Mid C Focus Team

Final Report

January 18, 2011

Table of Contents

1.0 Background.....4
2.0 Recovery Context by Major Population Group (MPG).....6
2.1 Cascade Eastern Slope Tributaries MPG.....6
2.2 John Day MPG.....7
2.3 Umatilla/Walla Walla MPG.....8
2.4 Yakima MPG.....8
3.0 Summary of Federal Actions.....8
4.0 Summary of Technical Expert Meetings.....9
4.1 Cascade Eastern Slopes MPG.....10
4.1.1 Fifteenmile Creek.....11
4.1.2 Deschutes.....11
4.1.3 Klickitat.....11
4.1.4 Rock Creek.....12
4.1.5 White Salmon.....12
4.2 John Day MPG.....13
4.2.1 John Day.....13
4.3 Umatilla/Walla Walla MPG.....13
4.3.1 Umatilla.....14
4.3.2 Wall Walla/Touchet.....14
4.4 Yakima MPG.....15
4.4.1 Yakima.....15
5.0 RME.....16
6.0 References.....20

Appendices

Appendix 1. Federal Action Spread Sheets

Appendix Table 2. Middle Columbia River steelhead: Summary of Federal Actions Cost by Subbasin: Fifteenmile Creek (2a), Deschutes (2b), Klickitat (2c), Rock Creek (2d), White Salmon (2e), John Day (2f), Umatilla (2g), Walla Walla/Touchet (2h), Yakima (2i).

Appendix Table 3. Middle Columbia River steelhead: Technical expert priorities and costs by subbasin: Yakima, Walla Walla/Touchet, Umatilla, Rock Creek, John Day, Deschutes, Fifeteenmile Creek, Klickitat, and White Salmon.

Appendix Table 4. Middle Columbia River steelhead: Monitoring sites and current assessment efforts by subbasin: Yakima (4a), Walla Walla (4b), Touchet (4c), Umatilla (4d), Rock Creek (4e), John Day (4f), Deschutes (4g), Fifeteenmile (4h), Klickitat (4i), and White Salmon (4j).

1.0 Background

The National Marine Fisheries Service (NMFS) listed 13 species of salmon and steelhead in the Columbia River Basin under the auspices of the Endangered Species Act (ESA) of 1973. The term "species" as defined by the ESA includes any distinct population segment of any species of vertebrate fish or wildlife. For Pacific salmon, the NMFS considers an evolutionarily significant unit, or "ESU", a "species" under the ESA. For Pacific steelhead, the NMFS has delineated distinct population segments (DPSs) for consideration as "species" under the ESA. One of those species, the Middle Columbia River steelhead DPS, was listed as threatened in 1999 (64 FR 16397) and reaffirmed on January 5, 2006 (71 FR 834). Section 4(f) of the ESA requires NMFS to develop recovery plans for marine species listed under the act. The Middle Columbia River Steelhead Distinct Population Segment ESA Recovery Plan (Mid C Plan) was completed in September 2009 and contains a strategy to restore the Middle Columbia River steelhead DPS to the point that they are again self-sustaining and no longer in need of protection of the ESA.

Pursuant to Section 7 of the ESA, Federal agencies are directed, among other things, to utilize their authorities in furtherance of the purposes of the ESA by carrying out programs for the conservation of listed species and to insure that any action authorized, funded, or carried out by each agency is not likely to jeopardize the continued existence of any listed species or adversely modify critical habitat. Among the five purposed identified in The Columbia River Basin Federal Caucus (the Caucus) MOU is to, "Coordinate federal recovery of anadromous and resident fish, particularly those listed as threatened or endangered under the ESA" (Federal Caucus MOU, 2008).

On June 17, 2008, the Caucus identified the Middle Columbia (Figure 1) as a potential area to focus federal efforts for delisting a species. There was general belief in the Caucus that the Middle Columbia River steelhead DPS was the closest to recovery of any listed species in the Columbia, and a coordinated federal effort could assist in expediting delisting. A draft scope of work was developed and approved on July 15, 2008 by the Caucus identifying a work group (the Middle Columbia Focus Team (Focus Team)) to:

1. Coordinate the federal presence at local Mid Columbia recovery planning/implementation meetings and workshops and
2. Develop a programmatic-level "accomplishment report" for implementation actions in the Mid Columbia, beginning with (1) federal efforts in the Yakima basin; (2) federal efforts in the Umatilla basin; and (3) efforts to reduce hatchery straying into the John Day and Deschutes basins.

The Caucus approved a work plan for the Focus Team on June 16, 2009. The work plan provided an approach to identify actions that have the potential for improvement of one or more viability parameters for Middle Columbia River steelhead populations. The task took two years with the first year focused on the Yakima and Umatilla basins and the second year on the remaining seven Middle Columbia basins. The work plan included a task to assess the adequacy of current monitoring efforts. The task evaluated the ability to detect change in adult and

juvenile steelhead by evaluating the precision of the monitoring efforts and identification of gaps.

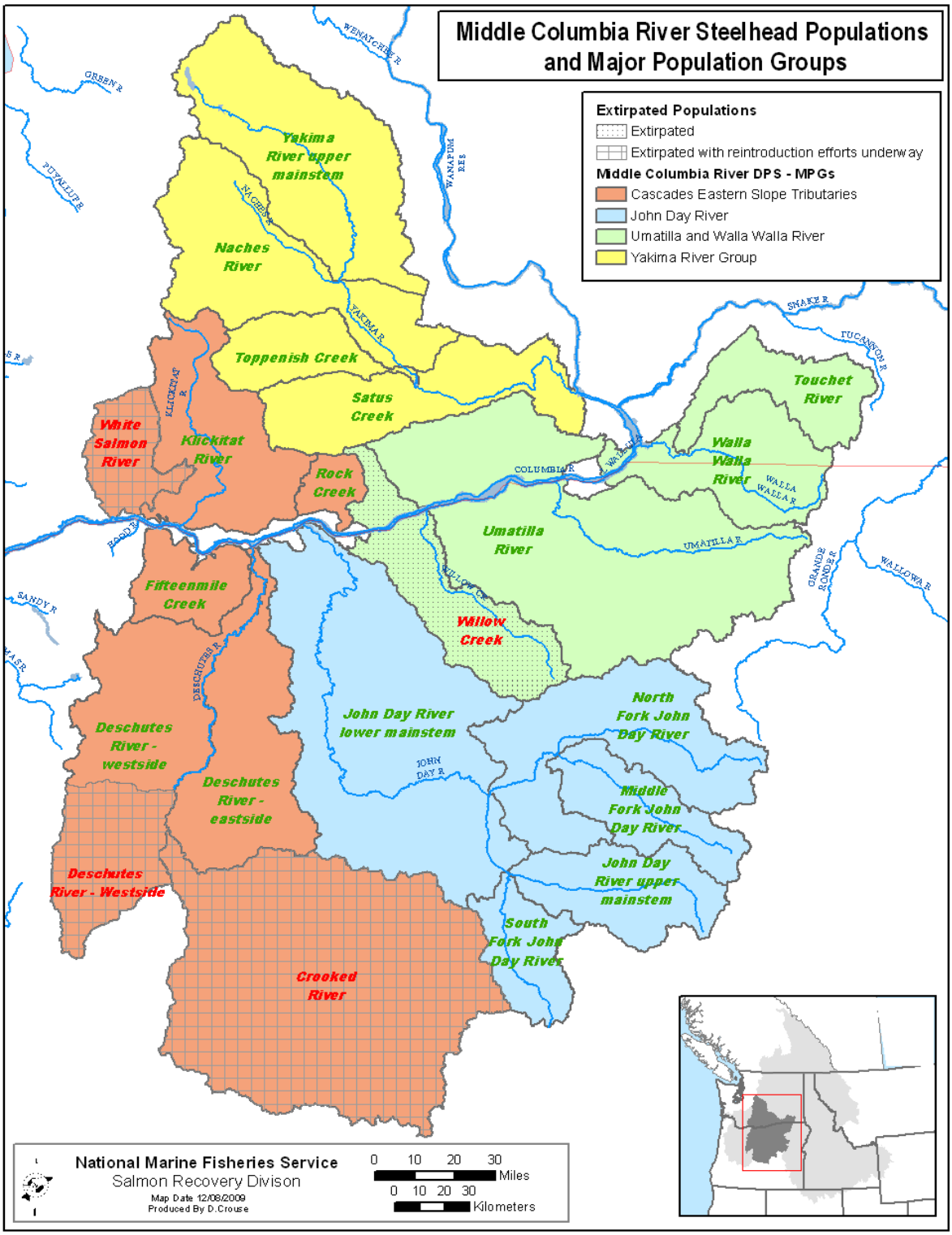

Figure 1. Middle Columbia Steelhead Populations

2.0 Recovery Context

Section 4(f) of the ESA requires NMFS to develop recovery plans for marine species listed under the Act. Recovery plans identify actions needed to restore threatened and endangered species to the point that they are again self-sustaining elements of their ecosystems and no longer need the protections of the ESA. Although recovery plans are guidance, not regulatory documents, the ESA clearly envisions recovery plans as the central organizing tool for guiding each species' recovery process.

NMFS appointed a team of scientists (the Interior Columbia TRT (ICTRT)) to define the Middle Columbia DPS structure and develop recommendations on biological viability criteria. The ICTRT used the principles described in a NMFS technical memorandum, *Viable Salmonid Populations and the Recovery of Evolutionarily Significant Units* (McElhany et al. 2000). A summary of recovery criteria for middle Columbia steelhead is found in the Mid C Plan at www.nwr.noaa.gov/Salmon Recovery.

If, as we believe, the decline of the middle Columbia steelhead DPS is caused by widespread habitat degradation, impaired mainstem and tributary passage, hatchery effects, and predation/ competition/ disease, then actions taken to improve, change, mitigate, reduce those factors will result in reduced risks and increased survival. Because of the steelhead's complex life cycle and the many changes that have taken place in its environment, the factors limiting its survival must be addressed in concert, and in an integrated way. The work needs to occur at a regional level, in terms of commitment to actions and funding, and at the local level, population by population and site by site. Significant investments of research, planning, regional coordination, actions, and political will are already underway. NMFS' overall goal for DPS viability, as formulated by the ICTRT and described in Chapter 3 the Mid C plan, is to have all four extant Major Population Groups (MPG) at viable (low risk) status, with representation of all the major life history strategies present historically, and with the abundance, productivity, spatial structure and diversity attributes required for long-term persistence. The following is a summary of the ICTRT criteria for each of the MPGs from Chapter 7 of the Mid C Plan.

2.1 Cascades Eastern Slope Tributaries MPG

Population	**Current ICTRT Risk Status**	**Population Size**
Fifteenmile Creek	Viable	Basic
Deschutes Eastside	Viable	Intermediate
Klickitat	(provisional) Moderate risk – insufficient data, hatchery influence	Intermediate
Rock Creek	(provisional) High risk – insufficient data	Basic

Population	Current ICTRT Risk Status	Population Size
Deschutes Westside	High risk	Large
White Salmon	Functionally extirpated	Basic
Crooked River	Extinct	Very Large

Two populations in this MPG meet the criteria for viable status (Fifteenmile Creek and Deschutes Eastside); one (Klickitat) is assigned a provisional moderate risk ("maintained" status) based on insufficient abundance/productivity data and an unknown degree of diversity risk from hatchery influence; one (Rock Creek) is assigned a provisional high risk status because of lack of data; one (Deschutes Westside) is at high risk for abundance/productivity and moderate risk for spatial structure/diversity, primarily because of blocked passage to a large amount of historically accessible habitat. Two populations in the MPG are extirpated (White Salmon and Crooked River); the Crooked River population was historically very large.

Recovery Scenario: For the Cascades Eastern Slope Tributaries MPG to be considered viable based on the currently extant populations, the Klickitat, Fifteenmile, and both the Deschutes Eastside and Westside populations should reach viable status, with one highly viable. The Rock Creek population should reach "maintained" status (25 percent or less risk level). MPG viability could be further bolstered if reintroduction of steelhead into the Crooked River succeeds and if the White Salmon population successfully recolonizes its historical habitat.

2.2 John Day MPG

Population	Current ICTRT Risk Status	Population Size
North Fork John Day	Highly viable	Large
Upper Mainstem John Day	Moderate risk	Intermediate
Lower Mainstem John Day	Moderate risk	Very Large
Middle Fork John Day	Moderate risk	Intermediate
South Fork John Day	Moderate risk	Basic

This MPG does not meet viability criteria despite the fact that one of its populations, the North Fork John Day, is the only steelhead population in the Middle Columbia DPS classified as highly viable. The other four populations in the MPG are at maintained status. Both the Upper and Lower Mainstem John Day populations have moderate risk for diversity because of out-of-DPS hatchery strays. The Middle Fork population has moderate risk because of low abundance. The South Fork population has moderate risk for abundance and productivity, and there is also some uncertainty concerning the proportion of hatchery strays spawning.

Recovery Scenario: For the John Day River MPG to reach viable status, the Lower Mainstem John Day River, North Fork John Day River, and either the Middle Fork John Day River or Upper Mainstem John Day River populations should achieve viable status, with one highly viable.

2.3 Umatilla/Walla Walla MPG

Population	Current ICTRT Risk Status	Population Size
Umatilla River	Moderate Risk	Large
Walla Walla River	Moderate Risk	Intermediate
Touchet River	High Risk (provisional because of insufficient data)	Intermediate

This MPG does not meet viability criteria because all three populations have moderate risk for both abundance/productivity and spatial structure/diversity and are assigned "maintained" status. The annual abundance data series for the Touchet River steelhead population is relatively short and has several missing years; the ICTRT cautions that the Touchet's status/risk rating is provisional and should be interpreted with caution.

Recovery Scenario: For the Umatilla/Walla Walla MPG to be viable, two populations should meet viability criteria, and of these one should be highly viable. The Umatilla River is the only large population, and therefore should be viable. Either the Walla Walla River or Touchet River population also should be viable.

2.4 Yakima MPG

Population	Current ICTRT Risk Status	Population Size
Upper Yakima River	High Risk	Large
Naches River	High Risk	Large
Satus Creek	Moderate Risk	Intermediate
Toppenish Creek	Moderate Risk	Basic

The Yakima MPG is currently rated at High Risk. The two largest populations in the drainage (Naches and Upper Yakima) are rated at High Risk; the Satus Creek and Toppenish Creek populations are rated as Maintained.

Recovery Scenario: For the Yakima River MPG to achieve viable status, two populations should be rated as Viable, including at least one of the two classified as Large - the Naches River and the Upper Yakima River. The remaining two populations should, at a minimum, meet the ICTRT's Maintained criteria.

3.0 Summary of Federal Actions

Federal agencies developed a list of recovery actions in each middle Columbia subbasin (Appendix 1). An action was identified as either a project or program and listed by the fiscal year it was obligated. An action was listed as either a "past action" (obligated from FY 99 through FY 07) or "current or proposed action" (obligated after FY 07). Each action was evaluated on its relative impact on viability parameters (abundance, productivity, spatial structure and diversity). This is not a comprehensive list of actions conducted in middle Columbia tributaries since 1999. Actions and cost shares by tribes, states and other entities are not included in the tables. .

A summary of the federal action tables was completed for each basin (Appendix Table 2). A total of 522 actions were funded during the period FY99 through FY07 at a cost of $387,483,894 (Table 1). A total of 267 actions for $764,754,285 were either funded or proposed for funding after FY 2007. The Yakima Basin had the most actions (176) and the most expenditure ($544,514,285). Rock Creek had the fewest actions (4) and least expenditures ($742,886).

Table 1. Summary of Actions

Basin	**Past Actions**		**Current and Proposed Actions**	
	# Actions	**Expenditures**	**# Actions**	**Expenditures**
Yakima	101	152,181,888	75	392,514,285
Deschutes	125	18,782,837	38	15,224,214
John Day	107	38,943,198	47	11,802,631
Umatilla	76	114,332,453	27	14,617,793
Walla Walla/ Touchet	63	26,258,759	19	312,103,285
Klickitat	14	27,080,057	36	14,558,716
White Salmon	17	$3,656,878	15	$965,436
Fifteenmile Creek	18	$6,124,699	7	$2,297,964
Rock Creek	1	73,125	3	669,761
Total	**522**	**$387,483,894**	**267**	**$764,754,085**

4.0 Summary of Technical Expert Meetings:

The focus team met with technical experts from basins containing Middle Columbia River steelhead. The technical experts were requested to review and evaluate the proposed federal actions (Appendix 1) and compare with actions they considered to be important for moving Middle Columbia steelhead towards delisting. The technical experts were asked to provide the following input:

1. After review of the past and proposed Federal action tables (Appendix 1), provide advice as to the extent those actions might lead to delisting.
2. Advice and rationale on the need for additional actions necessary to achieve delisting.
3. Advice and rationale on how to recommend actions needed to achieve delisting.
4. Advice and rationale on what actions might be helpful to achieve delisting.

This section summarizes the results of the meetings with basin technical experts. Some of their recommended actions are scheduled to be funded while other actions still need funds. No attempt was made to recommend where additional funds might be secured for actions still lacking funds. Costs associated with each action are listed in Appendix 3. An overview of the recovery strategy in each MPG is provided followed by a list of priority actions. The actions are not in priority order. It is anticipated that implementation of recommended actions will benefit each population and, as a result, move each population towards a higher viability status.

4.1 Cascade Eastern Slopes MPG

MPG Risk Status: Not Viable

MPG Recovery Scenario: Bring the Klickitat, Fifteenmile, and both the Deschutes Eastside and Westside populations to viable status, with one highly viable. Bring the Rock Creek population to “maintained” status.

The proposed actions for the five extant populations in the Cascades Eastern Slope MPG are based on restoring important tributary habitat functions in areas that likely supported substantial steelhead production in the past. The particular actions proposed for each population as identified below are predicated upon restoring natural conditions supporting summer rearing and overwintering in high potential reaches. Restoring degraded instream channel structure and the associated riparian habitats is a common element along with fixing passage. For several populations, restoring sufficient flow, addressing high summer water temperatures, and other water quality issues are also key components.

The recovery strategy for the two Deschutes River populations involves reducing the impacts and risks associated with chronically high levels of non-local stray hatchery spawners. Direct estimates of impacts on these particular populations are not available. The current steelhead hatchery program in the Klickitat River is a segregated program; an important objective is to minimize spawning interactions with natural-origin spawners. The Klickitat River strategy includes evaluating the performance of the current programs in the Klickitat (steelhead, Chinook and coho), maintaining a robust and viable treaty and non-treaty fishery, adjusting to complement natural recovery efforts, and considering the use of a conservation program using artificial production in restoring production above Castile Falls. Passage to the upper Deschutes basin (past Round Butte/Pelton Dam) and White Salmon basin (past Condit Dam) will improve spatial structure of the DPS.

4.1.1 Fifteenmile Creek

Current Population Risk Status: Viable.

Role in recovery scenario: Retain at viable status; candidate for highly viable status.

Recommended actions:
1. Decrease sedimentation and increase number of pools.
2. Enhance instream flows.
3. Improve on-farm efficiencies to increase instream flow and protect riparian areas.
4. Address poor passage conditions at Suford Falls

4.1.2 Deschutes East and West and Crooked River:

Current Population Risk Status: Eastside: Viable
Westside: High Risk
Crooked River: Extinct

Role in recovery scenario: Retain Eastside at viable; bring Westside to viable; re-introduce steelhead to the Crooked River to bolster MPG viability and possibly reduce need for improvements in other populations.

Recommended actions:
1. Restore passage at Round Butte/Pelton (allows for passage into Crooked River).
2. Reduce out-of-basin hatchery strays.
3. Retain additional water in Trout and Wykush Creeks and the Crooked River.
4. Expand the CRP program to improve riparian zone conditions.
5. Complete Opal Springs passage project (located above Round Butte/Pelton).

4.1.3 Klickitat:

Current Population Risk Status: Moderate risk.

Role in recovery scenario: Bring to viable status.

Recommended actions:
1. Complete Wahkiacus Hatchery.
2. Implement hatchery reform and HSRG measures.
3. Conduct RME programs to estimate population size and productivity.
4. Conduct habitat improvement projects in the upper Klickitat basin, White Creek, and the Klickitat Delta.
5. Assess effect of hatchery stock on natural spawning viability.

4.1.4 Rock Creek:

Current Population Risk Status: High risk.

Role in recovery scenario: Bring to maintained status.

Recommended actions:
1. Conduct a geomorphic study to include an evaluation of the historical role of beaver in the basin.
2. Evaluate the inundated area at the mouth.
3. Enhance RME funding including installation of a screw trap at the mouth.
4. Conduct habitat improvement projects.
5. Develop conservation easements on Rock Creek in a coordinated effort between Rock Creek and the Wind Power Company in Klickitat County.
6. Eliminate or provide passage through the culverts at the highway SR14 and Burlington Northern Railroad Bridge at the mouth of Pine Creek.

4.1.5 White Salmon:

Current Population Risk Status: Functionally extirpated.

Role in recovery scenario: Successful reintroduction will bolster MPG viability and possibly reduce need for improvements in other populations.

Recommended actions:
1. Restore passage at Condit Dam.
2. Address the passage obstruction at Buck Creek Diversion.

3. Restore natural conditions in Rattlesnake Creek through restoration of pools and purchase of 1-2 CFS of water rights.
4. Improve rearing environment (restore pools) in Buck Creek.
5. Provide monitoring funds, especially to evaluate natural recolonization, upon removal of Condit Dam.

4.2 John Day MPG

MPG Risk Status: Not viable.

MPG Recovery Scenario: Bring the Lower Mainstem John Day River and either the Middle Fork John Day River or Upper Mainstem John Day River populations to viable status. The North Fork population needs to continue as highly viable and the South Fork John Day can continue as maintained.

John Day River steelhead populations are affected by changes across all the types of habitat used in their complex life histories and across all their life stages. Of particular importance is the loss of rearing habitat quality and floodplain channel connectivity in the lower sections of major tributaries. Poor conditions in the downstream migration corridors affect both out migrating juveniles and returning adults. For some populations, increased sedimentation and altered flow regimes have resulted in increased mortality during incubation and early rearing. Higher summer water temperatures have significantly reduced the available rearing habitat.

Recovery strategies for John Day steelhead are designed to improve conditions across the range of habitats used for spawning, rearing, and migration. Actions projected to contribute the most would restore or maintain rearing habitat complexity and address sediment and temperature problems, especially in reaches that are adjacent to high quality habitats. Restoration of the associated riparian habitats will also contribute to sustaining natural stream functions. These actions will reduce sediment, restore a more normal hydrograph, and reduce water temperature. In addition, there are a significant number of actions to improve passage and connectivity of habitats for both juvenile and adult life stages.

4.2.1 John Day (all populations):

Recommended actions:

1. Evaluate the loss of John Day adults.
2. Evaluate origin and spawning success of out-of-basin hatchery strays.
3. Develop a restoration plan focused on the Malheur National Forest.
4. Address passage problems found in several tributaries.
5. Address slow federal permitting process

4.3 Umatilla/Walla Walla MPG

MPG Risk Status: Not viable.

MPG Recovery Scenario: Bring the Umatilla River and either the Walla Walla River or Touchet River population to viable status. Bring one population to highly viable status.

Tributary restoration strategies for these three populations put a high priority on building out from existing reaches of relatively good spawning and rearing habitat in the upper ends of major tributaries. The downriver tributary reaches targeted for restoration include a substantial amount of habitat projected to have historically supported steelhead production. The increased water temperatures during the summer rearing period, increased fine sediment levels, and loss of natural stream structure limit survival and capacity for summer rearing and overwintering in these reaches. The Mill Creek flood control channel restoration project is an example of a high priority action where access to pristine reaches in the upper basin will again occur when completed.

The magnitude of habitat degradation throughout these three drainages is considerable. Restoring juvenile rearing conditions in tributary and mainstem rearing areas included as priorities in each population will increase the range of historically important life history patterns, increasing the resilience of the populations to fluctuations in environmental conditions. Action strategies are aimed at reducing temperatures and sedimentation by restoring riparian cover, natural bank conditions and flow regimes in targeted reaches. Actions are designed to build upon the flow and passage improvements that have been gained in recent years.

4.3.1 Umatilla:

Current Population Risk Status: Moderate risk.

Role in recovery scenario: Bring to viable or highly viable.

Recommended actions:

1. Complete the Umatilla Basin Flow Project - Phase 3.
2. Address passage and floodplain connectivity problems in Birch, Upper Umatilla mainstem, and Meacham Creeks including the setback or removal of levees and the setback of the Union Pacific train track.
3. Install passage at BOR reservoir in McKay Creek.
4. Consolidate fish screens for the Feed and Stanfield canals into one fish screen located adjacent to Umatilla River.

4.3.2 Walla Walla/Touchet:

Current Population Risk Status: Walla Walla at moderate risk; Touchet at high risk.

Role in recovery scenario: Bring one or the other to viable or highly viable status.

Recommended actions:
1. Improve passage in Mill Creek (Walla Walla).
2. Modify and set back levees to increase floodplain connectivity and enhance riparian zones in the Walla Walla and Touchet Rivers.
3. Restore passage at Bennington Dam (Walla Walla).
4. Address passage at Nursery Bridge (Walla Walla).
5. Provide additional research funds to assess juvenile steelhead mortality in the Walla and Touchet Rivers.
6. Establish buffers on county roads to reduce siltation issues in the Walla Walla and Touchet Rivers.
7. Implement pump replacement project considered by CTUIR and COE to enhance summer through early winter flow in the Walla Walla basin.
8. Evaluate origin and spawning success of out-of-basin hatchery strays in the Walla Walla and Touchet Rivers.
9. Change COE vegetation standards to allow for riparian enhancement on COE levees in the Walla Walla and Touchet Rivers.

4.4 Yakima MPG

MPG Risk Status: High risk.

Recovery Scenario: Bring two populations (including either the Naches or Upper Yakima) to Viable status. Bring remaining two populations to Maintained status.

Tributary and mainstem habitats for steelhead in the Yakima basin have been substantially altered from historical conditions. High quality rearing habitat has been substantially reduced or rendered inaccessible. Flow regulation and irrigation diversions have significantly altered conditions for out migrating smolts, and reductions in floodplain habitat have reduced the extent and diversity of mainstem rearing areas.

Recovery actions proposed to benefit Yakima River steelhead populations are aimed at improving conditions across the freshwater habitats the fish use in all life stages – from incubation and rearing to juvenile and adult migration – especially in the Yakima River mainstem. This has the highest potential to quickly make a difference by increasing productivity in the areas where fish now spawn and restoring the pattern of extended rearing in the mainstem. It is also important to restore flow and temperature conditions conducive to steelhead rearing in mainstem reaches of the Naches River and the Upper Yakima, which are believed to have supported substantial production historically. All populations will benefit substantially from actions that increase survival for adult and smolt migrants in shared mainstem reaches. Restoring anadromous access into tributaries with large amounts of relatively high quality habitat by targeting flow improvements and barrier removals is also a high priority, especially for the Upper Yakima population, where much of the tributary habitat has been blocked.

4.4.1 Yakima (all populations):

Recommended actions:
1. Modify reservoir operations to improve rearing and out-migration flow conditions.
2. Implement Gap-to-Gap levee setback to restore floodplain and side channel habitats in the Union Gap and lower Naches reaches.
3. Restore passage to blocked areas in Upper Yakima (e.g. Manastash, Naneum, and Wilson creeks).
4. Improve instream flows below Roza Dam.
5. Provide passage at Cle Elum and Bumping dams.
6. Provide Yakima River water to replace tributary diversions in Cowiche and Manastash Creeks

5.0 Research, Monitoring, and Evaluation efforts in Mid-Columbia subbasins

The existing research, monitoring, and evaluation (RM&E) efforts in each of the 10 Mid-Columbia subbasins was documented to understand our ability to assess response of steelhead to recent and future management and restoration actions. Local and regional experts were asked to describe what fish sampling equipment and methods were used and what RM&E efforts were being done. Information was compiled for each subbasin (Appendix Tables 4a-4j). This information was used to develop a ranking (excellent, good, or poor) to describe how well the existing efforts could actually detect a response of steelhead adults, smolts, or parr (Table 1).

5.1 Findings:

A few watersheds have a lot of monitoring effort in place, but no single watershed appears to have everything required to detect the range of changes that might be expected from the suite of actions possible. For example, the Walla Walla subbasin appears to have the most extensive monitoring network of the Mid-Columbia, but experts did not feel they have enough effort or gear in the lower river where they feel the greatest response of steelhead spawning and rearing appears to be occurring and where it is likely to occur in the future.

A large element missing in most of the subbasins is the number of years that adequate RM&E efforts have been in place. No one watershed in the Mid-Columbia appears to have all the desired RM&E elements to track the response and benefits of recovery actions.

5.2 Conclusions:

The extensiveness and intensiveness of monitoring in some watersheds are woefully inadequate. An example would be the Yakima River watershed, but as with the case of most watersheds in the Mid-Columbia, increased RM&E was planned and it appears likely that much enhanced RM&E will be implemented in the very near future.

In general, the more years, the more likely the ability to detect change in status and trend of the steelhead populations. Without the desired RM&E elements to track the response and benefits of recovery actions in place, managers will likely continue to lack the information they need to judge when recovery goals are met.

Table 2. Assessment of ability to detect change in Middle Columbia River steelhead by watershed. Rating scale includes: Excellent, Good, or Poor.

Watershed	Adults	Smolts	Parr	Notes
• Fifteenmile	Poor: Very limited baseline data.	Poor-to-Good: Very limited baseline data.	Poor.	New Biop funding will enhance monitoring ability substantially: adding video monitoring for adults; adding several PTIS in tributaries. Mill Cr. as a reference/control Some macroinvertebrate assessments in past
• Deschutes	Good-to-Excellent: For area above Shears Falls (rm 43) with recent additions, including weirs and a PIT tag interrogation system.	Poor: For most of the subbasin. Good: For Trout Creek.	Poor: For entire subbasin	Funding and permitting limit monitoring efforts. An install of a PIT tag interrogation system is planned for the mouth.
• Klickitat	Good: Increasing ability to generate 95% confidence intervals. Improvements planned at ladders should help monitoring efforts for adults. Concern with how to account	Poor-to-Good: High variance in estimates. Opportunity to improve efficiency estimate efforts.	Poor: For watershed as a whole. Lack of systematic effort. Good: For White Creek, but not planned for long term.	Castile Falls opened in ~2008, coupled with monitoring for effectiveness Recently ~1,500 wild adult STH returning (current recovery goal is 1,000, but this may be too low of goal) Wiring of The Dalles

Watershed	Adults	Smolts	Parr	Notes
	for dip-ins in estimates.			Dam for PIT tag detection would help with monitoring efforts.
• Rock Creek	Good: Combination of redd surveys and two multiplexing PIT tag interrogation systems at key locations. With improved watershed conditions, steelhead could spawn below interrogator sites.	Poor: No smolt trapping being done.	Good: Recent study efforts by USGS and YN to produce parr population estimates and distribution yielding much information.	Currently all monitoring is being done as part of a USGS and YN study funded through BPA. This does not constitute an established long-term monitoring effort for the future.
• White Salmon	Poor: Some baseline data from past weir operations conducted by USFWS, but no clear commitments for funding monitoring in the future.	Poor: Some baseline data from recent smolt trapping efforts conducted by USFWS and USGS	Poor: Some baseline data from recent smolt trapping efforts conducted by USFWS and USGS	No clear indication that response to planned removal of Condit Dam will be assessed. Some baseline data on productivity of *O. mykiss* tributaries above Condit Dam (Rattlesnake and Buck creeks) from recent efforts conducted by USGS with funds from BPA and Yakama Nation
• John Day	Good-to-Excellent: Combining redd surveys with PIT tag info from mainstem Columbia (Bonneville, John Day) and lower mainstem John Day and selected	Poor-to-Good: Output from North Fork largely unknown. Spawning areas do exist below smolt traps.	Poor-to-Good: Output from North Fork largely unknown. Spawning areas do exist below smolt traps.	If recovery of lower John Day as a spawning area, would not be able to detect with current efforts.

Watershed	Adults	Smolts	Parr	Notes
	tributaries.			
• Umatilla	Excellent: For entire subbasin.	Good: For most of the subbasin. Excellent: for Meacham Creek.	Poor: None to minimal monitoring being conducted currently.	
• Walla Walla	Good: Concern that many adult spawners in lower mainstem river are not being counted, resulting in large underestimate of total run.	Good-to-Excellent: Decent coverage for estimating entire subbasin smolt output.	Poor-to-Good: Some one-pass efforts being done to assess relative abundance and density, and good data on movement is being collected.	No counting station in lower Walla Walla River. Returns to Nursery Bridge Dam (rkm 71.9), Mill Creek Diversion Dam (rkm 16.9) and Touchet's Dayton Dam (rkm 86.9) are used to estimate total adult run. Known steelhead spawning areas below counting stations include the mainstem Walla Walla between NBD and the mouth of Mill Creek, Cottonwood Creek and several other small Walla Walla tributaries, lower Mill Creek, upper Dry Creek, and Coppei Creek..
• Touchet	Poor-to-Good: Problem with spawners in Touchet River between Dayton and Prescott not being counted.	Good-to-Excellent: Smolts produced from spawning areas below rotary trap site are not included in estimate.	Poor-to-Good: Some one-pass efforts being done to assess relative abundance and density, and good data on movement is being collected.	
• Yakima	Excellent: High existing potential due to monitoring capabilities at Prosser and Roza dams, but some of this is unrealized with current operations (e.g.,	Poor: Some unrealized potential at Satus and Toppenish creeks. Prosser and Roza catch efficiency are low and largely unknown with little ability to change because	Poor: Some unrealized potential at Satus and Toppenish creeks. Prosser and Roza catch efficiency are low and largely unknown with little ability to change because	

Watershed	Adults	Smolts	Parr	Notes
	low number of fish actually PIT tagged)	of limitations of current facilities.	of limitations of current facilities.	

6.0 References

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.

McElhany, P., M.H. Ruckelshaus, M.J. Ford, T.C. Wainwright, and E.P. Bjorkstedt. 2000. Viable salmonid populations and the recovery of evolutionarily significant units. U.S. Dept. of Commerce, NOAA Tech. Memo. NMFS-NWFSC-42, 156 p.

National Marine Fisheries Service (NMFS). 2009. Middle Columbia River Steelhead Distinct Population Segment ESA Recovery Plan. November 2009. Available at: http://www.nwr.noaa.gov/Salmon-Recovery-Planning/Recovery-Domains/Interior-Columbia/Mid-Columbia/Mid-Col-Plan.cfm.

National Marine Fisheries Service (NMFS). 2010a. National Marine Fisheries Service Interim Recovery Planning Guidance, Version 1.3, June, 2010.

Snake River Salmon Recovery Board (SRSRB). 2006. Snake River Salmon Recovery Plan for Southeast Washington. December 2006. Available at: http://www.snakeriverboard.org/resources/library.htm