Appendix 1
Baker Blowdown Decision Memo

Response to Substantive Comments

This appendix provides the substantive comments received on the Baker Blowdown proposed action in July 2007, along with the agency's response to those comments.

Comment 1: ***Timber sale ignores socio-economic changes that have occurred in northwest portion of Washington state since 1994.***

Response: Forestry and logging jobs in Skagit County increased from 1995 to 1999 and remained at levels higher than 1995 until 2005. In 2005 and 2006 average employment levels for forestry and logging jobs fell to levels 55% of the 1995 average. Average employment in the wood manufacturing industry followed a similar pattern, but current employment levels in this sector are stronger than in the forestry and logging sector with current average employment at 82% of the 1995 average.

Employment in both sectors in 2006 accounted for 465 jobs in Skagit County. In addition, a new high-efficiency softwood lumber mill opened in Skagit County in 2006. Both of these factors indicate that there is still a demand for raw lumber in the county and that these employment sectors contribute to the local economy, although at a lower level than in 1995.

The above synopsis was based on socio-economic data provided by Joe Giannamore, Regional Labor Economist for the State of Washington, Washington Workforce Development Area 3, which includes Whatcom, Skagit, Island, and San Juan Counties (Project Record, Economic Section).

Comment 2: ***Need to demonstrate neutral or beneficial effects to LSR characteristics.***

Response: Planting conifers on 28 acres will be beneficial to the LSR. Currently this LSR is below the desired level of 80% or more forest in late successional or old-growth stages of development. Planting conifers is expected to avoid the development of a shrub dominated community and improve habitat for the northern spotted owl in 80 years when these areas will begin to provide foraging habitat.

Salvage harvest will retain high levels of down wood that will persist for the next 50 years when down wood recruitment is expected to occur naturally. The removal of down wood in excess of habitat needs is expected to have a neutral effect to the LSR (Wildlife Specialist report, p. 4). In total, project implementation would result in a small beneficial impact to LSR habitat (Wildlife Specialist Report, p. 5).

Comment 3: ***Road construction would be a net negative effect to the LSR through the removal of live trees, soil erosion, water quality degradation, vehicle pollution, litter, noxious weed introduction, increased human-caused fire, and negative effects on wildlife.***

Response: Temporary road construction activities are expected to have a neutral impact on LSR function. Temporary roads would be located in areas that require felling as few trees as possible. Road construction is expected to require felling a maximum of 17 live trees less than 20" diameter at breast height. For the longest temporary road, which also traverses the densest intact forest, it is expected that 10 trees, an average of 2.2 trees felled for every 100' of temporary road, will be felled (Wildlife Specialist Report p. 9). Approximately 7 trees, primarily alder, are expected to be felled to accommodate temporary roads in Units 3, 4, and 5.

At an average rate of 2.2 trees removed per 100' of temporary road length in Unit 9, and considering an acre an area of roughly 208' square, an average of 4.4 trees per acre will be removed to accommodate the temporary road. The stand through which the temporary road passes is approximately 15 acres in size. This stand is currently in the stem exclusion phase where tree mortality is occurring because of high tree stocking levels, which are approximately 150 trees per acre. This level of tree removal (3% of standing trees) would not affect the current seral stage (mid seral) of the stand or retard the development of old-growth characteristics that are expected to occur approximately 100 years in the future.

Temporary roads are located on gentle slopes and will be ripped following use to ensure water percolation and to avoid overland flow that results in soil erosion. Due to the relatively level topography and the roads' temporary presence, very little sediment will be eroded and transported to Rocky Creek. Due to the naturally high amounts of fine sediment and naturally high turbidity in Rocky Creek, the small amount of increased sediment (0.3%) will not affect water quality (Aquatics Specialist Report).

It is expected that motor vehicle pollution from logging equipment in the area of the proposed harvest units would be negligible when compared with the amount of motor vehicle pollution normally occurring along Forest Road 11 and the background levels of motor vehicle pollution in the Puget Sound area. The estimated time to complete logging is 4 weeks. A maximum of 10 vehicles per day would be associated with logging operations. Daily traffic on Forest Road 11 averages 730 vehicles per day in summer, 250 vehicles per day in fall, and 500 vehicles per day in spring. In addition to locally produce vehicle pollution, windborne pollution from the Puget Sound Region is delivered to the project area by the prevailing southwesterly winds. The amount of pollution generated by logging equipment and worker transportation to the site will be small compared to other local sources and windborne vehicle pollution. Because vehicle pollution mixes with the surrounding air and is dispersed by wind, the residence time of vehicle pollution will be too short to impact LSR habitat.

The use of roads will not result in litter and garbage having a negative effect on the LSR. Temporary roads will be used only by the logging company and ripped after log haul. The harvest contract (clause B6.34 Sanitation and Servicing) will prohibit the operator from leaving litter and garbage. Use of temporary roads and all system roads, except Forest Road 11, will be limited to the logging contractor, who will be required to remove any litter or garbage through harvest contract (clause B6.34 Sanitation and Servicing).

The cleaning of heavy equipment prior to being brought onto the site and the use of weed free straw are mitigation measures for this project (See page 2). Through these measures, weeds are not expected to be introduced into the area (Botany Specialist Report).

Temporary roads and all system roads, except Forest Road 11, will not be open to public use during or following logging operations. Only the logging contractor will use temporary roads. Logging equipment can ignite fires, and there is an increased risk of a human-caused fire start due to logging operations. However, the timber sale contract requires the contractor to increase its ability to extinguish fires as the risk of fire ignition and spread increases (as measured by the Industrial Fire Precaution Level) by requiring on-site fire suppression tools and through restrictions on periods of operation during times of greater relative humidity. Therefore, although the risk of human-caused fire increases due to logging operations, the risk of a human-caused fire expanding beyond a few square feet is extremely remote. As a result, any fire start due to logging operations would not affect LSR habitat (Fire Specialist Report).

The project is not expected to have a net negative impact on wildlife. Use of temporary and system roads may result in displacement of wildlife for short-periods of time while logging operations are occurring. Because these roads, except Forest Road 11, will have no motorized vehicle use following logging activities, the effects of potential temporary displacement of deer and elk (small increases in energy expended) are far less than the long-term benefits of increased access to forage and less energy expended accessing forage in salvage units. Additional positive benefits to species closely associated with late-successional and old-growth forests habitats will occur in 80 years as a result of 28 acres of reforestation. The net effect to wildlife would be positive, although some short-term negative impacts may occur to some individuals and some species due to displacement during logging operations (Wildlife Specialist Report p. 5).

Comment 4: ***Project does not move the LSR closer to habitat goals and the level of blowdown does not appear to impede the LSR from meeting its goals.***

Response: As described above in response to Comment 2, planting conifers on 28 acres does move the LSR closer to its goals by reducing the time until late successional forest develops. Within areas of high-intensity blowdown are piles of trees that would inhibit the establishment of conifer forest for several decades. Unless a sufficient number of trees are removed in these areas to allow conifer tree establishment, these areas will not contribute to meeting LSR goals for late successional and old-growth forest habitat.

Comment 5: ***Proposed action does not fit within the prioritized list of treatment areas prescribed by the Late Successional Reserve Assessment.***

Response: Treatment priorities identified in the Late Successional Reserve Assessment for the Mount Baker-Snoqualmie National Forest (USDA 2001) could not anticipate or incorporate future natural disturbance events such as a blowdown and were not intended to limit response to such events only if they occur in areas most deviant from the desired LSR condition. On page 66, the Assessment states: "The application of the priority recommendations, however, is not intended to be absolute. The recommendations are intended primarily to assist in prioritizing the implementation of specific projects and/or evaluating the relative benefit of stand treatment proposals."

Comment 6: ***Coarse woody debris is valuable and can be distributed unevenly. The distribution of down logs on treated acres as prescribed by LSRA may not be achieved by the proposal.***

Response: Post project coarse woody debris would be distributed as prescribed by the LSRA (Wildlife Specialist Report, pp. 4-5). Post-salvage levels of coarse woody debris will be above the "high" level identified by DecAID (Mellen et al. 2006). Because the down wood that would be retained within salvage units is patchily distributed, it would remain unevenly distributed following salvage. Throughout the entire area affected by the wind storm, down wood levels would be extremely high within riparian reserve areas where blowdown was intense, but where salvage harvest will not occur. Coarse woody debris will be patchily distributed at appropriate levels within salvage units, as well as across the entire area affected by blowdown (Wildlife Specialist Report, p. 5).

Comment 7: ***Project violates Record of Decision for Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl (Northwest Forest Plan) page C-12 because harvest areas and stand-replacing disturbance areas do not exceed 10 acres.***

Response: Standard 1 on page C-14 states that: "Salvage in disturbed sites of less than 10 acres is not appropriate…" The guideline applies to the disturbance, not the salvage unit size. Salvage unit sizes are mostly less than 10 acres for environmental reasons including excluding blown down trees in riparian reserves from harvest. The disturbed site from the wind event is approximately 128 acres; therefore, the project would be consistent with this standard.

Comment 8: ***Project violates the Northwest Forest Plan Record (page C-14) because some proposed sites have canopy closure > 40%***.

Response: Canopy closure readings in one proposed harvest area (just south of the intersection of Roads 11 and 12) was in excess of 40%, and therefore no salvage will occur in this area. Canopy closure in Unit 1 (the large eastern unit) averages 35%. Canopy closure on the 15 individual plots in Unit 1 ranged from 27 to 49%, with canopy closure at 5 plots > 40%. Although due to the uneven nature of wind throw, canopy closure exceeds 40% at some individual plots, the average canopy closure for this unit is less than 40% and is consistent with Salvage Guideline 1 on page C-14.

Canopy closure in Units 2, 5, 8, and 9 is less than 10%. Canopy closures in Units 3, 4, 6, and 7 range from 19 to 28% (Wildlife Specialist Report, p. 5; and Project Record).

Comment 9: ***Project would diminish habitat suitability (page C-13) in violation of Northwest Forest Plan through damage to standing trees, removal of large woody debris, removal of soil nutrients, removal of live trees during temporary road construction, soil compaction, stream siltation, and motor vehicle pollution.***

Response: The effects of the removal of live trees to accommodate temporary roads and motor vehicle pollution are summarized above in the response to Comment 2, and detailed in the Specialist Reports for Wildlife and Vegetation. Habitat suitability for species closely associated with late-successional and old growth forest will be retained because the seral stage of the stands where tress will be felled will remain unchanged and

would not affect the time necessary for old growth forest conditions to develop as a result of these impacts.

Damage resulting from rubbing trees yarded by skyline may occur on up to 12 trees in Unit 1 (Vegetation Specialist Report). This damage may eventually result in death of some of the trees, but these dead trees would increase snag habitat improving habitat suitability for species closely associated with dead wood. On average, the skyline portion of Unit 1 has approximately 208 trees per acre. For this 11 acre area, approximately 1.1 trees per acre may die as a result of logging damage. A maximum of an additional 108 trees (9.6 trees per acre) may be felled to accommodate the skyline logging system. Considering both factors, up to 12 trees per acre may be felled or die as a result of logging activities. This would result in a reduction of tree density from 208 to 196 trees per acre (6% reduction in live trees). Despite a slight reduction in the number of standing trees, the stand would retain its remaining characteristics of late-successional forest and is expected to develop old-growth forest characteristics in the same time frame as a stand with an average of 208 trees per acre. As a result, habitat suitability for species closely associated with late-successional and old-growth forest would not be diminished.

Large woody debris levels post-harvest would remain above the 80% tolerance level indicated by DecAID. This level of large woody debris is highly suitable habitat for species closely associated with down wood. The removal of down wood in portions of harvest units will increase, not diminish, habitat suitability for elk and deer (Wildlife Specialist Report, p. 6).

Soil nutrients are expected to be reduced by logging, but because short term seedling growth would not be affected, future habitat quality will not be diminished (Vegetation Specialist Report).

Disturbance to Baker Lake Blowdown soils is expected to range from 1.5 – 18.4 percent of harvest areas in the various units. Area that will be impacted includes log transportation routes such as skid trails, temporary roads, landings and skyline corridors. In total, soil impacts would occur on approximately 8.6 acres. Within that disturbed area, compaction may result in changes to tree growth.

Compaction effects on trees are caused by changes in root growth. In coarse textured soils, the rooting zone may have higher water holding capacity after compaction which may affect tree growth positively, or root growth may be inhibited in fine textured soils due to reduction in aeration, reduced water holding capacity, limited gas exchange, and lower soil strength (Page-Dumroese 2005). Studies have shown that tree growth is affected by compaction in different ways depending on soil texture. Clayey soils were more prone to reduced tree growth than loamy soils where tree growth was increased by compaction (Powers 2005). The Baker Blowdown soil resembles outwash sands and lacustrine clays in a Long Term Site Productivity experiment where soil compaction had little impact on tree growth 10 years after severe compaction, especially on sites with little or no developed understory (Powers 2005). Soil compaction with intact forest floors usually benefits conifer survival and growth (Fleming, 2006). Finer textured soils, which occur at deeper soil depths in Units 6, 8, and 9 (Soils Specialist Report), show less recovery than coarse textured soils 5 years after compaction (Page-Dumroese, 2005).

Fine textured soils, where tree growth may be somewhat slower as a result of soil compaction are limited to Units 6, 8, and 9 (Soils Specialist Report). The use of a seasonal restriction on operation will minimize soil compaction, and therefore the likelihood that tree growth will be affected on the 11 to 18.4 percent of the unit where soil compaction will occur (Soils Specialist Report). On the remaining 81.6 to 89 percent of the unit, soil compaction would have no effect on habitat suitability. Tree growth would be unaffected in Units 1 through 5 and 7, and on 81.6 to 89 percent of the remaining units, and the degree of compaction will be minimized by seasonally restricting the use of harvesting equipment in less than 19% of the area of three salvage units where soil compaction that could reduce tree growth. Therefore, the small area affected and the small possible reduction of tree growth is not expected to affect forest development to the extent that late successional habitat will be compromised by soil compaction in the Baker Lake Blowdown area.

The small amount of fine sediment generated by the project is not expected to be detectable in fish-bearing waters due to the relatively high naturally-occurring levels that occur in Rocky Creek. In the Bear Creek watershed, most, if not all, of the project generated sediment is expected to be trapped in the wetlands that occur between the project area and occupied fish habitat. As a result, no effects are expected to fish, or fish habitat, within or downstream of the project area as a result of the small amount of sediment delivered to streams (Aquatics Specialist Report).

Comment 10: ***Project is subject to Survey and Manage requirements of the Northwest Forest Plan*****.**

Response: Surveys were conducted for terrestrial mollusks and plants. No survey and manage terrestrial mollusks were detected. Two sensitive plant species were found during surveys and known sites will be managed using site management requirements for *Nephroma bellum* and *Platanthera orbiculata* for these species (Botany Specialist Report).

Comment 11: ***Disagrees that conifer forest regeneration should be a desired condition. Natural openings provide beneficial habitat that will be lost with more rapid conifer forest establishment.***

Response: On page A-4 of the *Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl*, the objective of Late Successional Reserves is "to protect and enhance conditions of late-successional and old-growth forest ecosystems which serve as habitat for late-successional and old-growth forest related species including the northern spotted owl". By definition, late-successional and old-growth forest ecosystems in western Washington are conifer dominated forests, and therefore conifer forests are the desired condition for the 80% of an LSR (USDA 2001).

The Baker LSR is currently below the desired habitat condition of 80% or more late-successional and old-growth forest (USDA 2001). There are some locations within LSRs that are not capable of producing conifer forests and will sustain early seral vegetation indefinitely. In the project area, there is a large wetland west of Unit 6, a series of wetlands west of Unit 9, and a large alder dominated riparian forest along Rocky Creek north of Units 6 and 8. All of these areas are expected to sustain early-seral vegetation

for very long period of time. In addition, large portions of the blowdown area in riparian reserves would not have any salvage harvest and are likely to develop into early seral brush vegetation that may persist for several decades or more. Therefore the project area is expected to contain an abundance of early seral forest habitats that will benefit early seral dependent species. However, these early seral forest stages do not provide habitat for late-successional and old-growth forest associated species, which is the primary objective of LSRs.

Perhaps most importantly, early seral forest habitats do not provide habitat for the northern spotted owl which is the species for which LSRs were primarily designed to recover. Spotted owl populations have declined in Washington by more than 7% over the last decade (Lint 2005). Providing sufficient habitat for the recovery of this threatened species is the primary desired condition for the LSR (USDA 2001).

Because the LSR is currently below its habitat goals for late-successional and old-growth conifer forest, because spotted owls populations are declining and their habitat locally is not sufficient for recovery, and because there is an abundance of early seral forest habitats in the project area that is expected to continue for decades into the future, the desired condition for salvage units is late successional or old-growth coniferous forest. Early seral species will occupy less habitat area as a result, but there will continue to be an abundance of early seral habitat area to accommodate these species (Wildlife Specialist Report pp. 12-13).

Comment 12: ***Artificial regeneration is not required for new forest establishment. Natural regeneration will be more valuable due to the heterogeneity in forest establishment.***

Response: Coniferous forest vegetation would eventually establish on the 28 acres where artificial regeneration is planned, but the establishment period may be many decades, or centuries (Chappell and Kagan 2001). Artificial regeneration will ensure the establishment of a conifer dominated forest much sooner than would occur if natural regeneration were relied on (Vegetation Specialist Report). In portions of the watershed where hemlock looper caused high levels of mortality, Forest employees have found that conifer regeneration is not occurring 5-7 years post-disturbance. Because conifer dominated forest is the desired condition for the salvage units, artificial regeneration will ensure that the desired condition is met considerably sooner than natural regeneration.

In the 28 acres where planting would occur, Douglas-fir and western redcedar seedlings will be planted at irregular spacing. Red alder and western hemlock will be expected to regenerate naturally. This planting design incorporates heterogeneity into the developing new forest. The design is intended to mimic natural conifer stand development and eventually lead toward species composition and structure found in naturally developed late old stands. Although not required for new forest establishment, planting will decrease time until the desired condition of late-successional and old-growth forest structure is achieved (Vegetation Specialist Report, p. 6).

Comment 13: ***Small forest openings are an important component of old-growth forests.***

Response: Small forest openings will be retained in the areas described above in response to Comment 11 and will remain common in the project area.

Comment 14: ***Project may not be consistent with Northwest Forest Plan (p. C-16) because costs of habitat impairment resulting from road construction may be greater than potential benefits. With no ecological benefits, this standard can not be met, especially since artificial regeneration is not necessary.***

Response: A discussion of the effects of road construction can be found in the response to Comment 3. The greatest impact of temporary road construction would occur in Unit 9 where 10 trees (2.2 trees pre acre) will be felled. The estimated stocking level of this mid-seral stand is approximately 150 trees per acre. Stocking density along the temporary road corridor would be reduced by 1.5%. This level of reduction would not change the seral stage or increase the length of time until late-successional forest structure develops (Wildlife Specialist Report, pp. 9-10). As a result there would be no habitat impairment resulting from temporary road construction. The project would benefit the LSR by reducing the time until late-successional forest habitat develops on 28 acres. There is a net benefit of the project on late-successional forest habitat.

Comment 15: ***Possible use of the area by spotted owls and murrelets, and other factors, exceed the threshold of extraordinary circumstances that would preclude the use of a CE. An EA should be required.***

Response: None of the salvage units currently provide spotted owl nesting, foraging or roosting habitat, so spotted owls are not expected to be present. The project would have no effect on spotted owls (Wildlife Specialist Report, p. 3, Project Record, Project Evaluation Consistency Form). Marbled murrelets may be present in Units 4, 5, 6, and 7. Murrelet habitat would not be affected by the project. Some disturbance of birds incubating or delivering food is possible, but is not expected to affect murrelet survival or reproductive rates (Wildlife Specialist Report, pp. 3-4). The mere potential presence of marbled murrelets does not preclude the use of a categorical exclusion; rather it is the degree of the potential effect on murrelets that determines whether extraordinary circumstances exist. The potential disturbance of marbled murrelets is unlikely to occur, and the effects would not result in decreased survival or reproduction. This potential impact to marbled murrelet does not rise to the level of an extraordinary circumstance.

Comment 16: ***The Aquatic Conservation Strategy requires that all management actions must maintain or improve watershed health. Temporary road construction and skyline corridors would result in unmitigated disturbance.***

Response: A careful analysis of Aquatic Conservation Strategy objectives has concluded that watershed conditions will be maintained (Aquatics Specialist Report, pp. 6-9). The project would have no impact to connectivity for aquatic or riparian dependent species; shorelines, banks, or bottom configurations; water temperature; in-stream flows; floodplain inundation or water table elevation; or the distribution of riparian dependent species. The project would generate small amounts of sediment, but because of the small size of the project, the presence of wetlands controlling water quality in Bear Creek, and the naturally turbid waters of Rocky Creek, watershed and landscape scale features will remain unchanged, and water quality and sediment regimes will not be detectably altered (Aquatic Specialist Report).

Because the number of trees that would be removed to accommodate skyline corridors and temporary roads are few, their removal would not measurably alter canopy closure. Because canopy closure controls ground water recharge and movement, these actions would not affect instream flows, flood plain inundation, or water table depth (Soils Specialist Report, pp. 4-5).

Comment 17: ***Salvage of logs will conflict with the watershed analysis desire to use down logs in other watersheds for stream restoration actions*****.**

Response: Pages 4-29 and 4-30 of the Baker River Watershed Assessment (USDA 2002) note that standards and guidelines for LSRs prohibit the collection of blown down trees for use in stream restoration projects in other watersheds where wood structures would improve watershed condition. That discussion in the watershed analysis is not entirely accurate. In areas where high levels of down wood were present, some of the roadside hazard trees created by hemlock looper mortality were moved outside of the Baker Watershed for use in restoration projects earlier in the decade.

A considerable amount of logs that fell across and blocked roads during the December 2006 wind storm were collected and stockpiled during road maintenance in the spring of 2007 for use in stream restoration actions. The amount of logs collected is sufficient for all planned steam restoration projects. Additional sources of down logs for stream restoration projects will be available when the new Federal Energy Regulatory license to operate the Baker Project is issued (currently expected in January 2008). License Article 109 (FERC 2006) will require the project operator to collect and stockpile logs greater than 12 inches in diameter and 8 foot long from both project reservoirs for use in restoration projects in other watersheds for 20 years.

Because there is currently a stockpiled supply of wood for out-of-basin stream restoration projects, and because the new license to operate the Baker Hydroelectric Project will supply wood for stream restoration projects, salvaging blown down trees as proposed would not limit stream restoration projects in other watersheds.

Comment 18: ***ACS standard of "maintaining and restoring" the health of the watershed can't be met by building new roads and opening closed roads*****.**

Response: A careful analysis of Aquatic Conservation Strategy objectives has concluded that watershed conditions will be maintained (Aquatic Specialist Report, pp. 6-9). The response to Comment 16 provides a summary of why the construction of temporary roads, and use of existing system roads, would maintain conditions consistent with ACS objectives at both local and watershed scales.

Comment 19: ***Reopening road 1102, which is within a riparian reserve, will have a cost to aquatic areas*****.**

Response: Implementation of the project would require removing brush and sapling trees from the road beds and ditches, smoothing the road surface (blading), and replacing or cleaning culverts on Forest Roads 1102 and 1102.025 (Engineering Specialist Report). In addition, a Beaver Deceiver would be installed near the first culvert on Forest Road 1102 (Engineering and Soils Specialist Reports). These road maintenance activities on Road 1102 will have little benefit or other impact to aquatic conditions due to the road's location on relatively flat ground on the watershed divide between Rocky and Bear Creek

watersheds (Aquatic Specialist Report). The Beaver Deceiver performing would prevent logs from plugging the culvert and diminish the risk of silt entering the aquatic system (Soils Specialist Report).

Removing brush and sapling trees from the road beds and ditches, smoothing the road surface, and replacing or cleaning culverts would generate small amounts of sediment; but because of the small size of the project, the presence of wetlands controlling water quality in Bear Creek, the naturally turbid waters of Rocky Creek, watershed and landscape scale features will remain unchanged, and water quality and sediment regimes will not be detectably altered (Aquatic Specialist Report).

Comment 20: ***The removal of fallen trees will increase the probability of additional blowdown through the loss of structural support supplied by the blown down trees.***

Response: Fallen trees are unlikely to provide structural support to residual standing live trees. "Wind resistance depends on the interaction of five factors: strength of the wood; shape and size of the crown; extent and depth of the root system; previous moisture conditions; and shape of the bole" (Barry 2005). Because the fallen trees are not, or do not, affect any of these five conditions, removal of them will not change the resistance of surviving trees to future wind storms. Therefore the removal of fallen trees is expected to have no effect on the probability of additional blowdown.

Comment 21: ***Damage to live trees resulting from logging activities will reduce the health of live trees, potentially reducing the number of legacy trees in the new stand.***

Response: Trees that survive disturbance events are "a legacy from the old-growth condition" of the former stand (Northwest Forest Plan p. B-3). Where live and dead material remains following a disturbance, young stands contain "old-growth structures and presumably old-growth associated organisms…" (Northwest Forest Plan p. B-3).

Live trees damaged by logging are estimated to be approximately 10 percent of the trees that are located within skyline corridors of Unit 1 and 4 (Vegetation Specialist Report). No logging damage is expected in ground-based logging because the density of standing trees is low, and logging equipment will have sufficient room to operate without damaging them. Therefore, damage to live trees from logging activities is expected to be limited to Units 1 and 4.

Trees damaged in skyline harvest areas may die as a result of the damage and add to future snags. Whether these trees are alive, snags, or down logs, they will continue to be a legacy from the previous stand and contribute beneficial structural material to the new stand. If damaged trees remain alive they will contribute to one of the five desired late successional and old-growth characteristics: "moderate to high numbers of trees with physical imperfections" (Northwest Forest Plan p. B-5).

Unit 1 is expected to retain an average of 196 trees per acre following logging operations (Response to Comment 9). Harvest Unit 4 is an area of intense blowdown and is estimated to require the cutting or damage of 3 potential legacy trees for skyline corridors. Harvest Unit 4 is small (8 acres in size) and is surrounded by untreated riparian reserves which include legacy trees on two sides (east and west). Although up to 3 potential legacy trees may be lost from the stand, most potential legacy trees will remain. This is consistent with Forest Plan direction which acknowledges: "Some deviation from these

general guidelines may be allowed to provide reasonable access to salvage sites and feasible logging operations. Such deviation should occur on as small a portion of the area as possible, and should not result in violation of the basic intent that late successional forest habitat or the development of such habitat in the future should not be impaired throughout the area" (Northwest Forest Plan pp. C 15-16).

Comment 22: ***Project must be expedited to insure that material removed is high quality.***

Response: The time frame of this project planning effort reflects the urgency to harvest dead timber as soon as possible. The Forest Service combined the public scoping period with the pre-decisional comment period to streamline the NEPA analysis process. The Baker Lake Blowdown project is one in a list of timber sale projects that are the highest priority projects on the Mt. Baker-Snoqualmie National Forest at this time. In light of that, it is recognized that trees of small diameter, and species with greater proportions of sapwood than others, are likely to decay quickly. Of the conifers within the blowdown area, western hemlock and Pacific silver fir are expected to decay most quickly, and Douglas-fir and western red cedar will last longer (Aho 1984).

Based on species composition data from nearby stands, western hemlock and Pacific silver fir represent approximately 50 percent of the trees that would be harvested. The remainder is approximately 40 percent red alder or Douglas-fir, and 10 percent western red cedar. A general rule practiced in the Pacific Northwest is to sell blown down timber within two years of the wind event to have a viable timber sale (Vegetation Specialist Report). The schedule for this project is to sell the blown down trees one year and four months after the wind storm.

Comment 23: ***Not removing blown down trees would increase chances of catastrophic fire.***

Response: The risk of catastrophic fire is primarily tied to the amount of fine fuels because these fuels influence the rate of fire spread, and therefore the likelihood that fire suppression resources can reach a wild fire at a small size and exert effective control. Fuel reduction activities in salvage units along Forest Road 11 and in Units 1 and 5 are expected to reduce the chance of a catastrophic fire (Fire and Fuels Specialist Report).

Comment 24: ***Large trees would produce very high quality logs and should be utilized.***

Response: Trees of all merchantable size classes, including large trees, would be utilized.

Literature Cited

Aho, P.E. and J.M. Cahill. 1984. Deterioration Rates of Blowndown Timber and Potential Problems Associated with Product Recovery. GTR PNW-167. Corvallis, OR: USDA Forest Service.

Barry, P.J., et al. 1998. How to Evaluate and Manage Storm-Damaged Forest Areas. Atlanta, GA: USDA Management Bulletin R8-MB 63.

Chappell, C. B. and J. Kagan. 2001. Westside Lowlands and Conifer-Hardwood Forest. Pp. 24-26 in: D.H. Johnson and T. A. O'Neil, ed. Wildlife-habitat relationships in Oregon and Washington. Oregon State University Press, Corvallis OR.

FERC 2006. Final Environmental Impact Statement. Baker River Hydroelectric Project, Washington (Project 2150). Federal Energy Regulatory Commission, Washington, DC and U.S. Army Crops of Engineers, Seattle, WA.

Lint, Joseph, tech. coord. 2005. Northwest Forest Plan—the first 10 years (1994–2003): status and trends of northern spotted owl populations and habitat. **Gen. Tech. Rep. PNW-GTR-648. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 176 p.**
http://www.fs.fed.us/pnw/publications/pnw_gtr648/

Mellen, Kim, Bruce G. Marcot, Janet L. Ohmann, Karen Waddell, Susan A. Livingston, Elizabeth A. Willhite, Bruce B. Hostetler, Catherine Ogden, and Tina Dreisbach. 2006. DecAID, the decayed wood advisor for managing snags, partially dead trees, and down wood for biodiversity in forests of Washington and Oregon. Version 2.0. USDA Forest Service, Pacific Northwest Region and Pacific Northwest Research Station; USDI Fish and Wildlife Service, Oregon State Office; Portland, Oregon.
http://wwwnotes.fs.fed.us:81/pnw/DecAID/DecAID.nsf

Page-Dumroese, D. S., M. F. Jurgensen, A. E. Tiarks, F. Ponder, Jr., F. G. Sanchez, R. L. Fleming, J. M. Kranabetter, R. F. Powers, D. M. Stone, J. D. Elioff, and D. A. Scott. 2006. Soil physical property changes at the North American long-term soil productivity sites: 1 and 5 years after compaction. Canadian Journal of Forest Research 36:551-564.

Powers, R. F., A. Scott, F. G. Sanchez, R. A. Voldseth, D. Page-Dumroese, J. D. Elioff, and D. M. Stone. 2005. The North American long-term soil productivity experiment: Findings from the first decade of research. Forest Ecology and Management 220:31-50.

Northwest Forest Plan 1994. Standards and Guidelines for Management of Habitat for Late-successional and Old-growth Forest Related Species Within the Range of the Northern Spotted Owl. Attachment A to the Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl. USDA Forest Service and USDI Bureau of Land Management.

USDA 2001. Forest-Wide Late Successional Reserve Assessment. Mount Baker-Snoqualmie National Forest. USDA Forest Service, Pacific Northwest Region, Mount Baker-Snoqualmie National Forest. Mountlake Terrace, WA. Page 84.

USDA 2002. Baker River Watershed Analysis. USDA Forest Service, Pacific Northwest Region, Mount Baker-Snoqualmie National Forest. Mountlake Terrace, WA. Pages 4-29 and 4-30.