TREE FALLING FOR MEASUREMENTS

Environmental Assessment No. OR120-00-06

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Chapter 1 - Purpose of and Need for Action

This chapter provides a brief description of the purpose of and need for the proposed action being analyzed in this environmental assessment.

Background

The Coos Bay District is preparing an Environmental Analysis that analyzes the impacts of "Tree falling for measurements" in conjunction with planned timber sales. The preparation of this EA is needed since both BLM and Umpqua Watersheds jointly moved for a stay of litigation in a lawsuit over the Coos Bay District's plan maintenance allowing tree falling for timber sales. On April 4, 2000 the following was signed by both parties and is effective until October 1, 2001.

"The Defendent (BLM) will not fell any sample trees for timber cruising purposes during the *current* fiscal year in the following situations and locations:

1. Reserve land use allocations under the Northwest Forest Plan(i.e. Late-Successional Reserves, and Riparian Reserves),

2. Timber Cruises for regeneration timber sales on any land use allocation,

3. Trees other than Douglas-fir (on any land use allocation) over 15 inches dbh, and,

4. Douglas-firs (on any land use allocation) over 20 inches dbh."

The Proposed Action analyzed in this EA may be implemented some time after the October 1, 2001 expiration of the stay of litigation agreement.

In order to evaluate the quantity and quality of timber for proposed vegetation management projects which involve merchantable timber (e.g., commercial thinning, regeneration harvest, density management), the Coos Bay District cruises these forest stands. The Coos Bay District uses four cruise methods that utilize both direct measurements and visual estimates for volume and value determination. In the past, District cruisers have felled randomly selected trees, within the action area, in conjunction with cruising.[1]

(1) 100% cruise method: Consists of visiting each tree in the project area and estimating its volume and value.

[1] Using the 3P cruising method, the probability that a tree becomes a part of the sample is proportional to predicted volume (an advance visual estimate of a tree's volume.)

(2) Variable Plot method: A specified number of sample plots are established over the project area. Each sample plot is visited and using an angle gauge (prism), the cruiser makes a 360 degree turn of the sample plot. Each tree that appears to have a diameter breast height (DBH) which is larger than the prism angle is selected as a sample tree. Both direct measurements and visual estimates are utilized using this cruise method.

(3) Fixed Plot method: A specified number of plots of equal area are established in an unbiased manner over the project area. Direct measurements and visual estimates are obtained on each tree within each plot boundary.

(4) 3P Fall, Buck and Scale: This cruise method is used to obtain direct measurements from a set of sample trees. The probability that a tree is selected as part of the sample is proportional to predicted volume (an advance visual estimate of a tree's volume). Sample trees are selected using a random numbers table that is generated from stand exam or pre-cruise (variable plot or 100% strip cruise) information. Once the sample trees have been selected a sub-set of these samples is randomly selected for falling. The number of samples to be selected for falling in this sub-set depends upon the estimated timber defect in the project area. This sub-set of samples are then felled, bucked to standard merchantable log lengths and scaled using direct measurements for volume and value. These direct measurements are then expanded into a total sale volume for the project.

Purpose and Need

Many managed stands have been planted with genetically improved stock, precommercially thinned and/or fertilized. These stands are growing faster and with different tree form than what typically occurred in natural stands. As a consequence, existing volume/taper tables based on data from natural stands do not always predict accurate tree volumes in managed stands. In heterogenous late-successional and old-growth stands, the potential for high defect makes it difficult to estimate volume in standing trees. The high value of this timber increases the need for accurate cruise measurements.

There is a need for accurate timber cruises. Accurate timber cruises facilitate the preparation of timber sales by which the BLM manages its forests for a variety of resource objectives, thereby ensuring a sustainable supply of timber to provide jobs which contribute to the economic stability of communities. Accurate timber cruises also ensure that the public receives fair value for the timber sold. BLM Manual Supplement Handbook H-5310-1 directs that BLM conduct consistent timber cruises that meet quality standards.

Although this activity (i.e., tree falling for measurement) could be incorporated into the project-specific Environmental Assessments for individual projects, it is often necessary for the timing of tree falling for measurement to precede the completion of the NEPA decision process for those projects. This proposal will provide for timely measurement of the forest stands so an accurate sale volume and value can be determined prior to sale advertisement. The purpose of this project is to improve the accuracy

of timber cruises and volume/taper tables by directly measuring a sub-set of sample trees being cruised for proposed management activities.

Implementation of the proposed action would conform to management actions and direction contained in the Coos Bay District's *Record of Decision and Resource Management Plan* (ROD/RMP; USDI, BLM 1995). The RMP provides a comprehensive ecosystem management strategy in conformance with the *Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl* (ROD; USDA and USDI 1994b).

Chapter 2 - Alternatives, Including the Proposed Action

This chapter describes the basic component features of the actions being analyzed in this environmental assessment.

I. No Action

Under this action "Tree Falling for Measurements" would not be used in conjunction with cruising. Cruising methods using direct measurement and visual estimates of timber quantity and quality would be used in determining timber volumes and values.

For regeneration harvests in heterogenous stands, indicative of late-successional and old-growth conditions, there would be no direct examination and measurement of visible and hidden defects to verify cruise estimates of volume and value.

For commercial thinning or density management actions in managed second-growth stands, no local volume tables would be generated to reflect local growth conditions and the effects of intensive management activities on timber volume and form. Existing taper/volume tables developed for mature, unmanaged stands would be used in conjunction with indirect measurements for determination of timber volume.

II. Proposed Action

In conjunction with visual cruising of merchantable timber, a set of sample trees would be felled, bucked and scaled, if deemed appropriate. The sample trees would be selected from proposed

harvest units. No sample trees would be cut until all "no harvest" areas (e.g., wildlife trees, buffer areas) have been identified, field marked, and deleted from the sale portion of the project.

Felling would be accomplished using gasoline-powered chainsaws and hand tools. The trees would be bucked to standard, merchantable lengths for direct measurement of volume and evaluation of condition and value. If and when the project is implemented, these sample trees may become part of the timber sold to the contractor (see paragraph "g," under Additional Design Features/Mitigation Measures, p. 6). This sampling of trees would primarily occur in Matrix (e.g., General Forest Management Area and Connectivity) land use allocations, but could be applied to density management actions in Late-Successional Reserves (LSR) and Riparian Reserves.

Sample trees would be randomly selected from the trees that would be felled in an associated project and normally scattered across the proposed project areas. The number of sample trees selected from a proposed project area depends upon site and stand conditions, especially the amount of defect in the timber. The amount of defect in the project area is visually estimated or obtained from a previous cruise results. The maximum number of sample trees selected in a proposed project area would be up to 2 trees per acre. A sub-set of these samples are randomly selected for falling. This sub-set of samples is usually less than one tree per acre when averaged across the project area.

For regeneration harvests in heterogenous stands which have high value and the potential for high defect, tree felling for measurement would occur to provide the most precise measurements practical for accurately determining timber volumes and values.

For commercial thinning or density management actions in relatively homogeneous stands, trees may be felled to construct a local volume table in which the timber volume of sample trees is related to the tree diameter and taper, and validation of new tree model equations.

Additional Design Features/Mitigation Measures

a. All required surveys for threatened and endangered species, survey and manage species, and cultural resources would be completed to protocol prior to initiation of any felling activity. Botanical and wildlife surveys as required by the S&M ROD (2001) would be completed in the project areas using a combination of established survey methods and current approved protocols for Survey and Manage species. Known S&M species sites will be managed in accordance with the S&M ROD (2001).

b. Tree falling would not proceed until Special Status Species clearances from resource specialists are received and appropriate mitigation and management recommendations are incorporated into the project if such species are found. Mitigation measures would be

incorporated upon identification of any animal, plant or fungal species requiring special management under the following references: the Endangered Species Act of 1973; BLM Manual 6840 - Special Status Species Management; "Oregon-Washington Special Status Species List," Information Bulletin No. OR-2000-092; Appendix C of the RMP; and the S&M ROD (2001). Project impacts would be mitigated or the project would be abandoned if any part of the proposal would adversely impact a Special Status species.

c. If required, consultation with the United States Fish and Wildlife Service (USFWS) would be completed prior to project implementation (e.g., falling trees). Additionally, the project would incorporate any additional design features required as a result of the Terms and Conditions contained within the corresponding Biological Opinion.

   Consultation with the National Marine Fisheries Service (NMFS) is not required prior to project implementation due to a "no effect" determination. See Chapter 4 (Fisheries)

d. Felling would avoid trees with obvious signs of wildlife use (e.g., trees with nests or cavities) to the extent possible.

e. Trees to be cut would be identified after excluding reserve trees and no harvest areas in the associated project (e.g., wildlife reserve trees, other buffer trees, green tree retention areas, unstable areas, flood plains and wetlands) and would be felled away from established buffers to the extent possible.

f. Trees immediately adjacent to stream channels are reserved and therefore would not be felled nor would trees be felled towards the stream channels.

g. Any decision to harvest (remove) the sample trees or retain them on site as coarse woody debris would be addressed in the project-specific environmental analysis for proposed management activities.

III. Features Common to Both Alternatives

There would be no road construction, renovation or decommissioning associated with either alternative. No use of any ground-based equipment would be involved.

IV. Resources That Would Remain Unaffected by Either Alternative

The following elements of the human environment, subject to requirements specified in statute, regulation, or executive order, would not be affected by either of the alternatives: air quality, prime or unique farm lands, flood plains, Native American religious concerns, solid or hazardous wastes, visual resources, wilderness, and Wild and Scenic Rivers. No effects on the introduction or spread

of invasive, non-native species and disease, or noxious weeds would be expected.

Additionally, the proposed action is not anticipated to have disproportionately high and adverse human health or environmental effects on minority populations and low-income populations.

Chapter 3 - Affected Environment

This chapter summarizes the specific resources that are present or have the potential to be present within the area, and that could be affected by the proposed action.

I. Timber/Vegetative Resources

The Coos Bay District manages 330,000 acres of land on the District (Summary, pages S-1 and S-4), composed of O&C and Public Domain lands. These acres are primarily distributed among the General Forest Management, Riparian Reserve, and Late-Successional Reserve land use allocations.

The ROD/RMP identified 61,900 acres as Matrix lands. Within the Matrix designation, 55,300 acres are designated as General Forest Management Area (GFMA) to be managed on a rotation of 60 - 80 years (RMP ROD p.53). The remaining 6,600 acres were designated as Connectivity/Diversity Blocks which are to be managed on a rotation of 150 years.

The ROD/RMP designated 133,700 acres as Late-Successional Reserves (LSR), 21,000 acres as Congressional or District Reserves, and approximately 89,600 acres[2] as Riparian Reserves on the Coos Bay District. Lands within Congressional or District Reserves are not scheduled for timber harvest. The LSR lands are managed for late-successional habitat and are not scheduled for regeneration timber harvest. Density management may occur in these reserves consistent with management direction contained in the Coos Bay District RMP.

For the proposed action, the following are land use allocations where tree falling for measurements would not take place:

a. Congressional or District Reserves;
b. Forest stands in Late-Successional Reserves that are greater than 80 years of age;
c. Typically, stands in all land use allocations less than 20 years of age are considered too small for commercial thinning or density management.

[2] There are 203,200 acres of Riparian Reserves underlying all of the allocations listed above. There are no other overlaps in the other acres.

II. Special Status and Special Attention Species

Special Status Species are those species requiring special management under the following references: the Endangered Species Act of 1973, BLM Manual 6840 - "Special Status Species Management," and the "Oregon and Washington Special Status Species list contained in Information Bulletin No. Or-2000-092, and Appendix C within the Coos Bay District RMP has identified the fish and wildlife species that are considered Special Status Species within the project planning area.

Special Attention Species are those species requiring special management under the S&M ROD (2001) and are also classified as Survey and Manage (S&M) species. Several species may be found within the project areas.

A. Wildlife

Federally listed wildlife species likely to be affected by the proposed action are the northern spotted owl, marbled murrelet, and bald eagle. Other special status species that may occur within the action area are listed in Appendix C-3 of the Coos Bay District RMP. Many species of neotropical migratory birds are present on the District (Appendix T, USDI 1994). Several Survey and Manage wildlife species as listed in the S&M ROD (2001) may also be found within the project areas.

B. Fish

There are approximately 356 miles of fish-bearing streams on the Coos Bay District, of which 216 miles provide habitat for anadromous fish species, and 140 miles are inhabited by resident cutthroat trout. Salmonid species occurring on BLM-administered lands include chinook salmon, coho salmon, steelhead trout, and both resident and anadromous forms of cutthroat trout. The range of non-salmonid fish species on the District is not known. Special Status fish species that occur on BLM lands are presented in Table 1.

Table 1: Fish Species on the Coos Bay District Which Are Listed, or May Potentially Be Listed, under the Endangered Species Act

Basin	Species	Federal Status
Oregon Coast & Southern Oregon/ Northern California	Coho Salmon	Threatened
Oregon Coast	Steelhead Trout	Candidate
KMP	Steellhead Trout	Not Warranted

Basin	Species	Federal Status
Oregon Coast	Cutthroat Trout	Candidate
Southern Oregon/California Coast	Cutthroat Trout	Not Warranted

C. Plants

The proposed treatment areas for timber sales have the potential to provide habitat for special status plant species. There are no federally-listed botanical species likely to be affected by the proposed action. Several Survey and Manage botanical species may be found within the project areas.

III. Water Resources

The Coos Bay District is composed of all or parts of watersheds located in the Mid-Coast basins. There are estimated to be more than 2,700 miles of streams and rivers on the Coos Bay District BLM. Wetlands areas are estimated to occur on over 200 acres. Streams and rivers provide a number of beneficial uses of water. The more common beneficial uses on the Coos Bay District include cold water for fish and other aquatic life, water for wildlife and livestock, water for irrigation, municipal and domestic water, and industrial water supplies.

Precipitation on the District varies from an annual average of around 60 inches along the coast to nearly 120 inches in the higher elevations of the Coast Range. The majority of the precipitation (85%) falls from November to March, with less than 2% falling from June through August. Lands managed by the BLM are located in and below the transient snow zone, an area that periodically receives both rain and snow during a storm event.

IV. Soils

The proposed action could potentially occur anywhere on the District where timber management activities are planned. This covers a large portion of District-managed lands, which are distributed over three major geomorphic formations: the Tyee, Otter Point and the Dothan-Fransiscan, spanning from north of the Umpqua River to the Chetco River near the California border. Due to the large areas involved, soil types and conditions will be variable and wide ranging.

V. Cultural Resources

Relatively few prehistoric or paleontological sites have been identified on Coos Bay District lands throughout the Coast Range and Siskiyou mountains. Identified historic cultural resources include sites related to early settlement, logging and mining. The majority of the District's cultural resource sites have not been evaluated for eligibility to the National Register of Historic Places.

Chapter 4 - Environmental Consequences

This chapter discusses the direct, indirect and cumulative impacts of the alternatives contained in this analysis on timber/vegetative, special status and special attention species, water, soils, and cultural resources.

I. No Action

A. Timber/Vegetative Resources

There would be no short-term impacts to timber resources because timber cruising would continue, but it would be restricted to methods that solely employ visual estimation of volume, defect and value. There would be no opportunity to verify assumptions made on form and defect by direct examination of felled and bucked sample trees. Equally, there would be limited opportunity for cruiser/appraiser training in the recognition of common timber defects.

The potential exists for long-term consequences because in the absence of visual verification and direct measurement, the tendency exists to underestimate timber quantity and quality (*Final Report of the Bureau of Land Management Oregon/Washington Timber Cruiser/ Appraiser Program*; USDI, BLM 1996; p. 37). If timber volumes on Matrix Area land use allocations are underestimated, additional acres of timber sale preparation would potentially be needed to meet the District's allowable sale quantity objective.

The allowable sale quantity is considered sustainable over the long-term. This is based on assumptions that the number of acres allocated for scheduled timber harvest is fixed and that certain inventoried volumes per acre are available for harvest. If cruising consistently underestimates the volume of timber available for harvest, this could result in an inability to meet the calculated sustained yield harvest level.

If timber quantity and value is underestimated, and in the absence of competition at the time of sale, there may be a reduction in monies received by the Federal government for commodities sold and a potential reduction in county revenues. Additionally, under this action, there is the potential that the cruise would not meet the quality standards set forth in BLM Manual Supplement Handbook H-5310-1.

B. Special Status and Special Attention Species

1. Wildlife

There would be no short-term direct, indirect, or cumulative impacts to Special Status Species or Special Attention Species resulting from cruising timber using visual estimation in place of felling and

scaling sample trees. This action would not involve the felling of any trees and would not constitute any disturbance or modification of suitable or critical habitat for these species.

2. Fish

There would be no short-term direct, indirect or cumulative impacts to fish or fish habitat under the No Action scenario because there would be no falling of trees for sampling and there would be no disturbance to fish.

3. Plants

There would be no short-term direct, indirect or cumulative impacts to Special Status or Special Attention plant species as a consequence of a No Action scenario because the alternative would not involve the felling of any trees for sampling and would not constitute any disturbance or modification of present or potential habitat for the species. Also, there would be no direct effects on habitat or micro-climate conditions necessary to the persistence of any Special Attention species that may occupy any proposed project area.

C. Water Resources

The No Action scenario would contribute no additional short-term direct, indirect or cumulative impacts to existing hydrological functions at a site or watershed scale because there would be no reduction in vegetative cover that would potentially affect peak and base flows. In addition, there would be no disruption of stream bank or stream channel configuration and structure. No reduction of stream shading which would affect water temperatures would occur. Finally, there would be no activities that have the potential to generate and transport sediments into the aquatic system.

D. Soils

There would be no short-term direct, indirect, or cumulative impacts to soils from the No Action scenario. There would be no activities involving the use of ground-based equipment or causing disturbance or displacement of the soil litter and surface mineral horizons. There would be no compaction or increase in the potential for surface erosion which affects long-term site productivity.

E. Cultural Resources

The No Action scenario would have no direct effect on cultural resources because there would be no new ground disturbance associated with adoption of this alternative.

II. Proposed Action

A. Timber/Vegetative Resources

Stand exams have shown that mature forest stands designated for regeneration harvest generally range from 40 to 125 trees per acre. Younger, managed stands that would be candidates for commercial thinning or density management typically range between 130 to 400+ trees per acre. The maximum number of sample trees selected would be up to 2 trees per acre. A sub-set of these sample trees is randomly selected for falling, the number of sample trees selected is dependent upon the amount of timber defect that is found within the project area. When averaged across the project area this sub-set of sample trees selected for falling is normally less than one tree per acre.

Assuming maximum sampling of acres across all timber sale proposals, on average, less than 1% of the standing trees would be felled in mature stands where regeneration harvest would occur, and less than 0.5% of the standing trees would be felled in early and mid-seral stands where commercial thinning and density management would occur. The effects of such sampling on the available timber base would be insignificant because of the small number of trees that would be felled.

Negative, direct, short-term impacts of implementing the proposed action on timber resources include mortality of the selected sample trees and potential collateral damage to adjacent trees. These impacts would be indistinguishable from and consistent with the range of natural variability associated with natural mortality common to Douglas-fir forests. "Death of one or a few overstory trees acts like a small minor disturbance and permits a small, single-cohort stand to grow from advance regeneration and other regeneration mechanisms." (Oliver and Larson 1990; p. 159). If felled trees were subsequently retained on site, there would be a localized, long-term beneficial impact to the levels of coarse and large woody debris present on the site.

B. Special Status and Special Attention Species

1. Wildlife

The proposed action would have negligible direct and indirect effects to Special Status and Special Attention wildlife species for the following reasons:

- all required surveys for Special Status and S&M wildlife species would be completed prior to felling and necessary protection buffers for any known sites would be established and incorporated into project design;
- if these actions may affect federally-listed wildlife species, consultation with USFWS will be completed prior to felling of trees;

- if a determination is made this action is likely to adversely affect federally-listed wildlife species, the mandatory terms and conditions of the applicable Biological Opinion will be applied;
- trees felled for the purposes of this proposed action would represent a minor change in the biological components (e.g., stand density, canopy closure) of the project units and would be similar in context to the natural attrition (e.g., windthrow, bug kill, root rot) of trees within a forested stand;
- trees with obvious wildlife values (e.g., nests, cavities) would be avoided;
- Site specific impacts would be analyzed and identified in a site specific environmental document before the trees would be felled.

2. Fish

The primary potential for effects to fish and their habitats is from disturbance within one site-potential tree height distance of perennial streams. Activities within this distance have the potential to affect stream banks, channel configuration, stream sedimentation, stream shade, and large wood recruitment that are important for maintaining or creating aquatic habitat.

There would be no effect to stream banks since no trees would be felled towards the stream channel and no trees immediately adjacent (typically ranges between 40 to 100 ft. on fish-bearing streams and 20 to 50 ft. on non-fish-bearing streams) to stream channels would be felled.

The ground disturbance associated with falling trees would be virtually nonexistent due to the small size of trees felled inside of the Riparian Reserve. In rare circumstances where sediment displacement may occur due to this activity, it would be captured by ground-level vegetation or topography before it could enter a stream channel. No sediment is expected to enter stream channels.

No vegetation immediately adjacent to stream channels would be affected. The small gaps created by falling individual trees would have a negligible impact on the shading effectiveness of the Riparian Reserves and would not affect canopy closure to a degree where it would adversely modify water temperatures. Stands in Riparian Reserves where sample tree falling might occur are typically densely stocked (130 - 400^{+} trees/ac), and the falling of up to 2 trees per acre would not have any measurable impact on stream shading or temperature.

The cutting of up to 2 trees per acre would not affect the potential for future recruitment of large wood into stream channels. Approximately 70% to 90% of large wood delivered to channels originates from within one-half a site-potential tree height of streams.

Recruitment of large wood on non-fish-bearing streams would not be affected since riparian stands proposed for silvicultural treatments are typically vigorous, densely stocked stands which are presently providing little recruitment of large wood to streams. There should be no effect to stream

channel configuration due to the cutting of up to 2 trees per acre.

Present watershed conditions that affect aquatic habitat quality would be expected to continue across the Coos Bay District because no direct or indirect effects of the proposed action have been identified at either the site or watershed levels. The Proposed Action will require no new road construction, would have no effect on peak or base flows, and would not affect the functioning of riparian areas.

Implementation of the Proposed Action would have no effect to listed, proposed or candidate fish species on the Coos Bay District. A "no effect" determination does not require consultation with the National Marine Fisheries Service or the United States Fish and Wildlife Service.

3. Plants

The proposed action would have negligible direct and indirect effects to Special Status and Special Attention botanical species for the following reasons:

- all surveys for Special Status and Special Attention botanical species would be completed prior to felling and necessary protection buffers for any known sites would be established;
- trees felled for the purposes of this proposed action would represent a minor change in the biological components (e.g., stand density, canopy closure) of the project units, and would be similar in context to the natural attrition (e.g., windthrow, bug kill, root rot) of trees within a forested stand;
- trees that are felled would provide minor forest gaps and fresh coarse woody debris that may temporarily benefit botanical diversity until the subsequent action is initiated.

C. Water Resources

There are no direct, indirect, or cumulative impacts to watershed and channel conditions arising from the proposed action because the felling of up to 2 sample trees per acre would not measurably change present conditions.

Impacts to water quality parameters identified by DEQ would also be negligible, as mitigating measures would avoid potential losses in shade and introduction of sediment. Extensive timber felling in upland areas and Riparian Reserves, has the potential to increase peak flows by removing vegetative cover or creating gaps in the canopy. These gaps allow increased accumulations of snow. During warm rain-on-snow events, there is a potential for increases in peak flows associated with rapid snow melt. The small size and scattered nature of the canopy gaps would not be sufficient to have any measurable effect on snow pack on the forest floor that would affect peak and base flows. This would be consistent with the range of natural variability associated with gap-phase mortality common to Douglas-fir forests.

The Proposed Action will require no new road construction, would have no effect on peak or base flows, and would not affect the functioning of riparian areas. There is no anticipated impact to channel function as there will be little change in the future recruitment of large wood into stream channels from this action. This will retain the trees most likely to enter the channel system. In areas where the felling of individual trees could result in impacts to the channel and wetlands system, such as flood plains and high water table areas, there will be no felling.

The potential for affecting stream temperature is very unlikely as the proposed action would involve the felling of up to two trees per acre on average. This level of canopy reduction would be too small to affect temperatures. The small gaps created by individual tree canopy removal would not affect canopy closure to a degree where shading of streams would be affected and adversely modify water temperatures. Riparian buffers of 100 feet or more in mountainous terrain have been reported to provide as much shade as undisturbed late-successional/old-growth forests (USDA, USDC and USDI 1993, p. V-28; USDA and USDI 1994a, Figure 3&4-4, pp. 3&4-60).

Appendix A describes how the project is consistent with each ACS objective.

D. Soils

The specific impacts of removal or retention of felled trees would be addressed in a subsequent project-specific environmental analysis.

Felling of trees could result in direct disturbance/displacement of the soil litter layer in the immediate vicinity of the tree(s) and insignificant compaction of the surface mineral horizon. Any impacts on soil resources, including compaction, disturbance, displacement, or surface erosion from falling up to 2 trees per acre would be insignificant, and short-term in nature. These impacts would be indistinguishable from and consistent with the effects of natural canopy gap formation. In terms of the felling operation, there would be no ground-based equipment used and no yarding of felled trees would occur, so there would be no soil disturbance associated with such activities.

E. Cultural Resources

The proposed action should have no effect on cultural resources because areas proposed for "Tree Falling for Measurements" would be inventoried in accordance with western Oregon BLM inventory standards, and if cultural resources were found, one of two alternative actions wold then be taken. Either the project would be redesigned to protect the cultural resources present or evaluation and mitigation procedures would be implemented for the cultural resource. The choice between these alternatives would be based on recommendations from the District archaeologist.

III. Monitoring

Monitoring would be specific to the project analysis for the proposed management activities to which the "Tree Falling for Measurements" is applied and would be in accordance with the Coos Bay District RMP, Appendix L, as amended.

Chapter 5 - Preparers

The following individuals were consulted and participated in the preparation of this environmental assessment:

Bob Gunther	Coo Bay District Planner
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Appendix A: Aquatic Conservation Strategy Objectives and Beneficial Uses

Table A-1: Documentation of Consistency with Aquatic Conservation Strategy Objectives

This table lists the nine Aquatic Conservation Strategy (ACS) Objectives and the interdisciplinary team's predicted impact on those objectives if either of the two alternatives described in Chapter 2 of Environmental Assessment (EA) Number OR120-00-06 were implemented.

ACS Objective 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.

No Action: The current distribution, diversity and complexity of watershed and landscape-scale features would be maintained. **Does not retard or prevent the attainment of ACS Objective 1.**

Proposed Action: The felling of up to two trees per acre would be consistent with the range of natural variability associated with gap-phase mortality common to Douglas-fir forests. As such, there would be a negligible effect on the current distribution, diversity and complexity of watershed and landscape-scale features. **Does not retard or prevent the attainment of ACS Objective 1.**

Table A-1: Documentation of Consistency with Aquatic Conservation Strategy Objectives

This table lists the nine Aquatic Conservation Strategy (ACS) Objectives and the interdisciplinary team's predicted impact on those objectives if either of the two alternatives described in Chapter 2 of Environmental Assessment (EA) Number OR120-00-06 were implemented.

ACS Objective 2. Maintain and restore spatial and temporal connectivity within and between watersheds. Lateral, longitudinal, and drainage network connections include flood plains, wetlands, upslope areas, headwater tributaries, and intact refugia. The network connections must provide chemically and physically unobstructed routes to areas critical for fulfilling life history requirements of aquatic and riparian dependent species.

No Action: The current condition of connectivity would be maintained. **Does not retard or prevent the attainment of ACS Objective 2.**

Proposed Action: The felling of up to two trees per acre would be consistent with the range of natural variability associated with gap-phase mortality common to Douglas-fir forests. As such, there would be a negligible effect on connectivity within and between watersheds. **Does not retard or prevent the attainment of ACS Objective 2.**

ACS Objective 3. Maintain and restore the physical integrity of the aquatic system, including shorelines, banks, and bottom configurations.

No Action: The current condition of the physical integrity of the aquatic system would be maintained. **Does not retard or prevent the attainment of ACS Objective 3.**

Proposed Action: There would be no effect to the physical integrity of the aquatic system since no trees immediately adjacent (typically within 20 to 50 feet on non-fish-bearing streams and 40 to 100 feet on fish-bearing streams) to stream channels would be felled nor would trees be felled towards the stream channel. **Does not retard or prevent the attainment of ACS Objective 3.**

Table A-1: Documentation of Consistency with Aquatic Conservation Strategy Objectives

This table lists the nine Aquatic Conservation Strategy (ACS) Objectives and the interdisciplinary team's predicted impact on those objectives if either of the two alternatives described in Chapter 2 of Environmental Assessment (EA) Number OR120-00-06 were implemented.

ACS Objective 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, growth, reproduction, and migration of individuals composing aquatic and riparian communities.

No Action: The current condition of water quality would be maintained. **Does not retard or prevent the attainment of ACS Objective 4.**

Proposed Action: There are no measurable impacts to water quality parameters identified by Oregon Department of Environmental Quality, as project design features (e.g., no-cut buffers, felling of up to two trees per acre, and no new road construction, would avoid potential losses in shade. There will be no introduction of sediment into the aquatic environment. The small gaps created by individual tree canopy removal would be within the range of natural variability associated with gap-phase mortality common to Douglas-fir forests and are not anticipated to affect canopy closure to a degree where shading of streams would be changed to the extent that it would measurably affect water temperatures. Soil disturbance associated with the falling of trees would be minimal in regard to sediment production, and any potential sediment resulting from this activity would be captured by ground-level vegetation or topography in the no-cut buffer areas. **Does not retard or prevent the attainment of ACS Objective 4.**

ACS Objective 5. 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.

No Action: The current condition of the sediment regime would be maintained. **Does not retard or prevent the attainment of ACS Objective 5.**

Proposed Action: The possibility of an impact to the sediment regime or an increase in sediment moving into streams is minimized or eliminated due to the following: no-cut buffers; felling of up to two trees per acre, which is within the range of natural variability associated with gap-phase mortality common to Douglas-fir forests; and no new road construction. Due to the small size and scattered nature of the canopy gaps, there would be no effect on peak or base flows. Soil disturbance associated with the falling of trees would be minimal in regard to sediment production and any potential sediment resulting from this activity would be captured by ground-level vegetation or topography in the no-cut buffer areas. **Does not retard or prevent the attainment of ACS Objective 5.**

Table A-1: Documentation of Consistency with Aquatic Conservation Strategy Objectives

This table lists the nine Aquatic Conservation Strategy (ACS) Objectives and the interdisciplinary team's predicted impact on those objectives if either of the two alternatives described in Chapter 2 of Environmental Assessment (EA) Number OR120-00-06 were implemented.

ACS Objective 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.

No Action: The current condition of in-stream flows would be maintained. **Does not retard or prevent the attainment of ACS Objective 6.**

Proposed Action: The small size and scattered nature of the canopy gaps that would be created would not be sufficient to have any measurable effect on peak and base flows, and would not constitute an effect any greater than would be associated with the loss of individual trees. This would be consistent with the range of natural variability associated with gap-phase mortality common to Douglas-fir forests. As such, this alternative would have no effect on in-stream flows. **Does not retard or prevent the attainment of ACS Objective 6.**

ACS Objective 7. Maintain and restore the timing, variability, and duration of flood plain inundation and water table elevation in meadows and wetlands.

No Action: The current condition of flood plain inundation and water tables would be maintained. **Does not retard or prevent the attainment of ACS Objective 7.**

Proposed Action: The current condition of flood plain inundation and water tables would be maintained. Specifically, no trees immediately adjacent to stream channels, typically within 20 to 50 feet on non-fish bearing streams and 40 to 100 feet on fish bearing streams, would be felled nor would trees be felled towards the stream channel. Additionally, no ground-disturbing activities would occur within flood plains, meadows or wetlands, and there would be no new road construction associated with this project. **Does not retard or prevent the attainment of ACS Objective 7.**

Table A-1: Documentation of Consistency with Aquatic Conservation Strategy Objectives

This table lists the nine Aquatic Conservation Strategy (ACS) Objectives and the interdisciplinary team's predicted impact on those objectives if either of the two alternatives described in Chapter 2 of Environmental Assessment (EA) Number OR120-00-06 were implemented.

ACS Objective 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.

No Action: The current condition of plant communities within riparian areas would be maintained. **Does not retard or prevent the attainment of ACS Objective 8.**

Proposed Action: The felling of up to two trees per acre would be consistent with the range of natural variability associated with gap-phase mortality common to Douglas-fir forests. The small canopy gaps created by individual tree canopy removal would have a negligible impact on the function of the riparian reserves. The no-cut buffers along streams would maintain thermal regulation and provide for stream bank protection. Trees that are felled would provide minor forest gaps and fresh coarse woody debris that may temporarily benefit botanical diversity. **Does not retard or prevent the attainment of ACS Objective 8.**

Table A-1: Documentation of Consistency with Aquatic Conservation Strategy Objectives

This table lists the nine Aquatic Conservation Strategy (ACS) Objectives and the interdisciplinary team's predicted impact on those objectives if either of the two alternatives described in Chapter 2 of Environmental Assessment (EA) Number OR120-00-06 were implemented.

ACS Objective 9. Maintain and restore habitat to support well-distributed populations of native plant, invertebrate and vertebrate riparian-dependent species.

No Action: The current condition of habitat to support riparian-dependent species would be maintained. **Does not retard or prevent the attainment of ACS Objective 9.**

Proposed Action: The possibility of an impact to habitat which supports native plant, invertebrate and vertebrate riparian-dependent species is minimized or eliminated due to project design features such as: no-cut buffers, including those along stream channels and known survey and manage sites; felling of up to two trees per acre, which is within the range of natural variability associated with gap-phase mortality common to Douglas-fir forests; avoiding felling of trees with obvious signs of wildlife use; and no new road construction. Trees that are felled would provide minor forest canopy gaps and fresh coarse woody debris that may temporarily benefit botanical and wildlife diversity, as well as enhance wildlife use. **Does not retard or prevent the attainment of ACS Objective 9.**

Table A-2. Beneficial Uses Review Summary

This table lists the downstream beneficial uses and displays the interdisciplinary team's predicted environmental impact on each beneficial use if the Proposed Action (Alternative 2) described in Chapter 2 of Environmental Assessment (EA) Number OR120-00-06 was implemented.

Downstream Beneficial Uses	Environmental Effect	Remarks/References
Public Water Supply	Not Affected	
Private Domestic Water Supply	Not Affected	
Irrigation	Not Affected	
Fisheries	No Effect	See Chapter 4 of the EA
Wildlife	Negligible Effect	See Chapter 4 of the EA
Recreation	Not Affected	
Maintenance of Aesthetic Quality	Not Affected	