3.7 AQUATIC CONSERVATION STRATEGY

3.7.1 Introduction

The Aquatic Conservation Strategy (ACS) was developed to improve and maintain the ecological health of watersheds and aquatic ecosystems contained within them on federal public lands. The four primary components of the ACS are designed to operate together to maintain and restore the productivity and resiliency of riparian and aquatic ecosystems:

- 1. **Riparian Reserves:** As stated in the 1994 ROD, "Riparian Reserves are lands along streams, wetlands, and lakes, and unstable and potentially unstable areas where special Standards and Guidelines direct land use." Riparian Reserves were mapped in the Project Area and described in Section 3.3 Watershed Resources.
- 2. **Key Watersheds:** As stated in the 1994 ROD, "Key Watersheds are a system of large refugia comprising watersheds that are crucial to at-risk fish species and stocks and provide high quality water. A Tier 1 Key Watershed contributes directly to conservation of at-risk anadromous salmonids, bull trout, and resident fish species, and they have a high restoration potential. A Tier 2 Key Watershed may not contain at-risk fish stocks, but are important sources of high quality water." The Clear Fork Cowlitz watershed has been identified as a Tier 2 Key Watershed.
- 3. **Watershed Analysis:** As stated in the 1994 ROD, "The Northwest Forest Plan Standards and Guidelines contain procedures for conducting watershed analysis that evaluates geomorphic and ecologic processes operating in specific watersheds." The *Clear Fork Watershed Analysis* (USDA 1998a) and the *Upper Tieton Watershed Analysis* (USDA 1998b) were used as information resources during the preparation of the White Pass Expansion Proposal EIS.
- 4. **Watershed Restoration:** As stated in the 1994 ROD, "A comprehensive, long-term program of watershed restoration to restore watershed health and aquatic ecosystems, including the habitats supporting fish and other aquatic and riparian-dependent organisms."

The four components of the ACS employ several tactics to approach the goal of maintaining the natural disturbance regime. Land use activities should be limited or excluded in those parts of the watershed prone to instability. The distribution of land use activities, such as timber harvest or roads, must minimize increases in peak streamflows. Headwater riparian areas need to be protected, so that when debris slides and flows occur they contain LWD and boulders necessary for creating habitat farther downstream. Riparian areas along larger channels need protection to limit bank erosion, ensure an adequate and continuous supply of LWD to channels, and provide shade and microclimate protection. As specified in the 1994 ROD:

"To protect the remaining high quality habitats, no new roads will be constructed in inventoried roadless areas in Key Watersheds. Watershed analysis must be conducted in all non-Key Watersheds that contain roadless areas before any management activities can occur within those roadless areas. Existing system and non-system road mileage should be reduced outside roadless areas in Key Watersheds, and if funding is insufficient to implement reductions, there should be no net increase in the amount of roads in Key Watersheds" (1994 ROD at B-19).

Any species-specific strategy aimed at defining explicit standards for habitat-elements would be insufficient for protecting even the targeted species. Therefore, the ACS must strive to maintain and improve ecosystem health at watershed and landscape scales to protect habitat for fish and other riparian-dependent species and resources and restore currently degraded habitats. This approach seeks to prevent further degradation and restore habitat over broad landscapes as opposed to individual projects or small watersheds. Because it is based on natural disturbance processes, it may take decades, possibly more than a century, to accomplish all of its objectives. Some improvements in aquatic ecosystems, however, can be expected in 10 to 20 years.

<u>Aquatic Conservation Strategy Objectives</u>

As stated in the Northwest Forest Plan Standards and Guidelines (B-11), Forest Service and BLM-administered lands within the range of the northern spotted owl will be managed to:

- 1. Maintain and restore the distribution, diversity, and complexity of watershed and landscape-scale features to ensure protection of the aquatic systems to which species, populations and communities are uniquely adapted.
- 2. Maintain and restore spatial and temporal connectivity within and between watersheds. Lateral, longitudinal, and drainage network connections include floodplains, wetlands, upslope areas, headwater tributaries, and intact refugia. These network connections must provide chemically and physically unobstructed routes to areas critical for fulfilling life history requirements of aquatic and riparian-dependent species.
- 3. Maintain and restore the physical integrity of the aquatic system, including shorelines, banks, and bottom configurations.
- 4. Maintain and restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems. Water quality must remain within the range that maintains the biological, physical, and chemical integrity of the system and benefits survival, addition, growth, reproduction, and migration of individuals composing aquatic and riparian communities.

- Maintain and restore the sediment regime under which aquatic ecosystems evolved. Elements of the sediment regime include the timing, volume, rate, and character of sediment input, storage, and transport.
- 6. Maintain and restore in-stream flows sufficient to create and sustain riparian, aquatic, and wetland habitats and to retain patterns of sediment, nutrient, and wood routing. The timing, magnitude, duration, and spatial distribution of peak, high, and low flows must be protected.
- 7. Maintain and restore the timing, variability, and duration of floodplain inundation and water table elevation in meadows and wetlands.
- 8. Maintain and restore the species composition and structural diversity of plant communities in riparian areas and wetlands to provide adequate summer and winter thermal regulation, nutrient filtering, appropriate rates of surface erosion, bank erosion, and channel migration and to supply amounts and distributions of coarse woody debris sufficient to sustain physical complexity and stability.
- 9. Maintain and restore habitat to support well-distributed populations of native plant, invertebrate, and vertebrate riparian-dependent species.

The 1994 ROD describes that standards and guidelines are designed to focus the review of proposed and certain existing projects to determine the compatibility with the ACSOs. The standards and guidelines focus on "meeting" and "not preventing attainment" of the ACSOs. In order to evaluate the compatibility of the alternatives with the ACSOs, Tables 3.7-FEIS1 and 3.7-FEIS2 present an evaluation of each ASCO within the context of five related resource areas: Geology and Soils, Water and Watershed Resources, Vegetation, Wildlife, and Fisheries. In order to determine whether each alternative will "meet" or "not prevent attainment" of the ASCOs, the evaluation includes a summary of the existing conditions for each resource area, based on watershed analysis and site-specific evaluations, and then refers the reader to the appropriate section of the EIS for more detailed discussion. The analysis then summarizes the effects of the alternatives at two scales: Site (location varies by resource) and 5th field (Upper Clear Fork Cowlitz, a Tier 2 key watershed, and Upper Tieton) to support a determination of the effect of the proposed development and cumulative effects. Finally, the evaluation presents a comparison of the severity of impacts by alternative in descending degree of impact in order to display the similarities or differences between the alternatives.

In addition to the analysis of compatibility with the ACSOs, the analysis of the existing watershed conditions in the two watersheds is presented in Table 3.7-1 (Upper Clear Fork Cowlitz watershed) and Table 3.7-2 (Upper Tieton watershed), where the existing conditions is compared to the potential effects of the alternatives. A summary of the existing watershed condition is included, along with the effects of the alternatives on those conditions, and a listing of design constraints that have been built into the alternatives in an effort not to retard the attainment of the Riparian Reserve Standards and Guidelines.

Also provided is an evaluation of the alternatives relative to appropriate and relevant Standards and Guidelines for Riparian Reserves (1994 ROD, pages C31-C38 – refer to Table 3.7-3).³²

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³² The Northwest Forest Plan includes Standards and Guidelines for Riparian Reserves that do not apply to the types of activities proposed in the White Pass Expansion (i.e., Watershed Restoration, Grazing Management, Minerals Management, Lands, and Research). These Standards and Guidelines are not evaluated in the White Pass Expansion EIS.



Compatibility Analysis of the Aquatic Conservation Strategy Objectives (ACSOs) at Two Scales within the Upper Clear Fork Cowlitz Watershed

4	CSO	1

Maintain and restore the distribution, diversity, and complexity of watershed and landscape-scale features to ensure protection of the aquatic systems to which species, populations and communities are uniquely adapted

species, populations and communities are uniquely adapted		
Geology and Soils	Watershed Resources	
Existing Conditions		
 Previous developments (timber harvest, ski area, road construction) have altered physical landscape features through the loss of soil productivity. Current risks to Riparian Reserves include some timber harvests, the construction of any new roads, dispersed/developed recreation, potential mass wasting, windthrow, and catastrophic fire (USDA 1998a). 	 Current risks to Riparian Reserves include some timber harvest, the construction of any new roads, dispersed/developed recreation, potential mass wasting, windthrow, and catastrophic fire (USDA 1998a). The road density of the Upper Clear Fork Cowlitz watershed that White Pass lies within is approximately 1.7 miles/mile² and the road density in Riparian Reserves is 1.5 miles/mile² (USDA 1998a). The Riparian Reserves in the majority of the watershed are functioning properly because very little management activity has occurred in the riparian areas (USDA 1998a). 	
	80 percent of the Clear Fork watershed is within Mount Rainier National Park or Wildernesses (USDA 1998a). Note that for the purposes of this EIS, this watershed has been modified to exclude the Mount Rainier National Park, and has been renamed the Upper Clear Fork Cowlitz watershed.	
	Geology and Soils Existing Conditions Previous developments (timber harvest, ski area, road construction) have altered physical landscape features through the loss of soil productivity. Current risks to Riparian Reserves include some timber harvests, the construction of any new roads, dispersed/developed recreation, potential mass wasting, windthrow, and catastrophic fire (USDA)	

Site Scale

Analysis area: 1,120 acres

Implementation of the Action Alternatives would increase the loss of soil productivity within the site scale. The effect at the landscape scale would not result in measurable changes to the distribution, diversity, and complexity of the watershed features.

• Alternative 2, Modified Alternative 4 and Alternative 9 include no new roads, thereby maintaining the existing road density of 1.5 miles/mile² in the White Pass Study Area. Alternative 6 includes the development of approximately 0.25 mile of new road in a Tier 2 Key Watershed/IRA, which would increase the road density to approximately 1.7 miles/mile² in the White Pass Study Area (refer to Table 3.3-10). Alternative 6 would require the decommissioning and obliteration of approximately 0.6 mile of road in the watershed to avoid a net increase in road mileage in the watershed. Construction of the road would require a site-specific modification of the

Clearing and grading associated with the Action Alternatives would not measurably affect landscapescale features at the site scale.

- The clearing and grading in Riparian Reserves range from approximately 4.1 acres in Alternative 9 to approximately 22.2 acres in Modified Alternative 4 (refer to Table 3.3-15).
- Alternative 2, Modified Alternative 4 and Alternative 9 include no new roads, thereby maintaining the existing road density of 1.5 miles/mile² in the White Pass Study Area. Alternative 6 includes the development of approximately 0.25 mile of new road in a Tier 2 Key Watershed/IRA, which would increase the road density to approximately 1.7 miles/mile² in the White Pass Study Area (refer to Table 3.3-10). Alternative 6 would require the decommissioning and obliteration of approximately 0.6 mile of road in the watershed to avoid a net increase in road

ACSO 1 Maintain and restore the distribution, diversity, and complexity of watershed and landscape-scale features to ensure protection of the aquatic systems to which species, populations and communities are uniquely adapted				
	Vegetation	Wildlife	Fisheries	
Existing Co	onditions		1	
At the I vegetati largely density. Riparia levels of in Water indicati conditions. 80 perc watersh Rainier Wildern Note the this EIS been medium Mount and has Upper C watersh	andscape scale, ion communities are intact. The low road , properly functioning n Reserves, and low of disturbance discussed ershed Resources are eve of near-natural ons. ent of the Clear Fork need is within Mount National Park or nesses (USDA 1998a). at for the purposes of this watershed has odified to exclude the Rainier National Park, the been renamed the Clear Fork Cowlitz	While the distribution, diversity, and complexity of watershed and landscape scale features are important components of wildlife habitat, the physical properties on which impacts to wildlife would be measured are primarily associated with the properties described for vegetation.	Previous developments (timbe harvest, ski area, road construction) have altered physical landscape features through road construction and the removal of vegetation. These alterations are generally localized to small areas within the larger watershed (refer to Section 3.4 – Fisheries). As described in Watershed Resources, Riparian Reserves are largely intact and functioning properly.	
Site Scale	ea: 1,120 acres			
The remova communitie Action Alter a measurabl	l of vegetation s associated with the rnatives would not have e effects on the cale features (refer to	Wildlife impacts at the site scale would be as described under Vegetation.	Fish impacts at the site scale would be as described under Watershed Resources, Vegetation and Geology and Soils.	
result in 5.6 percent was remaining to 45.5 3.3-15) The hydrogen the White be reduced to the weight and the weight and the weight and the weight are the weight are the weight and the weight are the weight are the weight are the weight and the weight are the weight are the weight and the weight are the weight and the weight are the weight are the weight are the weight and the weight are the we	tion Alternatives would a approximately 1.0 to cent reduction in canopy within Riparian es, with canopy cover and approximately 40.9 percent (refer to Table drologic maturity within ite Pass Study Area may ced by removal of ion under the Action tives, however, the			

Compatibility Analysis of the Aquatic Conservation Strategy Objectives (ACSOs) at Two Scales within the Upper Clear Fork Cowlitz Watershed

4	CSO	1

Maintain and restore the distribution, diversity, and complexity of watershed and landscape-scale features to ensure protection of the aquatic systems to which species, populations and communities are uniquely adapted

species, populations and communit	ies are uniquely adapted
Geology and Soils	Watershed Resources
Standards and Guidelines, which would require a coordinated review by the Regional Interagency Executive Committee and Regional Ecosystem Office. If this road were to be selected in the ROD for this FEIS, the Decision could not be rendered until the Regional Interagency Executive Committee concurs that such a modification to the Standards and Guidelines is consistent with the objective of the Standards and Guidelines. Such coordination has not taken place as of the publication of this FEIS. In addition, a decision for road construction within an IRA is reserved to the Chief of the Forest Service, unless he should choose to grant an exception otherwise (FSM 1920, i.d. 1920-2004-1, section 1925.03). • Under the Action Alternatives, there would be no change to the road density at the watershed scale. • Under all Action Alternatives, the total detrimental soil conditions would not exceed 20 percent within the site scale (refer to Table 3.2-3). • Total soil impacts as a result of clearing and grading at the site scale ranges from approximately 27.57 acres under Alternative 9 to 49.14 acres under Modified Alternative 4 (refer to Table 3.2-6).	mileage in the watershed. Under the Action Alternatives, there would be no change to the road density at the watershed scale.
Finding: Meets ACSO 1	Finding: Meets ACSO 1
5th Field Scale	
Analysis area: Upper Clear Fork Cowlitz River Watershe	
The effects of the Action Alternatives coupled with the cumulative actions range from approximately 340.01 acres (Alternative 9) to 361.58 acres (Modified Alternative 4), which equates to approximately 0.48 percent to 0.51 percent of the 5th field scale, respectively (refer to Section 3.2.4). Section 3.2 describes that the effects to Geology and Soils would not measurably affect the complexity and distribution of landscape-scale geology and soil features at the 5th field scale.	The effects of the Action Alternatives coupled with the cumulative actions range from approximately 304.86 acres (Alternative 9) to 322.98 acres (Modified Alternative 4), which equates to approximately 1.14 percent to 1.21 percent of the 5th field scale Riparian Reserves, respectively (refer to Section 3.3.4). As discussed in Section 3.3, the effects to Watershed Resources would not measurably affect the complexity and distribution of watershed and landscape-scale features at the 5th field scale.
Finding: Meets ACSO 1 Degree of impacts by alternative: 4=9>2>6>1	Finding: Meets ACSO 1 Degree of impacts by alternative: 4=9>2>6>1
Degree of impacts by afternative: 4=9>2>0>1	Degree of impacts by afternative: 4=9>4>0>1

Maintain and r ACSO 1 and landscape-	Maintain and restore the distribution, diversity, and complexity of watershed and landscape-scale features to ensure protection of the aquatic systems to which species, populations and communities are uniquely adapted		
Vegetation	Wildlife	Fisheries	
majority of canopy removal woul take place outside of Riparian Reserves and in subalpine parkland, resulting in an average canopy cover of 40.9 to 45.5 percent (refer to Table 3.3-15). Removal of vegetation within the Hogback Basin in Alternatives 2, 6 and Modified Alternative 4 would not alter the sub-alpine parkland community at the site scale.			
Finding: Does Not Prevent Attainment of ACSO 1	Finding: Does Not Prevent Attainment of ACSO 1	Finding: Meets ACSO 1	
5th Field Scale	<u>'</u>	1	
Analysis area: Upper Clear Fork Cow	itz River Watershed (70,722 acres)		
The effects to vegetation from the Action Alternatives and cumulative actions ranges from 0.33 percent of th CEAA in Alternatives 2 and 6 to 0.35 percent of the CEAA in Modified Alternative 4 (refer to Section 3.5.4). Therefore, no measurable impacts to the distribution and complexity of landscape-scale vegetation features at the 5th field scale are expected.	Wildlife impacts at the 5th field scale would be as described under Vegetation.	Fish impacts at the 5th field scale would be as described under Watershed Resources.	
Finding: Meets ACSO 1	Finding: Meets ACSO 1	Finding: Meets ACSO 1	
Degree of impacts by alternative: 4=9>2>6>1	Degree of impacts by alternative: 4=9>2>6>1	Degree of impacts by alternative: 4=9>2>6>1	

Compatibility Analysis of the Aquatic Conservation Strategy Objectives (ACSOs) at Two Scales within the Upper Clear Fork Cowlitz Watershed

Maintain and restore spatial and temporal connectivity within and between

ACSO 2	watersheds. These linkages must provide chemically and physically unobstructed routes to areas critical for fulfilling life history requirements of aquatic and riparian-dependent species.	
	Geology and Soils	Watershed Resources
Existing Con	nditions	
Existing geol under Vegeta	ogy and soils conditions are as described tion.	 Current risks to spatial connectivity include some timber harvest, the construction of any new roads, dispersed/developed recreation, and catastrophic fire (USDA 1998a). The Riparian Reserves in the majority of the watershed are functioning properly because very little management activity has occurred in the riparian areas (USDA 1998a). The Lower Clear Fork Cowlitz subwatershed has 79 road crossings and 1.25 road crossings per stream mile (USDA 1998a).
Site Scale		
	a: 1,120 acres	
Effects on geology and soils are as described under Vegetation.		Clearing in Riparian Reserves for construction and ski trail clearing would reduce forest connectivity, fragmenting riparian habitat. Such clearing could create localized barriers to fish and wildlife movement along riparian corridors (Refer to Wildlife). The Action Alternatives would not measurably affect spatial and temporal connectivity within the site scale. • The clearing and grading in Riparian Reserves range from approximately 4.1 acres in Alternative 9 to approximately 22.2 acres in Modified Alternative 4 (refer to Table 3.3-15). • The Action Alternatives would result in approximately 1.0 to 5.6 percent reduction in canopy cover within Riparian Reserves, with canopy cover remaining approximately 40.9 to 45.5 percent (refer to Table 3.3-15). • Streams may directly be impacted through the construction of culverts and bridges. However, these stream crossings would be located primarily on first order, ephemeral and intermittent streams within the Upper Clear Fork Cowlitz watershed portion of the White Pass Study Area. • All Action Alternatives minimize clearing and

grading in Riparian Reserves by locating the proposed design outside Riparian Reserves to the extent possible. Ski trail design is intended to parallel Riparian Reserves while minimizing

disturbance in riparian areas.

Compatibility Analysis of the Aquatic Conservation Strategy Objectives (ACSOs) at Two Scales within the Upper Clear Fork Cowlitz Watershed

A	CSO	2

Maintain and restore spatial and temporal connectivity within and between watersheds. These linkages must provide chemically and physically unobstructed routes to areas critical for fulfilling life history requirements of aquatic and riparian-dependent species.

aquatic and riparian-dependent species.			
Vegetation	Wildlife	Fisheries	
Existing Conditions		1	
 Development within the watershed has removed native vegetation and fragmented contiguous forested areas. The Riparian Reserves in the majority of the watershed are functioning properly because very little management activity has occurred in the riparian areas (USDA 1998a). 	Existing wildlife conditions are as described under Vegetation.	Existing fish and aquatic habitat conditions are as described for Watershed Resources.	
Site Scale			
Analysis area: 1,120 acres			
Under the Action Alternatives, vegetation removed for the development of additional ski area facilities would not measurably affect the connectivity between watersheds at the site scale. As described in Section 3.5 – Vegetation, clearing and grading within the mountain hemlock parkland community would not measurably change the community structure at the site scale. • Removal of vegetation associated with construction activities would increase the amount of non-forested conditions within Riparian Reserves. Vegetation removal in Riparian Reserves ranges from 4.1 acres under Alternative 9 to 22.2 acres in Modified Alternative 4 (refer to Table 3.3-15). • The Action Alternatives would result in approximately 1.0 to 5.6 percent reduction in canopy cover within Riparian Reserves, with canopy cover	As described in Section 3.6 – Wildlife, the Action Alternatives would have the greatest effect on connectivity for low mobility species. The removal of vegetation would reduce available connective habitat at the site scale. These effects are described under Vegetation.	As described in Section 3.4 – Fisheries, streams within the site scale contain no suitable fish habitat due to steep gradients. The installation of culverts on stream segments under all Action Alternatives would have no effect on connective aquatic habitat.	

ACSO 2	Maintain and restore spatial and temporal connectivity within and between watersheds. These linkages must provide chemically and physically unobstructed routes to areas critical for fulfilling life history requirements of aquatic and riparian-dependent species.		
	Geology and Soils	Watershed Resources	
		All Action Alternatives would avoid direct impacts to streams and wetlands where possible through the implementation of the Mitigation Measures and Management Requirements listed in Tables 2.4-2 and 2.4-3, the use of BMPs, and field fitting individual construction projects.	
Finding: Doo	Finding: Does Not Prevent Attainment of ACSO 2 Finding: Does Not Prevent Attainment of ACSO 2		
5th Field Sca			
Analysis area: Upper Clear Fork Cowlitz River Watershe Effects to geology and soils at the 5th field scale are as described for Vegetation.		The watershed resources effects of the Action Alternatives coupled with the cumulative actions ranges from approximately 304.86 acres (Alternative 9) to 322.98 acres (Modified Alternative 4), which equates to approximately 1.14 percent to 1.21 percent of the 5th field scale Riparian Reserves, respectively (refer to Section 3.3.4). As discussed in Section 3.3, the effects to Watershed Resources would not measurably affect connective riparian habitat at the 5th field scale.	
Finding: Me	ets ACSO 2	Finding: Meets ACSO 2	
Degree of im	apacts by alternative: 4>9>2>6>1	Degree of impacts by alternative: 4>9>2>6>1	

Compatibility Analysis of the Aquatic Conservation Strategy Objectives (ACSOs) at Two Scales within the Upper Clear Fork Cowlitz Watershed Maintain and restore spatial and temporal connectivity within and between

ACSO 2	Maintain and restore spatial and temporal connectivity within and between watersheds. These linkages must provide chemically and physically unobstructed routes to areas critical for fulfilling life history requirements of aquatic and riparian-dependent species.		
•	Vegetation	Wildlife	Fisheries
to 45.5 p 3.3-15). • Vegetati maintair above gr ground of	on would be need at a height of 3 feet cound to prevent disturbance and to a shading and wildlife		
Finding: Do Attainment	es not Prevent of ACSO 2	Finding: Does Not Prevent Attainment of ACSO 2	Finding: Meets ACSO 2
5th Field Sc			
Analysis area: Upper Clear Fork Cow The effects to vegetation from the Action Alternatives and cumulative actions ranges from 0.33 percent of the CEAA in Alternatives 2 and 6 to 0.35 percent of the CEAA in Modified Alternative 4 (refer to Section 3.5.4). Therefore, vegetation effects would not result in any measurable impacts to connective riparian habitat at the 5th field scale.		Wildlife impacts at the 5th field scale would be as described under Vegetation.	The effects of the Action Alternatives coupled with the cumulative actions range from approximately 304.86 acres (Alternative 9) to 322.98 acres (Modified Alternative 4), which equates to approximately 1.14 percent to 1.21 percent of the 5th field scale Riparian Reserves, respectively (refer to Section 3.4.4). Cumulative actions would result in isolated tree removal within the 5th field Riparian Reserves. Therefore, as discussed in Section 3.4 – Fisheries, fisheries effects would not result in any measurable effects to connective aquatic habitat at the 5th field scale.
Finding: Me	eets ACSO 2	Finding: Meets ACSO 2	Finding: Meets ACSO 2
Degree of in 4>9>2>6>1	npacts by alternative:	Degree of impacts by alternative: 4>9>2>6>1	Degree of impacts by alternative: 4>9>2>6>1

Compatibility Analysis of the Aquatic Conservation Strategy Objectives (ACSOs) at Two Scales within the Upper Clear Fork Cowlitz Watershed

	at 1 wo scales within the Opper Clear Fork Cowntz watershed		
ACSO 3	CSO 3 Maintain and restore the physical integrity of the aquatic system, including shorelines, banks, and bottom configurations.		
	Geology and Soils	Watershed Resources	
Existing C	onditions		
riparian high er Stream expector vegetar be associamprov	site scale, approximately 98 percent of the n area along streams occurs on medium to rosion potential soils (refer to Table 3.3-6). In channels within the subwatershed are sed to become more stable as upslope tive recovery proceeds. Such changes will ociated with riparian stand structure rements and reduction of sediment routing arm channels (USDA 1998a).	 Salvage logging activities have been reported to reduce the number of standing large trees and number of in-stream logs, thereby reducing the LWD recruitment potential (USDA 1998a). LWD is very abundant within the Lower Clear Fork Cowlitz subwatershed, which has more than 80 pieces per mile (USDA 1998a). The Lower Clear Fork Cowlitz subwatershed has 63.2 miles of streams (USDA 1998a). The Lower Clear Fork Cowlitz subwatershed displays evidence of historic channel widening that is attributed to past timber management and road construction projects (USDA 1998a). Stream channels within the subwatershed are expected to become more stable as upslope vegetative recovery proceeds. Such changes will be associated with riparian stand structure improvements and reduction of sediment routing to stream channels (USDA 1998a). 	

Site Scale

Analysis area: 1,120 acres

The Action Alternatives would impact the physical integrity of the aquatic system through clearing and grading within Riparian Reserves. These geology and soils impacts are not expected to affect aquatic systems measurably at the site scale.

- Clearing and grading on medium and high erosion potential soils within riparian areas ranges from 1.3 acres in Alternative 6 to 5.6 acres in Modified Alternative 4 (refer to 3.3-17).
- Millridge Creek is a perennial stream, the WEPP analysis (refer to Section 3.3 Watershed Resources and Appendix L) details approximate soil detachment as a result of each Action Alternative within the Upper Clear Fork Cowlitz Watershed. As described, short-term (year of construction) sediment detachment generated within the White Pass Study Area for project activities would increase within a range from approximately 9 percent under Alternative 6 to 68 percent under Modified Alternative 4 for the Upper Clear Fork Cowlitz Watershed. Within the

The Action Alternatives would impact the physical integrity of the aquatic system through clearing and grading within Riparian Reserves. These impacts are not expected to be measurable at the site scale.

- The Action Alternatives would cause a slight reduction in the amount of LWD within Riparian Reserves due to the removal of trees for ski facility construction. Alternatives 2, Modified Alternative 4, and 6 would include development of lifts and trails in Hogback and/or Pigtail Basins, which are dominated by subalpine parkland vegetation. This vegetation type is comprised of comparatively smaller size classes than other plant communities at the site scale, and is therefore less capable of providing LWD. Alternative 9 would remove approximately 4 acres of forest capable of providing LWD (refer to Table 3.3-15).
- Streams may directly be impacted through the construction of culverts and bridges. However, these stream crossings would be located primarily on first order, ephemeral and intermittent streams.

ACSO 3 Maintain and restore the physical integrity of the aquatic system, including shorelines, banks, and bottom configurations.			
	Vegetation	Wildlife	Fisheries
Existing Co	onditions		
been renumber and nur thereby recruitm 1998a). • LWD is the Low subwate than 80 1998a). • Stream subwate become vegetati Such chassocial structur reduction to stream 1998a).	s very abundant within ver Clear Fork Cowlitz ershed, which has more pieces per mile (USDA) channels within the ershed are expected to more stable as upslope ive recovery proceeds. It is a will be ted with riparian stand the improvements and on of sediment routing m channels (USDA)	While shorelines, banks, and bottom configurations are important components of wildlife habitat, the physical properties on which the effects to wildlife would be measured are primarily detailed under Watershed Resources.	 Prior development, timber harvest, and road construction have reduced the physical integrity of the aquatic system through the placement of culverts and hardened stream banks throughout the watershed. While shorelines, banks, and bottom configurations are important components of fish habitat, the physical properties on which the effects to fish would be measured are primarily detailed under Watershed Resources.
Site Scale			
The effects of the aquat	ea: 1,120 acres on the physical integrity ic system for vegetation ibed for Watershed	While shorelines, banks, and bottom configurations are important components of wildlife habitat, the physical properties on which the effects to wildlife would be measured are primarily detailed under Watershed Resources.	The construction of culverts under all Action Alternatives would impact the physical integrity of the aquatic system at the site scale. However, these culverts would be placed in first order streams that do not contain suitable fish habitat. Impacts to the physical integrity of the aquatic system would be as described for Watershed Resources.

ACSO 3 Maintain and restore the physical integrity of the aquatic system, including shorelines, banks, and bottom configurations.			
	Geology and Soils	Watershed Resources	
Upper Clear Fork Cowlitz Watershed, long-term (two to five years following construction), sediment detachment is expected to increase from approximately 3 percent under Alternative 9 to 10 percent under Modified Alternative 4 (Additional information on the results of the WEPP model can be found in Appendix L – WEPP Technical Report). • Ground disturbance would be minimized during project construction so that sediment delivery to streams and wetlands would be nominal (refer to Section 3.2 – Geology and Soils).		 Implementation of the Action Alternatives would not alter stream functionality at the site scale (refer to Section 3.3 – Watershed Resources). Millridge Creek is a perennial stream. According to the WEPP model (refer to Appendix L), short-term (year of construction) sediment detachment generated at the site scale for project activities would increase within a range of 9 percent under Alternative 6 to 68 percent under Modified Alternative 4. Long-term (two to five years following construction), sediment detachment is expected to increase from approximately 3 percent under Alternative 9 to 10 percent under Modified Alternative 4. Ground disturbance would be minimized during project construction so that sediment delivery to streams and wetlands would be nominal (refer to Section 3.2 – Geology and Soils). All Action Alternatives minimize clearing and grading in Riparian Reserves by locating the proposed design outside Riparian Reserves to the extent possible. Ski trail design is intended to parallel Riparian Reserves while minimizing disturbance in riparian areas. 	
Finding: Meets	ACSO 3	Finding: Does Not Prevent Attainment of ACSO 3	
5th Field Scale			
	pper Clear Fork Cowlitz River Watershe		
described for Vegetation. cumulative actions range from approximately 304 acres (Alternative 9) to 322.98 acres (Modified Alternative 4), which equates to approximately 1 percent to 1.21 percent of the 5th field scale Ripa Reserves, respectively (refer to Section 3.3.4). As discussed in Section 3.3, the effects to Watershed Resources would not measurably affect the physi integrity of aquatic systems at the 5th field scale. described in Section 3.3 – Watershed Resources, actions are localized to small areas scattered through the entire 5th field watershed.		Alternative 4), which equates to approximately 1.14 percent to 1.21 percent of the 5th field scale Riparian Reserves, respectively (refer to Section 3.3.4). As discussed in Section 3.3, the effects to Watershed Resources would not measurably affect the physical integrity of aquatic systems at the 5th field scale. As described in Section 3.3 – Watershed Resources, these actions are localized to small areas scattered throughout the entire 5th field watershed.	
Finding: Meets	ACSO 3	Finding: Meets ACSO 3	
Degree of impac	cts by alternative: 4=9>6>2>1	Degree of impacts by alternative: 4=9>6>2>1	

ACSO 3 Maintain and restore the physical integrity of the aquatic system, including shorelines, banks, and bottom configurations.			
Vegetation	Wildlife	Fisheries	
Finding: Does Not Prevent Attainment of ACSO 3	Finding: Does Not Prevent Attainment of ACSO 3	Finding: Does Not Prevent Attainment of ACSO 3	
5th Field Scale			
Analysis area: Upper Clear Fork Cow	elitz River Watershed (70.722 acres)		
The effects to vegetation from the Action Alternatives and cumulative actions ranges from 0.33 percent of the CEAA in Alternatives 2 and 6 to 0.35 percent of the CEAA in Modified Alternative 4 (refer to Section 3.5.4). As discussed in Section 3.3, the effects to watershed resources would not measurably affect the physical integrity of aquatic systems at the 5th field scale, as these actions are localized to small areas scattered throughout the entire 5th field watershed.	Wildlife impacts at the 5th field scale would be related to the effects described in Vegetation.	As described in Watershed Resources, no measurable impacts to the physical integrity of aquatic systems at the 5th field scale are expected.	
Finding: Meets ACSO 3	Finding: Meets ACSO 3	Finding: Meets ACSO 3	
Degree of impacts by alternative: 4=9>6>2>1	Degree of impacts by alternative: 4=9>6>2>1	Degree of impacts by alternative: 4=9>6>2>1	

Compatibility Analysis of the Aquatic Conservation Strategy Objectives (ACSOs) at Two Scales within the Upper Clear Fork Cowlitz Watershed

4	CSO	4

Maintain and restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems. Water quality must remain in the range that maintains the biological, physical, and chemical integrity of the ecosystem, benefiting survival, growth, reproduction, and migration of individuals composing its aquatic and riparian communities.

Existing Conditions

- Sediment introduced into streams within the watershed from management related events are slightly above background levels but well within range of natural variability (USDA 1998a).
- Millridge Creek is a sensitive stream to additional disturbances as a result of several slides originating from US 12 that have delivered large quantities of sediment. Additional sediment inputs will likely further affect Millridge Creek (USDA 1998a).
- Stream channels within the subwatershed are expected to become more stable as upslope vegetative recovery proceeds. Such changes will be associated with riparian stand structure improvements and reduction of sediment routing to stream channels (USDA 1998a).
- As described in Geology and Soils, background sediment inputs to Millridge Creek affect turbidity. Additional sediment inputs will likely further affect Millridge Creek (USDA 1998a).
- Sediment introduced into streams within the watershed from management related events are slightly above background levels but well within range of natural variability (USDA 1998a).
- 55 percent of Millridge Creek has a Pfankuch stability rating of Fair and 45 percent has a rating of Poor (USDA 1998a).
- Stream channels within the subwatershed are expected to become more stable as upslope vegetative recovery proceeds. Such changes will be associated with riparian stand structure improvements and reduction of sediment routing to stream channels (USDA 1998a).
- Currently all streams are maintaining Washington State temperature standards for Class AA waters (USDA 1998a).
- None of the streams within the Clear Fork Cowlitz Watershed are on the Washington Department of Ecology 303(d) list (USDA 1998a).

Site Scale

Analysis area: 1,120 acres

The Action Alternatives would result in increased sediment detachment at the site scale. Increased sediment detachment would have the potential to impact water quality within streams at the site scale (refer to Section 3.3 – Watershed Resources). The use of BMPs and Mitigation Measures described in Tables 2.4-2 to 2.4-4 would reduce the potential sediment yield to streams at the site scale.

 Millridge Creek is a perennial stream, the WEPP analysis (refer to Section 3.3 – Watershed Resources and Appendix L) details approximate soil detachment as a result of each Action Alternative within the Upper Clear Fork Cowlitz Watershed. As described, short-term (year of The Action Alternatives would result in potential impacts to water quality from increased sediment yield, pollutant runoff and increased water temperatures (refer to Section 3.3 – Watershed Resources). The use of BMPs and Mitigation Measures described in Tables 2.4-2 to 2.4-4 would reduce the likelihood of pollutant runoff from construction equipment to streams at the site scale. Overall, impacts to water quality are not expected to be measurable at the site scale.

 As described in Geology and Soils, the Action Alternatives would result in an increase in sediment detachment. This could lead to an increase in sediment yield and turbidity at the site scale.

	Maintain and restore water quality necessary to support healthy riparian,				
aquatic, and wetland ecosystems. Water quality must remain in the re					
ACSO 4 maintains the biological, physical, and chemical integrity of the ecosyste			_		
	benefiting survival	, growth, reproduction, and mig	gration of individuals		
	composing its aquatic and riparian communities.				
7	Vegetation	Wildlife	Fisheries		
Existing Con	nditions				
provide s functions yield to s are descr Soils and Resource cover ma temperat vegetatio to stream Existing Riparian approxin (refer to Stream c subwater become r vegetativ Such cha associate structure reduction	bus vegetation can sediment filtering so that reduce sediment streams. These impacts ribed in Geology and I Watershed es. The loss of canopy ay affect local stream ures where forested on that provides shade as has been removed. canopy cover in Reserves is mately 46.5 percent Table 3.3-15). hannels within the eshed are expected to more stable as upslope are recovery proceeds. In the provides will be a with riparian stand improvements and a channels (USDA)	While water quality is an important component of wildlife habitat, the physical properties on which effects to wildlife would be measured are primarily described under Geology and Soils, Watershed Resources, and Vegetation.	While water quality is an important component of fish habitat, the physical properties on which effects to fish would be measured are primarily described under Geology and Soils, Watershed Resources, and Vegetation.		
Site Scale					
	Analysis area: 1,120 acres				
canopy along with the Action result in an inthermal impa Section 3.3 – Resources). Coin riparian cathave a measu temperature attemperature att	of overstory riparian streams associated on Alternatives could acrease in indirect cts to streams (refer to Watershed Overall, the reduction nopy is not expected to trable impact on stream at the site scale. In in canopy cover iparian Reserves om 1.0 percent in ve 9 to 5.6 percent in	While water quality is an important component of wildlife habitat, the physical properties on which effects to wildlife would be measured are primarily described under Geology and Soils, Watershed Resources, and Vegetation.	While water quality is an important component of fish habitat, the physical properties on which effects to fish would be measured are primarily described under Geology and Soils, Watershed Resources, and Vegetation.		

Compatibility Analysis of the Aquatic Conservation Strategy Objectives (ACSOs) at Two Scales within the Upper Clear Fork Cowlitz Watershed

ACS	0	4

Maintain and restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems. Water quality must remain in the range that maintains the biological, physical, and chemical integrity of the ecosystem, benefiting survival, growth, reproduction, and migration of individuals composing its aquatic and riparian communities.

Geology and Soils

construction) sediment detachment generated within the site scale for project activities would increase within a range from approximately 9 percent under Alternative 6 to 68 percent under Modified Alternative 4. Long-term (two to five years following construction), sediment detachment is expected to increase from approximately 3 percent under Alternative 9 to 10 percent under Modified Alternative 4 (Additional information on the results of the WEPP model can be found in Appendix L – WEPP Technical Report).

- Ground disturbance would be minimized during project construction so that sediment delivery to streams and wetlands would be nominal (refer to Section 3.2 Geology and Soils).
- Understory vegetation would be maintained at a minimum height of 3 feet in areas that include clearing prescriptions with no grading (refer to Table 2.4-1) to minimize sediment delivery.
- No access corridors, staging areas, spoils piles, or other construction related materials would be placed in Riparian Reserves. Whenever feasible, potential impacts to Riparian Reserves would be minimized by bringing construction equipment and materials to the project site over snow (refer to Table 2.4-2).

Watershed Resources

- Ground disturbance would be minimized during project construction so that sediment delivery to streams and wetlands would be nominal (refer to Section 3.2 Geology and Soils).
- Implementation of the Action Alternatives is not expected to contribute to the listing of any stream on the Department of Ecology's 303(d) list since there would be no new point sources of pollution and water quality impacts are projected to be nominal (refer to Section 3.3 Watershed Resources).
- Impacts to stream temperature would occur from the removal of riparian canopy as described in Vegetation.
- Understory vegetation would be maintained at a minimum height of 3 feet in areas that include clearing prescriptions with no grading (refer to Table 2.4-1) to minimize sediment delivery and to help keep stream temperatures cool.
- All Action Alternatives minimize clearing and grading in Riparian Reserves by locating the proposed design outside Riparian Reserves to the extent possible. Ski trail design is intended to parallel Riparian Reserves while minimizing disturbance in riparian areas.
- Through implementation of a Stormwater Pollution Prevention Plan and the use of BMPs, no long-term changes in the pH, turbidity, and dissolved oxygen of streams at the site scale are expected (refer to Table 2.4-2).

Finding: Does Not Prevent Attainment of ACSO 4

Finding: Does Not Prevent Attainment of ACSO 4

5th Field Scale

Analysis area: Upper Clear Fork Cowlitz River Watershed (70,722 acres)

The effects of the Action Alternatives, coupled with the cumulative actions would not result in a measurable increase of sediment detachment at the fifth field scale. These actions occur within small, localized areas that are scattered throughout the entire watershed. Furthermore, a majority of the actions occur outside of Riparian Reserves and therefore are less likely to result

in sediment yield to streams within the fifth field scale.

The effects of the Action Alternatives coupled with the cumulative actions range from approximately 304.86 acres (Alternative 9) to 322.98 acres (Modified Alternative 4), which equates to approximately 1.14 percent to 1.21 percent of the 5th field scale Riparian Reserves, respectively (refer to Section 3.3.4). As described in Section 3.3 – Watershed Resources, these actions are localized to small areas scattered

ACSO 4	Maintain and restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems. Water quality must remain in the range that maintains the biological, physical, and chemical integrity of the ecosystem, benefiting survival, growth, reproduction, and migration of individuals composing its aquatic and riparian communities.		
7	Vegetation	Wildlife	Fisheries
canopy capproxin percent, Table 3.3. Understood be maint height of include caption with no garden.	A Alternative 4, with cover remaining at mately 45.5 to 40.9 respectively (refer to 3-15). Ory vegetation would ained at a minimum f 3 feet in areas that clearing prescriptions grading (refer to Table help keep stream cures cool.		
Attainment		Finding: Does Not Prevent Attainment of ACSO 4	Finding: Does Not Prevent Attainment of ACSO 4
5th Field Sca		litz River Watershed (70,722 acres)	
The effects to Action Altern actions range the CEAA in to 0.35 perce Modified Alt Section 3.5.4	o vegetation from the natives and cumulative is from 0.33 percent of Alternatives 2 and 6 int of the CEAA in ernative 4 (refer to). As described in Watershed Resources,	While water quality is an important component of wildlife habitat, the physical properties on which effects to wildlife would be measured are primarily described under Geology and Soils, Watershed Resources, and Vegetation.	While water quality is an important component of fish habitat, the physical properties on which effects to fish would be measured are primarily described under Geology and Soils, Watershed Resources, and Vegetation.

Compatibility Analysis of the Aquatic Conservation Strategy Objectives (ACSOs) at Two Scales within the Upper Clear Fork Cowlitz Watershed

at 1 wo beates within the opper oreal 1 ork counts watershed			
ACSO 4	Maintain and restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems. Water quality must remain in the range that maintains the biological, physical, and chemical integrity of the ecosystem, benefiting survival, growth, reproduction, and migration of individuals composing its aquatic and riparian communities.		
	Geology and Soils	Watershed Resources	
Therefore impacts to geology and soils are not expected to result in any measurable effects to water quality at the 5 th field.		throughout the entire 5th field. Sediment detachment would be as described under Geology and Soils. As discussed in Section 3.3 – Watershed Resources, the effects to Watershed Resources would not measurably affect water quality at the 5th field scale.	
Finding: Meets ACSO 4		Finding: Meets ACSO 4	
Degree of impacts by alternative: 4>6>2>9>1		Degree of impacts by alternative: 4>9>2>6>1	
ACSO 5	Maintain and restore the sediment regime in which the aquatic system evolved. Elements of the sediment regime include the timing, volume, rate, and character of sediment input, storage, and transport.		

Existing Conditions

- Millridge Creek is a sensitive stream to additional disturbances as a result of several slides originating from US 12 that have delivered large quantities of sediment. Additional sediment inputs will potentially further affect Millridge Creek (USDA 1998a).
- Stream channels within the subwatershed are expected to become more stable as upslope vegetative recovery proceeds. Such changes will be associated with riparian stand structure improvements and reduction of sediment routing to stream channels (USDA 1998a).
- The Lower Clear Fork Cowlitz subwatershed has been identified as having high impacts to stream channels from bedload movement; most of this bedload is sediment associated with the Wilderness areas and to a much lesser degree, past management activities such as road construction and timber harvest. Because of the heavy sediment movement, enough sediment deposition has occurred to cause problems with stream channel migration (USDA 1998a).
- Sediment introduced into streams within the watershed from management related events are slightly above background levels but well within range of natural variability (USDA 1998a).

- Millridge Creek is a sensitive stream to additional disturbances as a result of several slides originating from US 12 that have delivered large quantities of sediment. Additional sediment inputs will potentially further affect Millridge Creek. 55 percent of Millridge Creek has a Pfankuch stability rating of Fair and 45 percent has a rating of Poor (USDA 1998a).
- Stream channels within the subwatershed are expected to become more stable as upslope vegetative recovery proceeds. Such changes will be associated with riparian stand structure improvements and reduction of sediment routing to stream channels (USDA 1998a).
- The Lower Clear Fork Cowlitz subwatershed has been identified as having high impacts to stream channels from bedload movement; most of this bedload is sediment associated with the Wilderness areas and to a much lesser degree, past management activities such as road construction and timber harvest. Because of the heavy sediment movement, enough sediment deposition has occurred to cause problems with stream channel migration (USDA 1998a).
- Sediment introduced into streams within the watershed from management related events are slightly above background levels but well within range of natural variability (USDA 1998a).

ACSO 4	and wetland ecosys the biological, phys	re water quality necessary to suptems. Water quality must remains ical, and chemical integrity of the production, and migration of incunities.	i in the range that maintains he ecosystem, benefiting
,	Vegetation	Wildlife	Fisheries
these actions are localized to small areas scattered throughout the entire 5th field. The impacts to vegetation would not measurably affect water quality at the 5th field scale Finding: Meets ACSO 4		Finding: Meets ACSO 4	Finding: Meets ACSO 4
Degree of im 4>2>6>9>1	pacts by alternative:	Degree of impacts by alternative: 4>2>6>9>1	Degree of impacts by alternative: 4>9>2>6>1
	Elements of the sea of sediment input, seditions hannels within the	tre the sediment regime in which diment regime include the timing storage, and transport. While changes in sediment regimes are influence the quality of wildlife.	Changes in the sediment regime can
become vegetative Such character with ripal improver sediment channels Existing Riparian approximal vegetative sediment channels sediment	rshed are expected to more stable as upslope or recovery proceeds. Inges will be associated urian stand structure ments and reduction of a routing to stream (USDA 1998a). I canopy cover in Reserves is mately 46.5 percent Table 3.3-15).	can influence the quality of wildlife habitat, the physical properties on which effects to wildlife would be measured are primarily described under Geology and Soils, Watershed Resources, and Vegetation.	influence the quality of fish habitat through covering suitable spawning gravel and increasing turbidity.

ACSO 5 Maintain and restore the sediment regime in which the aquatic system evolved. Elements of the sediment regime include the timing, volume, rate, and character of sediment input, storage, and transport.			
	Geology and Soils	Watershed Resources	
Site Scale			
Analysis area	a: 1,120 acres		
Analysis area: 1,120 acres The Action Alternatives would result in increased sediment detachment at the site scale, which has the potential to impact the sediment regime within streams at the site scale (refer to Section 3.3 – Watershed Resources). The use of BMPs and Mitigation Measures described in Tables 2.4-2 to 2.4-4 would reduce the likely sediment yield to streams and are not expected to be measurable at the site scale. • Millridge Creek is a perennial stream, the WEPP analysis (refer to Section 3.3 – Watershed Resources and Appendix L) details approximate soil detachment as a result of each Action Alternative within the Upper Clear Fork Cowlitz Watershed. As described, short-term (year of construction) sediment detachment generated within the White Pass Study Area for project activities would increase within a range from approximately 9 percent under Alternative 6 to 68 percent under Modified Alternative 4 for the Upper Clear Fork Cowlitz Watershed, long-term (two to five years following construction), sediment detachment is expected to increase from approximately 3 percent under Alternative 9 to 10 percent under Modified Alternative 4 (Additional information on the results of the WEPP model can be found in Appendix L – WEPP Technical Report). • Ground disturbance would be minimized during project construction so that sediment delivery to streams and wetlands would be nominal (refer to Section 3.2 – Geology and Soils). • Sediment impacts to streams and wetlands would be minimized through the implementation of the Mitigation Measures in Table 2.4-2 and the use of BMPs during construction activities.		As described in Geology and Soils, the WEPP model indicates that short and long-term sediment detachment would increase under the Action Alternatives. Increased sediment detachment has the potential to impact the sediment regime through increased yield to streams. However, the use of BMPs and Mitigation Measures would reduce actual sediment yield and the potential impacts to sediment regime are not expected to be measurable at the site scale. • Ground disturbance would be minimized during project construction so that sediment delivery to streams and wetlands would be nominal (refer to Section 3.2 – Geology and Soils). • Sediment impacts to streams and wetlands would be minimized through the implementation of the Mitigation Measures in Table 2.4-2 and the use of BMPs during construction activities.	
	es Not Prevent Attainment of ACSO 5	Finding: Does Not Prevent Attainment of ACSO 5	

ACSO 5	Maintain and restore the sediment regime in which the aquatic system evolved. ACSO 5 Elements of the sediment regime include the timing, volume, rate, and character of sediment input, storage, and transport.		
7	Vegetation	Wildlife	Fisheries
Site Scale			
Analysis area The Action A reduce the sec function of ve clearing and g Reserves. Reduction within R ranges fr Alternation under M with can approxim percent, Table 3.3 Understo be maint height of sediment minimize areas tha prescript	Alternatives would diment filtering egetation through grading in Riparian on in canopy cover iparian Reserves from 1.0 percent under ive 9 to 5.6 percent odified Alternative 4, opy cover remaining at nately 45.5 to 40.9 respectively (refer to	While changes in sediment regimes can influence the quality of wildlife habitat at the site scale, the physical properties on which effects to wildlife would be measured are primarily described under Geology and Soils, Watershed Resources, and Vegetation.	As described in Geology and Soils and Watershed Resources, changes to the sediment regime are not expected to be measurable at the site scale. Therefore, no measurable effects to the quality of fish habitat are expected at the site scale.
Finding: Doo	es Not Prevent	Finding: Does Not Prevent	Finding: Does Not Prevent
Attainment		Attainment of ACSO 5	Attainment of ACSO 5

Compatibility Analysis of the Aquatic Conservation Strategy Objectives (ACSOs)

Comp		Clear Fork Cowlitz Watershed	
ACSO 5	Maintain and restore the sediment regime in which the aquatic system evolved.		
	Geology and Soils	Watershed Resources	
5th Field So	cale		
Analysis are	ea: Upper Clear Fork Cowlitz River Watershe	ed (70,722 acres)	
cumulative a increase of s These action are scattered Furthermore Riparian Re in sediment Therefore the	of the Action Alternatives, coupled with the actions would not result in a measurable sediment detachment at the fifth field scale. It is occur within small, localized areas that all throughout the entire watershed. It is, a majority of the actions occur outside of serves and therefore are less likely to result yield to streams within the fifth field scale. It is impact to geology and soils would not be measurable effects to sediment regime at scale.	The effects of the Action Alternatives coupled with the cumulative actions range from approximately 304.86 acres (Alternative 9) to 322.98 acres (Modified Alternative 4), which equates to approximately 1.14 percent to 1.21 percent of the 5th field scale Riparian Reserves, respectively (refer to Section 3.3.4). As described in Section 3.3 – Watershed Resources, these actions are localized to small areas scattered throughout the entire 5th field. The effects to watershed resources would not measurably affect sediment regime at the 5th field scale.	
Finding: M	eets ACSO 5	Finding: Meets ACSO 5	
Degree of in	npacts by alternative: 4>6>2>9>1	Degree of impacts by alternative: 4>6>2>9>1	
ACSO 6	Maintain and restore in-stream flows sufficient to create and sustain riparian, aquatic, and wetland habitats and to retain patterns of sediment, nutrient, and wood routing. The timing, magnitude, duration, and spatial distribution of peak, high, and low flows must be protected		
Existing Co	onditions		
Decreased s	oil permeability and increases in	Increased runoff has the potential to change the	

Decreased soil permeability and increases in impervious areas (e.g., facilities, parking lots, road network, timber harvest) have contributed to increased runoff within the watershed.

- Increased runoff has the potential to change the timing, magnitude and duration of peak, high and low flows.
- Peak flow alterations within the main tributary streams from Mount Rainier National Park and Wildernesses are not expected to change over time except in areas where past human disturbance has affected the area (USDA 1998a).
- The frequency of flooding and peak flows is expected to remain relatively constant throughout the Clear Fork watershed because 80 percent of the watershed is within Mount Rainier National Park or Wildernesses (USDA 1998a).
- As described in Appendix I Fisheries Technical Report and Biological Evaluation, peak/base flows are rated functioning adequately as Aggregate Recovery Percentage exceed 95 percent.
- Pavement and developed facilities result in increased surface flow (Wright et al., 1990).

ACSO 5	Maintain and restore the sediment regime in which the aquatic system evolved. Elements of the sediment regime include the timing, volume, rate, and character of sediment input, storage, and transport.		
.	Vegetation	Wildlife	Fisheries
5th Field Sca	ale		
Analysis area	a: Upper Clear Fork Cow	litz River Watershed (70,722 acres)	
The effects to vegetation from the Action Alternatives and cumulative actions ranges from 0.33 percent of the CEAA in Alternatives 2 and 6 to 0.35 percent of the CEAA in Modified Alternative 4 (refer to Section 3.5.4). As described in Section 3.3 – Watershed Resources, these actions are localized to small areas scattered throughout the entire 5th field. The impacts to vegetation would not measurably affect sediment regime at the 5th field scale.		While changes in sediment regimes can influence the quality of wildlife habitat at the 5th field scale, the physical properties on which effects to wildlife would be measured are primarily Geology and Soils, Watershed Resources, and Vegetation.	As described in Geology and Soils and Watershed Resources, changes to the sediment regime are not expected to be measurable at the 5th field scale. Therefore, no measurable effects to the quality of fish habitat are expected at the 5th field scale.
Finding: Me	eets ACSO 5	Finding: Meets ACSO 5	Finding: Meets ACSO 5
	npacts by alternative:	Degree of impacts by alternative: 4>2>6>9>1	Degree of impacts by alternative: 4>9>2>6>1
ACSO 6 aquatic, and wetlan wood routing. The		ore in-stream flows sufficient to nd habitats and to retain pattern timing, magnitude, duration, a s must be protected	ns of sediment, nutrient, and
Existing Con	nditions		
Existing Conditions Vegetation within the watershed is hydrologically mature as the Aggregate Recovery Percentage exceeds 95 percent (refer to Appendix I – Fisheries Technical Report and Biological Evaluation). The effects of vegetation removal on in-stream flows would be as described in Watershed Resources.		While changes in instream flows can influence the quality of wildlife habitat, the physical properties on which effects to wildlife would be measured are primarily described under Watershed Resources.	While changes in instream flows can influence the quality of fish habitat, the physical properties on which effects to fish would be measured are primarily described under Watershed Resources.

Compatibility Analysis of the Aquatic Conservation Strategy Objectives (ACSOs) at Two Scales within the Upper Clear Fork Cowlitz Watershed

1	CSO	6

Maintain and restore in-stream flows sufficient to create and sustain riparian, aquatic, and wetland habitats and to retain patterns of sediment, nutrient, and wood routing. The timing, magnitude, duration, and spatial distribution of peak, high, and low flows must be protected

wood routing. The timing, magnitude, duration, and spatial distribution of peak high, and low flows must be protected	
Geology and Soils	Watershed Resources
Site Scale	
Analysis area: 1,120 acres	
Under the Action Alternatives, additional impervious surfaces and developed areas (buildings, temporary road) would increase runoff within the site scale. The effect of increased runoff on in-stream flows would be as described under Watershed Resources.	 Under the Action Alternatives, in-stream flows would be affected at the site scale through the removal of vegetation (which may further reduce hydrologic maturity) and increases in impervious surfaces. As described in Section 3.3 – Watershed Resources, the increased two-year peak flow ranges from 0.2 percent under Alternatives 6 and 9 to 0.4 percent under Modified Alternative 4. Similarly, the increased seven-day low flow ranges from 0.7 percent under Alternative 9 to 1.6 percent under Modified Alternative 4 (refer to Table 3.3-15). The changes in the timing, magnitude, duration, and spatial distribution of peak, high, and low flows due to implementation of the Action Alternatives would not be measurable at the mouth of the Flow Model Analysis Area analyzed for this EIS (refer to Section 3.3.3.5 – Flow Regime). Implementation of the Action Alternatives would not alter stream functionality at the site scale (refer to Section 3.3 – Watershed Resources). Through the implementation of Lift and Trail Construction Techniques listed in Table 2.4-1 and the use of BMPs, there would be a small reduction of the changes in the timing, magnitude, duration, and spatial distribution of peak, high, and low flows due to the minimization of clearing trees and vegetation at the site scale.
Finding: Does Not Prevent Attainment of ACSO 6	Finding: Does Not Prevent Attainment of ACSO 6
5th Field Scale	
Analysis area: Upper Clear Fork Cowlitz River Watershe	ed (70,722 acres)

The effects of the Action Alternatives, coupled with the cumulative actions would not result in a measurable increase in runoff at the fifth field scale. The effects of the Action Alternatives coupled with the cumulative actions range from approximately 340.0 acres (Alternative 9) to 361.6 acres (Modified Alternative 4), which equates to approximately 0.48 percent to 0.51 percent of the 5th field scale, respectively (refer to Section 3.2.4). These actions occur within small,

As described in Geology and Soils, the effects of the Action Alternatives, coupled with the cumulative actions, range from approximately 340.0 acres (Alternative 9) to 361.6 acres (Modified Alternative 4), which equates to approximately 0.48 percent to 0.51 percent of the 5th field, respectively (refer to Section 3.2.4). The removal of vegetation and increased impervious surfaces associated with these actions would not result in any measurable changes to runoff at

ACSO 6	Maintain and restore in-stream flows sufficient to create and sustain riparian, aquatic, and wetland habitats and to retain patterns of sediment, nutrient, and wood routing. The timing, magnitude, duration, and spatial distribution of peak, high, and low flows must be protected		
'	Vegetation	Wildlife	Fisheries
Site Scale			
Analysis area	: 1,120 acres		
on vegetation	Action Alternatives at the site scale would ed for Watershed	Effects of the Action Alternatives on wildlife at the site scale would be as described for Watershed Resources.	Effects of the Action Alternatives on fish at the site scale would be as described for Watershed Resources.
Attainment of 5th Field Sca Analysis area Effects of the	Le : Upper Clear Fork Cow Action Alternatives at the 5th field scale described for	Finding: Does Not Prevent Attainment of ACSO 6 Plitz River Watershed (70,722 acres) Effects of the Action Alternatives on wildlife at the 5th field scale would be as described for Watershed Resources.	Finding: Does Not Prevent Attainment of ACSO 6 Effects of the Action Alternatives on fish at the 5th field scale would be as described for Geology and Soils and Watershed Resources.

	at I wo Scales within the Opper		
ACSO 6	Maintain and restore in-stream flows sufficient to create and sustain riparian, aquatic, and wetland habitats and to retain patterns of sediment, nutrient, and wood routing. The timing, magnitude, duration, and spatial distribution of peak, high, and low flows must be protected		
	Geology and Soils	Watershed Resources	
localized areas that are scattered throughout the entire watershed. Therefore impacts to geology and soils would not result in any measurable effects to in-stream flows at the 5th field scale.		the 5th field scale. As described in Section 3.2 – Geology and Soils, these actions are localized to small areas scattered throughout the entire 5th field. Additionally, the flow model analysis described in Section 3.3 – Watershed Resources details that there would not be a measurable effect on the flow regime at the site scale, and therefore, no measurable effect is expected at the 5th field. Cumulative impacts to watershed resources would not result in any measurable changes to the flow regime at the 5 th field scale.	
Finding: Me	eets ACSO 6	Finding: Meets ACSO 6	
Degree of in	npacts by alternative: 4>2>6>9>1	Degree of impacts by alternative: 4>2>6>9>1	
ACSO 7	Maintain and restore the timing, v inundation and water table elevati	ariability, and duration of floodplain on in meadows and wetlands	
Existing Con	nditions		
Decreased soil permeability and increases in impervious areas (e.g., facilities, parking lots, road network, timber harvest) have contributed to increased runoff, potentially resulting in changes to water levels and floodplain inundation within the watershed.		 As described in Geology and Soils, increased runoff has the potential to affect water levels and floodplain inundation within the watershed. Peak flow alterations within the main tributary streams from Mount Rainier National Park and Wildernesses are not expected to change over time except in areas where past human disturbance has affected the area (USDA 1998a). The frequency of flooding and peak flows is expected to remain relatively constant throughout the Clear Fork Cowlitz watershed because 80 percent of the fifth-field watershed is within Mount Rainier National Park or Wildernesses (USDA 1998a). 	

ACSO 6 aquatic, and wetland wood routing. The ti	Maintain and restore in-stream flows sufficient to create and sustain riparian, aquatic, and wetland habitats and to retain patterns of sediment, nutrient, and wood routing. The timing, magnitude, duration, and spatial distribution of peak, high, and low flows must be protected		
Vegetation	Wildlife	Fisheries	
Finding: Meets ACSO 6	Finding: Meets ACSO 6	Finding: Meets ACSO 6	
Degree of impacts by alternative: 4>2>6>9>1	Degree of impacts by alternative: 4>2>6>9>1	Degree of impacts by alternative: 4>2>6>9>1	
	e the timing, variability, and duer table elevation in meadows as	0 0 1	
Existing Conditions			
Vegetation within the watershed is hydrologically mature as the Aggregate Recovery Percentage exceeds 95 percent (refer to Appendix I – Fisheries Technical Report and Biological Evaluation). The effects of vegetation removal on water levels in streams and wetlands would be as described in Watershed Resources.	While changes in water levels and floodplain inundation can influence the quality of wildlife habitat, the physical properties on which effects to wildlife would be measured are primarily described under Watershed Resources.	While changes in water levels and floodplain inundation can influence the quality of fish habitat, the physical properties on which effects to fish would be measured are primarily described under Watershed Resources.	

Maintain and restore the timing, variability, and duration of floodpl			
ACSO 7	inundation and water table elevation in meadows and wetlands		
	Geology and Soils	Watershed Resources	
Site Scale			
Analysis area	: 1,120 acres		
Analysis area: 1,120 acres Under the Action Alternatives, additional impervious surfaces and developed areas would increase runoff, but are not expected to result in measurable changes to water levels or floodplain inundation within the site scale. The effects would be as described for Watershed Resources.		 Under the Action Alternatives, water levels in streams, wetlands, and floodplains would be affected at the site scale through the removal of vegetation (which may further reduce hydrologic maturity) and increases in impervious surfaces. At the site scale, water levels of streams and wetlands are strongly influenced by groundwater sources (refer to Section 3.3 – Watershed Resources). Streams within the site scale are small, ephemeral snow melt channels that do not exhibit floodplain development. The changes in the changes in water levels due to flow regime alterations from the implementation of the Action Alternatives would not be measurable at the site scale (refer to Section 3.3.3.5 – Flow Regime). Implementation of the Action Alternatives would not alter floodplain inundation within the site scale (refer to Section 3.3 – Watershed Resources). 	
Finding: Meets ACSO 7		Finding: Meets ACSO 7	
5th Field Sca			
	: Upper Clear Fork Cowlitz River Watershe		
The geology and soils effects of the Action Alternatives coupled with the cumulative actions range from approximately 340.0 acres (Alternative 9) to 361.6 acres (Modified Alternative 4), which equates to approximately 0.48 percent to 0.51 percent of the 5th field scale, respectively (refer to Section 3.2.4). These actions occur within small, localized areas that are scattered throughout the entire watershed. Therefore, impacts to geology and soils are not expected to measurably affect water levels or floodplain inundation at the 5th field scale.		As described in Geology and Soils, the effects of the Action Alternatives, coupled with the cumulative actions, range from approximately 340.0 acres (Alternative 9) to 361.6 acres (Modified Alternative 4), which equates to approximately 0.48 percent to 0.51 percent of the 5th field, respectively (refer to Section 3.2.4). As described in Section 3.2 – Geology and Soils, these actions are localized to small areas scattered throughout the entire 5th field. Therefore, impacts to watershed resources would not result in any measurable impacts to water levels in streams and wetlands or floodplain inundation at the 5th field scale.	
Finding: Me	ets ACSO 7	Finding: Meets ACSO 7	
Degree of impacts by alternative: 4>2>6>9>1 Degree of impacts by alternative: 4>2>6>9>1			

Compatibility Analysis of the Aquatic Conservation Strategy Objectives (ACSOs) at Two Scales within the Upper Clear Fork Cowlitz Watershed Maintain and restore the timing variability, and duration of floodplain

ACSO 7	Maintain and restore the timing, variability, and duration of floodplain inundation and water table elevation in meadows and wetlands		
V	/egetation	Wildlife	Fisheries
Site Scale			
Analysis area	: 1,120 acres		
Analysis area: 1,120 acres Effects of the Action Alternatives on vegetation would be as described for Watershed Resources.		Effects of the Action Alternatives on wildlife would be as described for Watershed Resources.	Effects of the Action Alternatives on fish would be as described for Watershed Resources.
Finding: Me	ets ACSO 7	Finding: Meets ACSO 7	Finding: Meets ACSO 7
5th Field Sca	ale		
	* *	vlitz River Watershed (70,722 acres)	
on vegetation would be as d Watershed Re	esources.	Effects of the Action Alternatives on wildlife at the 5th field scale would be as described for Watershed Resources.	Effects of the Action Alternatives on fish at the 5th field scale would be as described for Geology and Soils and Watershed Resources.
Finding: Me	ets ACSO 7	Finding: Meets ACSO 7	Finding: Meets ACSO 7
Degree of im 4>2>6>9>1	pacts by alternative:	Degree of impacts by alternative: 4>2>6>9>1	Degree of impacts by alternative: 4>2>6>9>1

ACSO 8	communities in riparian zones and winter thermal regulation, nutrien erosion, bank erosion, and channed distributions of large wood suffici	composition and structural diversity of plant d wetlands to provide adequate summer and at filtering, appropriate rates of surface el migration and to supply amounts and ent to sustain physical complexity and stability.
	Geology and Soils	Watershed Resources
Geology and Soils Existing Conditions Existing geology and soils conditions are as described in Vegetation.		 The Riparian Reserves in the majority of the watershed are functioning properly because very little management activity has occurred in the riparian areas (USDA 1998a). Salvage logging activities have been reported to reduce the number of standing large trees and number of in-stream logs, thereby reducing the LWD recruitment potential (USDA 1998a). LWD is very abundant within the Lower Clear Fork Cowlitz subwatershed, which has more than 80 pieces per mile (USDA 1998a). Stream channels within the subwatershed are expected to become more stable as upslope vegetative recovery proceeds. Such changes will be associated with riparian stand structure improvements and reduction of sediment routing to stream channels (USDA 1998a). Within the 5th field watershed, there are approximately 39.8 miles of road inside the existing riparian corridors (USDA 1998a).
Site Scale	o. 1 120 comps	
	eology and soils are as described for	Clearing in Riparian Reserves associated with the Action Alternatives would affect plant community composition, structure and function. • The clearing and grading in Riparian Reserves range from approximately 4.1 acres in Alternative 9 to approximately 22.2 acres in Modified Alternative 4 (refer to Table 3.3-15). • The Action Alternatives would cause a slight reduction in the amount of LWD within Riparian Reserves due to the removal of trees for ski facility construction. Alternatives 2, 6 and Modified

Compatibility Analysis of the Aquatic Conservation Strategy Objectives (ACSOs) at Two Scales within the Upper Clear Fork Cowlitz Watershed

Maintain and restore the species composition and structural diversity of plant

		rian zones and wetlands to prov	
ACSO 8	_	lation, nutrient filtering, approp	-
	bank erosion, and channel migration and to supply amounts and dist large wood sufficient to sustain physical complexity and stability.		· ·
	Vegetation Vegetation	Wildlife	Fisheries
Existing Co	onditions		
Develop watersh changed compose function The Rip majority function very litt has occurrent areas (U. Salvage been reported in the reby recruiting 1998a). Stream subwated become vegetati Such chewith rip improve sediment channel.	pment within the led has not significantly d plant community sition, structure or in. parian Reserves in the yof the watershed are ning properly because the management activity surred in the riparian USDA 1998a). The logging activities have ported to reduce the of standing large trees of in-stream logs, a reducing the LWD ment potential (USDA)	Existing wildlife conditions are similar to those described for Vegetation.	Existing fisheries and aquatic habitat conditions are similar to those described for Watershed Resources.
Site Scale	1 120		
	ea: 1,120 acres	True con a decision of the control o	I
vegetation redevelopment facilities wo community Riparian Reby: The Accause a amount Reserve	action Alternatives, emoved for the at of additional ski area ould affect plant structure and function in serves at the site scale tion Alternatives would slight reduction in the of LWD within Riparian es due to the removal of r ski facility	The effects to the composition, structure and function of plant communities utilized by riparian-dependent species are described in Vegetation.	As described in Watershed Resources, riparian community composition, structure and function would be impacted by clearing and grading associated with the Action Alternatives. Construction of the four bridges over perennial streams in Alternative 9 would result in impacts to streambank function.

Maintain and restore the species composition and structural diversity of plant

ACSO 8	communities in riparian zones and winter thermal regulation, nutrient	wetlands to provide adequate summer and filtering, appropriate rates of surface erosion, on and to supply amounts and distributions of esical complexity and stability.
	Geology and Soils	Watershed Resources
		Alternative 4 would include development of lifts and trails in Hogback and/or Pigtail Basins, which are dominated by subalpine parkland vegetation. This vegetation type is comprised of comparatively smaller size classes than other plant communities in the White Pass Study Area, and is therefore less capable of providing LWD. Alternative 9 would remove approximately 4 acres of forest capable of providing LWD (refer to Table 3.3-15). • The potential direct impacts to wetlands would range from approximately 0.04 acre in Alternative 9, 0.09 acre in Alternative 2, 0.11 acre in Alternative 6, and approximately 0.12 acre in Modified Alternative 4 (refer to Table 3.3-13). These impacts would be avoided through implementation of Mitigation Measures in Table 2.4-2 and the use of BMPs. • All Action Alternatives minimize clearing and grading in Riparian Reserves by locating the proposed design outside Riparian Reserves to the extent possible. Ski trail design is intended to parallel Riparian Reserves while minimizing disturbance in riparian areas. • Construction prescriptions and Mitigation Measures in Table 2.4-2 include lop and scatter, with no removal of woody material from cleared areas. Wood would also be placed in stream channels to enhance channel complexity and reduce channel erosion.
Finding: Do	oes Not Prevent Attainment of ACSO 8	Finding: Does Not Prevent Attainment of ACSO 8

Compatibility Analysis of the Aquatic Conservation Strategy Objectives (ACSOs) at Two Scales within the Upper Clear Fork Cowlitz Watershed

Maintain and restore the species composition and structural diversity of plant

ACSO 8 winter thermal regularies erosion, bank erosio	rian zones and wetlands to pro lation, nutrient filtering, appro on, and channel migration and e wood sufficient to sustain ph	opriate rates of surface to supply amounts and
Vegetation	Wildlife	Fisheries
construction. Alternatives 2, 6 and Modified Alternative 4 would include development of lifts and trails in Hogback and/or Pigtail Basins, which are dominated by subalpine parkland vegetation. The vegetation type is comprised of comparatively smaller size classes than other plant communities at the site scale, and is therefore less capable of providing LWD. Alternative 9 would remove approximately 4 acres of forest capable of providing LWD (refer to Table 3.3-15). • Understory vegetation would be maintained at a minimum height of 3 feet in Riparian Reserves (refer to Table 2.4-1) to prevent ground disturbance, minimize sediment delivery, maintain shading and wildlife habitat, and to help keep stream temperatures cool. • The hydrologic maturity at the site scale may be reduced by removal of vegetation, however, the majority canopy removal would take place outside of Riparian Reserves and it subalpine parkland, resulting in an average canopy cover of 40.9 to 45.5 percent (refer to Table 3.3-15). • Construction prescriptions and Mitigation Measures in Table 2.4-include lop and scatter, with no removal of woody material from cleared areas. Wood would also be placed in stream channels to enhance channel complexity and reduce channel erosion.		
Finding: Does Not Prevent Attainment of ACSO 8	Finding: Does Not Prevent Attainment of ACSO 8	Finding: Does Not Prevent Attainment of ACSO 8

ACSO 8	communities in riparian zones and winter thermal regulation, nutrient	omposition and structural diversity of plant wetlands to provide adequate summer and filtering, appropriate rates of surface erosion, on and to supply amounts and distributions of viscal complexity and stability.	
Geology and Soils Watershed Resources			
5th Field S	cale		
	ea: Upper Clear Fork Cowlitz River Watersho		
	eology and soils in the 5th field scale are as or Vegetation.	The watershed resources effects of the Action Alternatives coupled with the cumulative actions range from approximately 304.86 acres (Alternative 9) to 322.98 acres (Modified Alternative 4), which equates to approximately 1.14 percent to 1.21 percent of the 5th field scale Riparian Reserves, respectively (refer to Section 3.3.4). As discussed in Section 3.3, the effects to Watershed Resources would not measurably affect riparian plant community composition, structure and function at the 5th field scale.	
Finding: M	leets ACSO 8	Finding: Meets ACSO 8	
Degree of i	mpacts by alternative: 4>2>6>9>1	Degree of impacts by alternative: 4>2>6>9>1	
ACSO 9 Existing Co	plant, invertebrate, and vertebrate in		
road confeatures Current timber dispers	as developments (timber harvest, ski area, enstruction) have altered riparian habitat is through the loss of soil productivity. It risks to riparian habitat include some harvest, the construction of any new roads, ed/developed recreation, potential mass g, windthrow, and catastrophic fire (USDA).	 Current risks to riparian habitat include some timber harvest, the construction of any new roads, dispersed/developed recreation, low LWD recruitment potential, potential mass wasting, windthrow, and catastrophic fire (USDA 1998a). The road density of the watershed at the site scale is approximately 1.7 miles/mile². The road density in Riparian Reserves is 1.5 miles/mile² (USDA 1998a). The Riparian Reserves in the majority of the watershed are functioning properly because very little management activity has occurred in the riparian areas (USDA 1998a). 80 percent of the fifth-field watershed is within Mount Rainier National Park or Wildernesses (USDA 1998a). Stream channels within the subwatershed are expected to become more stable as upslope vegetative recovery proceeds. Such changes will be associated with riparian stand structure improvements (USDA 1998a). 	

ACSO 8	communities in ripo winter thermal regulerosion, bank erosi	re the species composition and arian zones and wetlands to proulation, nutrient filtering, appropersion, and channel migration and ge wood sufficient to sustain place.	ovide adequate summer and opriate rates of surface to supply amounts and
	Vegetation	Wildlife	Fisheries
5th Field S		1'- D'- W 1 1/70 700	
The effects Action Alte cumulative 0.33 percen Alternatives percent of the Modified A Section 3.5. would not re impacts to re community	to vegetation from the rnatives and actions range from t of the CEAA under s 2 and 6 to 0.35 he CEAA under lternative 4 (refer to 4). Vegetation impacts esult in any measurable riparian plant composition, structure at the 5th field scale.	The effects to the composition, structure and function of plant communities utilized by ripariandependent species are described in Vegetation.	As described in Watershed Resources, no measurable impacts to the composition, structure and function of riparian plant communities at the 5th field scale are expected.
Finding: M	Ieets ACSO 8	Finding: Meets ACSO 8	Finding: Meets ACSO 8
Degree of i 4>2>6>9>1	mpacts by alternative:	Degree of impacts by alternative: 4>2>6>9>1	Degree of impacts by alternative: 4>2>6>9>1
vegetat largely density Riparia levels c in Wate indicati conditi 80 perc watersh Rainier Wilder The Ri majorit functio very lit activity	andscape scale, ion communities are intact. The low road , properly functioning in Reserves, and low of disturbance discussed ershed Resources are ive of near-natural	The physical properties on which impacts influencing the distribution of invertebrate and vertebrate riparian dependent species would be measured are primarily described under Watershed Resources and Vegetation.	 Previous developments (timber harvest, ski area) have altered habitat characteristics through road construction and tree removal. Overall complexity of fish habitat features remains relatively stable. The physical properties on which impacts influencing fish habitat would be measured are primarily watershed resources. Refer to Watershed Resources.

ACSO 9	Maintain and restore habitat to support well-distributed populations of native plant, invertebrate, and vertebrate riparian-dependent species.		
	Geology and Soils	Watershed Resources	
5th Field Sca	5th Field Scale		
Analysis area	a: Upper Clear Fork Cowlitz River Watershe	ed (70,722 acres)	
Analysis area: Upper Clear Fork Cowlitz River Watershot The effects of the Action Alternatives coupled with the cumulative actions range from approximately 340.01 acres under Alternative 9 to 361.58 acres under Modified Alternative 4, which equates to approximately 0.48 percent to 0.51 percent of the 5th field scale, respectively (refer to Section 3.2.4). Section 3.2 describes that the effects to geology and soils would not measurably affect habitat for ripariandependent species at the 5th field scale.		The effects of the Action Alternatives coupled with the cumulative actions range from approximately 304.86 acres under Alternative 9 to 322.98 acres under Modified Alternative 4, which equates to approximately 1.14 percent to 1.21 percent of the 5th field scale Riparian Reserves, respectively (refer to Section 3.3.4). As discussed in Section 3.3, the effects to watershed resources would not measurably affect habitat for riparian-dependent species at the 5th field scale.	
Finding: Me	eets ACSO 9	Finding: Meets ACSO 9	
Degree of impacts by alternative: 4>2>6>9>1		Degree of impacts by alternative: 4>2>6>9>1	

ACSO 9 Maintain and restore habitat to support well-distributed populations of native plant, invertebrate, and vertebrate riparian-dependent species.			
	Vegetation	Wildlife	Fisheries
5th Field S	cale		
Analysis are	ea: Upper Clear Fork Cov	vlitz River Watershed (70,722 acres)	
Action Alte actions rang the CEAA i to 0.35 perc Modified A Section 3.5. to vegetatio result in any habitat for r species at the	to vegetation from the rnatives and cumulative ges from 0.33 percent of an Alternatives 2 and 6 tent of the CEAA in the lternative 4 (refer to 4). Therefore, impacts are not expected to a measurable impacts to iparian-dependent the 5th field scale.	Wildlife impacts at the 5th field scale would be related to the effects described in Vegetation.	Fish impacts at the 5th field scale would be as described in Watersher Resources.
Finding: Meets ACSO 9 Finding: Meets ACSO 9		Finding: Meets ACSO 9	
Degree of it 4>2>6>9>1	mpacts by alternative:	Degree of impacts by alternative: 4>2>6>9>1	Degree of impacts by alternative: 4>2>6>9>1

Compatibility Analysis of the Aquatic Conservation Strategy Objectives (ACSOs) at Two Scales within the Upper Tieton River Watershed

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1	CSO	1

Maintain and restore the distribution, diversity, and complexity of watershed and landscape-scale features to ensure protection of the aquatic systems to which species, populations and communities are uniquely adapted

which species, populations and communities are uniquely adapted				
Geology and Soils	Watershed Resources			
Existing Conditions				
Previous developments (timber harvest, ski area) have altered physical landscape features through road construction and slope recontouring. Current risks to Riparian Reserves include timber harvest, the construction of new roads, dispersed/developed recreation, low LWD recruitment potential, potential mass wasting, windthrow, and catastrophic fire (USDA 1998b).	 The disturbance regime in this watershed is functioning adequately because much of the watershed is within Wilderness. Timber harvest has been minimal so it has not altered the disturbance regime (USDA 1998b). Due to the relatively low levels of harvest and roading, hydrologic patterns at the watershed level have not been changed significantly as a result of forest management activities (USDA 1998b). It is estimated that less than 15 percent Equivalent Clearcut Area has been disturbed in the watershed, and unstable riparian areas are intact, so the watershed is rated to be functioning adequately (USDA 1998b). Risks to Riparian Reserves include timber harvest, the construction of new roads, dispersed/developed recreation, low LWD recruitment potential, potential mass wasting, windthrow, and catastrophic fire (USDA 1998b). Only 2 of the 37 sub-drainages analyzed have a road density greater than 3.0 miles/mile² (USDA 1998b). 			

Site Scale

Analysis area: 450 acres

Implementation of the Action Alternatives would increase the loss of soil productivity within the site scale. The effect at the landscape scale would not result in measurable changes to the distribution, diversity, and complexity of geology and soils features.

- Under the Action Alternatives, the total acreage of detrimental soil conditions within the site scale would range from 2.9 percent under Alternative 2 to 3.6 percent under Alternative 9 (refer to Table 3.2-3), which is below the 20 percent threshold for an activity area (USDA 1990b).
- Total soil impacts as a result of clearing and grading at the site scale ranges from approximately 18.40 acres (4.08 percent of the site scale) under Alternative 2 to 47.23 acres (10.5 percent of the site scale) in Alternative 9 (refer to Table 3.2-8).

Clearing and grading in Riparian Reserves, road density and hydrologic maturity associated with the Action Alternatives would not measurably affect landscape-scale watershed features at the site scale.

- The clearing and grading in Riparian Reserves range from approximately 0.0 acre in Alternative 2 to 20.3 acres (8.6 percent of total) in Alternative 9 (refer to Table 3.3-15).
- Tere would be no new roads proposed in the Upper Tieton watershed portion of the White Pass Study Area, so there would be no change to the road density (refer to Table 3.3-11).
- Alternative 9 would result in the greatest effects to the distribution, diversity and function of Riparian Reserves among the Action Alternatives due to the removal of mature forest along perennial streams. Riparian function would be reduced at ski trail and bridge crossings, but would be maintained along these streams at the site scale.

ACSO 1 Maintain and restore the distribution, diversity, and complexity of watershed and landscape-scale features to ensure protection of the aquatic systems to which species, populations and communities are uniquely adapted			
7	Vegetation	Wildlife	Fisheries
Existing Con			
Upper T to the ex represen vegetatic develope the exist conditio It is estin percent Area has watershe riparian watershe	e activities within the lieton have contributed disting land cover, as ted by the mosaic of on communities and ed areas that comprise ing vegetation ins. In attack that less than 15 Equivalent Clearcut is been disturbed in the ed, and unstable areas are intact, so the ed is rated to be ing adequately (USDA)	While the distribution, diversity, and complexity of watershed and landscape scale features are important components of wildlife habitat, the physical properties on which impacts to wildlife would be measured are primarily associated with the properties described for Vegetation.	Previous developments (timber harvest, ski area) have altered physical landscape features through road construction and slope recontouring. These alterations are generally localized rather than landscape-scale changes (refer to Section 3.4 – Fisheries).
Site Scale Analysis area	a: 450 acres		
The effects to communities Action Alter a measurable scale feature because all p would contin Section 3.5). The rem commun would o mixed commun Closed C Remova commun characte acre und	o vegetation associated with the natives would not have effect on landscape- s at the site scale lant communities ue to persist (refer to	Wildlife impacts at the site scale would be as described under Vegetation.	Fisheries impacts would be as described under Geology and Soils Vegetation and Watershed Resources.

ACSO 1 landscape-scale features to ensure pr		on, diversity, and complexity of watershed and protection of the aquatic systems to which
	species, populations and communit	Watershed Resources
Finding: Do	es not prevent attainment of ACSO 1	Finding: Does not prevent attainment of ACSO 1
5th Field Sca	ale	
Analysis area	a: Upper Tieton River Watershed (118,204 ac	res)
coupled with approximatel 361.4 acres (approximatel field scale, re 3.2 – Geolog geology and distribution a and soil feature.	and soils effects of the Action Alternatives, the cumulative actions, ranges from ly 332.57 acres (under Alternative 2) to under Alternative 9), which equates to ly 0.28 percent to 0.31 percent of the 5th espectively (refer to Section 3.2.4). Section y and Soils describes that the effects to soils would not measurably affect the and complexity of landscape-scale geology ares at the 5th field scale.	The Action Alternatives, coupled with the cumulative actions, would affect approximately 322.01 acres (under Alternative 2) to 342.31 acres (under Alternative 9) of Riparian Reserves, which equates to approximately 1.80 percent to 1.92 percent of the 5th field scale Riparian Reserves, respectively (refer to Section 3.3.4). As discussed in Section 3.3 – Watershed Resources, the effects to Riparian Reserves would not measurably affect the landscape-scale distribution and complexity of watershed and landscape-scale features at the 5th field scale.
Finding: Me		Finding: Meets ACSO 1
Degree of in	npacts by alternative: 9>4>6>2=1	Degree of impacts by alternative: 9>4>6>2=1

ACSO 1	Maintain and restore the distribution, diversity, and complexity of watershed and landscape-scale features to ensure protection of the aquatic systems to which species, populations and communities are uniquely adapted		
Vegetation Wildlife			Fisheries
any altern Appendix communi eliminate Reduced Riparian Action A from 0.0 Alternati under Alternaty canopy c approxim	e scale, the most of native (refer to x G). However, plant ities would not be and at the site scale. canopy cover within Reserves under the alternatives ranges percent under ve 2 to 8.6 percent ternative 9, with over remaining at nately 40.9 to 49.5 respectively (refer to 3-15).		
Finding: Doe attainment o	es not prevent f ACSO 1	Finding: Does not prevent attainment of ACSO 1	Finding: Does not prevent attainment of ACSO 1
5th Field Sca			
Analysis area	: Upper Tieton River Wa	atershed (118,204 acres)	
Action Alternactions range: the Cumulative Area (CEAA: Vegetation) in to 0.35 perceived Modified Alto Section 3.5.4; effects occur Reserves, and no effect on recommunities. occurring with are localized scattered through Therefore, no to the distribution of landscape-features at the expected.	Cumulative actions hin Riparian Reserves to small areas that are ughout the 5th field. In measurable impacts ation and complexity scale vegetation to 5th field scale are	Wildlife impacts at the 5th field scale would be as described under Vegetation.	Fisheries impacts would be as described under Geology and Soils, Vegetation and Watershed Resources. The fisheries effects of the Action Alternatives coupled with cumulative actions ranges from approximately 322.01 acres (under Alternative 2) to 342.31 acres (under Alternative 9), which equates to approximately 1.80 percent to 1.92 percent of the 5th field, respectively (refer to Section 3.4.4). As discussed in Section 3.4 - Fisheries, the effects to fish or aquatic habitat would not measurably affect the distribution and complexity of landscape-scale features associated with fisheries at the 5th field scale.
Finding: Me		Finding: Meets ACSO 1	Finding: Meets ACSO 1
Degree of im 9>4>6>2=1	pacts by alternative:	Degree of impacts by alternative: 9>4>6>2=1	Degree of impacts by alternative: 9>4>6>2=1

Compatibility Analysis of the Aquatic Conservation Strategy Objectives (ACSOs) at Two Scales within the Upper Tieton River Watershed

Maintain and restore spatial and temporal connectivity within and between

ACSO 2 watersheds. These linkages must provide chemically and physically unobstructed routes to areas critical for fulfilling life history requirements a aquatic and riparian-dependent species.	
Geology and Soils	Watershed Resources
Existing Conditions	
Existing geology and soils conditions are as described under Vegetation.	 The Riparian Reserves in the majority of the watershed are properly functioning because very little management activity has occurred in the riparian areas (USDA 1998b). Due to the relatively low levels of harvest and roading, spatial connectivity at the watershed scale has not been changed significantly as a result of forest management activities (USDA 1998b). Risks to spatial connectivity include timber harvest, the construction of new roads, dispersed/developed recreation, and catastrophic fire (USDA 1998b).
Site Scale	
Analysis area: 450 acres Effects on geology and soils are as described under Vegetation.	Clearing in Riparian Reserves for ski trails and construction would reduce forest continuity, fragmenting riparian habitat. Such clearing may create localized barriers to fish and wildlife movement along riparian corridors (refer to Wildlife). The Action Alternatives would not measurably affect spatial and temporal connectivity within the site scale. • The clearing and grading in Riparian Reserves ranges from approximately 0 acres in Alternative 2 to 20.3 acres in Alternative 9 (refer to Table 3.3-15). • Reduced canopy cover within Riparian Reserves under the Action Alternatives ranges from 0.0 percent under Alternative 2 to 8.6 percent under Alternative 9, with canopy cover remaining at approximately 40.9 to 49.5 percent, respectively (refer to Table 3.3-15). • Streams may be directly impacted through the construction of four bridges (under Alternative 9). • All Action Alternatives minimize clearing and grading in Riparian Reserves by locating the proposed design outside Riparian Reserves to the

extent possible. Ski trail design is intended to

Compatibility Analysis of the Aquatic Conservation Strategy Objectives (ACSOs) at Two Scales within the Upper Tieton River Watershed

ACSO	1
	_

Maintain and restore spatial and temporal connectivity within and between watersheds. These linkages must provide chemically and physically unobstructed routes to areas critical for fulfilling life history requirements of aquatic and riparian-dependent species.

Vegetation	Wildlife	Fisheries
Existing Conditions		
 Development within the watershed has removed native vegetation and fragmented contiguous forested areas. The Riparian Reserves in the majority of the watershed are properly functioning because very little management activity has occurred in the riparian areas (USDA 1998b). Due to the relatively low levels of harvest and roading, spatial connectivity at the watershed scale has not been changed significantly as a result of forest management activities (USDA 1998b). 	Existing wildlife conditions are as described under Vegetation.	Existing fisheries and aquatic habitat conditions are as described under Watershed Resources.
Site Scale		
Analysis area: 450 acres		
Under the Action Alternatives, vegetation removed for the development of additional ski area facilities would affect the connectivity between watersheds at the site scale. • Removal of vegetation associated with construction activities would increase the amount of non-forested area within Riparian Reserves. Vegetation removal in Riparian Reserves ranges from approximately 0 acre in Alternative 2 to 20.3 acres (8.6 percent of total) in Alternative 9 (refer to Table 3.3-15). • Alternative 9 would result in the greatest amount of fragmentation of mature forest of all Action Alternatives. • Reduced canopy cover within Riparian Reserves under the	As described in Section 3.6 – Wildlife, the Action Alternatives would have the greatest affect on connectivity for low mobility species. The removal of vegetation would reduce available connective habitat at the site scale. These effects are described under Vegetation.	Alternative 9 would result in the construction of four bridges over perennial streams. As bridge footings are located upslope of the ordinary high water mark, no measurable impacts to connective aquatic habitat are expected to occur. Impacts to riparian habitat are as described under Watershed Resources.

ACSO 2 Maintain and restore spatial and temporal connectivity within and between watersheds. These linkages must provide chemically and physically unobstructed routes to areas critical for fulfilling life history requirements of aquatic and riparian-dependent species.			
	Geology and Soils	Watershed Resources	
		 parallel Riparian Reserves while minimizing disturbance in riparian areas. All Action Alternatives would avoid direct impacts to streams and wetlands where possible through the implementation of the Mitigation Measures and Management Requirements listed in Tables 2.4-2 and 2.4-3, the use of BMPs, and field fitting the individual construction projects. 	
	Finding: Does Not Prevent Attainment of ACSO 2 Finding: Does Not Prevent Attainment ACSO 2		
5th Field Sca		cres)	
Analysis area: Upper Tieton River Watershed (118,204 a Geology and soils impacts at the 5th field are as described under Vegetation.		The effects of the Action Alternatives, coupled with the cumulative actions, on Riparian Reserves range from approximately 322.01 acres (Alternative 2) to 342.31 acres (Alternative 9), which equates to approximately 1.80 percent to 1.92 percent of the 5th field Riparian Reserves, respectively (refer to Section 3.3.4). Watershed resource impacts would not result in any measurable changes to the connective riparian habitat at the 5th field. These actions are localized to small areas scattered throughout the entire 5th field.	
Finding: Me	ets ACSO 2	Finding: Meets ACSO 2	
Degree of im	pacts by alternative: 9>4>6>2=1	Degree of impacts by alternative: 9>4>6>2=1	

Compatibility Analysis of the Aquatic Conservation Strategy Objectives (ACSOs) at Two Scales within the Upper Tieton River Watershed

ACSO 2 Maintain and restore spatial and temporal connectivity within and between watersheds. These linkages must provide chemically and physically unobstructed routes to areas critical for fulfilling life history requirements of aquatic and riparian-dependent species.			
•	Vegetation Wildlife Fisheries		
from 0.0 Alternation under Alternation of the canopy of th	Alternatives ranges percent under live 2 to 8.6 percent liternative 9, with cover remaining at mately 40.9 to 49.5 respectively (refer to 3-15). Riparian Influence legetation would be led at a minimum f 3 feet above ground ant ground disturbance laintain shading and connectivity.		
Finding: Do Attainment 5th Field Sca		Finding: Does Not Prevent Attainment ACSO 2	Finding: Does Not Prevent Attainment ACSO 2
		atershed (118,204 acres)	
Action Alternactions range the CEAA in to 0.35 perce Modified Alt Section 3.5.4 effects occur Reserves, and no effect on chabitat. Cum occurring with are localized scattered through Therefore, in would result impacts to co	o vegetation from the natives and cumulative is from 0.33 percent of Alternatives 2 and 6 int of the CEAA in ernative 4 (refer to i). A majority of these outside of Riparian di would therefore have connective riparian ulative actions thin Riparian Reserves to small areas that are oughout the 5th field. In pacts to vegetation in no measurable onnective riparian 5th field scale.	Impacts to connective riparian habitat are not expected to be measurable at the 5th field scale (refer to Vegetation). Therefore, wildlife impacts would not result in any measurable impacts to riparian-dependent species at the 5 th field scale.	The effects of the Action Alternatives, coupled with the cumulative actions, range from approximately 322.01 acres (Alternative 2) to 342.31 acres (Alternative 9), which equates to approximately 1.80 percent to 1.92 percent of the 5th field scale, respectively (refer to Section 3.4.4). Cumulative actions would result in isolated tree removal within the 5th field Riparian Reserves. Therefore, fisheries impacts would not result in any measurable effects to connective aquatic habitat at the 5 th field scale (refer to Section 3.4 – Fisheries).
Finding: Me		Finding: Meets ACSO 2	Finding: Meets ACSO 2
Degree of in	pacts by alternative:	Degree of impacts by alternative:	Degree of impacts by alternative:

9>4>6>2=1

9>4>6>2=1

9>4>6>2=1

ACSO 3 Maintain and restore the physical integrity of the aquatic system, including shorelines, banks, and bottom configurations.		
Geology and Soils	Watershed Resources	
At the site scale, approximately 30 percent of the riparian area along streams occurs on medium to high erosion potential soils (refer to Table 3.3-6).	 Most streams are considered to be functioning adequately for the channel type with deep pools within geomorphic constraints (USDA 1998b). The streambank conditions of the North Fork Tieton River is rated functioning adequately (USDA 1998b). Approximately 80 percent of the stream length within the site scale have stable banks (refer to Table 3.3-6). Prior development, timber harvest, and road construction have reduced the physical integrity of the aquatic system through the placement of culverts and hardened stream banks throughout the watershed. 	
Site Scale		
 Clearing and grading on medium and high erosion potential soils within riparian areas ranges from 0.0 acre in Alternative 2 to 0.5 acre in Alternative 9 (refer to Table 3.3-17). Ground disturbance would be minimized during project construction so that sediment delivery to streams and wetlands would be nominal (refer to Section 3.2 – Geology and Soils). 	The Action Alternatives would impact the physical integrity of the aquatic system through clearing and grading within Riparian Reserves. These impacts are not expected to be measurable at the site scale. • The Action Alternatives would cause a slight reduction in the amount of LWD within Riparian Reserves due to the removal of trees for ski facility construction. Alternatives 6 and 9 include development of a 2.5-acre parking lot, which would eliminate riparian function in approximately 1.9 acres of Riparian Reserves (refer to Section 3.3.3.3). Under Modified Alternative 4, a 7-acre parking lot would eliminate riparian function from approximately 2.1 acres of Riparian Reserves (refer to Section 3.3.3.3). • All Action Alternatives minimize clearing and grading in Riparian Reserves by locating the proposed design outside Riparian Reserves to the extent possible. Ski trail design is intended to parallel Riparian Reserves while minimizing disturbance in riparian areas. • Streams may be directly impacted through the construction of four bridges (for Alternative 9). • Implementation of the Action Alternatives would not alter stream functionality within the White Pass Study Area or within the watershed (refer to Section 3.3 – Watershed Resources).	

ACSO 3 Maintain and restore the physical integrity of the aquatic system, including shorelines, banks, and bottom configurations.			
•	Vegetation	Wildlife	Fisheries
Existing Cor	nditions		
majority of the properly function little manage	Reserves in the ne watershed are stioning because very ment activity has ne riparian areas b).	While shorelines, banks, and bottom configurations are important components of wildlife habitat, the physical properties on which the effects to wildlife would be measured are primarily described under Watershed Resources.	 Prior development, timber harvest, and road construction have reduced the physical integrity of the aquatic system through the placement of culverts and hardened stream banks throughout the watershed. While shorelines, banks, and bottom configurations are important components of fish habitat, the physical properties on which the effects to fish would be measured are
Site Scale			
Analysis area			
The effects o	n the physical integrity e system for vegetation and under Watershed	While shorelines, banks, and bottom configurations are important components of wildlife habitat, the physical properties on which the effects to wildlife would be measured are primarily described under Watershed Resources.	The construction of four bridges under Alternative 9 would impact the stream banks of perennial streams at the site scale. Impacts to the physical integrity of the aquatic system would be as described under Watershed Resources.

ACSO 3 Maintain and restore the physical integrity of the aquatic system, including shorelines, banks, and bottom configurations.		
Geology and Soils Watershed Resources		
	 Construction of ski trails and bridges under Alternative 9 would reduce the length of streams with stable banks to approximately 72 percent of the total stream length (refer to Table 3.3-12). Ground disturbance would be minimized during project construction so that sediment delivery to streams and wetlands would be nominal (refer to Section 3.2 – Geology and Soils). 	
Finding: Meets ACSO 3	Finding: Does Not Prevent Attainment of ACSO 3	
5th Field Scale		
Analysis area: Upper Tieton River Watershed (118,204 a	acres)	
Geology and soils impacts at the 5th field are as described under Vegetation.	The effects of the Action Alternatives, coupled with the cumulative actions, on Riparian Reserves range from approximately 322.01 acres (Alternative 2) to 342.31 acres (Alternative 9), which equates to approximately 1.80 percent to 1.92 percent of the 5th field Riparian Reserves, respectively (refer to Section 3.3.4). Cumulative effects to watershed resources would not result in any measurable changes to the physical integrity of aquatic systems at the 5th field scale. As described in Section 3.3 – Watershed Resources, these actions are localized to small areas scattered throughout the entire 5th field.	
Finding: Meets ACSO 3	Finding: Meets ACSO 3	
Degree of impacts by alternative: 9>4>6=2=1	Degree of impacts by alternative: 9>4>6>2=1	

ACSO 3 Maintain and restore the physical integrity of the aquatic system, including shorelines, banks, and bottom configurations.		
Vegetation	Wildlife	Fisheries
Finding: Does Not Prevent Attainment of ACSO 3 5th Field Scale	Finding: Does Not Prevent Attainment of ACSO 3	Finding: Does Not Prevent Attainment of ACSO 3
Analysis area: Upper Tieton River Wa		
The effects to vegetation from the Action Alternatives and cumulative actions ranges from 0.33 percent of the CEAA in Alternatives 2 and 6 to 0.35 percent of the CEAA in Modified Alternative 4 (refer to Section 3.5.4). A majority of these effects occur outside of Riparian Reserves, and would therefore have no effect on the physical integrity of aquatic systems. Cumulative actions occurring within Riparian Reserves are localized to small areas that are scattered throughout the 5th field. Therefore, impacts to vegetation are not expected to result in any measurable impacts to the physical integrity of aquatic systems at the 5th field scale.	The effects to the physical integrity of aquatic systems utilized by riparian-dependent species are described in Vegetation.	As described in Watershed Resources, no measurable impacts to the physical integrity of aquatic systems at the 5th field scale are expected.
Finding: Meets ACSO 3	Finding: Meets ACSO 3	Finding: Meets ACSO 3
Degree of impacts by alternative: 9>4>6>2=1	Degree of impacts by alternative: 9>4>6>2=1	Degree of impacts by alternative: 9>4>6>2=1

Compatibility Analysis of the Aquatic Conservation Strategy Objectives (ACSOs) at Two Scales within the Upper Tieton River Watershed

ACSO	4

Maintain and restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems. Water quality must remain in the range that maintains the biological, physical, and chemical integrity of the ecosystem, benefiting survival, growth, reproduction, and migration of individuals composing its aquatic and riparian communities.

T		
Geology and Soils	Watershed Resources	
Existing Conditions		
Sediment sources due to management appear to be limited within the watershed. Since most of the watershed is undisturbed, it is rated functioning adequately relative to sediment (USDA 1998b).	 None of the streams within the watershed have been designated as "water quality limited" by the Washington State Department of Ecology on the 1996 or 1998 303(d) lists (USDA 1998b). Temperatures in the tributaries of this watershed are believed to be meeting the state water quality standard of 61 degrees Fahrenheit for most of the summer months (USDA 1998b). Sediment sources due to management appear to be limited within the watershed, and since most of it is undisturbed, this watershed is rated functioning adequately relative to sediment (USDA 1998b). 	
Site Seele		

Site Scale

Analysis area: 450 acres

The Action Alternatives would result in increased sediment detachment at the site scale. Increased sediment detachment has the potential to impact water quality within streams at the site scale (refer to Section 3.3 – Watershed Resources). The use of BMPs and Mitigation Measures described in Tables 2.4-2 to 2.4-4, and summarized below, would reduce the potential sediment yield to streams at the site scale.

- Long-term sediment detachment increases would range from 0.0 percent under Alternative 2 to 0.8 percent under Alternative 9. Short-term sediment detachment would range from 0.0 percent under Alternative 2 to 12.8 percent under Alternative 9 (refer to Table 3.3-FEIS4).
- Ground disturbance would be minimized during project construction so that sediment delivery to streams and wetlands would be nominal (refer to Section 3.2 – Geology and Soils).
- No access corridors, staging areas, spoils piles, or other construction related materials would be placed in Riparian Reserves. Whenever feasible, potential impacts to Riparian Reserves would be minimized by bringing construction materials and equipment to the project site via and at the time of snowpack (refer to Table 2.4-2).

The Action Alternatives would result in potential impacts to water quality from increased sediment yield, pollutant runoff and increased water temperatures (refer to Section 3.3 – Watershed Resources). Impacts resulting from increased sediment would be as described in Geology and Soils. The use of BMPs and Mitigation Measures described in Tables 2.4-2 to 2.4-4 would reduce the likelihood of pollutant runoff from construction equipment to streams at the site scale. Impacts to stream temperature would occur from the removal of riparian canopy as described in Vegetation. Overall, impacts to water quality are not expected to be measurable at the site scale.

- Implementation of the Action Alternatives is not expected to contribute to the listing of any stream on the Department of Ecology's 303(d) list since there would be no new point sources of pollution and water quality impacts are projected to be nominal (refer to Section 3.3 Watershed Resources).
- Ground disturbance would be minimized during project construction so that sediment delivery to streams and wetlands would be nominal (refer to Section 3.2 Geology and Soils).
- All Action Alternatives minimize clearing and grading in Riparian Reserves by locating the

Compatibility Analysis of the Aquatic Conservation Strategy Objectives (ACSOs) at Two Scales within the Upper Tieton River Watershed

ACSO	4

be maintained at a minimum height of 3 feet in areas that include clearing prescriptions with no grading (refer to Table 2.4-1) to minimize sediment delivery and to help keep stream temperatures cool.

Maintain and restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems. Water quality must remain in the range that maintains the biological, physical, and chemical integrity of the ecosystem, benefiting survival, growth, reproduction, and migration of individuals composing its aquatic and riparian communities.

	· / · /	
v	, , ,	gration of individuals
composing its aqua	atic and riparian communities.	
Vegetation	Wildlife	Fisheries
nditions		
regetation can provide bring functions that ent yield to streams. It is are described in soils and Watershed the loss of canopy fect local stream where forested at provides shade to be en removed.	While water quality is an important component of wildlife habitat, the physical properties on which effects to wildlife would be measured are primarily described under Geology and Soils, Watershed Resources, and Vegetation.	While water quality is an important component of fish habitat, the physical properties on which effects to fish would be measured are primarily described under Geology and Soils, Watershed Resources, and Vegetation.
. 450 paras		l .
	While water quality is an important	While water quality is an important
streams associated on Alternatives could acrease in indirect cts to streams. Overall, in riparian canopy is to have a measurable eam temperature at the cover within Riparian would be reduced by of 0 percent under ve 2 to 8.6 percent ternative 9, with	component of wildlife habitat, the physical properties on which effects to wildlife would be measured are primarily described under Geology and Soils, Watershed Resources, and Vegetation.	component of fish habitat, the physical properties on which effects to fish would be measured are primarily described under Geology and Soils, Watershed Resources, and Vegetation.
	benefiting survival composing its aqual regetation and provide ring functions that ent yield to streams. It is are described in Soils and Watershed the loss of canopy feet local stream where forested at provides shade to een removed. It 450 acres of overstory riparian streams associated on Alternatives could acrease in indirect cets to streams. Overall, in riparian canopy is to have a measurable eam temperature at the cover within Riparian would be reduced by of 0 percent under ve 2 to 8.6 percent	while water quality is an important component of wildlife habitat, the physical properties on which effects to wildlife would be measured are primarily described under Geology and Soils, Watershed Resources, and Vegetation. While water quality is an important component of wildlife habitat, the physical properties on which effects to wildlife would be measured are primarily described under Geology and Soils, Watershed Resources, and Vegetation. While water quality is an important component of wildlife habitat, the physical properties on which effects to wildlife habitat, the physical properties on which effects to wildlife habitat, the physical properties on which effects to wildlife habitat, the physical properties on which effects to wildlife habitat, the physical properties on which effects to wildlife habitat, the physical properties on which effects to wildlife habitat, the physical properties on which effects to wildlife habitat, the physical properties on which effects to wildlife habitat, the physical properties on which effects to wildlife would be measured are primarily described under Geology and Soils, Watershed Resources, and Vegetation.

ACSO 4	Maintain and restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems. Water quality must remain in the range that maintains the biological, physical, and chemical integrity of the ecosystem, benefiting survival, growth, reproduction, and migration of individuals composing its aquatic and riparian communities.		
	Geology and Soils	Watershed Resources	
		 proposed design outside Riparian Reserves to the extent possible. Ski trail design is intended to parallel Riparian Reserves while minimizing disturbance in riparian areas. Through the implementation of a Stormwater Pollution Prevention Plan and the use of BMPs, no long-term changes in the pH, turbidity, and dissolved oxygen of streams at the site scale are expected. 	
Finding: Does Not Prevent Attainment of ACSO 4 Finding: Does Not Prevent Attainment of ACS			
5th Field Sca	ale		
Analysis area	a: Upper Tieton River Watershed (118,204 a	cres)\	
cumulative actions areas that are Furthermore, Riparian Res in sediment y Therefore, no	f the Action Alternatives, coupled with the ctions would not result in a measurable ediment detachment at the fifth field scale. It is would occur within small, localized a scattered throughout the entire watershed. It is a majority of the actions occur outside of erves and therefore are less likely to result wield to streams within the fifth field scale. It is effects to geology and soils at the fifth ected to measurably impact water quality.	The effects of the Action Alternatives, coupled with the cumulative actions, on Riparian Reserves range from approximately 322.01 acres (Alternative 2) to 342.31 acres (Alternative 9), which equates to approximately 1.80 percent to 1.92 percent of the 5th field Riparian Reserves, respectively (refer to Section 3.3.4). Cumulative effects to watershed resources would not result in any measurable changes to water quality at the 5th field scale. These actions are localized to small areas scattered throughout the entire 5th field. Sediment impacts to water quality would be as described under Geology and Soils.	
Finding: Me	ets ACSO 4	Finding: Meets ACSO 4	
Degree of in	npacts by alternative: 9>4>6>2=1	Degree of impacts by alternative: 9>4>6>2=1	

ACSO 4	Maintain and restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems. Water quality must remain in the range that maintains the biological, physical, and chemical integrity of the ecosystem, benefiting survival, growth, reproduction, and migration of individuals composing its aquatic and riparian communities.			
	Vegetation	Wildlife	Fisheries	
Finding: Do	oes Not Prevent	Finding: Does Not Prevent	Finding: Does Not Prevent	
	t of ACSO 4	Attainment of ACSO 4	Attainment of ACSO 4	
5th Field So		1 1/110 204		
	ea: Upper Tieton River W			
Action Alteractions rang the CEAA in to 0.35 percent Modified Al Section 3.5.4 effects occur. Reserves, and less of an effect they do not oppositely to Cumulative within Ripar localized to scattered thr. Therefore, in would result measurable at the 5th field.		While water quality is an important component of wildlife habitat, the physical properties on which effects to wildlife would be measured are primarily described under Geology and Soils, Watershed Resources, and Vegetation.	While water quality is an important component of fish habitat, the physical properties on which effects to fish would be measured are primarily described under Geology and Soils, Watershed Resources, and Vegetation.	
_	eets ACSO 4	Finding: Meets ACSO 4	Finding: Meets ACSO 4	
Degree of in 9>4>6>2=1	mpacts by alternative:	Degree of impacts by alternative: 9>4>6>2=1	Degree of impacts by alternative: 9>4>6>2=1	

Compatibility Analysis of the Aquatic Conservation Strategy Objectives (ACSOs) at Two Scales within the Upper Tieton River Watershed

ACSO	5

Maintain and restore the sediment regime in which the aquatic system evolved. Elements of the sediment regime include the timing, volume, rate, and character of sediment input, storage, and transport.

of seatment input, storage, and transport.			
Watershed Resources			
 Sediment sources due to management appear to be limited within the watershed. Since most of the watershed is undisturbed, it is rated functioning adequately relative to sediment (USDA 1998b). Streams within the headwater portions of the watershed are typically Rosgen Type A and B channels (SE Group 2004 and USDA 1998b). Characteristics of these stream types are primarily sediment transport channels and do not contain high quality fish habitat (USDA 1998b). 			

The Action Alternatives would result in increased sediment detachment at the site scale, resulting in potential impacts to the sediment regime at the site scale (refer to Section 3.3 – Watershed Resources). The use of BMPs and Mitigation Measures described in Tables 2.4-2 to 2.4-4 would reduce the likely sediment yield to streams. Therefore, impacts to sediment regime and are not expected to be measurable at the site scale.

- Long-term sediment detachment increase would range from 0.0 percent under Alternative 2 to 0.8 percent under Alternative 9. Short-term sediment detachment would range from 0.0 percent under Alternative 2 to 12.8 percent under Alternative 9 (refer to Table 3.3-FEIS4).
- Ground disturbance would be minimized during project construction so that sediment delivery to streams and wetlands would be nominal (refer to Section 3.2 Geology and Soils).
- No access corridors, staging areas, spoils piles, or other construction related materials would be placed in Riparian Reserves. Whenever feasible, potential impacts to Riparian Reserves would be minimized by bringing construction materials and equipment to the project site via and at the time of snowpack (refer to Table 2.4-2).
- Stabilization and revegetation of disturbed soils in accordance with the SWPPP would minimize sediment detachment and yield (refer to Tables 2.4-3 and 2.4-4).

As described in Geology and Soils, the WEPP model indicates that long-term sediment detachment would increase under the Action Alternatives. Increased sediment detachment has the potential to impact the sediment regime through increased yield to streams. However, the use of BMPs and Mitigation Measures would reduce actual sediment yield. Therefore, impacts to sediment regime are not expected to be measurable at the site scale.

- Ground disturbance would be minimized during project construction so that sediment delivery to streams and wetlands would be nominal (refer to Section 3.2 – Geology and Soils).
- Sediment impacts to streams and wetlands would be minimized through the implementation of the Mitigation Measures and Management Requirements in Tables 2.4-2 and 2.4-3 as well as the use of BMPs during construction activities.
- The Action Alternatives would not impact stream channel types at the site scale. They would continue to function primarily as sediment transport channels.

Finding: Does Not Prevent Attainment of ACSO 5

Finding: Does Not Prevent Attainment of ACSO 5

ACSO 5	Maintain and restore the sediment regime in which the aquatic system evolved. Elements of the sediment regime include the timing, volume, rate, and character of sediment input, storage, and transport.		
7	Vegetation	Wildlife	Fisheries
Existing Con	nditions		
sediment filte reduce sedim These impact	regetation can provide ering functions that ent yield to streams. as are described in Soils and Watershed	While changes in sediment regimes can influence the quality of wildlife habitat, the physical properties on which effects to wildlife would be measured are primarily described under Geology and Soils, Watershed Resources, and Vegetation.	Changes in the sediment regime can influence the quality of fish habitat through covering suitable spawning gravel and increasing turbidity. Sediment due to management appears to be limited within the watershed. Since most of the watershed is undisturbed, it is rated functioning adequately relative to sediment (USDA 1998b).
Site Scale			
Analysis area	: 450 acres		
reduce the see function of vertices clearing and gresserves. Vertices approximated Alternative 2 Alternative 9 15). Within Reseas, unwould be minimum maintain minimized areas that prescript	alternatives would diment filtering egetation through grading in Riparian getation removal in erves ranges from y 0.0 acres in to 20.3 acres in (refer to Table 3.3-tiparian Influence inderstory vegetation e maintained at a in height of 3 feet to sediment filtering and e sediment yield in the include clearing ions with no grading Table 2.4-1).	While changes in sediment regimes can influence the quality of wildlife habitat at the site scale, the physical properties on which effects to wildlife would be measured are primarily described under Geology and Soils, Watershed Resources, and Vegetation.	As described in Geology and Soils and Watershed Resources, changes to the sediment regime are not expected to be measurable at the site scale. Therefore, no measurable effects to the quality of fish habitat are expected at the site scale.
Finding: Me	ets ACSO 5	Finding: Does Not Prevent Attainment of ACSO 5	Finding: Does Not Prevent Attainment of ACSO 5

Compatibility Analysis of the Aquatic Conservation Strategy Objectives (ACSOs) at Two Scales within the Upper Tieton River Watershed

	at Two Scales within the Up	per Tieton River Watershed	
ACSO 5	Maintain and restore the sediment regime in which the aquatic system evolved. Elements of the sediment regime include the timing, volume, rate, and character of sediment input, storage, and transport.		
	Geology and Soils	Watershed Resources	
5th Field Sca	le		
Analysis area	: Upper Tieton River Watershed (118,204 a	ncres)	
Analysis area: Upper Tieton River Watershed (118,204 at The effects of the Action Alternatives, coupled with the cumulative actions would not result in a measurable increase in sediment detachment at the fifth field scale. These actions occur within small, localized areas that are scattered throughout the entire watershed. Furthermore, a majority of the actions occur outside of Riparian Reserves and therefore are less likely to result in sediment yield to streams within the fifth field scale. Therefore no effects to geology and soils at the fifth field are expected to measurably impact sediment regime.			
Finding: Me	ets ACSO 5	Finding: Meets ACSO 5	
Degree of im	pacts by alternative: 9>4>6>2=1	Degree of impacts by alternative: 9>4>6>2=1	
ACSO 6	aquatic, and wetland habitats and	lows sufficient to create and sustain riparian, I to retain patterns of sediment, nutrient, and tude, duration, and spatial distribution of protected	
Existing Con	ditions		
Decreased soil permeability and increases in impervious areas (e.g., facilities, parking lots, road network, timber harvest) have contributed to increased runoff within the watershed.		 Increased runoff has the potential to change the timing, magnitude and duration of peak, high and low flows. Less than 15 percent Equivalent Clearcut Area has been disturbed in the watershed, and unstable riparian areas are intact, so the watershed is rated to be functioning adequately (USDA 1998b). Due to the relatively low levels of harvest and 	

roading, hydrologic patterns at the watershed level have not been changed significantly as a result of forest management activities (USDA 1998b). Pavement and developed facilities result in increased surface flow (Wright et al., 1990).

Maintain and restore the sediment regime in which the aquatic system evolved.				
ACSO 5	y			
	character of sedim	ent input, storage, and transpor	rt.	
7	egetation ⁷	Wildlife	Fisheries	
5th Field Sca	le			
Analysis area:	Upper Tieton River Wa	tershed (118,204 acres)		
Action Alternactions ranges the CEAA in 20.35 percent of Modified Alternaction 3.5.4) effects occur of Reserves, and less of an efferegime as they close proximin Cumulative at Riparian Reservall areas that throughout the no impacts to expected to mean the Cean and the Cean area of the Cean and the Cean area of	vegetation from the atives and cumulative from 0.33 percent of Alternatives 2 and 6 to f the CEAA in rnative 4 (refer to . A majority of these outside of Riparian would therefore have ct on the sediment of do not occur within a cy to waterbodies. Setions occurring within rves are localized to at are scattered at 5th field. Therefore, vegetation are easurably affect me at the 5th field	While changes in sediment regimes can influence the quality of wildlife habitat at the 5th field scale, the physical properties on which effects to wildlife would be measured are primarily Geology and Soils, Watershed Resources, and Vegetation.	As described in Geology and Soils and Watershed Resources, changes to the sediment regime are not expected to be measurable at the 5th field scale. Therefore, no measurable effects to the quality of fish habitat are expected at the 5th field scale.	
scale. Finding: Mee	ets ACSO 5	Finding: Meets ACSO 5	Finding: Meets ACSO 5	
	pacts by alternative:	Degree of impacts by alternative: 9>4>6>2=1	Degree of impacts by alternative: 9>4>6>2=1	
ACSO 6 Maintain and restore in-stream flows sufficient to create and sustain riparian, aquatic, and wetland habitats and to retain patterns of sediment, nutrient, and wood routing. The timing, magnitude, duration, and spatial distribution of peak, high, and low flows must be protected				
Existing Con	ditions			
Existing Con				

Compatibility Analysis of the Aquatic Conservation Strategy Objectives (ACSOs) at Two Scales within the Upper Tieton River Watershed

ACSO	(

Maintain and restore in-stream flows sufficient to create and sustain riparian, aquatic, and wetland habitats and to retain patterns of sediment, nutrient, and

ACSO 6	aquatic, and wetland habitats and to retain patterns of sediment, nutrient, and wood routing. The timing, magnitude, duration, and spatial distribution of peak, high, and low flows must be protected		
	Geology and Soils	Watershed Resources	
Site Scale			
Analysis area	a: 450 acres		
surfaces and within the sit for Watershe under Alterna would includ increased run and grease as effect of increased described	ction Alternatives, additional impervious developed areas would increase runoff et scale. The effects would be as described d Resources. The proposed parking lot atives 6, 9 and Modified Alternative 4 le stormwater management to offset noff volume, and to capture sediment, oil associated with the surface runoff. The eased runoff on in-stream flows would be under Watershed Resources.	Under the Action Alternatives, in-stream flows would be affected at the site scale through the removal of vegetation (which may further reduce hydrologic maturity) and increases in impervious surfaces. As described in Section 3.3 – Watershed Resources, the increase in two-year peak flow ranges from 0.0 percen under Alternative 2 to 1.1 percent under Alternative 9. Similarly, the increase in seven-day low flow ranges from 0.0 percent under Alternative 2 to 4.6 percent under Alternative 9. • The changes in the timing, magnitude, duration, and spatial distribution of peak, high, and low flows due to implementation of the Action Alternatives would not be measurable at the mout of the Flow Model Analysis Area analyzed for this EIS (refer to Section 3.3.3.5 – Flow Regime). • Implementation of the Action Alternatives would not alter stream functionality or the hydrologic regime within the site scale (refer to Section 3.3 – Watershed Resources). • Through the implementation of Lift and Trail Construction Techniques listed in Table 2.4-1 and the use of BMPs, there would be a small reductior of the changes in the timing, magnitude, duration, and spatial distribution of peak, high, and low flows due to the minimization of clearing trees and vegetation at the site scale. Alternative 9 includes the highest impact to forest conditions with the removal of trees within mature forest (refer to Section 3.3 – Watershed Resources and Section 3.5 – Vegetation)	
	es Not Prevent Attainment of ACSO 6	Finding: Does Not Prevent Attainment of ACSO 6	
5th Field Sca			
	a: Upper Tieton River Watershed (118,204 a		
Alternatives, would not resthe fifth field	and soils effects of the Action coupled with the cumulative actions sult in a measurable increase in runoff at I scale. The effects of the Action coupled with the cumulative actions range	As described in Geology and Soils, the effects of the Action Alternatives, coupled with the cumulative actions, range from approximately 332.57 acres (Alternative 2) to 361.4 acres (Alternative 9), which equates to approximately 0.28 percent to 0.31 percent	

ACSO 6	aquatic, and wetlan	re in-stream flows sufficient to ad habitats and to retain pattern timing, magnitude, duration, a must be protected	ns of sediment, nutrient, and
	Vegetation	Wildlife	Fisheries
Site Scale			
Analysis are	ea: 450 acres		
on vegetatio	ne Action Alternatives on at the site scale would bed for Watershed	Effects of the Action Alternatives on wildlife at the site scale would be as described for Watershed Resources.	Effects of the Action Alternatives on fish at the site scale would be as described for Watershed Resources
Attainment 5th Field So Analysis are Effects of the on vegetation	ea: Upper Tieton River W ne Action Alternatives on at the 5th field scale described for	Finding: Does Not Prevent Attainment of ACSO 6 atershed (118,204 acres) Effects of the Action Alternatives on wildlife at the 5th field scale would be as described for Watershed Resources.	Finding: Does Not Prevent Attainment of ACSO 6 Effects of the Action Alternatives on fish at the 5th field scale would be as described for Geology and Soils and Watershed Resources.

Compatibility Analysis of the Aquatic Conservation Strategy Objectives (ACSOs) at Two Scales within the Upper Tieton River Watershed

ACSO	Ô

Maintain and restore in-stream flows sufficient to create and sustain riparian, aquatic, and wetland habitats and to retain patterns of sediment, nutrient, and wood routing. The timing, magnitude, duration, and spatial distribution of peak, high, and low flows must be protected

Geology and Soils	Watershed Resources
from approximately 332.57 acres (Alternative 2) to 361.4 acres (Alternative 9), which equates to approximately 0.28 percent to 0.31 percent of the 5th field scale, respectively (refer to Section 3.2.4). These actions occur within small, localized areas that are scattered throughout the entire watershed. Therefore no impacts to geology and soils would result in measurable effects to in-stream flows at the 5th field scale.	of the 5th field, respectively (refer to Section 3.2.4). The removal of vegetation and increased impervious surfaces associated with these actions would not result in any measurable changes to runoff at the 5th field scale. As described in Section 3.2 – Geology and Soils, these actions are localized to small areas scattered throughout the entire 5th field. Impacts to watershed resources would not result in measurable affects to instream flows at the 5 th field scale.
Finding: Meets ACSO 6	Finding: Meets ACSO 6
Degree of impacts by alternative: 9>4>6>2=1	Degree of impacts by alternative: 9>4>6>2=1

ACSO 7

Maintain and restore the timing, variability, and duration of floodplain inundation and water table elevation in meadows and wetlands

Existing Conditions

Decreased soil permeability and increases in impervious areas (e.g., facilities, parking lots, road network, timber harvest) have contributed to increased runoff, potentially resulting in changes to water levels and floodplain inundation within the watershed.

- It is estimated that less than 15 percent Equivalent Clearcut Area has been disturbed in the watershed, and unstable riparian areas are intact, so the watershed is rated to be functioning adequately (USDA 1998b).
- Due to the relatively low levels of harvest and roading, hydrologic patterns at the watershed level have not been changed significantly as a result of forest management activities (USDA 1998b).
- The majority of the watershed is rated as functioning adequately in regard to floodplain connectivity (USDA 1998b).

Site Scale

Analysis area: 450 acres

Under the Action Alternatives, additional impervious surfaces and developed areas would increase runoff, but are not expected to result in measurable changes to water levels or floodplain inundation at the site scale. The effects would be as described for Watershed Resources.

Under the Action Alternatives, water levels in streams, wetlands, and floodplains would be affected at the site scale through the removal of vegetation (which may further reduce hydrologic maturity) and increases in impervious surfaces.

At the site scale, water levels of streams and wetlands are strongly influenced by groundwater sources (refer to Section 3.3 – Watershed Resources). The groundwater influence acts to moderate water levels. As described in Section 3.3 – Watershed Resources, streams within the site

ACSO 6	Maintain and restore in-stream flows sufficient to create and sustain riparian, aquatic, and wetland habitats and to retain patterns of sediment, nutrient, and wood routing. The timing, magnitude, duration, and spatial distribution of peak, high, and low flows must be protected		
	Vegetation	Wildlife	Fisheries
Finding: M	leets ACSO 6	Finding: Meets ACSO 6	Finding: Meets ACSO 6
Degree of impacts by alternative: 9>4>6>2=1		Degree of impacts by alternative: 9>4>6>2=1	Degree of impacts by alternative: 9>4>6>2=1
ACSO 7 Existing Co	inundation and wat	re the timing, variability, and du er table elevation in meadows a	
A minor amount of canopy alteration has occurred at the site scale, but not at a level which could measurably affect floodplain inundation (USDA 1998b).		While changes in water levels and floodplain inundation can influence the quality of wildlife habitat, the physical properties on which effects to wildlife would be measured are primarily described under Watershed Resources.	While changes in water levels and floodplain inundation can influence the quality of fish habitat, the physical properties on which effects to fish would be measured are primarily described under Watershed Resources.
Site Scale	450		
	ea: 450 acres	Effect of the Aution Alternation	Effects of the Action Alternatives
Effects of the Action Alternatives on vegetation at the site scale would be as described for Watershed Resources.		on wildlife at the site scale would be as described for Watershed	

ACSO 7	7 Maintain and restore the timing, variability, and duration of floodplain inundation and water table elevation in meadows and wetlands		
	Geology and Soils	Watershed Resources	
		scale are narrow, deeply incised channels and therefore have very limited floodplain development. • The changes in water levels due to flow regime alterations from the implementation of the Action Alternatives would not be measurable at the site scale (refer to Section 3.3.3.5 – Flow Regime). • Implementation of the Action Alternatives would not alter floodplain inundation at the site scale (refer to Section 3.3 – Watershed Resources). • Alternative 9 includes the highest impact to forest conditions at the site scale. Through the implementation of Lift and Trail Construction Techniques listed in Table 2.4-1 and the use of BMPs, there would be a reduction of the changes to floodplain inundation due to the minimization of clearing trees and vegetation at the site scale (refer to Section 3.3 – Watershed and 3.5 – Vegetation).	
Finding: Med	ets ACSO 7	Finding: Meets ACSO 7	
5th Field Sca			
-	: Upper Tieton River Watershed (118,204 a		
Alternatives, would not res or floodplain geology and s coupled with approximately acres (Alterna 0.28 percent t respectively (soccur within s throughout the to geology and sould be s	and soils effects of the Action coupled with the cumulative actions, ult in measurable changes to water levels inundation at the fifth field scale. The soils effects of the Action Alternatives the cumulative actions range from y 332.57 acres (Alternative 2) to 361.4 ative 9), which equates to approximately to 0.31 percent of the 5th field scale, refer to Section 3.2.4). These actions small, localized areas that are scattered e entire watershed. Therefore no effects d soils are expected to result in ffects to water levels or floodplains at the contract of the scale of the	As described in Geology and Soils, the effects of the Action Alternatives, coupled with the cumulative actions, range from approximately 332.57 acres (Alternative 2) to 361.4 acres (Alternative 9), which equates to approximately 0.28 percent to 0.31 percent of the 5th field, respectively (refer to Section 3.2.4). The removal of vegetation and increased impervious surfaces associated with these actions would not result in any measurable changes to water levels or floodplain inundation at the 5th field scale. As described in Section 3.2 – Geology and Soils, these actions are localized to small areas scattered throughout the entire 5th field.	
Finding: Med	ets ACSO 7	Finding: Meets ACSO 7	
Degree of im	pacts by alternative: 9>4>6>2=1	Degree of impacts by alternative: 9>4>6>2=1	

ACSO 7	ACSO 7 Maintain and restore the timing, variability, and duration of floodplain inundation and water table elevation in meadows and wetlands		
Vegetation		Wildlife	Fisheries
Finding: Me	ets ACSO 7	Finding: Meets ACSO 7	Finding: Meets ACSO 7
5th Field Sca			
Analysis area	: Upper Tieton River W	atershed (118,204 acres)	
Effects of the	Action Alternatives at the 5th field scale described for	Effects of the Action Alternatives on wildlife at the 5th field scale would be as described for Watershed Resources.	Effects of the Action Alternatives on fish at the 5th field scale would be as described for Geology and Soils and Watershed Resources.
Finding: Me		Finding: Meet s ACSO 7	Finding: Meets ACSO 7
Degree of im 9>4>6>2=1	pacts by alternative:	Degree of impacts by alternative: 9>4>6>2=1	Degree of impacts by alternative: 9>4>6>2=1

ACSO 8	communities in riparian zones and winter thermal regulation, nutrien	omposition and structural diversity of plant diversity of plant wetlands to provide adequate summer and at filtering, appropriate rates of surface erosion, ion and to supply amounts and distributions of sysical complexity and stability.
	Geology and Soils	Watershed Resources
Existing Get Existing get under Vege	ology and soils conditions are as described	 The Riparian Reserves in the majority of the watershed are properly functioning because very little management activity has occurred in the riparian areas (USDA 1998b). Due to the relatively low levels of harvest and roading, plant community composition at the watershed scale has not been changed significantly as a result of forest management activities (USDA 1998b). Risks to plant community composition, structure and function include timber harvest, the construction of new roads, dispersed/developed recreation, and catastrophic fire (USDA 1998b). The North Fork Tieton River has had little riparian timber harvest or other management and is rated functioning adequately relative to LWD (USDA 1998b).
Site Scale		
	ea: 450 acres geology and soils are as described under	Clearing in Riparian Reserves associated with the Action Alternatives would affect plant community composition, structure and function. • The clearing and grading in Riparian Reserves range from approximately 0.0 acres in Alternative 2 to 20.3 acres in Alternative 9 (refer to Table 3.3-15). These impacts would affect riparian community composition, structure and function. • Reduction in canopy cover within Riparian Reserves under the Action Alternatives ranges from 0.0 percent under Alternative 2 to 8.6 percent under Alternative 9, with canopy cover remaining at approximately 49.5 to 40.9 percent, respectively (refer to Table 3.3-15).

ACSO 8	Maintain and restore the species composition and structural diversity of plant communities in riparian zones and wetlands to provide adequate summer and winter thermal regulation, nutrient filtering, appropriate rates of surface erosion, bank erosion, and channel migration and to supply amounts and distributions of large wood sufficient to sustain physical complexity and stability.		
	Vegetation	Wildlife	Fisheries
watersh changed compositions function of the Rijmajorit properling very lith has occurred areas (U.S.). The North has had harvest and is radequal.	pment within the ned has not significantly d plant community sition, structure or	Existing wildlife conditions are as described under Vegetation.	Existing fisheries and aquatic habitat conditions are as described under Watershed Resources.
Site Scale			
Under the A vegetation r developmer facilities we community in Riparian scale. • Remove associal activities amount condition Reserved in Riparian repairs and reserved in Riparian reserved in Ripari	ea: 450 acres Action Alternatives, emoved for the at of additional ski area ould affect plant structure and function Reserves at the site al of vegetation ted with construction es would increase the of non-forested ons within Riparian es. Vegetation removal rian Reserves ranges oproximately 0 acres in	The effects to the composition, structure and function of plant communities utilized by riparian-dependent species are as described under Vegetation.	As described in Watershed Resources, riparian community composition, structure and function would be impacted by clearing and grading associated with the Action Alternatives. Construction of the four bridges over perennial streams in Alternative 9 would result in impacts to streambank function. BMPs and Mitigation Measures listed in Tables 2.4-2 through 2.4-4 would minimize the impacts to streambank function and riparian communities as described under Watershed Resources.

Compatibility Analysis of the Aquatic Conservation Strategy Objectives (ACSOs) at Two Scales within the Upper Tieton River Watershed

Maintain and restore the species composition and structural diversity of plant

ACSO 8	communities in riparian zones and wetlands to provide adequate summer and winter thermal regulation, nutrient filtering, appropriate rates of surface erosion, bank erosion, and channel migration and to supply amounts and distributions of large wood sufficient to sustain physical complexity and stability.	
Geology and Soils		Watershed Resources
		 All Action Alternatives minimize clearing and grading in Riparian Reserves by locating the proposed design outside Riparian Reserves to the extent possible. Ski trail design is intended to parallel Riparian Reserves while minimizing disturbance in riparian areas. The Action Alternatives would cause a slight reduction in the amount of LWD within Riparian Reserves due to the removal of trees for ski facility construction. Alternatives 6 and 9 would include development of a 2.5-acre parking lot in the Upper Tieton River watershed, which would eliminate riparian function in approximately 1.9 acres of Riparian Reserves (refer to Section 3.3.3.3). Under Modified Alternative 4, the 7-acre parking lot would eliminate riparian function from approximately 2.1 acres of Riparian Reserves (refer to Section 3.3.3.3). Construction prescriptions and Mitigation Measures in Table 2.4-2 include lop and scatter requirements, with no removal of woody material from cleared areas. Wood would also be placed in stream channels to enhance channel complexity and reduce channel erosion. The potential direct impacts to wetlands would range from approximately 0.0 acres in Alternative 2, Modified Alternative 4, and Alternative 6, and 0.03 acre in Alternative 9 (refer to Table 3.3-13). These impacts would be avoided through implementation of Mitigation Measures in Table 2.4-2 and the use of BMPs as well as field fitting the individual construction projects. The hydrologic maturity within the White Pass Study Area may be reduced by removal of vegetation under the Action Alternatives. However, the majority of canopy removal would take place outside of Riparian Reserves. The hydrologic maturity of the watershed would not be measurably affected at the 5th field scale.
Finding: Do	oes Not Prevent Attainment of ACSO 8	Finding: Does Not Prevent Attainment of ACSO 8

Compatibility Analysis of the Aquatic Conservation Strategy Objectives (ACSOs) at Two Scales within the Upper Tieton River Watershed

Maintain and restore the species composition and structural diversity of plant

ACSO 8 community winter the bank eros	ies in riparian zone rmal regulation, ni on, and channel m	es and wetlands to prov utrient filtering, appro	vide adequate summer and priate rates of surface erosion, amounts and distributions of and stability.
Vegetation		Wildlife	Fisheries
Alternative 2 to 20.3 Alternative 9 (refer to 15). • Alternative 9 would a greatest amount of from of dense forests of all Alternatives. • Reduction in canopy within Riparian Resethe Action Alternative from 0.0 percent under Alternative 2 to 8.6 punder Alternative 9, cover remaining at approximately 49.5 to percent, respectively Table 3.3-15). • The Action Alternative and the serves due to the retrees for ski facility of Alternatives 6 and 9 include development acre parking lot, whice eliminate riparian fur approximately 1.9 ac Riparian Reserves (resultantive 4, the 7-allot would eliminate rifunction from approximates of Riparian Reserves of Riparia	esult in the agmentation Action cover eves under es ranges er ercent with canopy of 40.9 (refer to eves would on in the in Riparian emoval of construction. would of a 2.5-h would ction in res of fer to Modified ere parking parian imately 2.1 erves (refer ent ground even ground eve		
Finding: Does Not Prevo Attainment of ACSO 8		Does Not Prevent ent of ACSO 8	Finding: Does Not Prevent Attainment of ACSO 8

ACSO 8	Maintain and restore the species composition and structural diversity of plant communities in riparian zones and wetlands to provide adequate summer and winter thermal regulation, nutrient filtering, appropriate rates of surface erosion, bank erosion, and channel migration and to supply amounts and distributions of large wood sufficient to sustain physical complexity and stability.			
	Geology and Soils	Watershed Resources		
5th Field S	cale			
Analysis area: Upper Tieton River Watershed (118,204 acres)				
Geology and soils impacts at the 5th field are as described under Vegetation.		The effects of the Action Alternatives, coupled with the cumulative actions, on Riparian Reserves range from approximately 322.01 acres (Alternative 2) to 342.31 acres (Alternative 9), which equates to approximately 1.80 percent to 1.92 percent of the 5th field Riparian Reserves, respectively (refer to Section 3.3.4). As described in Section 3.3 – Watershed Resources, these actions are localized to small areas scattered throughout the entire 5th field. Effects to watershed resources would not result in any measurable changes to the composition, structure and function of riparian plant communities at the 5th field scale.		
Finding: M	Ieets ACSO 8	Finding: Meets ACSO 8		
Degree of i	mpacts by alternative: 9>4>6>2=1	Degree of impacts by alternative: 9>4>6>2=1		
ACSO 9 Maintain and restore habitat to support well-distributed populations of native plant, invertebrate, and vertebrate riparian-dependent species.				
• Previou	onditions us developments (timber harvest, ski area)	The disturbance regime in this watershed is		
 Previous developments (timber harvest, ski area) have altered habitat characteristics through road construction and tree removal. Risks to Riparian Reserves include timber harvest, the construction of new roads, dispersed/developed recreation, low LWD recruitment potential, potential mass wasting, windthrow, and catastrophic fire (USDA 1998b). 		functioning adequately because much of the watershed is within Wilderness. Timber harvest has been minimal so it has not altered the disturbance regime (USDA 1998b). • Due to the relatively low levels of harvest and roading, hydrologic patterns at the watershed level have not been changed significantly as a result of forest management activities (USDA 1998b). • It is estimated that less than 15 percent Equivalent Clearcut Area has been disturbed in the watershed, and unstable riparian areas are intact, so the watershed is rated to be functioning adequately (USDA 1998b).		

ACSO 8	Maintain and restore the species composition and structural diversity of plant communities in riparian zones and wetlands to provide adequate summer and winter thermal regulation, nutrient filtering, appropriate rates of surface erosion, bank erosion, and channel migration and to supply amounts and distributions of large wood sufficient to sustain physical complexity and stability.		
	Vegetation	Wildlife	Fisheries
5th Field S	cale		
	ea: Upper Tieton River W		
Alternatives ranges from CEAA in A 0.35 percen Modified A Section 3.5. effects occur Reserves, and no effect on communitie occurring ware localized scattered that Therefore, I would result to the comp function of	ion effects of the Action is and cumulative actions a 0.33 percent of the lternatives 2 and 6 to at of the CEAA in lternative 4 (refer to 4). A majority of these are outside of Riparian and would therefore have a riparian plant as. Cumulative actions within Riparian Reserves d to small areas that are roughout the 5th field. The impacts to vegetation at in measurable impacts osition, structure and riparian plant at the 5th field scale.	The wildlife effects to the composition, structure and function of plant communities utilized by riparian-dependent species are as described under Vegetation.	As described in Watershed Resources, no measurable impacts to the composition, structure and function of riparian plant communities at the 5th field scale are expected.
Finding: M	leets ACSO 8	Finding: Meets ACSO 8	Finding: Meets ACSO 8
Degree of i 9>4>6>2=1	mpacts by alternative:	Degree of impacts by alternative: 9>4>6>2=1	Degree of impacts by alternative: 9>4>6>2=1
Upper contrib cover, a mosaic commu areas th vegetat It is est percent Area ha watersh	plant, invertebrate,	The physical properties on which impacts influencing the distribution of invertebrate and vertebrate riparian dependent species would be measured are primarily watershed resources and vegetation. Refer to Watershed Resources and Vegetation.	1 1

at Two Scales within the Opper Tieton Kiver watershed			
ACSO 9 Maintain and restore habitat to support well-distributed populations of native plant, invertebrate, and vertebrate riparian-dependent species.			
Geology and Soils	Watershed Resources		
	 Risks to Riparian Reserves include timber harvest, the construction of new roads, dispersed/developed recreation, low LWD recruitment potential, potential mass wasting, windthrow, and catastrophic fire (USDA 1998b). Most streams are considered to be functioning adequately for the channel type with deep pools within geomorphic constraints (USDA 1998b). The streambank conditions of the North Fork Tieton River is rated functioning adequately (USDA 1998b). Only 2 of the 37 sub-drainages analyzed have a road density greater than 3.0 miles/mile² (USDA 1998b). 		
Site Scale			
Analysis area: 450 acres			
 Implementation of the Action Alternatives would increase the loss of soil productivity within the site scale. The geology and soils impacts would not result in measurable changes to riparian habitat at the site scale. Under all Action Alternatives, the total acreage of detrimental soil conditions would not exceed 20 percent within the site scale (refer to Table 3.2-3). Total soil impacts as a result of clearing and grading at the site scale ranges from approximately 18.40 acres under Alternative 2 to 47.23 acres in Alternative 9 (refer to Table 3.2-8). Under all Action Alternatives, there would be no new roads proposed in the watershed at the site scale, so there would be no change to the road density (refer to Table 3.3-11). 	Clearing and grading in Riparian Reserves, road density and stream crossings associated with the Action Alternatives would affect the site scale. Impacts to watershed resources are not expected to have a measurable impact on riparian habitat at the site scale. • The clearing and grading in Riparian Reserves range from approximately 0 acres in Alternative 2 to 20.3 acres in Alternative 9 (refer to Table 3.3-15). • Under all Action Alternatives, there would be no new roads proposed in the watershed at the site scale, so there would be no change to the road density (refer to Table 3.3-11). • Under Alternative 9, impacts to aquatic habitat would result from four new permanent bridge crossings on perennial streams within the Upper Tieton watershed as a result of ski trail construction (refer to Table 2.3.1-2, Table 3.3-11 and Figure 3-17). • Under all Action Alternatives, there would be no direct impacts to stream channels or aquatic habitat. For all Action Alternatives there could be a slight change to the timing, duration, or magnitude of low flow and peak flow conditions due to land cover alterations from implementation of the Action Alternatives.		

A	Maintain and restore habitat to support well-distributed populations of native plant, invertebrate, and vertebrate riparian-dependent species.		
Vegetation	Wildlife	Fisheries	
watershed is rated to be functioning adequately (USDA 1998b).			
Site Scale			
Analysis area: 450 acres			
 The removal of vegetation communities associated with the Action Alternatives would not be measurable at the site scale (refer to Section 3.5). The reduction in canopy cover within Riparian Reserves associated with the Action Alternatives would not measurably impact the aquatic habitat at the site scale. The following details these effects at the site scale: The removal of vegetation communities at the site scale would occur predominately in a mixed conifer community with Medium tree – Multi-story – Closed Canopy forest structure. Removal of mixed conifer communities with old growth characteristics range from 0 acres under Alternative 2 to 24.2 acres under Alternative 9 (refer to Appendix G). Under Alternative 9, removal of the mixed conifer community with Medium tree – Multi-story – Closed Canopy forest structure equates to approximately 5.4% 	Wildlife impacts at the site scale would be related to the effects described in Watershed Resources and Vegetation. Populations of riparian dependent wildlife would be temporarily displaced during construction activities (refer to Section 3.6 – Wildlife).	Fisheries impacts would be related to the effects described in Geology and Soils, Vegetation and Watershed Resources. Construction of a parking lot in Alternatives 6, 9, and Modified Alternative 4 would impact Riparian Reserves, potentially increasing flow to riparian habitat due to decreased soil permeability. Construction of four bridge crossings on perennial streams in Alternative 9 would impact aquatic habitat. Under all Action Alternatives, there would be no direct impacts to stream channels or riparian habitat. For all Action Alternatives there could be a slight change to the timing, duration, or magnitude of low flow and peak flow conditions due to land cover alterations from implementation of the Action Alternatives. BMPs and Mitigation Measures listed in Tables 2.4-2 through 2.4-4 would minimize the impacts to riparian habitat.	

ACSO 9	ACSO 9 Maintain and restore habitat to support well-distributed populations of native plant, invertebrate, and vertebrate riparian-dependent species.		
Geology and Soils		Watershed Resources	
Finding: Do	oes not prevent attainment of ACSO 9	Finding: Does not prevent attainment of ACSO 9	
5th Field Se	_	Finding. Does not prevent attainment of ACSO 7	
	ea: Upper Tieton River Watershed (118,204 ac	cres)	
The effects cumulative acres under Alternative percent to 0 respectively describes th not measura scale.	of the Action Alternatives, coupled with the actions, range from approximately 332.57 Alternative 2 to 361.4 acres under 9, which equates to approximately 0.28 .31 percent of the 5th field scale, (refer to Section 3.2.4). Section 3.2 at the effects to Geology and Soils would ably affect riparian habitat at the 5th Field	The effects of the Action Alternatives, coupled with the cumulative actions, range from approximately 322.01 acres under Alternative 2 to 342.31 acres under Alternative 9, which equates to approximately 1.80 percent to 1.92 percent of the 5th field scale, respectively (refer to Section 3.3.4). Cumulative actions would not result in any measurable changes in the timing, duration, or magnitude of low flow and peak flow events at the fifth field scale for the Upper Tieton River watershed (refer to Section 3.3.3.5 – Flow Regime). Therefore, no measurable effects to riparian habitat are expected (refer to Section 3.3 – Watershed Resources).	
	eets ACSO 9	Finding: Meets ACSO 9	
Degree of in	mpacts by alternative: 9>4>6>2=1	Degree of impacts by alternative: 9>4>6>2=1	

ACSO 9 Maintain and restore habitat to support well-distributed populations of native plant, invertebrate, and vertebrate riparian-dependent species.			
Vegetation		Wildlife	Fisheries
of the White Pass Stude within the Upper Tiet Watershed, the most of alternative (refer to A G). However, plant communities would neliminated at the site of the Reduction in canopy of within Riparian Reser the Action Alternative from 0.0 percent under Alternative 2 to 8.6 percent under Alternative 9, we canopy cover remaining approximately 49.5 to percent, respectively (Table 3.3-15). Finding: Does not prevent of ACSO 8.	on River of any ppendix ot be scale. cover eves under es ranges er ercent with ng at 0 40.9 (refer to	nding: Does not prevent	Finding: Does not prevent
attainment of ACSO 9 5th Field Scale	att	ainment of ACSO 9	attainment of ACSO 9
Analysis area: Upper Tieto	on River Waters	shed (118.204 acres)	
The mixed conifer vegetat communities with Medium Multi-story – Closed Cand structure removed under Alternative 9 equates to approximately 0.02% of the Upper Tieton River Water most of any alternative (read Appendix G). As discussed Section 3.3 and 3.5, the veint material would not measur affect riparian habitat at the field scale.	ion Win tree — sca oppy forest description act of the scale of the search of the searc	aldlife impacts at the 5th field ale would be related to the effects scribed in Vegetation. As scribed in Section 3.6, impacts to arian-dependent species would cur from short-term noise ruptions, increased human ivity, and the loss of habitat ulting from the effects of the tion Alternatives and cumulative ions. These effects are localized small areas scattered throughout entire 5th field. Therefore, idlife impacts would not result in y measurable effects to riparian-pendent species at the 5 th field.	The effects of the Action Alternatives, coupled with the cumulative actions, range from approximately 322.01 acres under Alternative 2 to 342.31 acres under Alternative 9, which equates to approximately 1.80 percent to 1.92 percent of the 5th field scale, respectively (refer to Section 3.4.4). Cumulative actions would not result in any measurable changes in the timing, duration, or magnitude of low flow and peak flow events at the fifth field scale for the Upper Tieton River watershed (refer to Section 3.3.3.5 – Flow Regime). Therefore, fisheries impacts are not expected to measurably effect riparian habitat at the 5 th field scale (refer to Section 3.3 – Watershed Resources).
Finding: Meets ACSO 9		nding: Meets ACSO 9	Finding: Meets ACSO 9
Degree of impacts by alto 9>4>6>2=1		gree of impacts by alternative: 4>6>2=1	Degree of impacts by alternative: 9>4>6>2=1

Table 3.7-1: Evaluation of Watershed Condition and Project Effects – Upper Clear Fork Cowlitz Watershed

Existing Condition	Effect of Proposed Action	Design and Assessment Considerations		
Watershed Issues:				
 Clearing and Grading in Riparian Reserves/ Riparian Reserve Functionality Current risks to Riparian Reserves include some timber harvest, the construction of any new roads, dispersed/developed recreation, potential mass wasting, windthrow, and catastrophic fire (USDA 1998a). The Riparian Reserves in the majority of the watershed are functioning properly because very little management activity has occurred in the riparian areas (USDA 1998a). Salvage logging activities have been reported to reduce the number of standing large trees and number of in-stream logs, thereby reducing the LWD recruitment potential (USDA 1998a). LWD is very abundant within the Lower Clear Fork Cowlitz subwatershed, which has more than 80 pieces per mile (USDA 1998a). 	 There are approximately 395.3 acres of Riparian Reserves in the Upper Clear Fork Cowlitz watershed portion of the White Pass Study Area (refer to Table 3.3-5). The clearing and grading in Riparian Reserves range from approximately 4.1 acres in Alternative 9 to approximately 22.2 acres in Modified Alternative 4 (refer to Table 3.3-15). The Action Alternatives would result in approximately 1.0 to 5.6 percent reduction in canopy cover within Riparian Reserves, with canopy cover remaining approximately 40.9 to 45.5 percent (refer to Table 3.3-15). Populations of riparian dependent wildlife would be temporarily displaced during construction (refer to Section 3.6 – Wildlife). The Action Alternatives would cause a slight reduction in the amount of LWD within Riparian Reserves due to the removal of trees for ski facility construction. Alternatives 2, 6 and Modified Alternative 4 would include development of lifts and trails in Hogback and/or Pigtail Basins, which are dominated by subalpine parkland vegetation. This vegetation type is comprised of comparatively smaller size classes than other plant communities in the White Pass Study Area, and is therefore less capable of providing LWD. Alternative 9 would remove approximately 4 acres of forest capable of providing LWD (refer to Table 3.3-15). 	 All Action Alternatives minimize clearing and grading in Riparian Reserves by locating the proposed design outside Riparian Reserves to the extent possible. Ski trail design is intended to parallel Riparian Reserves while minimizing disturbance in riparian areas. Construction prescriptions and Mitigation Measures in Table 2.4-2 include lop and scatter, with no removal of woody material from cleared areas. Wood would also be placed in stream channels to enhance channel complexity and reduce channel erosion. No access corridors, staging areas, spoils piles, or other construction related materials would be placed in Riparian Reserves. Whenever feasible, potential impacts to Riparian Reserves would be minimized by bringing construction equipment and materials to the project site over snow (refer to Table 2.4-2). 		

Table 3.7-1: Evaluation of Watershed Condition and Project Effects – Upper Clear Fork Cowlitz Watershed

Existing Condition	Effect of Proposed Action	Design and Assessment Considerations
 Impacts to Riparian Habitat of Streams and Wetlands The Lower Clear Fork Cowlitz subwatershed has 63.2 miles of streams (USDA 1998a). The Lower Clear Fork Cowlitz subwatershed displays evidence of historic channel widening that is attributed to past timber management and road construction projects (USDA 1998a). Millridge Creek is a sensitive stream to additional disturbances as a result of several slides originating from US 12 that have delivered large quantities of sediment. Additional sediment inputs will likely further affect Millridge Creek. Fifty-five percent of Millridge Creek has a Pfankuch stability rating of Fair and 45 percent has a rating of Poor (USDA 1998a). Stream channels within the subwatershed are expected to become more stable as upslope vegetative recovery proceeds. Such changes will be associated with riparian stand structure improvements and reduction of sediment routing to stream channels (USDA 1998a). 	 The potential direct impacts to wetlands would range from approximately 0.04 acre in Alternative 9, 0.09 acre in Alternative 2, 0.11 acre in Alternative 6, and approximately 0.12 acre in Modified Alternative 4 (refer to Table 3.3-13). These impacts would be avoided through implementation of Mitigation Measures in Table 2.4-2 and the use of BMPs. Streams may directly be impacted through the construction of culverts and bridges. However, these stream crossings would be located primarily on first order, ephemeral and intermittent streams within the Upper Clear Fork Cowlitz watershed portion of the White Pass Study Area. Implementation of the Action Alternatives would not alter stream functionality within the White Pass Study Area (refer to Section 3.3 – Watershed Resources). There would be no change to the floodplain connectivity within the watershed as a result of the Action Alternatives (refer to Section 3.3 – Watershed Resources). Millridge Creek is a perennial stream, the WEPP analysis (refer to Section 3.3 – Watershed Resources). Millridge Creek is a perennial stream, the WEPP analysis (refer to Section 3.3 – Watershed Resources). Millridge Creek is a perennial stream, the WEPP analysis (refer to Section 3.3 – Watershed Resources and Appendix L) details approximate soil detachment as a result of each Action Alternative within the Upper Clear Fork Cowlitz Watershed. As described, short-term (year of construction) sediment detachment generated within the White Pass Study Area for project activities would increase within a range from approximately 9 percent under Alternative 4 for the Upper Clear Fork Cowlitz Watershed. Within the 	 All Action Alternatives would avoid direct impacts to streams and wetlands where possible through the implementation of the Mitigation Measures and Management Requirements listed in Tables 2.4-2 and 2.4-3, the use of BMPs, and field fitting individual construction projects. Utilities would cross streams by using aerial crossings (at ground elevation, refer to Chapter 2), and wetland impacts from utility trenching would be avoided altogether. Vegetation would be maintained at a height of 3 feet above ground to prevent ground disturbance and to maintain shading and wildlife habitat. Wetland impacts would be avoided by maintaining the existing contours and drainage patterns in wetlands that intersect proposed ski trails. Vegetation removal in wetlands would be conducted by hand/chainsaw. No heavy equipment would operate in wetlands. The tree removal prescription for each chairlift and its corresponding ski trails is outlined in Table 2.4-1. All construction techniques involve design components that are intended to avoid/minimize ground disturbance. These include over-the-snow access and construction and the use of helicopters. Sediment impacts to streams and wetlands would be minimized through the implementation of the Mitigation Measures in Table 2.4-2 and the use of BMPs during construction activities.

Table 3.7-1: Evaluation of Watershed Condition and Project Effects – Upper Clear Fork Cowlitz Watershed

Existing Condition	Effect of Proposed Action	Design and Assessment Considerations
Water Quality and Sediment Transport	Upper Clear Fork Cowlitz Watershed, long-term (two to five years following construction), sediment detachment is expected to increase from approximately 3 percent under Alternative 9 to 10 percent under Modified Alternative 4 (Additional information on the results of the WEPP model can be found in Appendix L – WEPP Technical Report). • Alternative 2, Modified Alternative 4 and	Sediment impacts to streams and wetlands would
 Within the 5th field watershed, there are approximately 39.8 miles of road inside the existing riparian corridors (USDA 1998a). The road density of the Lower Clear Fork Cowlitz subwatershed that White Pass lies within is approximately 1.7 miles/mile² and the road density in Riparian Reserves is 1.5 miles/mile² (USDA 1998a). The Lower Clear Fork Cowlitz subwatershed has 79 road crossings and 1.25 road crossings per stream mile (USDA 1998a). The Lower Clear Fork Cowlitz subwatershed has been identified as having high impacts to stream channels from bedload movement; most of this bedload is sediment associated with the Wilderness areas and to a much lesser degree, past management activities such as road construction and timber harvest. Because of the heavy sediment movement, enough sediment deposition has occurred to cause problems with stream channel migration (USDA 1998a). Sediment introduced into streams within the watershed from management related events are slightly above background levels but well within range of natural variability (USDA 1998a). 	Alternative 9 include no new roads, thereby maintaining the existing road density of 1.5 miles/mile² in the White Pass Study Area. Alternative 6 includes the development of approximately 0.25 mile of new road in a Tier 2 Key Watershed/IRA, which would increase the road density to approximately 1.7 miles/mile² in the White Pass Study Area (refer to Table 3.3-10). Alternative 6 would require the decommissioning and obliteration of approximately 0.6 mile of road in the watershed to avoid a net increase in road mileage in the watershed. Under the Action Alternatives, there would be no change to the road density at the watershed scale. • Ground disturbance would be minimized during project construction so that sediment delivery to streams and wetlands would be nominal (refer to Section 3.2 – Geology and Soils). • Implementation of the Action Alternatives is not expected to contribute to the listing of any stream on the Department of Ecology's 303(d) list since there would be no new point sources of pollution and water quality impacts are projected to be nominal (refer to Section 3.3 – Watershed Resources).	be minimized through the implementation of the Mitigation Measures in Table 2.4-2 and the use of BMPs during construction activities. • Through implementation of a Stormwater Pollution Prevention Plan and the use of BMPs, no long-term changes in the pH, turbidity, and dissolved oxygen of streams within the White Pass Study Area and the watershed due to the Proposed Action are expected. • The tree removal prescription for each chairlift and its corresponding ski trails is outlined in Table 2.4-1. All construction techniques involve design components that are intended to avoid/minimize ground disturbance. These include over-the-snow access and construction and the use of helicopters.

Table 3.7-1: Evaluation of Watershed Condition and Project Effects – Upper Clear Fork Cowlitz Watershed

Existing Condition	Effect of Proposed Action	Design and Assessment Considerations
 Currently all streams are maintaining Washington State temperature standards for Class AA waters (USDA 1998a). None of the streams within the Clear Fork Cowlitz Watershed are on the Washington Department of Ecology 303(d) list (USDA 1998a). Refer to Section 3.3 – Watershed for additional information regarding surface water quality standards and water quality within the White Pass Study Area. 	 Understory vegetation would be maintained at a minimum height of 3 feet in areas that include clearing prescriptions with no grading (refer to Table 2.4-1) to minimize sediment delivery and to help keep stream temperatures cool. Refer to the WEPP model discussion above. Additional information on the results of the WEPP model can be found in Section 3.3 and Appendix L – WEPP. 	
 Impacts to Flow Regime and Water Yield Peak flow alterations within the main tributary streams from Mount Rainier National Park and Wildernesses are not expected to change over time except in areas where past human disturbance has affected the area (USDA 1998a). The frequency of flooding and peak flows is expected to remain relatively constant throughout the Clear Fork Cowlitz watershed because 80 percent of the Clear Fork Cowlitz watershed is within Mount Rainier National Park or Wildernesses (USDA 1998a). Note that for the purposes of this EIS, this watershed has been modified to exclude the Mount Rainier National Park, and has been renamed the Upper Clear Fork Cowlitz watershed. 	 The changes in the timing, magnitude, duration, and spatial distribution of peak, high, and low flows due to implementation of the Proposed Action would not be measurable at the mouth of the Flow Model Analysis Area analyzed for this EIS (refer to Section 3.3.3.6 – Flow Regime). The hydrologic maturity within the White Pass Study Area may be reduced by removal of vegetation under the Proposed Action, however, the majority of canopy removal would take place outside of Riparian Reserves and in subalpine parkland, resulting in an average canopy cover of 40.9 to 45.5 percent (refer to Table 3.3-15). 	 Implementation of the Lift and Trail Construction Techniques listed in Table 2.4-1, and the use of BMPs, would reduce the potential for changes in the timing, magnitude, duration, and spatial distribution of peak, high, and low flows due to the minimization of clearing trees and vegetation within the White Pass Study Area. Alternatives 2, 6 and 9 minimize grading in Riparian Reserves during the development of ski area facilities. Impacts from grading to Riparian Reserves within the Upper Clear Fork Cowlitz River watershed range from 2.7 acres under Alternative 6 to 4.2 acres under Alternative 2 (refer to Table 3.3-15). Modified Alternative 4 would include 8.3 acres of grading in Riparian Reserves within the Upper Clear Fork Cowlitz River watershed, more than the other Action Alternatives due to the construction of trails 4- 16, 4-17 and 4-18 (refer to Table 3.3-15). Vegetation would be maintained at a minimum height of 3 feet above ground to prevent ground disturbance and to maintain shading and wildlife habitat.

Table 3.7-2: Evaluation of Watershed Condition and Project Effects - Upper Tieton Watershed

Table 3.7-2: Evaluation of Watershed Condition and Project Effects - Upper Tieton Watershed

Existing Condition	Effect of Proposed Action	Design and Assessment Considerations
 Impacts to Riparian Habitat of Streams and Wetlands Most streams are considered to be functioning adequately for the channel type with deep pools within geomorphic constraints (USDA 1998b). The majority of the watershed is rated as functioning adequately in regard to floodplain connectivity (USDA 1998b). The streambank conditions of the North Fork Tieton River is rated functioning adequately (USDA 1998b). 	 The potential direct impacts to wetlands would range from approximately 0.0 acres in Alternative 2, Modified Alternative 4, and Alternative 6, and 0.03 acre in Alternative 9 (refer to Table 3.3-13). These impacts would be avoided through implementation of Mitigation Measures in Table 2.4-2 and the use of BMPs as well as field fitting the individual construction projects. Streams may be directly impacted through the construction of four bridges (Alternative 9). The tree removal prescription for each chairlift and its corresponding ski trails is outlined in Table 2.4-1. Implementation of the Action Alternatives would not alter stream functionality within the White Pass Study Area or within the watershed (refer to Section 3.3 – Watershed Resources). There would be no change to the floodplain connectivity within the watershed as a result of the Action Alternatives (refer to Section 3.3 – Watershed Resources). 	 All Action Alternatives would avoid direct impacts to streams and wetlands where possible through the implementation of the Mitigation Measures and Management Requirements listed in Tables 2.4-2 and 2.4-3, the use of BMPs, and field fitting the individual construction projects. Utilities would cross streams by using aerial crossings, and wetland impacts from utility trenching would be avoided altogether. Vegetation would be maintained at a minimum height of 3 feet above ground to prevent ground disturbance and to maintain shading and wildlife habitat. Wetland impacts would be avoided by maintaining the existing contours and drainage patterns in wetlands that intersect proposed ski trails. Vegetation removal in wetlands would be conducted by hand/chainsaw. No heavy equipment would operate in wetlands. The tree removal prescription for each chairlift and its corresponding ski trails is outlined in Table 2.4-1. All construction techniques involve design components that are intended to avoid/minimize ground disturbance. These include over-the-snow access and construction and the use of helicopters.

Table 3.7-2: Evaluation of Watershed Condition and Project Effects - Upper Tieton Watershed

Existing Condition	Effect of Proposed Action	Design and Assessment Considerations
 Water Quality and Sediment Transport None of the streams within the Upper Tieton watershed have been designated as "water quality limited" by the Washington State Department of Ecology on the 1996 or 1998 303(d) lists (USDA 1998b). Temperatures in the tributaries are believed to be meeting the state water quality standard of 61°F degrees for most of the summer months (USDA 1998b). Sediment sources due to management appear to be limited within the watershed, and since most of it is undisturbed, this watershed is rated functioning adequately relative to sediment (USDA 1998b). Only 2 of the 37 sub-drainages analyzed have a road density greater than 3.0 miles/mile² (USDA 1998b). Refer to Section 3.3 – Watershed Resources for information regarding surface water quality standards and water quality within the White Pass Study Area. 	 Under all Action Alternatives, there would be no new roads proposed in the Upper Tieton watershed portion of the White Pass Study Area, so there would be no change to the road density (refer to Table 3.3-11). Ground disturbance would be minimized during project construction so that sediment delivery to streams and wetlands would be nominal (refer to Section 3.2 – Geology and Soils). Implementation of the Action Alternatives is not expected to contribute to the listing of any stream on the Department of Ecology's 303(d) list since there would be no new point sources of pollution and water quality impacts are projected to be nominal (refer to Section 3.3 – Watershed Resources). Understory vegetation would be maintained at a minimum height of 3 feet in areas that include clearing prescriptions with no grading (refer to Table 2.4-1) to minimize sediment delivery and to help keep stream temperatures cool. 	 Sediment impacts to streams and wetlands would be minimized through the implementation of the Mitigation Measures and Management Requirements in Tables 2.4-2 and 2.4-3 as well as the use of BMPs during construction activities. Through the implementation of a Stormwater Pollution Prevention Plan and the use of BMPs, no long-term changes in the pH, turbidity, and dissolved oxygen of streams within the White Pass Study Area and the watershed due to the Proposed Action are expected. The tree removal prescription for each chairlift and its corresponding ski trails is outlined in Table 2.4-1. All construction techniques involve design components that are intended to avoid/minimize ground disturbance. These include over-the-snow access and construction and the use of helicopters. Under Alternative 9, over the snow construction would be less feasible due to the lower elevation of the development.

Table 3.7-2: Evaluation of Watershed Condition and Project Effects - Upper Tieton Watershed

Existing Condition	Effect of Proposed Action	Design and Assessment Considerations	
 Impacts to Flow Regime and Water Yield A minor amount of canopy alteration has occurred at White Pass Ski Area but not at a level which could measurably affect streamflows (USDA 1998b). Due to the relatively low levels of harvest and roading, hydrologic patterns at the watershed level have not been changed significantly as a result of forest management activities (USDA 1998b). There are several minor domestic uses from spring developments and groundwater wells for summer home system water supply and for the White Pass Ski Area (USDA 1998b). 	 The changes in the timing, magnitude, duration, and spatial distribution of peak, high, and low flows due to implementation of the Action Alternatives would not be measurable at the mouth of the Flow Model Analysis Area analyzed for this EIS (refer to Section 3.3.3.5 – Flow Regime). The hydrologic maturity within the White Pass Study Area may be reduced by removal of vegetation under the Action Alternatives. However, the majority of canopy removal would take place outside of Riparian Reserves. The hydrologic maturity of the watershed would not be measurably affected at the 5th field scale. 	• Through the implementation of Lift and Trail Construction Techniques listed in Table 2.4-1 and the use of BMPs, there would be a small reduction of the changes in the timing, magnitude, duration, and spatial distribution of peak, high, and low flows due to the minimization of clearing trees and vegetation within the White Pass Study Area. Alternative 9 includes the highest impact to forest conditions with the removal of large trees in the existing SUP area (refer to Section 3.3 – Watershed Resources and Section 3.5 – Vegetation)	

Table 3.7-3: Evaluation of Riparian Reserves Standards and Guidelines for the White Pass Expansion Proposal Alternatives

1994 ROD Standard and Guideline	Alternative 1	Alternative 2	Modified Alternative 4	Alternative 6	Alternative 9
Roads Management:					
RF-2 – For each existing or planned road, meet ACS objectives by: a) minimizing road and landing locations in Riparian Reserves, b) completing watershed analyses prior to construction of new roads or landings in Riparian Reserves, c) preparing road design criteria, elements, and standards that govern construction and reconstruction and maintenance criteria that govern road operation, maintenance, and management, e) minimizing disruption of natural hydrologic flow paths, including diversion of streamflow and interception of surface and subsurface flow, f) restricting side casting as necessary to prevent the introduction of sediment to streams, and g) avoiding wetlands entirely	No new roads or landing areas would be developed under Alternative 1. Road operation and maintenance would be carried out based on current approvals and the annual operating plan, which would not include road obliteration or restoration.	No new roads or landing areas would be developed under Alternative 2. Road operation and maintenance would be carried out based on current approvals and the annual operating plan, which would not include road obliteration or restoration.	No new roads or landing areas would be developed under Modified Alternative 4. Road operation and maintenance would be carried out based on current approvals and the annual operating plan, which would not include road obliteration or restoration.	A 0.25-mile road would be developed within a Tier 2 Key watershed in the White Pass IRA under Alternative 6, directly impacting approximately 0.1 acre of Riparian Reserves and indirectly affecting an additional 0.5 acre during construction. The road would be designed to cross the Riparian Reserve as close to perpendicular as possible, in an effort to minimize road impacts to Riparian Reserves. Watershed analyses for the Clear Fork Cowlitz (USDA 1998a) and the Upper Tieton (USDA 1998b) have been conducted. The new road would be managed under the current annual operating plan. New culverts would be sized to pass the 100-year flow and debris. (refer to Table 2.4-2, MM6). All road construction would be	No new roads or landing areas would be developed under Alternative 9. Road operation and maintenance would be carried out based on current approvals and the annual operating plan, which would not include road obliteration or restoration.

Table 3.7-3: Evaluation of Riparian Reserves Standards and Guidelines for the White Pass Expansion Proposal Alternatives

1994 ROD Standard and Guideline	Alternative 1	Alternative 2	Modified Alternative 4	Alternative 6	Alternative 9
when constructing new roads.				conducted within the approved construction limits, and proper placement of BMPs would be conducted according to Management Requirement MR1 to insure that sediment introduction is minimized (refer to Table 2.4-3). Tree removal techniques include lop and scatter, with no landing sites required. Under Alternative 6, the proposed road would not be constructed in wetlands. Road operation and maintenance would be carried out based on current approvals and the annual operating plan, which would not include road obliteration or restoration.	

Table 3.7-3: Evaluation of Riparian Reserves Standards and Guidelines for the White Pass Expansion Proposal Alternatives

	F						
1994 ROD Standard and Guideline	Alternative 1	Alternative 2	Modified Alternative 4	Alternative 6	Alternative 9		
RF-3 – Determine the influence of each road on the ACS objectives through watershed analysis. Meet ACS objectives by: a) reconstructing roads and associated drainage features that pose a substantial risk, b) prioritizing reconstruction based on current and potential impact to riparian resources and the ecological value of the riparian resources affected, and c) closing and stabilizing, or obliterating and stabilizing roads based on the ongoing and potential effects to the ACS objectives and considering short-term and long-term transportation needs.	Watershed analyses for the Clear Fork Cowlitz (USDA 1998a) and the Upper Tieton (USDA 1998b) have been conducted. Under Alternative 1, no existing roads would be obliterated or reconstructed within the SUP area. Road management would be carried out based on current approvals and the annual operating plan. No existing road conditions requiring correction are known.	Watershed analyses for the Clear Fork Cowlitz (USDA 1998a) and the Upper Tieton (USDA 1998b) have been conducted. Under Alternative 2, no existing or proposed roads would be obliterated or reconstructed within the existing or proposed SUP area. Road management would be carried out based on current approvals and the annual operating plan. No existing road conditions requiring correction are known.	Watershed analyses for the Clear Fork Cowlitz (USDA 1998a) and the Upper Tieton (USDA 1998b) have been conducted. Under Modified Alternative 4, no existing or proposed roads would be obliterated or reconstructed within the existing or proposed SUP area. Road management would be carried out based on current approvals and the annual operating plan. No existing road conditions requiring correction are known.	Under Alternative 6, 0.25 mile of new road would be constructed in an IRA in a Tier 2 Key Watershed. In order to remain consistent with the Standards and Guidelines for Key Watersheds, 0.6 mile of existing road would be decommissioned and obliterated in order not to increase the mileage of road in the IRA and Key Watershed.	Watershed analyses for the Clear Fork Cowlitz (USDA 1998a) and the Upper Tieton (USDA 1998b) have been conducted. Under Alternative 9, no existing or proposed roads would be obliterated or reconstructed within the existing or proposed SUP area. Road management would be carried out based on current approvals and the annual operating plan. No existing road conditions requiring correction are known.		

Table 3.7-3: Evaluation of Riparian Reserves Standards and Guidelines for the White Pass Expansion Proposal Alternatives

1994 ROD Standard and Guideline	Alternative 1	Alternative 2	Modified Alternative 4	Alternative 6	Alternative 9
RF-4 – New culverts, bridges and other stream crossings shall be constructed, and existing culverts, bridges and other stream crossings determined to pose a substantial risk to riparian conditions will be improved, to accommodate at least the 100-year flood, including associated bedload and debris. Priority for upgrading will be based on the potential impact and the ecological value of the riparian resource affected. Crossings will be constructed and maintained to prevent diversion of streamflow out of the channel and down the road in the event of a crossing failure.	Under Alternative 1, no new culverts or bridges would be constructed (refer to Section 3.3 – Watershed).	Under Alternative 2, 1 new culvert would be constructed. This new culvert would be sized to pass the 100-year flow and debris (refer to Table 2.4-2, MM6 and Section 3.3 - Watershed).	Under Modified Alternative 4, 1 new bridge and 11 new culverts would be constructed. The new bridge and culverts would be sized to pass the 100- year flow and debris (refer to Table 2.4-2, MM6 and Section 3.3 - Watershed).	Under Alternative 6, four new culverts would be constructed. All new culverts would be sized to pass the 100-year flow and debris (refer to Table 2.4-2, MM6 and Section 3.3 - Watershed).	Under Alternative 9, 4 new bridges and 11 new culverts would be constructed. All new bridges would be sized to pass the 100-year flow and (refer to Table 2.4-2, MM6 and Section 3.3 - Watershed).

Table 3.7-3: Evaluation of Riparian Reserves Standards and Guidelines for the White Pass Expansion Proposal Alternatives

1994 ROD Standard and Guideline	Alternative 1	Alternative 2	Modified Alternative 4	Alternative 6	Alternative 9
RF-5 – minimize sediment delivery to streams from roads. Outsloping of the roadway surface is preferred, except in cases where outsloping would increase sediment delivery to streams or where outsloping in unfeasible or unsafe. Route road drainage away from potentially unstable channels, fills, and hillslopes.		and Modified Alternative 4, ment and maintenance would connual operating plan.		Under Alternative 6, the new road would be sloped to drain away from potentially unstable channels, fills, and hillslopes so that sediment from roads would not be transported to these areas. For all construction activities under Alternative 6, a SWPPP would be prepared to direct the use of BMPs, which would minimize sediment impacts during road construction. Under Alternative 6, no new watershed related management plans would be implemented.	Under Alternative 9, no new roads would be constructed. Road management and maintenance would continue based on existing approvals and the current annual operating plan.

Table 3.7-3: Evaluation of Riparian Reserves Standards and Guidelines for the White Pass Expansion Proposal Alternatives

1994 ROD Standard and Guideline	Alternative 1	Alternative 2	Modified Alternative 4	Alternative 6	Alternative 9			
Recreation Management:	Recreation Management:							
RM-1 – New Recreational Facilities within Riparian Reserves, including trails and dispersed sites, should be designed to not prevent meeting ACS objectives. For existing recreation facilities within Riparian Reserves, evaluate and A	No new development would take place within Riparian Reserves and no restoration projects would be implemented in Riparian Reserves. Existing conditions would not prevent attainment of ACS objectives at the 5 th field scale.	Under Alternative 2, Riparian Reserves would receive 17.7 acres of clearing and grading treatments (approximately 2.8 percent of the total Riparian Reserves in the White Pass Study Area). The Action Alternatives include Mitigation Measures, Management Requirements, and BMPs that are designed to maintain ground vegetation and shading, minimize impacts to LWD recruitment potential, and minimize erosion and sedimentation impacts (refer to Tables 2.4-2 and 2.4-3). Alternative 2 would not prevent attainment of ACS objectives at the 5 th field scale.	Under Modified Alternative 4, Riparian Reserves would receive approximately 25.8 acres of clearing and grading treatments (approximately 4.1 percent of the total Riparian Reserves in the White Pass Study Area). The Action Alternatives include Mitigation Measures, Management Requirements, and BMPs that are designed to maintain ground vegetation and shading, minimize impacts to LWD recruitment potential, and minimize erosion and sedimentation impacts (refer to Tables 2.4-2 and 2.4-3). Modified Alternative 4 would not prevent attainment of ACS objectives at the 5 th field scale.	Under Alternative 6, Riparian Reserves would receive approximately 12.6 acres of clearing and grading treatments (approximately 2.0 percent of the total Riparian Reserves in the White Pass Study Area). The Action Alternatives include Mitigation Measures, Management Requirements, and BMPs that are designed to maintain ground vegetation and shading, minimize impacts to LWD recruitment potential, and minimize erosion and sedimentation impacts (refer to Tables 2.4-2 and 2.4-3). Alternative 6 would not prevent attainment of ACS objectives at the 5 th field scale.	Under Alternative 9, Riparian Reserves would receive approximately 24.4 acres of clearing and grading treatments (approximately 3.8 percent of the total Riparian Reserves in the White Pass Study Area). The Action Alternatives include Mitigation Measures, Management Requirements, and BMPs that are designed to maintain ground vegetation and shading, minimize impacts to LWD recruitment potential, and minimize erosion and sedimentation impacts (refer to Tables 2.4-2 and 2.4-3). Alternative 9 would not prevent attainment of ACS objectives at the 5 th field scale.			

Table 3.7-3: Evaluation of Riparian Reserves Standards and Guidelines for the White Pass Expansion Proposal Alternatives

1994 ROD Standard and Guideline	Alternative 1	Alternative 2	Modified Alternative 4	Alternative 6	Alternative 9
RM-2 – Adjust dispersed and developed recreation practices that retard or prevent attainment of ACS objectives. Where adjustment measures, such as education, use limitations, traffic control devices, increased maintenance, relocation of facilities, and/or specific site closures are not effective, eliminate the practice or occupancy.	No new developed recreation facilities would be constructed within Riparian Reserves. Existing detrimental conditions within Riparian Reserves in the SUP area would continue to exist due to the high density use in the existing SUP area. No specific ski area facilities have been identified as contributing to the non-attainment of ACS objectives.	facilities would be designed Reserves would include clea Measures, Management Rec minimize impacts to LWD in	and constructed to minimize aring and grading, as describe quirements, and BMPs that ar recruitment potential, and mir t, the Action Alternatives wou	e additional ski facilities and to impacts to Riparian Reserves and for RM-1. The Action Alter e designed to maintain ground nimize erosion and sedimentate ald not retard or prevent the at	s. Impacts to Riparian rnatives include Mitigation d vegetation and shading, ion impacts (refer to Tables

Table 3.7-3: Evaluation of Riparian Reserves Standards and Guidelines for the White Pass Expansion Proposal Alternatives

1994 ROD Standard and Guideline	Alternative 1	Alternative 2	Modified Alternative 4	Alternative 6	Alternative 9
Fire/Fuels Management:					
FM-1 - Design fuel treatment and fire suppression strategies, practices, and activities to meet ACS objectives, and to minimize disturbance or riparian ground cover and vegetation. Strategies should recognize the role of fire in ecosystem function and identify those instances where fire suppression or fuels management activities could be damaging to long-term ecosystem function	Under Alternative 1, no timber removal and slash burning would take place. The ACS objectives would continue to be met at the 5 th field scale in both the Upper Tieton and Upper Clear Fork Cowlitz watersheds.	Under the Action Alternatives, all tree removal would be by manual methods outlined in Table 2.4-1. Felled trees would be lopped and scattered, or placed in streams. No other fuels treatment would take place. All understory vegetation less than 3 feet tall would be retained. The ACS objectives would continue to be met at the 5 th field scale in both the Upper Tieton and Upper Clear Fork Cowlitz watersheds.			
General Riparian Area M	anagement:				
RA-1 – Identify and attempt to secure instream flows needed to maintain riparian resources, channel conditions, and aquatic habitat.	Under Alternative 1, no change to in-stream flows would take place. Instream flows would remain at existing conditions at the 5 th field scale in both the Upper Tieton and Upper Clear Fork Cowlitz watersheds.	Action Alternatives there co flow conditions due to land changes in the timing, durat the existing in-stream flows	ould be a slight change to the cover alterations from impler ion, or magnitude of low flow at the fifth field scale for bot	mpacts to stream channels or a timing, duration, or magnitud mentation of the Action Altern and peak flow conditions we that the Upper Tieton River wat Watershed Resources –Flow	e of low flow and peak natives. However, any ould not be measurable in ershed and the Upper Clear

Table 3.7-3: Evaluation of Riparian Reserves Standards and Guidelines for the White Pass Expansion Proposal Alternatives

1994 ROD Standard and Guideline	Alternative 1	Alternative 2	Modified Alternative 4	Alternative 6	Alternative 9
RA-2 – Fell trees in Riparian Reserves when they pose a safety risk. Keep felled trees on-site when needed to meet coarse woody debris objectives.	Under Alternative 1, no trees would be felled near Riparian Reserves.		Service personnel, trees woul pose a safety risk. All felled t		
WR-3 – Do not use mitigation or planned restoration as a substitute for preventing habitat degradation.	Under Alternative 1, there would be no new impacts to Riparian Reserves.	Mitigation Measures and M	ves, impacts to Riparian Reser Ianagement Requirements listo zation of Riparian Reserve im cale.	ed in Tables 2.4-2 and 2.4-3 v	vere created in conjunction
FW-4 – Cooperate with federal, tribal, and state fish management agencies to identify and eliminate impacts associated with habitat manipulation, fish-stocking, harvest and poaching that threaten the continued existence and distribution of native fish stocks occurring on federal lands.	Under Alternative 1, no new watershed management or restoration plans would be implemented.	implementation of the Whit Tables 2.4-2 and 2.4-3 were	, state, local, and tribal agenci te Pass Expansion. The Mitiga e created in conjunction with i ity of the 5 th field Upper Tieto	ation Measures and Managementury from cooperating federa	ent Requirements listed in I agencies to maintain the