOR, and BPA should be added to the list of those previously involved in the Teanaway.

Response: Upper Yakima Action #4 changed as suggested.

40. Comment: In Upper Yakima Action #9, the action should reference modifications made at Kachess Dam, not Keechelus.

Response: Upper Yakima Action #9 corrected.

41. Comment: The biological role of the Yakima River "mainstem block" of naturally produced steelhead—considered by the ICTRT to be part of the Satus Creek steelhead population—is questionable. As part of the delisting threshold defined in the Yakima Plan, this appears to be an abundance "surcharge" on the other populations. The biological basis for such a "surcharge" with respect to either individual population viability or MPG viability is unclear.

Response: The options for addressing the uncertainties created by the ICTRT inclusion of the lower mainstem in the Satus population area were specifically designed to maximize the ability to meet delisting standards in a flexible manner. For clarification, see p. 3-11 of the DPS Plan and Section 4.1.1 Delisting Threshold of the Yakima Plan.

42. Comment: The percentage of age 1 steelhead smolts passing Prosser Dam (Figure 2.1) is unusually high for an interior population (e.g., Peven et al. 1994). Age data from returning Yakima adult steelhead (Tables 2.1–2.3 of the Plan) indicate a much lower incidence of adults produced from age 1 smolts than observed in the smolt outmigration at Prosser. Apparently a majority of age 1 downstream migrants at Prosser are either holding over for a second year of rearing before seaward migration or age 1 smolts survive to adult return at a relatively low rate compared to smolts outmigrating at ages 2 and 3. This discrepancy between smolt and adult age compositions should be noted and discussed in this section of the Plan.

> ***Response***: The Peven reference to the high percentage of year 1 smolts was added and the point clarified: "The percentage of age 1 steelhead smolts passing Prosser Dam (Figure 2.1) is unusually high for an interior population (e.g., Peven et al. 1994)."
>
> The differences in survival for year 1 and older smolts is already discussed in Section 2.5.7.

43. Comment: Viability assessments for the 4 independent Yakima populations are based on mean abundance and productivity data in Section 2.4.2 of the Plan. Introductory paragraphs do not mention the methodology for estimating these parameters and the possible limitations of that methodology.

> ***Response***: Added statement to Section 2.6: "These analyses are based on the best information available. While this information is at times limited, the stock status assessments represent a solid effort to utilize existing data to evaluate viability. As noted in Chapter 7, Research, Monitoring and Evaluation, these assessments should be updated as our ability to determine population-specific VSP parameter improves."

44. Comment: One sentence in Section 3.3.1, Basin-wide Threats and Limiting Factors, reports a hypothesis of Yakima River investigators (Martin and Pearsons 1994; Table 6) that unfavorable summer flows in the upper Yakima River, resulting from reservoir releases, may cause the observed slower growth of resident rainbow trout underyearlings compared to yearlings in other regional rivers. What was not mentioned in the Plan was that relatively small size at age 1 was common to fish samples collected from both the upper Yakima mainstem and its tributaries, suggesting that some factor other than flow regulation (likely temperature) may have been influential. Also not mentioned in this paragraph was the fact that the report by Martin and Pearsons also showed that Yakima mainstem *O. mykiss* were of comparable size to those in other regional rivers at ages 2-5.

> ***Response***: Yakima Basin Fish & Wildlife Recovery Board believes that it cited this reference appropriately. The Board also agrees that additional investigation to understand the effects of high summer flows on juvenile rearing is warranted

(see Section 7.2.3), and that the other questions in these comments should be addressed as part of that work.

45. Comment: The first sentence in this paragraph states that "—flow oscillations during irrigation season also reduce habitat quality for juvenile steelhead (Stanford 1994)." Based on the paper title given in the References list, the cited study was conducted in the upper Colorado River. It would seem unlikely that juvenile steelhead occur in that stream. This reference should be checked for accuracy. Comparisons between regulated river systems should also take into consideration the likely differences in flow regimes and environmental factors that could be at play.

Response: The citation was an error, has been removed, and "may" was added before "reduce."

46. Comment: The Recovery Strategies (Section 4.3) use a lot of subjective terms such as restore, improve, and enhance. Use of these terms may be problematic. For example, "improving" flow conditions is confusing because changing flows to benefit one species could harm other species. There is also ongoing discussion and debate about how flows could be changed in the Yakima to benefit steelhead. More detailed descriptions of the specific restoration actions are provided later, but the commenter recommends avoiding or explicitly defining potentially subjective terminology. In general, the Plan should not assume that everyone is like-minded about the strategies necessary to "recover" steelhead in the basin. The available biological information is limited and allows substantial room for expert judgment and experimentation. The recovery plan provides an essential road map for managers, but it only works if the road map to recovery is clearly defined.

Response: This plan represents an effort to do the best possible job with existing data and understandings. The Yakima Basin Fish & Wildlife Recovery Board recognizes that there are significant uncertainties about the underlying biology and the best approaches to improving conditions for steelhead. The Board and NMFS are committed to an ongoing effort to address these uncertainties and work through associated disagreements over management approaches as part of implementing this recovery plan. This will require rigorous application of an adaptive management process that identifies key uncertainties, proposes competing hypotheses and uses recovery actions and appropriate research and monitoring to test these hypotheses and adjust management accordingly. The Board also acknowledges that recovery will require making compromises as attempts to improve the full range of anadromous species and the broader ecological functions that support them are made. The Board encourages stakeholders to participate in this adaptive implementation process.

Comments and *Responses* Related to Resident *O. mykiss* and the Relationship with Anadromous *O. mykiss*:

47. Comment: Many of the identified steelhead populations in the Yakima Basin, such as the Naches and Upper Yakima, are actually subpopulations within a larger independent *O. mykiss* population that includes the resident form. This commenter suggested that the plan should be modified accordingly.

Response: The ICTRT used all available data and a consistent methodology in defining populations that are thought to be demographically independent over 100 years. The approach has been reviewed extensively, and the ICTRT adjusted boundaries in the Yakima according to technical comments they received. For steelhead, because of the lack of data, they relied on geographic distance between likely or current spawning areas. Large distances separate all of the defined populations in the Yakima Basin.

The technical team agrees that there is an opportunity for both resident and anadromous forms of *O. mykiss* to interbreed, since the two forms appear to share a common gene pool over evolutionary time periods (Busby et al. 1996). However, as noted by the BRT (Biological Review Team), existing data are very sparse with regard to interactions between resident and anadromous forms (Kostow 2003). The BRT considered the impacts of a healthy native population of resident fish and a nearly extinct anadromous form, similar to the anadromous and resident populations in the Upper Yakima. It concluded that the loss of the anadromous form would, in most cases, substantially change the character and future evolutionary potential of steelhead ESUs. In addition, there is even less empirical evidence that, once lost, a self-sustaining anadromous run can be regenerated from a resident salmonid population. (See also response to Comment 51.)

Existing data are sparse on the distinctness of the resident and anadromous life forms in the Yakima basin. Additional genetic and life history information needs to be collected to resolve this key knowledge gap. In general, the ICTRT believes that the resident and anadromous forms are linked at least at low to moderate levels. However, in populations such as these, with a substantial historical anadromous component, the loss of anadromy is as substantive a loss of diversity as can be imagined and would compromise the distinctiveness of the population. Since steelhead are so much more fecund, it also affects overall population productivity. In summary, despite the apparent reproductive exchange between resident and anadromous *O. mykiss*, the two life forms remain markedly separated physically, physiologically, ecologically, and behaviorally, and this plan addresses only the recovery of anadromous steelhead.

48. Comment: The conclusion about the risk of extinction of the Upper Yakima steelhead population should perhaps be tempered by the lack of knowledge about

how the resident form may exacerbate or ameliorate the risk. This commenter believes that given the available data, the Upper Yakima *O. mykiss* population is likely viable, if not highly viable.

> ***Response***: The Upper Yakima steelhead population is rated at a high risk of extinction because of low adult returns, poor spatial structure, and concern about its genetic diversity. NMFS agrees that there is a fairly robust resident trout population in the upper Yakima, but because of the distinctness of the resident and adult life forms, NMFS does not agree that the Upper Yakima population is viable.
>
> The Final Listing Determination for 10 Distinct Population Segments of West Coast Steelhead in January 2006 (71 FR 834) addressed the effect of co-occurring rainbow trout on the extinction risk of steelhead. In order for the resident form to exacerbate or ameliorate the risk of extinction, there would first have to be no marked separation of population groups as a consequence of biological factors. The FRN provides the argument that despite the apparent reproductive exchange between resident and anadromous *O. mykiss*, the two life forms remain markedly separated physically in adult size and fecundity; physiologically by undergoing smoltification; ecologically in their preferred prey and principal predators; and behaviorally in their migratory strategy. Given the marked separation between the anadromous and resident life-history forms in physical, physiological, ecological, and behavioral factors, NMFS concluded that the anadromous steelhead populations are discrete from the resident rainbow trout populations.
>
> The FRN goes on to point out that the best available scientific information does not demonstrate that an extirpated anadromous population can be re-established by a resident population. Evolutionary theory and empirical evidence suggest that the ability of residents to contribute to anadromy quickly diminishes if the fitness of their anadromous progeny is low (NMFS 2004a).
>
> NMFS' RSRP (Recovery Science Review Panel) concluded that in cases where an anadromous run is extinct or not self-sustaining, there is no scientific justification for the claim that the long-term viability of an *O. mykiss* ESU or steelhead DPS could be maintained by the resident life-history form alone or that a viable anadromous population could feasibly be reestablished from a pure resident population (RSRP 2005). In addition, the BRT concluded that although the resident form can enable the larger *O. mykiss* ESU to endure short-term physical, environmental, and ecological barriers to anadromous migration, no evidence supports resident fish being able to perform this function over the long term if the anadromous form is extirpated.

49. Comment: The productivity of *O. mykiss* may be underestimated by not counting the resident form and by neglecting to account for steelhead recruitment from resident parents.

Response: The commenter highlights a potential source of bias in evaluating the productivity of steelhead. Additional data need to be collected on the recruitment of steelhead from resident parents and the number of resident offspring produced by adult steelhead. In the upper Yakima basin, even though there is a relatively large population of resident *O. mykiss*, if these fish are producing anadromous offspring, production is at a very low rate as indicated by the low abundance of steelhead.

The fundamental issue raised in the comment is that steelhead are regarded as a separate DPS for policy reasons. As stated in the 2006 final listing determination, in NMFS' previous status reviews of West Coast *O. mykiss* we applied the agency's ESU policy and concluded that, where they co-occur and have the opportunity to interbreed, the resident and anadromous life-history forms are part of a single ESU. The USFWS disagreed that resident *O. mykiss* should be included in the steelhead ESUs and recommended that only the anadromous fish be listed (USFWS 1997). As a result, NMFS developed a DPS policy that takes a somewhat different approach from the ESU policy but is logical, reasonable, and appropriate for identifying DPSs of *O. mykiss*. The DPS policy is based on the definition found in the ESA of "species" which states "… any subspecies of fish…and any distinct population segment of any species…, which interbreeds when mature."

50. Comment: The probability of steelhead extinction could be adjusted to account for the presence of large resident populations.

Response: The commenter addresses the question as to what extent the presence of co-occurring rainbow trout affects the extinction risk of a steelhead population. The response to this comment is similar to that of Comment 48 and 51.

In the January 2006 final listing determination for steelhead, the BRT concluded "that the collective contribution of the resident life-history form to the persistence of a larger *O. mykiss* ESU is unknown and may not substantially reduce the overall extinction risks to the ESU in-total (NMFS 2003; 2004a). The two *O. mykiss* life histories represent an adaptive "bet-hedging" strategy for sustaining reproductive potential despite high variability in physical and ecological conditions. However, although the resident form can enable the larger *O. mykiss* ESU to endure short-term physical, environmental, and ecological barriers to anadromous migration, there is no evidence that resident fish can perform this function over the long term if the anadromous form is extirpated. It is also unclear to what extent resident populations depend on infusions from anadromous fish for their long-term persistence. The RSRP and ISAB underscored that "resident populations by themselves should not be relied upon to maintain long-term viability of an (*O. mykiss*) ESU."

51. Comment: It is inaccurate to state that the likelihood of retaining the anadromous trait after many generations of residency is unknown. The commenter cites Thrower and Joyce, 2004 as documentation that the anadromous trait is known to persist in populations of non-anadromous *O. mykiss* even after many generations of reproductive isolation. The commenter suggested that further study is needed.

Response: NMFS believes that the statement in the plan is accurate. While Thrower's results indicate that the correlation between smoltification and other traits associated with fitness in the freshwater environment provide a mechanism to explain how a low level of smoltification could persist despite the loss of all smolts from the isolated population, this example is only 70 years old, which is fairly short from an evolutionary perspective. Please note that on p. 304 of the same citation, Thrower notes that the marine survival rate of smolts produced by the resident population is lower than those produced by the related anadromous population. Thrower notes that this is likely due to the lack of selective pressures to maintain traits associated with marine survival. A citation to Thrower has been added to the discussion in the Yakima Steelhead Recovery Plan.

Thrower 's studies on the sequestered steelhead population are focused on the question of whether a resident population that historically was directly linked with an anadromous component could be used as a source for re-establishing anadromy *once habitat conditions supporting anadromy are restored*. That is fundamentally a different question from what the risk level is for a population that has lost a sustained anadromous return (the technical team thinks the risk is high, regardless of the number of resident fish that remain, because of the loss of the diversity and resilience associated with having a sustained anadromous component). NMFS concluded that having the potential to restore anadromy does not mitigate for the loss of anadromy in terms of current risks. It is a good thing that resident populations could serve as a source to re-establish anadromous runs, but NMFS has concluded that risks to the *O. mykiss* population that historically included a sustained anadromous component are still high until sustained anadromy is restored.

NMFS acknowledges that the nature of the relationship between resident and anadromous forms is inherently complex and has stated that an improved understanding of the range of interactions is needed. The resident/anadromous relationship is recognized as a key knowledge gap in Chapter 7, Research, Monitoring and Evaluation, of the DPS plan and will require further research and monitoring. As concluded by the BRT, the contribution of the resident life-history form to the persistence of a larger *O. mykiss* ESU is unknown and may not substantially reduce the overall extinction risks to the ESU in total. Given the uncertainty and lack of demonstration of an anadromous population being reestablished, NMFS believes the precautionary approach is justified.

52. Comment: The plan is not a reliable source for biologically justified adult steelhead recovery goals. Current research efforts to understand how environmental conditions, survival trade-offs, and genetic inheritance influence the abundance of anadromous individuals in *O. mykiss* populations will likely result in significant changes in recovery goals and strategies over the next several years.

> ***Response***: The plan bases its recovery goals and objectives (Chapter 4) on the VSP framework developed by McElhany (June 2000) and specific recovery criteria based on that framework and articulated by the ICTRT (2004). The Independent Scientific Advisor Board (ISAB) recently reviewed the ICTRT criteria and concluded, "The proposed criteria are based on a well-reasoned and well-supported set of scientific principles and are laid out in a relatively transparent fashion with clear guidelines and examples of their application. The general approach employed by the ICTRT and underlying understanding of conservation biology and salmon biology are scientifically defensible with no apparent conceptual gaps that might negate the defensibility of the approach."
>
> The ICTRT developed the methodology for evaluating viability criteria recognizing that there are individual situations and that recovery planners can discuss those situations with respect to viability. For instance, recovery planners could discuss the decrease or increase in the distance they consider a population to be from viability.
>
> NMFS supports research to better understand factors that influence the abundance of anadromous individuals and will use the information to update the plan's recovery goals and strategies.

53. Comment: In general, the plan's description of the importance of resident *O. mykiss* to the viability of the MCR steelhead DPS is flawed. The plan appears to try to justify the political decision to exclude resident trout from the DPS by downplaying the importance of the resident life history to steelhead viability.

> ***Response***: The commenter points out correctly that there was a policy decision to exclude resident rainbow trout from the DPS, resulting in a shared NMFS-USFWS jurisdiction for *O. mykiss* (see response to Comment 49). However, NMFS disagrees that there has been an attempt to downplay the importance of the resident life history to steelhead viability. In Section 2.5.6 of the Yakima Steelhead Plan, Resident/Anadromous Interactions, NMFS points out that the "dynamic expression of life-history characteristic makes *O. mykiss* very challenging to understand and manage." Also, the nature of the relationship between resident and anadromous forms is inherently complex. Setting realistic goals for steelhead production in different parts of the Upper Yakima and Naches systems will require an improved understanding of the range of interactions between resident and anadromous life histories. This is identified as a key knowledge gap in Chapter 7.

The application of the DPS policy to steelhead listings has required NMFS to focus on the anadromous form of *O. mykiss*. As stated in the response to Comment 47, the loss of anadromy would compromise the distinctiveness of the population.

54. Comment: The following conclusion seems unwarranted: "competitive interactions between larger resident individuals and juvenile anadromous *O. mykiss* may also reduce the production of smolts, especially where habitat conditions have shifted to promote residency." The commenter stated that there is no evidence in the literature that such behavioral interactions, if they do exist, would result in reduced smolt production.

Response: Our concern is both with the competitive interactions between larger resident individuals and smaller juvenile anadromous *O. mykiss* and when habitat conditions have shifted to promote residency. Assuming that carrying capacity is being approached, there is a competitive disadvantage for smaller anadromous juveniles when rearing in proximity with larger resident individuals. Human influence may exacerbate the problem if habitat conditions have been altered to support larger resident *O. mykiss* over smaller anadromous juveniles. A healthy balance of rearing conditions is necessary to support both life forms.

55. Comment: Section 2.5.6 describes a radio-tracking study of Upper Yakima steelhead, which in all cases (n=15) were observed to spawn with steelhead. Not cited were the results of an earlier, more extensive study of steelhead and resident rainbow trout spawning distributions in the Upper Yakima River system, that also provided evidence of gene flow between anadromous and resident individuals (Pearsons et al. 1998). This species interactions study has been ongoing and resulted in a number of reports as well as a peer-reviewed publication (see Pearsons et al. 2007) that corroborate these findings.

Response: Pearsons' work on this topic is cited elsewhere in the Yakima Plan, and a reference to it has been added to Section 2.5.6.

56. Comment: According to the definition of independent populations by McElhany et al. (2000), it is not clear how the resident trout in the upper Yakima and Naches subbasins can be excluded from the evaluation of steelhead viability.

Response: The basis of the comment is that *O. mykiss* are similar genetically when they co-occur and that individuals can occasionally produce progeny of the alternate life-history form. We agree that the population definition by McElhany can include the resident as well as the anadromous forms. However, as stated in the final listing determination FRN, the ESA requirement that a group of organisms must interbreed when mature to qualify as a DPS is a necessary but not exclusive condition. Under the definition, although all organisms that belong to a DPS must interbreed when mature, not all organisms

that share some reproductive exchange with members of the DPS must be included in the DPS. The DPS policy does not rely on reproductive isolation to determine "discreteness," but on the marked separation of population groups as a consequence of biological factors. As stated in the answer to Comment 47, despite the apparent reproductive exchange between resident and anadromous *O. mykiss*, the two life forms remain markedly separated physically, physiologically, ecologically, and behaviorally. Therefore, this plan only addresses the recovery of anadromous steelhead. Resident trout are not included in the recovery of steelhead.

57. Comment: Critical uncertainties urgently need to be acknowledged and thoroughly addressed in the Monitoring and Adaptive Management plans to be developed after the Plan is adopted. In addition, monitoring should include resident trout populations, not just sampling of migrating juveniles or migrating adults.

Response: NOAA agrees that critical uncertainties should be clearly defined and addressed in monitoring and adaptive management plans. The Oregon Steelhead Plan contains the identification of critical uncertainties that currently limit the ability to make informed management decisions. The Oregon Steelhead Plan then developed RME objectives from those critical uncertainties. NMFS anticipate a similar approach to be used in the remainder of the Middle Columbia DPS management units. Chapter 10 of the DPS Plan now contains two sections detailing data gaps and critical uncertainties.

Resident trout populations should be monitored when there is a question on the overlap with steelhead viability parameters. The concern and monitoring needs are greatest in areas supporting large rainbow trout populations.

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