DRAFT RESPONSE TO COMMENTS ON THE YAKIMA STEELHEAD RECOVERY PLAN

Prepared by the Yakima Basin Fish & Wildlife Recovery Board on July 27th, 2009

This document has been prepared for submission to NOAA Fisheries for inclusion in the response to comments currently being prepared for NOAA's Middle Columbia River Steelhead Recovery Plan. Page number referents are to the 8-18-08 review draft of the Yakima Steelhead Recovery Plan. A revised draft of the plan that incorporates changes to the plan made in response to comments is being provided with this document.

This document provides:

a) Reponses to comments compiled by NOAA and assigned to the Yakima Basin Fish & Wildlife Recovery Board for response. In this section comment numbers are those assigned by NOAA in its compilation of comments;

b) Responses submitted to NOAA on the Yakima Plan by the Bureau of Reclamation and the Yakima Basin Joint Board that were not included in NOAA's compilation but should be addressed in the final compiled response to comments;

c) A subset of B pertaining to the implications of resident/anadromous interactions for the ICTRT viability analysis which NOAA should respond to;

d) A list of additional edits made to the Yakima Steelhead Recovery in response to the Yakima Basin Fish & Wildlife Recovery Board's 12/23/08 comment letter.

e) Highlighting of a single comment made on NOAA's DPS plan pertaining to the Yakima Basin;

f) References cited in this document.

To follow up on this document and its incorporation into NOAA's response to comments, please contact Alex Conley at (509) 453-4104 or aconley@ybfwrb.org.

A) RESPONSES TO COMMENTS COMPILED BY NOAA AND ASSIGNED TO THE YBFWRB

COMMENT on p4, 36-1:

One commenter stated that 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. Their 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. They were skeptical that the Upper Yakima population would approach the 1,500 fish abundance threshold in the absence of a hatchery supplementation program.

RESPONSE:

We agree that there are significant uncertainties about the likely rate of recovery for the Upper Yakima population. We are 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 calls for 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.

CORRESPONDING EDITS TO PLAN:

None

COMMENT p10, 36-3:

One commenter stated that 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:

We agree 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 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.

CORRESPONDING EDITS TO PLAN:

None

We broke comment 24-21 into two parts, and then combined the responses to the second half and comments 14-6 ,14-7 and 24-3. Here's 24-21 A with response:

COMMENT p13, 24-21, part A: 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.

CORRESPONDING EDITS TO PLAN:

None

And here is a single response to 24-21B, 14-6 , 14-7 and 24-3:

COMMENT p13, 24-21, part B: The Yakima plan could reduce the level of uncertainty associated with recovery strategies by adding an appendix describing quantitative aspects of the basis for concluding that these actions can result in meeting or approaching viability objectives and adding an appendix with quantitative specifics of the potential effects of the actions.

COMMENT p15, 14-6: One commenter was concerned that 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.

COMMENT p15, 14-7: One commenter observed that 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. He would like to see a list of prioritized actions and the expected short term and long term benefits of each action to the population.

COMMENT p11, 24-3:

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 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. Some of this detail will be developed by the Yakima Basin Fish & Wildlife Recovery Board and its partners 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; no improvement or degradation 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 will require a rigorous and quantitative approach to adaptive management as priority actions are being implemented. It is possible that adaptive management will 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, it is also possible that the proposed actions will 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. We encourage the commentators to participate in the development of the RME supplement and the ongoing maintenance of the implementation schedule.

CORRESPONDING EDITS TO PLAN:

Language was added to sections 5.3 and 6.3 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.

COMMENT p13, 24-22:

The ICTRT suggested developing a schedule of tasks and milestones to be completed during the periodic review cycles.

RESPONSE: This will incorporated into the implementation schedule managed by the Yakima Basin Fish & Wildife Recovery Board and the Research, Monitoring and Evaluation (RME) supplement to the Yakima Steelhead Recovery Plan, to be released in 2009-10.

CORRESPONDING EDITS TO PLAN:

None

COMMENT p15, 14-1:

One commenter expressed concern that 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 points out that 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:

We agree, and the plan acknowledges, that currently-available approaches to allocating ladder counts to specific populations lack certainty (see Section 7.1.1). 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. The limited correlation between dam counts and tributary redd counts needs to be further reviewed; while some of the discrepencies 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).

CORRESPONDING EDITS TO PLAN:

None

COMMENT p15, 14-9:

One commenter pointed out that data for the upper Yakima steelhead population is lacking and that 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 radiotracking 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 a Research, Monitoring and Evaluation (RME) supplement to the Yakima Steelhead Recovery Plan, to be released in 2009-10.

CORRESPONDING EDITS TO PLAN:

None

COMMENT p15, 14-10: One commenter stated that 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:

We believe 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.

CORRESPONDING EDITS TO PLAN:

None

COMMENT p15, 14-13:

One commenter questioned the decision by the recovery board when following ICTRT guidelines to strive for a "maintenance standard" for the Toppenish population and a "viable standard" for the Naches population. They pointed out that 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 (Interior Columbia Technical Recovery Team) 2007). Recovery planners identified the Naches population as more likely to achieve viable status in the short term when compared with the Upper Yakima population (see Section 4.1.1). Since the Toppenish population is a small population, it can not 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), and exceeding viable status for all populations is the ultimate goals of the Recovery Plan.

CORRESPONDING EDITS TO PLAN:

None

COMMENT p15, 14-14:

One commenter stated that 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 historic or potential conditions. We also note 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. We anticipate 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.

CORRESPONDING EDITS TO PLAN:

None

COMMENT p16, 36-2 One commenter agreed with the "high risk" rating of the Upper Yakima population, but suggested that the Naches population is in better shape and should be changed to "maintained" viability status. This commenter believes that 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: We agree that the Naches population is in better shape than the Upper Yakima population, for the reasons noted by the commentator. However, the ICTRT still classified it as high risk based on the criteria laid out by the ICTRT (ICTRT (Interior Columbia Technical Recovery Team) 2007) and the data compiled in the Naches stock status assessment (ICTRT (Interior Columbia Technical Recovery Team) In press). As noted in other responses, partners in the basin are working to improve our ability to estimate population-specific abundances. We believe that it is possible that improved estimates would support reclassifying the Naches population as 'maintained'. This re-evaluation should occur as part of the 5-year stock status review to be completed by NOAA.

CORRESPONDING EDITS TO PLAN:

None

Comments deferred to the ICTRT response:

Comment 14-16 One commenter quoted the definition of independent populations by McElhany et. al (2000) and said that by this definition, it is not clear how the resident trout in the upper Yakima and Naches subbasins can be excluded from the evaluation of steelhead viability.

We assume that this question will be addressed by NOAA Fisheries; do let us know if additional input from the Yakima Basin Fish & Wildlife Recovery Board is desired.

Comments submitted to NOAA on the Yakima Plan, but not included in NOAA's compilation:

Comments submitted by the Bureau of Reclamation and not included in the NOAA compilation:

Location	**Comment**	**Response?**	**Plan Edits?**
p. 30, second paragraph	It is unclear how the 25,000 -75,000 range was determined. The EDT estimate is about 46,000 but likely an overestimate because of the inability to completely account for resident 0. *mykiss* (see Appendix B) which make up a large part of the largest population in the basin. The intrinsic potential analysis suggests something between 14,000 and 55,000 and also suffers from the problem of not being able to account for resident 0. *mykiss.* The other estimates from the literature are generally from about 20,000 to 100,000 but the 100,000 estimate is likely the result of a flawed approach. Given these numbers it seems that a more appropriate range would be 15,000 - 55,000.	As noted in the plan, you are correct that 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, but 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	No changes proposed

		are inherently limited, and the range presented in the plan is not intended to provide specific management objectives (for these, see chapter 4).	
p. 34, Productivity	Because of presence of large numbers of resident rainbow in Upper Yakima and possible Naches there is not a subset of years where density dependence can assume to have been low for juvenile freshwater rearing.	We have relied on the NOAA ICTRT viability analysis and have refered this question to NOAA for a response.	No change proposed.
p. 63, Upper Yakima Population	The viability curve is based on the methodology outlined in McElhany et al. 2000. McElhany et al. though outline the need to make some modifications based where steelhead form a sub-population within a larger independent 0. *mykiss* population that includes the resident form. This is the case in the Upper Yakima. Those modifications do not seem to have been made so the validity of resulting curve is in question and should likely be stricken.	We have relied on the NOAA ICTRT viability analysis and have refered this question to NOAA for a response.	No change proposed.
p. 64, Spatial Structure and Diversity	As noted above in the Upper Yakima and the Naches the steelhead likely form a sub-population within a larger independent population of 0. *mykiss* which includes the resident form. It is not clear how this fact has been incorporated into these analyses. It appears that the steelhead have been treated as an independent population (as defined in McElhany et al. 2000) which they are not. For example the minimum population size is in part derived from a minimum independent spawning population size of 500 individuals set to avoid genetic problems (see pages 2-10 ofNMFS Mid-Columbia Steelhead Recovery Plan). It is not at all clear how a minimum independent population size	We have relied on the NOAA ICTRT viability analysis and have refered this question to NOAA for a response.	No change proposed.

	should be applied in a situation where steelhead form a sub-population relative to the genetic concerns raised concerning population size.		
p. 68, first paragraph	If steelhead numbers had declined by 90% 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.	The estimates of 90% 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 you cite, and only a single year (2002) has surpassed 4,000 fish. To state that no declines have occurred since 1900 requires ignoring the complex trends of recent years.	No change proposed.

p. 93, second paragraph	This paragraph begins by talking about the bypass reaches associated with the Roza and Chandler power plants. About mid-way through the paragraph more generalized statements are made about "these flows" but it is not clear if the bypass flows are thought to truncate the migration window or reduce the survival of kelts or if these effects relate to the power plant bypass reaches or flow conditions in general.	The plan has been updated to clarify that these comments apply to all the sources of low flows noted.	Text of plan edited to clarify reference.
p. 94, Rapid Change	The citation for the effect of the change in flows with flip flop on invertebrates should be included.	The plan has been updated accordingly.	A citation to Arango 2001 has been added.
p. 96, last paragraph	Eitemiller et al. 2002 should be included as a citation regarding Yakima River basin floodplains.	The plan has been updated accordingly.	The citation has been added.
p. 103, Gaps	There should be some discussion here about how the concern about gaps is affected by the fact that the Naches and Upper Yakima steelhead populations are actually sub-populations within independent 0.*mykiss* populations. Does the presence of the resident form in the gaps between the known steelhead spawning areas meditate the gaps between the steelhead in any way?	We have relied on the NOAA ICTRT viability analysis and have refered this question to NOAA for a response.	No change proposed.
p. 103, Altered Flows	What data was used to determine water temperatures under "natural flow" conditions? If the estimates are the result of modeling exercises the models should be identified and described.	The referent to this comment is unclear, as no reference is made to natural flow conditions in this section.	No change proposed.
p. 104, first paragraph	Given the entry time data on page 36, relative to entry times in years of higher and cooler runoff, it isn't clear 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.	We agree that there are uncertainties regarding the extent of selective pressures, and have edited the text accordingly.	Text changed to indicate the lack of certainty re selective pressures on migration timing and life histories.
p. 105, Predation	Should probably note here, as was done earlier in the Chapter, that steelhead smolts do not seem susceptible to bass predation.	A referent to the earlier discussion has been added to this section	Added “As noted under predation in Section 3.3.1,” to text.
p. 105, Gravel	Reference is made here to Kittitas	This discussion	The discussion of

Mines	County which would not seem to be part of the lower Yakima River basin.	has been moved to the Basinwide section to address the inconsistency you noted.	gravel mining has been moved from Section 3.3.2 to 3.3.1.
p. 105, Impaired Passage	It is not clear to what extent the issues identified here are significant issues relative to steelhead. For example, is predation at Horn Rapids a particular problem when it comes to steelhead?	We agree 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. We encourage Reclamation and its partners to work to better characterize, and if warrented, address these impacts.	No changes proposed.
p. 112, last paragraph	It should perhaps be noted that the data on smolt delay at Roza is primarily from hatchery spring chinook and little, if any, data is available concerning steelhead smolts.	A footnote has been added to the text to indicate that while empirical data is primarily available for hatchery Chinook smolt passage, the same conditions are	Footnote added to section 3.3.6

		expected to be encountered by outmigrating steelhead.	
p. 113, second paragraph	As we have noted before there seems to be little actual data to confirm the speculation about ladder and dam operations at Roza 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, was operating past mid-October.	The language in section 3.3.6 has been edited to indicate that the duration of low-pool operations varied year to year.	Discussion of Roza passage timing in Section 3.3.6 updated to address comment.
p. 113, second paragraph	The data from the DART database for many years for the 1959-2003 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. The analysis should be refined to include only those years and months when counts were actually being made.	The language in section 3.3.6 has been edited to note that between 1999 and 2009, 20% of the run past Roza were counted between November 1st and March 15th. Full counts were made throughout this period.	Discussion of Roza passage timing in Section 3.3.6 updated to address comment.
p. 113, Altered Flows, second paragraph, first and second sentences	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 the next sentence then flows during May and June should have the opposite effect.	The plan has been edited to clarify the timing and potential impacts of reservoir filling and summer water delivery.	Section 3.3.6, Altered streamflows, edited to reflect comment.
p. 116, Columbia River Dams	The situation with reservoirs is complicated. As noted in the Supplemental Comprehensive Analysis ofthe Federal Columbia River Power System (NOAA 2008) the mainstem reservoirs can both heat up and cool off the river.	The plan has been updated accordingly.	Changed “increase” to “affect” in Section 3.4.2.
p. 124, Table 4.1	How does the delisting threshold number for Upper Yakima relate to the viability analysis shown in Figure 2.15? Is the 500 fish shown here the maintenance level?	The 500 fish geomean is the minimum threshold for a large population to	No change proposed.

		meet the ICTRT maintenance standards, as noted in the footnote to Section 4.1.1.	
p. 133, Upper Yakima Population Recovery Strategies	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. Given the available data, the Upper Yakima 0. *mykiss* population is likely viable if not highly viable. What this means for the steelhead sub-population within that larger independent population is unknown.	We have relied on the NOAA ICTRT viability analysis and have refered this question to NOAA for a response.	No change proposed.
p. 135, Other Upper Yakima Area Tributaries	This concludes that both Taneum and Manastash are expected to be consistent producers of steelhead if access is improved. Since the report 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?	Other tribs with similar conditions (e.g. Swauk & 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.	No change proposed.
p. 142, Basinwide Action #1	The write up suggests that assessment of affects to water supply and flooding should be done and then concludes that there should be no affect on water supply and few impacts with respect to flooding. This should be modified to simply indicate that the analyses need to be done.	The plan has been updated accordingly.	The statement in the draft that "These changes would have very little effect on water supplies while returning the river to a more normative hydrograph" has been changed to "The potential of these changes to

			return the river to a more normative hydrograph without significantly impacting water supplies should be evaluated."
p. 143, Basinwide Action #2???	Add BPA to the partners list and as an agency involved in previous screening work.	The plan has been updated accordingly. Note reference is to BW2, not BW1	Update per comment.
p. 152, Lower Mainstem Action #3	May expand partner list since some of the listed sites are not Reclamation diversions.	We have expanded the partner list accordingly.	Irrigation Districts added to list of partners.
p. 152, Lower Mainstem Action #5	The Storage Alliance is not responsible for assessing storage options; that has been Reclamation and Ecology. Some of the costs of any new storage options would likely be assigned to Fisheries and some ofthat to Steelhead. Some estimate of steelhead costs should be possible.	The Storage Alliance is not mentioned in the text you reference; Ecology has been added to the list of partners.	Ecology has been added to the list of partners.
p. 155, Lower Mainstem Action #8	It should be noted here that the Sulphur Creek Wasteway barrier has been completed.	The plan has been updated accordingly.	Update per comment.
p. 161, Naches Action #6	It is not clear what role Reclamation would play as the structures identified for modification are not Reclamation facilities.	The BOR is responsible for operations of the fish ladder and screens at Nelson/Cowiche Dam. While not a lead for this action, they may need to be involved at some level.	No changes proposed.
p. 170, Naches Action #21	Reclamation should be listed as a partner since the YTID canal that might be used as part of the project is a Reclamation owned facility.	The plan has been updated accordingly.	Reclamation has been added to the list of partners.
p. 175, Naches Action #30	The winter flow setting below Rimrock was modified in 2008.	The plan has been updated accordingly.	Added statement that "The Bureau increased winter flow in the Tieton

			in 2008 (to a base of ~100-125 cfs vs earlier targets as low as 30cfs); this commitment should be continued."
p. 186, Upper Yakima Action #1	Construction is scheduled to begin 2009.	The plan has been updated accordingly.	Statement added: "BOR has completed a preliminary design and is scheduled to begin construction in 2009."
p. 186, Upper Yakima Action #2	The cost derivation on this action is unclear. The $160K estimate was for the current subordination/tucking effort in some years. Since Reclamation has not agreed with the proposal it should likely be moved to Moderate with respect to Implementation Likelihood.	The plan has been updated accordingly.	Likelyhood of implementation changed to Moderate; cost derivation language clarified.
p. 171, Upper Yakima Action #4	YRBWEP should be replaced with Reclamation and BPA should likely be added to the list for those previously involved in the Teanaway.	The plan has been updated accordingly.	BPA added to the list of partners.
p. 190, Upper Yakima Action #9	This action should reference modifications made at Kachess Dam not Keechelus.	The plan has been updated accordingly.	"Keechelus" changed to "Kachess" in action description.

Comments submitted by the Bureau of Reclamation and not included in the NOAA compilation that pertain to the Yakima Plan but need a response by Tom Cooney *(note these were included above, but are recaptured here for NOAA's convenience).*

If any corresponding changes need to be made in the Yakima Plan, we need to know ASAP.

p. 34, Productivity	Because of presence of large numbers of resident rainbow in Upper Yakima and possible Naches there is not a subset of years where density dependence can assume to have been low for juvenile freshwater rearing.
p. 63, Upper Yakima Population	The viability curve is based on the methodology outlined in McElhany et al. 2000. McElhany et al. though outline the need to make some modifications based where steelhead form a sub-population within a larger independent 0. *mykiss* population that includes the resident form. This is the case in the Upper Yakima. Those modifications do not seem to have been made so the validity of resulting curve is in question and should likely be stricken.
p. 64, Spatial Structure and Diversity	As noted above in the Upper Yakima and the Naches the steelhead likely form a sub-population within a larger independent population of 0. *mykiss* which includes the resident form. It is not clear how this fact has been incorporated into these analyses. It appears that the steelhead have been treated as an independent population (as defined in McElhany et al. 2000) which they are not. For example the minimum population size is in part derived from a minimum independent spawning population size of 500 individuals set to avoid genetic problems (see pages 2-10 ofNMFS Mid-Columbia Steelhead Recovery Plan). It is not at all clear how a minimum independent population size should be applied in a situation where steelhead form a sub-population relative to the genetic concerns raised concerning population size.
p. 103, Gaps	There should be some discussion here about how the concern about gaps is affected by the fact that the Naches and Upper Yakima steelhead populations are actually sub-populations within independent 0.mykiss populations. Does the presence of the resident form in the gaps between the known steelhead spawning areas meditate the gaps between the steelhead in any way?
p. 133, Upper Yakima Population Recovery Strategies	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. Given the available data, the Upper Yakima 0. mykiss population is likely viable if not highly viable. What this means for the steelhead sub-population within that larger independent population is unknown.

Comment from NOAA Compilation and flagged for ICTRT response:

Comment 14-16 One commenter quoted the definition of independent populations by McElhany et. al (2000) and said that by this definition, it is not clear how the resident trout in the upper Yakima and Naches subbasins can be excluded from the evaluation of steelhead viability.

Comments submitted by the Yakima Basin Joint Board and not included in the NOAA compilation:

COMMENT:

Page 48, para. 2. This paragraph 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. The investigators (Pearsons et al. 1998) concluded "Ecological and genetic evidence indicated that rainbow and steelhead trout in the Yakima basin interbreed when in sympatry. --- The most common modes of interbreeding --- appears to occur between female steelhead and male rainbow trout and between precocial male steelhead and female rainbow trout." 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:
Pearson's work on this topic is cited elsewhere in the plan, and a reference to it has been added to section 2.5.6.

CORRESPONDING EDITS TO PLAN:

Added reference and key findings from Pearsons 1998 to Section 2.5.6.

COMMENT:

Sec. 2.5.7 Smolt Outmigration
The percentage of age 1 steelhead smolts passing Prosser Dam (Fig. 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 reference to the high percentage of year 1 smolts has been added to the plan. The differences in survival for year 1 and older smolts is already discussed in Section 2.5.7.

CORRESPONDING EDITS TO PLAN:

Added statement that "The percentage of age 1 steelhead smolts passing Prosser Dam (Fig. 2.1) is unusually high for an interior population (e.g., Peven et al. 1994)." Added Peven as reference.

COMMENT:
Sec. 2.6. Viability Assessments for Yakima Basin Steelhead
Viability assessments for the 4 independent populations are based on mean abundance and productivity data in Sec. 2.4.2 of the Plan. Introductory paragraphs on page 54 do not mention the methodology for estimating these parameters and its possible limitations of that methodology.

RESPONSE:
A clarifying sentence has been added to the plan.

CORRESPONDING EDITS TO PLAN:

Added statement to Section 2.6 noting that, "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, these assessments should be updated as our ability to determine population-specific VSP parameter improves."

COMMENT:

Sec. 3.3.1 Basin-wide Threats and Limiting Factors
Page 94, para. 2. One sentence in this paragraph 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:

We believe that we have cited this reference appropriately. We also agree that additional investigation to understand the effects of high summer flows on juvenile rearing is warranted (see Section 7.2.3), and that the questions that you bring up should be addressed as part of that work.

CORRESPONDING EDITS TO PLAN:

None.

COMMENT:

Page 94, para. 3. 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:

This citation was in error and has been removed.

CORRESPONDING EDITS TO PLAN:

Removed citation and added "may" before reduce.

COMMENT:

A carrying-capacity-based approach in areas that already have current or historic evidence of steelhead spawning may be preferable to the Intrinsic Potential (IP) approach. The IP approach provides a starting point for discussion but does not incorporate many necessary variables such as natural migration barriers (these can only be identified in the field) and seasonal variability in flow. On-the-ground habitat surveys should be conducted in areas with high IP values to confirm suitability for steelhead. Furthermore, steelhead carrying capacity estimates should be filtered by documentation of juvenile *O. mykiss* presence.

RESPONSE:

The Intrinsic Potential mapping done by the ICTRT incorporates both published information on natural barriers and extensive ground-truthing by biologists familiar with the Yakima Basin. It should include all natural barriers of significance. We agree that further work to refine and test the capacity estimates created by the IP model would be valuable, but also note that in its current form it provides a solid basis for the ICTRT Viability analysis.

CORRESPONDING EDITS TO PLAN:

None.

COMMENT:

Page 49, third paragraph: The statement made about presence of the anadromous trait after many generations of residency being "unknown" is incorrect. The anadromous trait is known to persist in populations of non-anadromous *O. mykiss*, even after many generations of reproductive isolation (Thrower and Joyce 2004). An earlier version of the Plan was revised in response to this comment, but the new version still has the same statement followed by a caveat to explain findings of Thrower and Joyce (2004). It is more appropriate to site the best available information and suggest further study if the authors feel more research is needed. In its current form, the statement made on page 49, paragraph 4 is still inaccurate, and the citations used to support the statement do not reflect the most rigorous empirical study of this issue.

RESPONSE:

We believe 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. We have added a citation to Thrower to our discussion of this point.

CORRESPONDING EDITS TO PLAN:

Additional detail on the Thrower example has been added to the text and a citation to Thrower added to discussion of loss of selection for traits associated with marine survival.

COMMENT

Pages 48-49: I recommend avoiding citation of NOAA's 2004 Science Review Panel Report. Though the topic is relevant, I found the report to be badly biased. None of the members of the review panel were fish biologists, and they provided a very one-sided perspective on the issue of anadromy in O. mykiss populations. It was clear throughout the report that they were trying to make a case for the paramount importance of steelhead to overall O. mykiss viability, to the extent that they were willing to make suspect and even comical arguments. For example, the report includes a section that describes the range of habitat used by steelhead and argues that loss of the anadromous form of O. mykiss eliminates these fish from 99.97% of their potential natural habitat. Though the percentage may be accurate, the implied significance of the ocean to the overall viability of O. mykiss is radically overstated. O. mykiss populations with no access to the ocean have thrived for thousands of years. I'm in favor of restoration and protection of steelhead, a beautiful and charismatic O. mykiss life-history form, but let's not make grandiose statements about their importance to the future existence of the entire species in an attempt to promote our personal policy objectives. Citation of such obviously biased and unscientific sources only reduces the credibility of the Recovery Plan.

RESPONSE:

We note that disagreement over findings is an essential part of scientific investigation, and should not be a reason to avoid citation of a work. The Science Review Panel Report provides a valuable review of existing findings related to the role of anadromy. In addition, under the DPS policy, the viability of the listed anadromous form of O. mykiss is the management goal. The ability of resident O. mykiss to survive independent of the anadromous form is irrelevant if the explicit policy goal is to maintain the existence of the anadromous form.

CORRESPONDING EDITS TO PLAN:

None.

COMMENT:

Pg. 128: The Recovery Strategies section uses 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 I recommend avoiding or explicitly defining potentially subjective terminology. In general, the Recovery 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. We recognize that there are significant uncertainties about the underlying biology and the best approaches to improving conditions for steelhead. We 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. We also acknowledge that recovery will require making compromises as we attempt to improve the full range of anadromous species and the broader ecological functions that support them. We actively encourage the Joint Board and its partners to participate in this adaptive implementation process.

CORRESPONDING EDITS TO PLAN:

None.

Edits made as proposed in Yakima Basin Fish & Wildlife Recovery Board 12/23/08 letter:

- Minor edits to the executive summary to reflect planned date of issue of NOAA plan
- Overview map added to the executive summary
- Update the Public Involvement Section (1.3.2) and Appendix D to reflect additional outreach activities conducted between August and December of 2008.
- Added 2008-9 to Table 2.5 and corrected previous years data as needed
- Discussion of recent PIT-tag data on adult migrants heading significant distances upstream in the Columbia and Snake prior to entering the Yakima Basin added to Section 2.5.1; corresponding uncertainties flagged in Section 7.2.5.
- Table 2.9 caption & notes clarified to indicate that Columbia passage data is from fish PIT-tagged in tributaries as juveniles. Text edited to clarify the source of PIT tags referenced in table 2.9 and discuss implications for analysis of population-specific run timing
- Table 2.15 Naches redd survey results updated
- Table 2.16 replaced with summary table that covers all three years of the Karp study.
- Table 2.17 kelt data updated with additional 2007 & 2008 data
- Figure 2.11 on smolt ages updated with 2005-2007 data
- Table 2.18 on smolt size updated with 2005 to 2007 data
- Table 2.20 replaced with updated table that includes survival rates based on adult returns
- Added clarifying headers to tables 3.x
- Added references to the USGS's Scientific Investigations Report 2008-5124, Effects of Potential Future Warming on Runoff in the Yakima River Basin, Washington, to the plan's discussions of climate change (Sections 3.3.1 (p.98) and 7.6.1); Also added Climate impact groups references.
- Corrected typographic error on p 121 (replaced "viaility" with "viability")
- Added additional data on fish passage at Roza Dam prior to 1958 to page 113
- Listed the Mid-Columbia Fisheries Enhancement Group as a partner for Naches actions 5, 12, 19, and 22, and Upper Yakima actions 4, 14, 15, and 18
- Removed Burbank Creek from discussion of arid watersheds on p 235
- Provided updated numbers for the summary of YTAHP activities in Section C.2.2
- Updated description of RFEG program in C.5.1 per request of MCFEG staff.
- Updated pagination, the Table of Contents, Table of Figures and Table of Tables, citations and bibliography to reflect all other edits.

Comments submitted to NOAA on the DPS plan, not included in NOAA's compilation:

BOR comments on Mid-C

3-11, footnote 25	It is unclear what the biological role is of the mainstem Satus block. It is defined as essentially 500 more steelhead anywhere in the basin. It appears to be an abundance "surcharge" on the other populations since there is no productivity, spatial distribution or genetic diversity criteria associated with it. The biological basis for such a "surcharge" with respect to either individual population viability or MPG viabilitv is unclear.

This is a comment on the draft in the NOAA-written portion of the plan that draws on the Yakima Plan. I would recommend that NOAA refer the reader to the discussion in section 4.1.1 of the Yakima Plan. Let me know if I can be of help in clarifying this issue and drafting NOAA's response.

REFERENCES CITED IN RESPONSES:

ICTRT (Interior Columbia Technical Recovery Team) (2007). Viability criteria for application to Interior Columbia Basin salmonid ESUs. Technical review draft. Portland, OR, U.S. Department of Commence, NOAA Fisheries**:** 90 pp. + 3 appendices and 3 attachments.

ICTRT (Interior Columbia Technical Recovery Team) (In press). Yakima Basin stock status assessments. Portland, OR, U.S. Department of Commerce, NOAA Fisheries Northwest Science Center.

Karp, C., W. Larrick, et al. (2009). Steelhead Movements in the Upper Yakima River Basin, Fall 2002 – Spring 2006. Denver, Colorado, U.S. Department of the Interior, Bureau of Reclamation Technical Service Center.