This response conflicts with data presented in the *Sediment Behavior Analysis Report* by G&G Associates. Figure 26 (p.40) of that report shows a "Maximum Volume Eroded" curve that anticipates almost 2.3 million cubic yards (mcy) would erode in less than 100 days. The "Minimum Volume Eroded" shown in the figure is about 1.6 mcy in approximately 110 days. The *Sediment Behavior Analysis Report* indicates the "rapid erosion scenario" results in an additional 600,000 cy of eroded sediment in less than four months.

A6-27 Continued

The larger volume was considered to be the upper limit of volume that could be eroded from the reservoir. This volume is over 91 percent of the total sediment contained in the reservoir and would leave an average of less than a foot of fine sediment remaining on reservoir area. When calculating *near-term* impacts on TSS, this higher volume of sediment was used in the analysis.

- P 15 of 26 – 4c. Sediment Angle of Repose
  Response 4C (p.16) states: *"The geotechnical report was conducted specifically to address the anticipated angle of repose of the material remaining in the reservoir after dam removal...*(p.17) *upstream of 2,000 feet from the dam the material is primarily sand and larger sized particles. The Squire Report concludes that this material will form embankments at approximately 30 degrees to the horizontal...*(p. 17) *The report found that the long-term and short-term angle of repose* [for sand] *was between 30 and 42 degrees."*

  This response by PacifiCorp improperly characterizes information contained in the geotechnical report.[6] The geotechnical report specifically states (p. 1): *"The additional work was conducted...to provide additional information on the* ***sediments located near the head of the reservoir****"* [emphasis added]. The limited area of evaluation combined with shallow depths of subsurface investigation in the test pits limit the applicability of the data. The geotechnical study was conducted to (p.3) *"further characterize the grain size distribution of the reservoir sediments near the head of the reservoir,* ***where gravels and cobbles are concentrated****"* [emphasis added]. PacifiCorp's response in 4C implies the geotechnical data apply to all reservoir sediments *"upstream of 2,000 feet of the dam"*. This characterization is misleading since Figure 6 (p. 15) in the DR Gathard & Associates March 1998 report[7] characterizes the reservoir sediment as *"Fine Material"* to a distance of more than 7,000 feet upstream of the dam, where according to Figure 7 in the same report, sediment thickness is approximately 20 feet. In addition, Figures 6 and 7 together show *"Fine Material"* thickness exceeds 50 feet immediately upstream of 2,000 feet. Extrapolation of the slope angle information for sand and gravel presented on page 10 of the Squire Report is inappropriate for most of the sediments in the reservoir. The Squire Report was limited to coarse sediment characterization, constrained the length of time for the "Larger Term" (Table 10, p. 10) slope angle to approximately one-year (instead of long-term as implied by PacifiCorp), and did not evaluate embankment stability of slopes 20 to 50 feet high formed in *"Fine Material"* as reported in DR Gathard & Associates.

A6-28

The lower limit was developed by assuming either predam side slopes or a 2H:1V slope at the edge of the river. This lower value would leave more sediment behind to be affected by erosive processes after the first year of dam removal. This lower value was used to analyze potential effects of *long-term* erosion.

Eroded river width used to determine the eroded sediment volume was selected as the *smaller* of average upstream average river width or predam rock surfaces in the eroded reach. To use values of river width greater than the distance between predam rock surfaces would not have presented a realistic evaluation. Further, the larger volume of eroded sediment discussed above was used in analysis when that value created a higher effect on TSS. Predam river channel dimensions were smaller than average upstream river width in most of the reservoir reach and was used in analysis of eroded volume.

A6-27

See response to Comment A6-26.

A6-28

To assure that the analysis of sediment erosion accounted for the potential for flatter slopes forming in fine sediments, an analysis was conducted that assumed flatter slopes. This procedure is discussed in detail in the Sediment Behavior Analysis Report (G&G Associates 2004a). The range of eroded sediment volume was developed to address the potential for slopes flatter than those contained in the geotechnical analysis, as thoroughly discussed in the report and in several other responses. While the Squier Associates Report (1997) did not evaluate slope failure angles in fine sediment, the analysis in the Sediment Behavior Analysis Report did include an analysis with slopes much flatter than 2H:1V. That analysis included the erosion of all but a small quantity of fine sediment as discussed above.

[6] Squire Associates. November 20, 1997. Additional Geotechnical Exploration and Laboratory Testing at the Condit Hydroelectric Project. Appendix 2 to the DR Gathard & Associates (March 1998) report.
[7] DR Gathard & Associates. March 1998. Sediment Removal Investigation Draft Report. Appendix A to R.W. Beck. May 1998. Condit Hydroelectric Project Removal Summary Report Engineering Considerations.

- P. 18 – 19, 4d. Sediment Erosion
  Response 4d (p.19) states: "*Vegetation is intended to address only surface erosion on flatter slopes...*". This statement conflicts with page 51 of the *Sediment Behavior Analysis Report* where soil loss was calculated using the Universal Soil Loss Equation (USLE). The heading for section 5.1.2.2 is specific to Steep Slopes which are defined in the report (p. 47) as slopes between 20% and 100%. The analysis specifically assumed *"forest fully covered"* (p.51) to simulate vegetation cover by the third year. There is no justification for this assumption in the report or PacifiCorp's response in 4d. PacifiCorp's response fails to address any of the Mid Term and Long Term concerns expressed by the Counties. A6-29

Since the erosion of lake sediment severity and duration continue to be underestimated, the water quality and sediment impacts on beneficial uses in the White Salmon River in the G&G Associates May 2004 *Sediment Behavior Effects on Beneficial Uses Report* relied on by the Draft SEIS are also underestimated, particularly with regard to duration of impacts. Without reasonably accurate predictions of the actual duration of severe impacts through full consideration of all contributing factors as described above, the full need for mitigating measures is not disclosed. The *Sediment Behavior Effects on Beneficial Uses Report*'s assessment of duration of impacts is based on the premise that (page 2) *"Beyond five years after the dam is breached, no adverse effects are anticipated because any remaining reservoir sediment would be mobilized only during rare, extremely high floods, when background suspended sediment and turbidity levels would be very high."* This is unreasonably optimistic given that embankment erosion from sediments in the reservoir has been underestimated in volume and duration, because the stability of slope gradients was over-estimated, time to vegetation maturity was underestimated, and mass wasting processes were not included in the USLE analysis method, as described above. Lack of mass wasting consideration and the angle of embankment repose underestimate are factors which extend into the long term erosion assessment. More reasonably, impacts will extend 5 to 10 years, and possibly for decades to centuries if landslides occur as described below, and the period that project-caused turbidity water quality violations under Chapter 173-201A WAC will extend for 5 to 10 years in the White Salmon River. A6-30

2.2. Landslides Of The Pre-Dam Slopes As A Result Of Drawdown

The potential for drawdown induced landslides of the pre-dam slopes has not been identified or analyzed in the Draft SEIS or in supporting documents developed on behalf of PacifiCorp. Over 200 landslides were related to the failure and rapid drawdown of the Teton Dam reservoir in 1976. Several types of landslides, including rockfall were induced as a result of the failure. Washington State has recent examples of landslides occurring in bedrock along major transportation corridors requiring closures along I-90 and SR 20. There is no information in the Draft SEIS or supporting documents describing the nature and implications of discontinuities in the bedrock inundated by Northwestern Lake, and the response to the rock mass relative to the sudden drawdown resulting from the sole alternative in the Draft SEIS. Typical fracture characterization studies identifying factors such as the number of fracture sets, orientation, spacing, A6-31

A6-29
PacifiCorp's analysis does address the mid-term and long-term sediment erosion issues. The referenced section, Section 5.1.2. "Mid-Term Sediment Erosion – Surface Erosion and Upland Conveyance Formation" specifically addresses the mid-term erosion process. The mid-term process assumes actions discussed in the revegetation plan would be implemented, including replanting of trees. Planted trees are anticipated to be fully established by the end of three years. The Universal Soil Loss Equation does not distinguish between size of trees but does present different cover conditions as discussed in the Sediment Behavior Analysis Report, page 50 (G&G Associates 2004a). The differing conditions are represented in the equation by the cropping factor, C, presented in Table 3.5a of *River Mechanics* (Julien 2002) as discussed thoroughly in the Sediment Behavior Analysis Report, Section 5.1.2 (G&G Associates 2004a). The cropping factor is used to express the variation in erosion due to the variation in land cover. The value presented in the Sediment Behavior Analysis Report (G&G Associates 2004a) is the most conservative value (highest, causing the highest calculated erosive effects) presented in Table 3.5a.

A6-30
Implicitly, this comment continues to make the incorrect assumption of long-term mass wasting as observed at Teton Dam. As discussed in Section 4.1 Geology, Soils and Sediments in the FSEIS there would be unstable sediments once the dam is removed and those unstable sediments from any source would be removed. Also see the responses to Comments A6-12, A6-13, A6-16, and A6-20.

A6-31
Using the Teton Dam failure as an analog for sediment transport phenomenon at Condit Dam ignores differences in bedrock strength, distribution of surficial deposits, and hydraulic differences between the two sites. The strong nature of the bedrock in the area of Condit Dam is evidenced by the narrow bedrock channels present downstream of the dam and the steep bedrock cliffs evident in pre-dam photographs. The relative lack of surficial deposits surrounding the Condit reservoir is related to the steep

river gradient, the steep topography surrounding the White Salmon River in the reservoir area, and the size and geologic characteristics of the drainage basin. All of these factors make the situation at Condit Dam substantially different from the margins of the former Teton reservoir where river terraces and other low shear strength surficial deposits are common. Also, many of the more than 200 landslides that occurred at Teton Dam were induced when the reservoir filled rather than during and after the failure. The continuing blockage of the Teton River channel with slide debris related to the dam failure retards sediment transport, providing yet another difference between the two sites. As a mitigation measure, PacifiCorp has agreed to dislodge unstable sediment once the drawdown has been completed. Removal of unstable sediment is not limited to reservoir sediment.

fracture length, area and shape, degree of connectivity, aperture and other factors have not been conducted. The effect of water during the nearly 100 years of inundation has not been considered in any analysis of slope stability. Water has the potential to both weaken rock by chemical deterioration over time, and during the drawdown phase to develop excessive "pore pressure" forces under an "undrained" condition. In our opinion, there is a risk for large-scale landslides in weakened rock subject to high pressures interior to the rock mass during drawdown and subsequent drainage of the rock mass. A6-32

Should landslides occur the morphology of the White Salmon River would be changed, potentially for centuries. The hoped for transport of gravels would not occur as a result of new pool formation behind each landslide mass. Instead, the pools would trap bedload sediment, acting as "mini-dams" to the transport of potential spawning gravels. Randle, *et al.* (2000) indicated pools formed by landslides following the collapse of Teton Dam required decades to fill with bedload, before additional downstream transport of bedload into the next pool would occur. Additional effects included increased stream flow travel times and increased water temperatures as a result of the landslide formed pools. A6-33

2.3. Aquatic Habitat Impacts from Sediment are Underestimated

Page 4.1-3 of the Draft SEIS says that a 3 to 5 year duration to move gravel and cobbles will *"...help to avoid deposition of fine reservoir sediment in the space between gravel particles."* This conflicts with page 4.1-4 of the Draft SEIS which says *"As long as sediment is retained behind the dam is subject to river transport, even on an intermittent basis, turbidity levels in the White Salmon River would be affected"* and *"...two floodplain widening events are likely to occur subsequent to the fifth year after breaching,"* and page 4.2-9 which says *"limited duration spikes in turbidity are expected to continue for 3 to 5 years after breaching."* Our analysis under Section 2.1 and as in prior comments indicates episodic turbidity could last even longer, embedding in spawning gravels, because sediment impact durations were underestimated for a variety of reasons. These are described in more detail in Section 3 below. A6-34

2.4. Associated and Cumulative Impacts

Page 4.1-7 of the Draft SEIS says the release of sediments to the in-lieu site and Bonneville Pool caused by the proposed method of dam breaching is a *"natural flux of sediment...*[and] *any dredging would be subject to a separate environmental review and permit process."* It cannot be argued that long term erosion from unstable reservoir sediments are independent of the project or part of the natural background, for however much longer than 5 years they may persist. The extended period of sediment release is a residual effect of the method proposed to remove the dam. There are mitigation measures by which the project could minimize these impacts, which include sediment removal before and/or after breach of the dam. Defining impacts caused by exposure of reservoir sediments from breaching the dam as natural background after 5 years, as suggested by the *Sediment Behavior Effects on Beneficial Uses Report*, ignores measures available to the project to prevent or minimize these impacts. A6-35

A6-32
As evidenced by the steep rock walls of the valley downstream from the dam, this rockmass is not highly susceptible to the kinds of rockmass failures exhibited at the Teton Dam. The strong nature of the bedrock in the area of Condit Dam is evidenced by the narrow bedrock channels present downstream of the dam and the steep bedrock cliffs evident in pre-dam photographs. The rocks underlying the Northwestern Lake reservoir are basalts and should not be classified as weak rocks. Given the rockmass quality of basalts in this area and the limited time (in terms of basalt weathering rates) that these rocks have been submerged, there is no reason to consider the risk for large-scale landslides or to conduct further rock engineering investigations for this purpose.

A6-33
Landslides like those at Teton Dam are not expected with the removal of Condit Dam. Using the Teton Dam failure as an analog for sediment transport phenomenon at Condit Dam ignores differences in bedrock strength, distribution of surficial deposits, and hydraulic differences between the two sites. The strong nature of the bedrock in the area of Condit Dam is evidenced by the narrow bedrock channels present downstream of the dam and the steep bedrock cliffs evident in pre-dam photographs. The relative lack of surficial deposits surrounding the Condit reservoir is related to the steep river gradient, the steep topography surrounding the White Salmon River in the reservoir area, and the size and geologic characteristics of the drainage basin. All of these factors make the situation at Condit Dam substantially different from the margins of the former Teton reservoir where river terraces and other low shear strength surficial deposits are common. Also, many of the more than 200 landslides that occurred at Teton Dam were induced when the reservoir filled rather than during and after the failure. The continuing blockage of the Teton River channel with slide debris related to the dam failure retards sediment transport, providing yet another difference between the two sites. As a mitigation measure, PacifiCorp has agreed to remove all unstable sediment once the drawdown has been completed. Removal of unstable sediment is not limited to reservoir sediment. Also see response to Comment A6-32.

A6-34

Deposition of fine sediment between gravel particles is a natural process that happens in riverbeds. The spikes in sediment concentration in the White Salmon River described in Section 4.1 Geology, Soils and Sediment, subsection Flood Scouring, are related to potential major floods that would provide sufficient movement of bedload sediments to mitigate the plugging of gravels by fine sediment. The predicted spikes in sediment concentration after five years are considered minor compared to the amount of natural sediment carried by the river during flood stage. The likelihood of large spikes in sediment in later years would be greatly reduced by the measures taken to dislodge and move unstable sediment after the reservoir is drained.

A6-35

Once the accumulated sediment behind Condit Dam is flushed out of the reservoir or is no longer subject to movement, then all of the sediment reaching the in-lieu site would be due to the natural flux in the river. This natural flux may cause a desire/need for dredging at the in-lieu site in the future.

2.5. Conclusion

Articles and analysis relied on by the Draft SEIS, durations of turbidity assumed under non-conservative assumptions, and expectations of impacts using more reasonable assumptions, all lead to the conclusion that turbid episodes will persist longer than the Draft SEIS indicates. This means that impacts to salmonids, habitat, and water quality will persist longer than disclosed in the Draft SEIS. A6-36

3. SALMON POPULATION IMPACTS

3.1. Direct Salmonid Impacts

The Draft SEIS predicts that all fish, macroinvertebrates, and aquatic insects in the lower White Salmon River and reservoir will be killed outright or displaced during the flush of water and sediment released when the dam is initially breached. Longer term effects of the proposed dam removal approach could result in even greater environmental damage and have not been analyzed in the Draft SEIS or previous SEPA documents and supporting documents. A6-37

State law requires that an EIS *"provide impartial discussion of significant environmental impacts"* and *"shall serve as the means of assessing the environmental impact of proposed agency action, rather than justifying decisions already made"* (WAC 197–11–400). A6-38 For reasons discussed in this comment letter, it is reasonable to expect the dam removal effects on aquatic habitat quality represent only a best case scenario that assumes the dam breaching approach works perfectly, weather will be normal, sediment transport and recruitment mechanisms work as predicted, and fish migration patterns are average. The analyses in this Draft SEIS (and previous SEPA documents and supporting documents on which it builds) fail to recognize the cascading change of adverse effects to fish that could take place if the modeled approach fails to occur as planned. A6-39

The Draft SEIS fails to adequately discuss uncertainty involved with the proposed dam removal approach. As with any large scale manipulation of the environment there is a need to anticipate other reasonably likely outcomes and be prepared to adaptively manage new situations. Not only has PacifiCorp failed to prepare an adaptive management plan, but the Draft SEIS has failed to recognize this shortcoming. Questions that need to be asked include: How will the massive sediment load trapped behind the dam be managed if the drain tunnel plugs and the expected material is not removed within the first six hours? How will long term risks to habitat be controlled and who will be responsible for risk containment assuming PacifiCorp no longer has financial responsibility under the Settlement Agreement? Is there an adequate monitoring program in place to detect, identify, evaluate, and manage unexpected impacts? A6-40

The Final SFEIS (FERC 2002) identified 10 federally-listed threatened and endangered species that would be affected by the proposed action. The Lower Columbia River coho salmon has also been listed as threatened since that time (70 FR 37160). Critical habitat A6-41

A6-36
Based on the discussion in the responses to comments above, the DSEIS conclusions were sound and appropriate.

A6-37
Please see responses to Comments A6-22 and A6-50.

A6-38
The Settlement Agreement does not in any way limit Ecology's environmental review.

A6-39
While impacts to fish and other aquatic organisms were assessed based on the predicted behavior of sediments released during the breaching of Condit Dam, the overall impacts to fish, other aquatic organisms, and habitat were estimated based on the full range of predicted weather, sediment transport, recruitment mechanisms, and fish behavior patterns. Estimates were conservative and based on a worst case scenario basis, rather than on a best case scenario basis. Refer to Section 4.3 Aquatic Resources.

A6-40
Please see responses to Comments A6-12, A6-13, and A6-16.

A6-41
Refer to Section 4.3 and Table 4.3-2 of the DSEIS and FSEIS for information regarding the updated listing status of federally listed ESA salmonids and their critical habitat (with changes in status listed in Table 4.3-3). Section 4.3 of the DSEIS and the FSEIS states that there would be short-term impacts to ESA-listed species and that long-term effects would create substantial benefits for listed species within the White Salmon River basin. This is the primary reason for removing Condit Dam, and these impacts and benefits are accurately described in the DSEIS and FSEIS.

Impacts are expected to be minimal for listed species that do not have reproducing populations present in the White Salmon River basin. Short-term impacts to listed fish present in the river below the dam would be the most severe (but would primarily impact populations of steelhead and

Chinook salmon reproducing in the White Salmon River below Condit Dam). There is insufficient habitat available in the lower White Salmon River to support viable populations of winter- or summer-run steelhead and only a marginally viable population of fall-run Chinook salmon. Coho, who primarily spawn and rear in smaller tributary streams (not present below Condit Dam), are essentially extirpated from the basin.

No available bull trout spawning habitat is below Condit Dam, and the occasional adult bull trout observed in the lower river are mostly foraging fluvial adults. The Hood River system is the most likely source of these fish. Bull trout are most likely to enter the river to forage during smolt out-migrations in the spring and early summer, rather than in October when the dam would be breached. (October is also the spawning period for bull trout and most of the mature adults would be on their natal spawning beds, not the White Salmon River). After dam breaching, a combination of a lack of available forage (smolts) and high suspended sediment levels would keep fluvial bull trout from entering the river. As suspended sediment concentrations subside, it is possible that bull trout may occasionally enter the river for thermal refuge, but they are more likely, during the first few years, to choose streams where large numbers of salmon smolts are available. Bull trout frequently make foraging migrations of up to 100 miles in a few days and can easily access the White Salmon River basin above the dam site, once levels of suspended sediments drop.

Only two bull trout have ever been documented in the basin above Condit Dam and extensive surveys throughout the accessible watershed have failed to find bull trout spawners. This is an indication of a population that is essentially below the levels of detection during surveys and also below the number of adult spawners necessary for a viable population. Removal of the dam and reconnecting suitable spawning habitat in the upper basin with fluvial foraging habitat in the mainstem Columbia River, combined with the additional prey base that anadromous salmonids in the upper basin would provide, is the only viable method to restore bull trout in the White Salmon River basin. Making the upper basin spawning

has been identified for the Lower Columbia River Chinook salmon, the Middle Columbia River steelhead, and bull trout. The impacts analysis of the Draft SEIS generally concludes by describing significant short term adverse effects to listed fish but noting that habitat for these species could be better in the future. This implies that impacts expected with the proposed dam removal plan are somehow acceptable. It is not reasonable to expect this broad brush approach to evaluating impacts for species already in danger of extinction or likely to become endangered in the foreseeable future provides reasonable assurance that jeopardy will be avoided. No acceptable level of risk for each species has been determined.

A6-41 Continued

The following species specific issues are critical but have not been addressed in the Draft SEIS.

Steelhead

There is evidence that the remaining steelhead population in the White Salmon River contains unique genetic characteristics and is at extreme risk of extirpation (White Salmon Subbasin Plan 2004[8]). The size of the spawning population of anadromous *O. mykiss* downstream of the dam is believed to be below the quasi-extinction threshold of 50 spawners. The diversity and genetic fitness of steelhead below the dam have been reduced due to low spawning numbers and hatchery introgression. However, Phelps *et al.* (1990)[9] found that introgression from hatchery rainbow plants was not evident in the wild rainbow trout samples and high levels of genetic diversity still exist in this population. One hypothesis is that the steelhead smolts were produced from resident rainbow trout above Condit Dam, and the genetic diversity and fitness of anadromous *O. mykiss* has been maintained. The population of *O. mykiss* upstream of Condit Dam may comprise the genetic reservoir for the White Salmon's native anadromous steelhead. Further review of potential permanent impacts or complete loss of this unique species should be completed before dam removal.

A6-42

As currently proposed by NMFS, the resident *O. mykiss* below Condit Dam will be listed as part of the Middle Columbia River ESU (69 FR 33113). NMFS noted that listing the Middle Columbia River ESU is uncertain and that if a number of actions are taken the listing would be reevaluated (69 FR 33164). However, no ESA-related consideration is given in the SEIS to the resident *O. mykiss* below or above the dam other than to mention it is a primary concern for NOAA. No mitigation provisions are made to protect this species.

A6-43

[8] White Salmon Subbasin Plan. 2004. Report prepared for the Northwest Power and Conservation Council by numerous contributors lead by the Yakama Nation, Klickitat County, and Washington Department of Fish and Wildlife. May 28, 2004.

[9] Phelps, S. R., N. Switzler, and B. Ingram. 1990. Electrophoretic characterization of five rainbow trout collections from the White Salmon River, Washington and determination of their genetic similarities to four hatchery strains. Unpublished report to the Pacific Power and Light Company from the Washington Department of Fisheries, Olympia. 28 p.

habitat available to fluvial bull trout from other stream basins is another benefit of dam removal.

Recovery of listed salmonids in the White Salmon River requires access to habitat above Condit Dam. Restricting available anadromous habitat to the reach of river below the dam does not provide sufficient habitat to maintain viable populations of steelhead and salmon and separates available bull trout spawning habitat from fluvial bull trout in the Columbia River mainstem.

A6-42

The analysis of the genetic information in the Phelps et al. (1990) citation in this comment was incomplete and preliminary. No follow up analysis was conducted. It did indicate that steelhead juveniles collected below the dam were not closely related to resident rainbow populations above the dam. It was impossible to distinguish juveniles spawned from potential native winter or summer-run steelhead in the sample, or from juveniles naturally spawned by any number of hatchery strays or crosses between hatchery and potential native steelhead. The nature of the sample (collected from juveniles with parents coming from diverse populations) is the most probable explanation for the preliminary results published by Phelps et al. (1990). The population of native rainbow trout above the dam is a descendent of both resident and anadromous populations that were present in the watershed before the construction of Condit Dam, and these are the only rainbow trout in the White Salmon basin that have been established to be native fish. It is not possible to determine at this time if these fish had anadromous or resident ancestors.

The documented migratory behavior of native rainbow trout that are resident in the mainstem above the dam is primarily that of migratory resident rainbow trout. However, it is also possible that the potential for anadromous behavior may still exist in populations of rainbow trout above the dam. A complex interaction of inherited behavior and physiology, stream temperature and flow regime, accessibility, and food resources would determine which populations above the dam, if any, reestablish anadromous populations after dam breaching. Even if native rainbow trout retain inherited anadromous behavior, that is no indication that the

behavior patterns necessary to successfully migrate to a marine environment and return in numbers sufficient to sustain a run of steelhead would be expressed after dam removal. If native rainbow trout retain the capacity to establish anadromous populations, the only way for them to express anadromous behavior would be the reestablishment of access to the ocean. Rivers that have the capacity to maintain populations of large migratory stream resident rainbow trout retain that capacity when steelhead are introduced (i.e., MacKenzie River and the south forks of the Stillaguamish and Skykomish Rivers). Populations of large resident trout are generally depressed by over-harvest by sports fishermen, rather than the presence of anadromous rainbow trout.

A6-43

Under the current listing of the DPS, all of the naturally spawned *O. mykiss* below the dam are regarded as anadromous (i.e. steelhead trout). The resident population of *O. mykiss* above the dam were not included in the DPS and are not listed under the ESA. No mitigation specifically for resident trout was deemed necessary.