Day Walker Timber Sale

Decision Record

Walker Creek Terrestrial Restoration Project Environmental Assessment
DOI-BLM-OR-S060-2011-0012

January 2015

United States Department of the Interior
Bureau of Land Management Oregon State Office
Salem District
Tillamook Resource Area

Township 3 South, Range 6 West, Sections 15, 22, 23, 25 and 26
Willamette Meridian
Yamhill County, Oregon

Responsible Agency: USDI – Bureau of Land Management

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BLM
Salem District

BLM/OR/WA/PL-15/014+1792

1.0 Introduction

The Bureau of Land Management (BLM) conducted an environmental analysis for the Walker Creek Terrestrial Restoration Project (Walker Creek Project; EA# DOI-BLM-OR-S060-2011-0012). The proposed treatments in the Day Walker Timber Sale were analyzed under this EA. The EA analyzed the effects of density management thinning and associated actions on 575 acres of forest stands aged 38 to 99 years old. This is the first decision under the EA to implement activities on 203 acres of the Walker Creek Project area in what hereafter is referred to as the Day Walker Timber Sale (stand ages 61 – 87 years old). This sale is located within the Adaptive Management Area (AMA) and Riparian Reserves land use allocations in the Nestucca River fifth-field watershed in Yamhill County, Oregon.

2.0 Decision

I have decided to implement the treatments described in Alternative 2, the proposed action, in the EA on pages 24 – 43 for those units in Sections 15, 22, 23, 25 and 26; T. 3 S., R. 6 W., WM. (See attached map), hereafter referred to as the "selected action." This decision is based on site-specific analysis in the Walker Creek Terrestrial Restoration Project EA, the supporting project record, management recommendations contained in the *Nestucca Watershed Analysis* (1994), the management direction contained in the *Salem District Resource Management Plan* (RMP) (May 1995), which are incorporated by reference in the EA, as well as the management guidance found in the *Late-Successional Reserve Assessment for Oregon's Northern Coast Range Adaptive Management Area* (January 1998).

Project Unit Number Crosswalk	
Walker Creek Project EA Unit #	**Day Walker Timber Sale Unit #**
15-14	1
15-23	2
22-1	3
23-1	4
26-12	5
25-1	6

Decision Summary

The following is a summary of this decision:

Density Management

- Variable density thinning on approximately 203 acres of 61-87 year old forest within AMA and Riparian Reserves.
    - Within the AMA – 114 acres
    - Within the RR – 89 acres
- Units 1, 2 and 3 have diameter cut limits where all trees greater than or equal to the quadratic mean diameter (QMD[1]) plus 20% are reserved from harvest.

[1] QMD is the quadratic mean diameter, a measure of the average tree diameter. QMD measures the mean diameter of trees in the stand at breast height.

- Of the 203 total acres, approximately 3 acres will be cleared for road construction (described below).
- Approximately 4,306 MBF of timber will be harvested.
- *Phellinus weirii* treatments will occur on up to 45 acres where the root disease is especially prevalent. The treatment will occur in one to seven acres patches where treatments would include leaving approximately 20 trees/acre at relatively wide spacing of the highly susceptible species (Douglas-fir and grand fir) along with retention of any existing hardwoods and less-susceptible conifers. These areas will be underplanted with disease-resistant western redcedar and red alder. The *Phellinus weirii* treatment prescription will not occur within a one site tree slope distance of any stream (approximately 220 feet) regardless of *Phellinus* infection level.

Timber Yarding Methods

- Ground-based yarding – 178 acres (88 percent)
- Skyline yarding – 25 acres (12 percent)

Fuels

- Approximately 55 landing piles will be burned under conditions conducive to good atmospheric mixing in accordance with Oregon Department of Forestry Smoke Management guidelines. Understory slashing will occur where necessary in Units 1 (EA15-14), 2 (EA 15-23), and 3 (EA 22-1) in order to facilitate underplanting.
- *Phellinus weirii* treatments: up to 45 acres of *Phellinus weirii* treatments may occur that would include hand piling and burning of slash less than 6" in diameter. Burning will occur under conditions conducive to good atmospheric mixing in accordance with Oregon Department of Forestry Smoke Management guidelines.

Roads

NEW CONSTRUCTION (Total 10 segments)	
New Natural Surfaced Road Construction Temporary (undisturbed ground)	*0.75 miles*
New Natural Surfaced Road Construction Temporary (previously disturbed ground)	*0.59 miles*
RENOVATION	
Renovation/Decommission – Natural Surface, not currently decommissioned (3-6-26.3 rd. – Spur C). • Reopen - then full decommission = block, waterbar, pull culverts, decompact, plant/seed	*0.15 miles (counts toward reduction of miles in watershed)*
Renovation/Decommission – Natural Surface currently decommissioned (Spur D and Spur J). • Reopen - then full decommission = block, waterbar, pull culverts, decompact, plant/seed	*0.52 miles*
Renovation/Permanent – Gravel Surface (main system roads) • Renovation = blading/grading, brushing, rocking, culvert replacement, ditch cleaning, etc.	*10.9 miles*

Decommissioning entails removing stream-crossing culverts if present, de-compacting the surface, water barring, seeding or planting with native species, and restricting OHV use. Restricting OHV use may include the strategic placement of boulders, logs, root wads, or other types of earthen barriers.

Coarse Wood Development

- Density Management Stands 80 years and older (timber sale units 1, 2 and 3): After harvest, create down wood, snags and/or live topped trees. Selected trees will be approximately the size of the post-harvest quadratic mean diameter. Units 1 and 2 will have fewer than 55 trees per acre after harvest and therefore ½ of the required coarse wood has been created in adjacent and nearby forest stands that are not being treated by thinning (EA p. 33; 530 trees were treated in 2014 under the Salem District Wildlife Tree and Down Wood Creation Categorical Exclusion to meet this requirement). For the remaining needed coarse wood, ½ will be created after harvest and, after a five year evaluation of naturally recruited coarse wood; the remainder will be created (EA p. 33). Treatments will include felling 25% of the required trees, topping below live crown 25% of the trees and topping or girdling within live crown for the remaining 50% of the trees. 75% of the treatments will be in small groups (3-5 trees) and 25% scattered throughout the units. The following table shows the needed coarse wood to meet the target 3,200 cubic feet of coarse wood (EA p. 49).

Unit #	Acres	≤ 55TPA post-harvest?	Post-harvest QMD	Total Needed trees/ac	Needed in Unit (per acre)	Post-Harvest CWD trees/ac	Total trees
1	35	Yes	27.9”	10.7	5.4	2.7	94
2	13	Yes	30.9”	8.5	4.2	2.1	27
3	35	No	27.2”	13	13	6.5	228
Total trees have been rounded to nearest tree.							

- Density Management Stands less than 80 years old (timber sale units 4, 5 and 6): After harvest, create down wood by falling two trees per acre at least 20” in diameter; and create two snags or live- topped trees per acre by topping either in live crown or below live crown two trees at least 20” in diameter (total of four coarse wood structures per acre). Treatments will be 75% grouped (3-5 trees) and 25% scattered. The following table shows the needed coarse wood.

Unit #	Acres	Needed trees/ac	Total trees
4	10	4	40
5	61	4	244
6	46	4	184

Project Design Features

- Project Design Features described in the EA (pp. 36-43) will be incorporated into the timber sale contract.

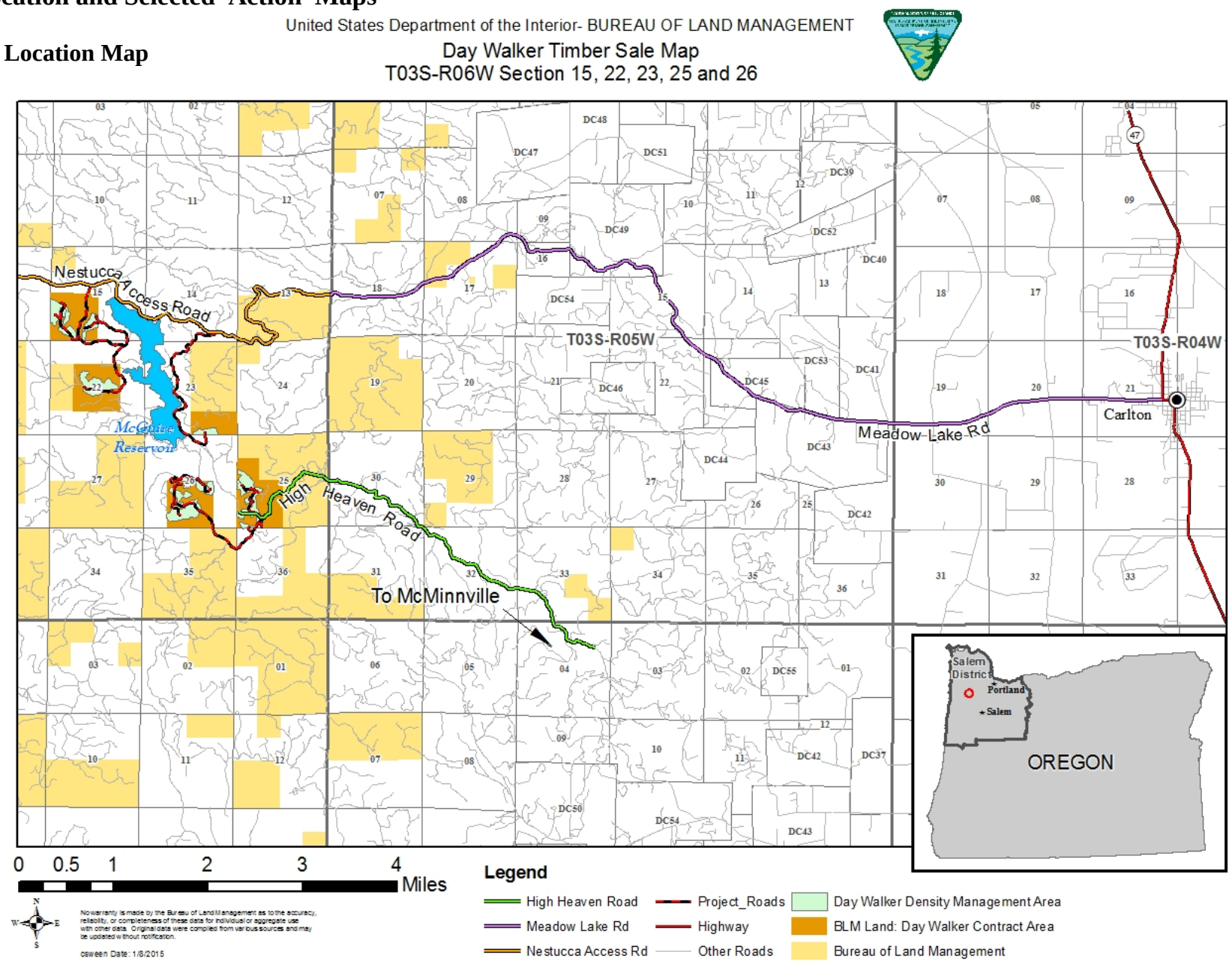
Refinements to the Project since the EA was published

Project boundaries and acreage: The EA estimated that the area included in the Day Walker Timber Sale was 220 acres, 132 in the AMA and 88 in the Riparian Reserves. These draft boundaries provided an analysis area for the interdisciplinary team. Throughout the planning process and subsequent sale layout, the boundaries were refined to reflect and address on-the-ground conditions, logging feasibility, and resource needs. The final project area was calculated using GPS and Geographic Information Systems data in 2014. The final timber sale unit areas amount to 203 acres (114 ac. AMA, 89 ac. RR). Nearly all of the 18 acre reduction occurred within the AMA land use allocation mostly because the eastern planning unit boundary in EA unit 25-1 included an area that was previously thinned and not ready to be harvested again, but also due to normal layout differences between the planning area and on-the-ground conditions.

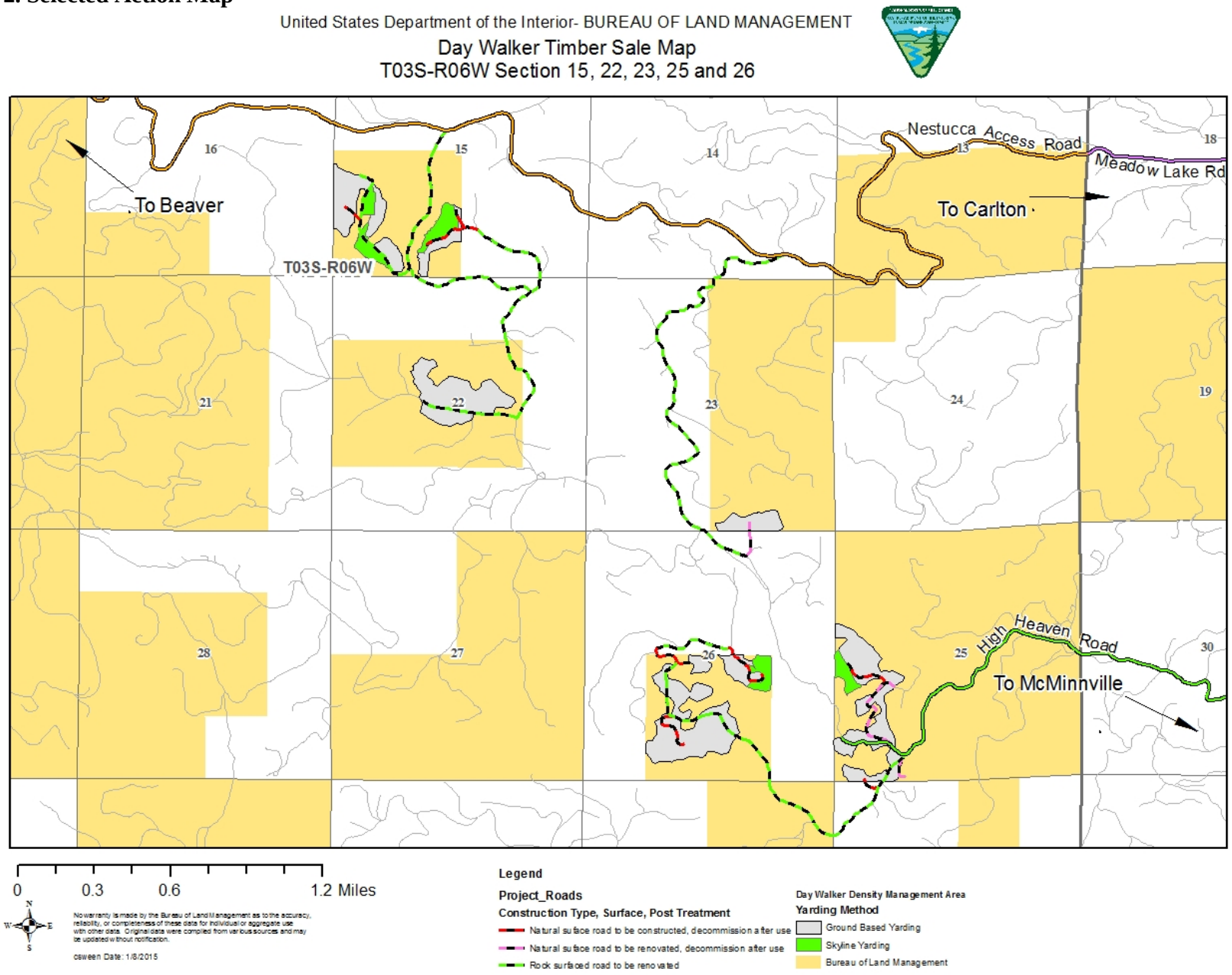
Location and Selected Action maps appear on the following pages.

3.0 Location and Selected Action Maps

Map 1. Location Map



Map 2. Selected Action Map



4.0 Alternatives Considered

The EA analyzed the effects of the No Action and Proposed Action alternatives. No unresolved conflicts concerning alternative uses of available resources (section 102(2) (E) of NEPA) were identified. An alternative that would apply density management only in stands less than 80 years old was considered but not analyzed in detail (EA p. 44). Complete descriptions of the two alternatives are contained in the EA, pp. 24 to 43.

5.0 Decision Rationale

Considering public comment, the content of the EA and supporting project record, the management recommendations contained in the *Nestucca Watershed Analysis*, management guidance found in *The Late-Successional Reserve Assessment for Oregon's Northern Coast Range Adaptive Management Area*, and the management direction contained in the RMP, I have decided to implement a portion of Alternative 2, the selected action, as described in section 2.0 of this DR. The following is my rationale for this decision.

The Selected Action:

- Best meets the purpose and need of the project (EA section 1.1) by beginning the process of changing the developmental pathway of 203 acres of forestland from one of a simple single overstory structure with little structural diversity or complexity to the desired future condition (EA pp. 22-23) where an understory is established and additional structural features such as snags, live topped trees, and large down wood are present. These stand structural changes will occur with minimal adverse effect to sensitive species or their habitat based on surveys showing sensitive species are not present; or the incorporation of design features to specifically minimize adverse effects (EA pp. 36-43).

The No Action alternative was not selected because it does not meet the Purpose and Need directly or would greatly delay the achievement of the Purpose and Need by indefinitely prolonging the simple structural state of the forest stands as evidenced by other forest stands in the Walker Creek planning area (EA pp. 44, 47, 54, 91, and, 102).

6.0 Compliance with Direction

The Day Walker Timber Sale has been designed to conform to the following documents, which direct and provide the legal framework for management of BLM-managed lands within the Salem District:

1. *Salem District Record of Decision and Resource Management Plan, May 1995 (ROD/RMP):* The ROD/RMP has been reviewed and it has been determined that the Day Walker Timber Sale and associated activities conforms to the land use plan terms and conditions (e.g. complies with management goals, objectives, direction, standards and guidelines) as required by 43 CFR 1610.5 (BLM Handbook H1790-1). Implementing the ROD/RMP is the reason for doing these activities (ROD/RMP p.1-3).

2. The Salem 1995 RMP is the plan of record for the Salem District. The 1995 RMP incorporated land use allocations and standards and guidelines from the *Record of Decision for Amendments to*

Forest Service and Bureau of Land Management Planning Documents within the Range of the Northern Spotted Owl and Standards and Guidelines for Management of Habitat for Late-Successional and Old-Growth Forest Related Species within the Range of the Northern Spotted Owl, April 1994 (the Northwest Forest Plan, or NWFP).

3. *Record of Decision and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines,* January 2001.

4. *Revised Recovery Plan for the Northern Spotted Owl, (Strix occidentalis caurina).* U. S. Fish and Wildlife Service, 2011.

The analysis in the Walker Creek Terrestrial Restoration Project EA is site-specific and tiers to analyses found in the *Salem District Proposed Resource Management Plan/Final Environmental Impact Statement* (RMP/FEIS), September 1994. The RMP/FEIS includes the analysis from the *Final Supplemental Environmental Impact Statement on Management of Habitat for Late-Successional and Old-Growth Forest Related Species within the Range of the Northern Spotted Owl* (NWFP/FSEIS*),* February 1994. In addition, the EA is tiered to the *Final Supplemental Environmental Impact Statement For Amendment to the Survey & Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines* (S&M FSEIS, November 2000).

Survey and Manage Review

The Day Walker Timber Sale is consistent with court orders relating to the Survey and Manage mitigation measure of the Northwest Forest Plan, as incorporated into the Salem District RMP. For a more detailed description of the history and status of the Survey and Manage mitigation see EA pp. 14-16.

The current status of the Survey and Manage mitigation is that the BLM can continue developing and implementing projects that meet the 2011 Settlement Agreement exemptions or species list as long as certain criteria are met. These criteria include:

(1) projects in which any Survey and Manage pre-disturbance survey has been initiated (defined as at least one occurrence of actual in-the-field surveying undertaken according to applicable protocol) in reliance upon the Settlement Agreement on or before April 25, 2013;

(2) projects, at any stage of project planning, in which any known site (as defined by the 2001 Record of Decision) has been identified and has had known site-management recommendations for that particular species applied to the project in reliance upon the Settlement Agreement on or before April 25, 2013; and

(3) projects, at any stage of project planning, that the BLM and FS designed to be consistent with one or more of the new exemptions contained in the Settlement Agreement on or before April 25, 2013.

The Day Walker Timber Sale is consistent with all three criteria because pre-disturbance surveys were initiated in all stands 80 years old and older prior to April 25, 2013 and relied on the Settlement Agreement (terrestrial mollusk, botany (including lichens and bryophytes) and red tree voles); known site management has been applied for active red tree vole sites found during surveys, as well as certain

pin lichens found during surveys (no S&M mollusks were found); and the Day Walker Timber Sale as described in the Walker Creek Terrestrial Restoration Project EA was designed to be consistent with the Settlement Agreement in place on or before April 25, 2013.

Red tree vole protection areas: The BLM completed protocol surveys on the Walker Creek Terrestrial Restoration Project in 2011 and 2012 using the *SURVEY PROTOCOL for the RED TREE VOLE Arborimus longicaudus* (= *Phenacomys longicaudus* in the Record of Decision of the Northwest Forest Plan) v. 2.1, (October 2002). Transect surveys were completed in all units over 80 years of age despite none of the units containing habitat that would trigger survey requirements. Transect surveys were conducted on three units of the Day Walker Timber Sale, units 1 (EA unit 15-14), 2 (EA unit 15-23) and 3 (EA unit 22-1). Two active tree vole sites were located during surveys neither of which was inside the boundaries of any of the original Walker Creek proposed units. One is in a riparian area south of unit 1 and a second in an area adjacent to the southeast part of the original EA unit 15-23, which is now unit 2. Ten acre management areas have been established for these sites and they are excluded from the timber sale area.

Survey and Manage lichen management: Thirty-five sites of *Stenocybe clavata*, twenty-seven sites of *Chaenotheca chrysocephala*, one site of *Chaenotheca ferruginea*, one site of *Cheanothecopsis pusilla* and one site of *Hypogymnia duplicata* were found. These five species require known site management. Management recommendation and expert input indicate that site protection can be achieved by protecting the trees that the species occur on from direct logging damage. All of the trees where these S&M species were found have been marked and will be reserved from harvest.

Compliance with the Aquatic Conservation Strategy

The BLM reviewed the No Action and Proposed Action alternatives relative to the ACS objectives at the project scale. The No Action alternative does not retard or prevent the attainment of any of the nine ACS objectives because this alternative would maintain current conditions (EA pp. 122-127). The Proposed Action also does not retard or prevent the attainment of any of the nine ACS objectives.

Over the long-term, the Day Walker Timber Sale and associated activities will aid in meeting ACS objectives by speeding the development of older forest characteristics in the Riparian Reserves that will improve spotted owl habitat, a riparian associated species. In addition, more open stands outside of no harvest buffers, along with strategic underplanting will allow for the development and growth of multi-layered riparian forest. No harvest buffers along all streams will assure that wood routing dynamics will continue to function and the creation of coarse wood structures will add structural diversity in the near term where little exists now (EA pp. 126-127).

Compliance with the National Historic Preservation Act (NHPA)

Compliance with Section 106 of the NHPA was completed using the 1998 Oregon Protocol under the 2012 National Programmatic Agreement. A pre-project survey was completed in August of 2013 for inventoried cultural resources that may occur in the Day Walker Timber Sale area of which none were located. Project Design Features requiring post-project survey and the stoppage of work if cultural resources are discovered have been incorporated into the project. Consultation with the State Historic Preservation Office is not required.

7.0 Public Involvement, Consultation, and Coordination

Public Scoping

The BLM mailed a scoping letter, dated September 12, 2011, to 15 potentially affected or interested individuals, groups, and agencies. In addition, a description of the proposal was included in the Salem Bureau of Land Management Project Update for September 2011, which was mailed to more than 150 individuals and organizations. The BLM received one response during the scoping period and utilized comments in the response to consider issues and refine the action alternatives (EA p. 11).

EA and FONSI Comment Period and Comments

The BLM made the EA and an unsigned FONSI available for public review from March 12, 2014 to April 11, 2014. Two comment letters were received during the EA comment period. Responses to the public comments can be found in Appendix A of this Decision Record. The scoping and EA comment letters and emails are available for review at the BLM's Tillamook Resource Area Office.

Consultation and Coordination

Wildlife: United States Fish and Wildlife Service (USFWS)

The proposed project is expected to have a short-term negative impact on spotted owl dispersal habitat but have a long-term positive effect on spotted owl suitable habitat, which requires informal consultation with the US Fish and Wildlife Service. There will not be any effects to marbled murrelets or their habitat. In accordance with regulations pursuant to Section 7 of the Endangered Species Act of 1973, as amended, informal consultation with the US Fish and Wildlife Service (USFWS) concerning the potential impacts of the Day Walker Timber Sale upon the spotted owl and/or their designated Critical Habitat has been completed by including the timber sale within the *Biological Assessment (BA) Of Habitat Modification Projects Proposed During Fiscal Years 2015 And 2016 In The North Coast Planning Province, Oregon, That Are Not Likely To Adversely Affect (Nlaa) Northern Spotted Owls Or Marbled Murrelets And Their Critical Habitats* (August 7, 2014). A Letter of Concurrence (LOC) for the BA has been received from the USFWS (FWS Reference Number 01EOFW00-2014-I-0234) indicating their agreement that the Day Walker Timber Sale would not adversely affect spotted owls or their habitat since the design and features of the day Walker Timber Sale are consistent with those described in the Biological Assessment.

Fish: National Marine Fisheries Service (NMFS)

The BLM determined that based on the potential for small inputs of sediment to Oregon Coast coho salmon habitat streams from timber haul and culvert replacement, and that there is a possibility of a slight reduction of wood recruitment potential to a coho habitat stream, that informal consultation with National Marine Fisheries Service is warranted (Section 4.2.2 of the EA). Consultation with the National Marine Fisheries Service on these potential effects of the Walker Creek Terrestrial Restoration Project (which includes the Day Walker Timber Sale) on coho was conducted with a project specific consultation (Section 7 Streamlined Consultation) in the summer of 2014. A Letter of Concurrence indicating that no aspect of the project would result in adverse effects to Oregon Coast coho was

received from the National Marine Fisheries Service on September 23, 2014 thus concluding consultation requirements (NMFS reference Number WCR-2014-588). Required assessment for Magnuson-Stevens Fisheries Conservation and Management Act Essential Fish Habitat for the proposed action is included in EA (Section 3.3.3 of the EA).

8.0 Conclusion

Finding of No Significant Impact

I reviewed the comments on the EA and draft FONSI and no information was provided that lead me to believe the analysis, data, or conclusions are in error or that the selected action needs to be altered. There are no significant new circumstances or information relevant to the selected action or associated environmental effects. I have determined in the Finding of No Significant Impact (FONSI, December 2014) for the Walker Creek Terrestrial Restoration Project that Alternative 2, proposed action, will not significantly affect the quality of the human environment, individually or cumulatively with other actions in the general area, and that no environmental effects meet the definition of significance in context or intensity as defined in 40 CFR 1508.27. There are no site specific impacts that would require supplemental/additional information to the analysis done in the *Salem District Proposed Resource Management Plan/Final Environmental Impact Statement*, September 1994 (RMP/FEIS). Therefore, an environmental impact statement is not needed and therefore will not be prepared.

Administrative Review Opportunities

The decision described in this document is a forest management decision and is subject to protest by the public. In accordance with Forest Management Regulations at 43 CFR 5003, protests of this decision may be made within 15 days of the publication of a notice of decision in a newspaper of general circulation. The notice of decision will be published in the Yamhill Valley News-Register newspaper on January 27, 2015.

To protest this decision a person must submit a written protest to Karen Schank, Tillamook Resource Area Field Manager, 4610 Third Street, Tillamook, Oregon 97141 by the close of business (4:30 p.m.) on February 11, 2015. A written protest electronically transmitted (e.g., email, facsimile, or social media) will not be accepted as a protest. A written protest must be on paper.

The protest must clearly and concisely state which portion or element of the decision is being protested and the reasons why the decision is believed to be in error, as well as cite the applicable regulations. Any objection to the project design or my decision to go forward with this project must be filed at this time in accordance with the protest process outlined above. If a timely protest is received, this decision will be reconsidered in light of the statements of reasons for the protest and other pertinent information available and the BLM shall serve a decision in writing on the protesting party (43 CFR 5003.3).

Implementation

If no protest is received within 15 days after publication of this Decision Record (Day Walker Timber Sale) this decision will become final. The planned sale date is February 25, 2015. For additional information, contact Andy Pampush (503) 815-1143, Tillamook Resource Area, Salem District BLM, 4610 Third Street, Tillamook, Oregon, 97141.

Approved by: _____ 1/14/2015

Karen Schank
Tillamook Field Manager

Date

Appendix A: Response to Public Comments Received on the Walker Creek Terrestrial Restoration Project (EA# DOI-BLM-OR-S060-2011-0012)

Comments from: American Forest Resources Council

Submitted by: Andy Geissler - Western Oregon Field Forester

The comments submitted by AFRC were generally supportive of the Walker Creek Terrestrial Restoration Project. AFRC specifically indicated that they are pleased that the Tillamook Resource Area is implementing restoration work in stands over the 80 year age class and within Late Successional Reserves as well as Riparian Reserves. AFRC also said that they were happy to see that the Purpose and Need statement included provisions to contribute to a stable timber supply. The following comments are those gleaned from the comment letter where AFRC indicated they would like to see treatments done differently or had specific recommendations for options they would like to see made available. The BLM responses follow the comments.

1. *We encourage the BLM to focus their riparian reserve treatments on a variety of native habitats. Often the management of these reserves gets focused only on late-seral habitat, so we would like the BLM to keep options open to meet all aspects of the ACS. Utilization of gap cuts to promote early seral habitat in the reserves, treatments to diversify all areas of the reserve, and prescriptions that account for the full range of objectives that the ACS mandates should be considered.*

BLM Response: The Aquatic Conservation Strategy (ACS) objectives are very focused on the near stream and in-stream environments. Forest stand management that could affect stream conditions must be carefully considered to minimize or avoid impacts to such factors as stream temperature, stream dynamics that are influenced by large wood, and water quality that is affected by sediment. Unfortunately there is little empirical data and a wide range of opinions as to what types and intensities of actions could occur in riparian reserves nearer to the streams without causing undo negative impacts. Most of the Walker Creek Project units are fairly close or very close to habitat for the ESA listed Oregon Coast Coho which limits our ability to conduct stand management activities that may cause negative impacts even if they are minor or transitory. We evaluated all of the riparian reserves in the Walker Creek Project area and are treating those that appear to be the most in need of management to further diversify and promote development of late-successional forest conditions. We did not consider gap treatments in the riparian reserves due to the potential for increasing stream temperature by removing shade and the reduction in in-stream wood potential.

2. *Furthermore, we would like the BLM to broaden their Riparian Reserve treatment areas to achieve the multiple ACS objectives in the future. Most of the land adjacent to and over intermittent streams in the project area were previously clearcut and now resemble a dense and uniform plantation. Implementing 60-100 foot no-cut buffer seems excessive for such stand conditions.*

BLM Response: The BLM considered the full range of ACS objectives when developing the Walker Creek Project. Some of the ACS objectives are not readily achievable at the project scale and rely on a broad diversity of environmental conditions for full achievement. You have

mischaracterized the forest conditions that predominate in the Walker Creek Project in that only about 35 acres in section 17 resulted in previous clearcut harvest. All of the remaining project acres resulted from repeated fires and grazing with subsequent natural seeding providing the current forest cover (EA p. 46). Implementing no-harvest buffers up to 100 feet assures that we can demonstrate that over 90% of potential in-stream wood would remain after harvest thus not causing negative effects to fish habitat (EA p. 65), especially in those stands that have trees large enough to already contribute "large" wood.

3. *One of the main benefits of thinning at this stage of seral development is the accelerated attainment of large trees to provide large in stream wood. It has been documented by many that most of the wood that naturally recruits to streams comes from within the first 65 feet of the stream channel (Murphy and Koski, 1989; McDade et al. 1990. Johnson et al. 2011). So if this is where the LWD is coming from then why not thin in this region to accelerate its creation?*

BLM Response: Research has found that nearly all in-stream wood comes from the first 100 feet from the stream channel (McDade et al. 1990). This is also the area where most of the primary shade comes from. Because most of the trees near creeks in the Walker Creek Project are already large enough to be considered functional large wood for streams, growing trees larger is not a primary objective for treating riparian reserve stands. The primary objective is to diversify the stands by introducing a shade tolerant forest layer that will provide further shade and potentially additional coarse wood in the future. Because of the presence of ESA listed coho habitat we designed the project to avoid negative impacts to fish, including in the short term.

4. *It has also been documented that vegetated buffers that are greater than 33 feet in width have been shown to be effective at trapping and storing sediment (Rashin et al. 2006). Partial cutting down to one or two conifers from intermittent stream channels would accelerate the recruitment of LWD with minimal impacts to sedimentation and stream temperature.*

BLM Response: As stated in the previous comment, the design of the no-harvest buffers in the Walker Creek Project are intended to eliminate the possibility of negative impacts to listed fish by maintaining nearly all pre-harvest shade and large wood input potential. The buffer widths were not designed at the proposed widths due to concerns for sediment trapping.

5. *Appropriate harvesting systems should be used to achieve an economically viable sale in order to meet this objective. We would like to see flexibility in the EA and contract to allow a variety of equipment access to the sale areas. We feel that there are several ways to properly harvest any piece of ground, and certain restrictive language can limit some potential bidders, thus driving the bid value down.*

BLM Response: To the extent that our planning documents allow, we have considered harvesting operations in as broad a way as possible. Restrictions generally pertain to limiting soil compaction on any given unit to 10% or less, limit soil erosion by limiting ground based operations to dry seasons and slopes 35% or less, and managing potential sediment runoff from landings. We have attempted to consider these restrictions in a more condition based light rather than having hard and fast cut-off dates and specifically limiting types of equipment (EA pp. 38-41).

6. *We encourage the BLM to conduct an economic analysis early in their planning process to explore the viability of each stand treatment.*

BLM Response: Formal economic analyses are generally not done unless there is a specific question as to merchantability regarding a particular project. Our planning process and project development occurs a considerable amount of time before sales are offered, which makes it very difficult to anticipate what the log market may be at the time of sale. Most all units proposed for sale are obviously either merchantable or not. For those units that are in need of treatment but are questionable as to merchantability, we conduct economic assessments. This can also be difficult to do since we do not generally sell single units but rather package several units together to form a timber sale. The Walker Creek Project is a forest habitat restoration project that also has an objective to provide timber to the local market. Sometimes it is in the best interest of the BLM's forest management plans to include some acreage in sales that may not stand on their own economically but when included with other acres that would be profitable to harvest, resulting in a viable timber sale.

7. *Including language in the EA and contract that specifies damage tolerance levels rather than firm restrictions gives the operator flexibility to utilize their equipment to its maximum efficiencies. For example, quantifying a residual stand damage threshold rather than entirely restricting activity during certain months (or restricting log lengths) will allow an operator the flexibility to alter their yarding techniques to meet the threshold throughout the seasons instead of having to completely shut down during certain months.*

BLM Response: The Walker Creek Project as proposed primarily limits restrictions to those specifically identified in the Salem District RMP; generally those that affect soils and water quality. We plan to use contract language that is included in every BLM timber sale contract to control resource damage not otherwise specifically mentioned. For example, there is no restriction on log lengths included in the EA, and the permitted equipment includes most all that we typically encounter in western Oregon (EA pp 38-41).

8. *Though some of the proposal area is planned for cable harvest, there are opportunities to use certain ground equipment such as fellerbunchers and processors in the units to make cable yarding more efficient. Allowing the use of processors and fellerbunchers throughout these units can greatly increase its economic viability, and in some cases decrease disturbance by decreasing the amount of cable corridors, reduce damage to the residual stand and provide a more even distribution of woody debris following harvest.*

BLM Response: As noted earlier, to limit soil erosion concerns and to be consistent with our Best Management Practices, we only allow ground based harvesting equipment on slopes that average 35% or less. If a purchaser felt that it would be beneficial to use processors or fellerbunchers in units with 35% or less slopes in conjunction with cable harvesting, that would be permitted as long as the area that becomes compacted is 10% or less of the unit.

9. *The ability to yard and haul timber in the winter months will often make the difference between a sale selling and not, and we encourage the BLM to continue to look for ways to accommodate this.*

BLM Response: Our analysis shows that wet weather hauling on gravel roads that cross streams in the vicinity of ESA listed coho salmon would result in negative impacts that may be significant to coho. However we did look for opportunity to provide winter operations and determined that

approximately 90 acres of the project includes cable harvesting units that could be operated on, including hauling, during all times of the year without unacceptable adverse effects.

10. *We also understand the BLM's financial challenge of maintaining a large road system; however, there are ways to negate these costs while still adding critical new roads to its system and keeping existing ones. Removing culverts, waterbarring, and closing a rocked road to vehicular traffic is a relatively inexpensive practice that would leave the roadbed intact for future use. We encourage the BLM to carefully consider the future management needs and added costs of fully decommissioning roads throughout their landscape. AFRC believes that constructing a road today, then obliterating it, and then rebuilding that same road in 20 years is a waste of time and money.*

BLM Response: The Walker Creek Project is within the Nestucca River Tier 1 Key Watershed, as identified in the Salem District RMP. The management direction from the RMP is to reduce road mileage within the watershed therefore the construction of new *permanent* roads is not part of this project. The construction of 2.5 miles of temporary road over 15 segments would occur with this project (EA p. 28). We do not plan to "obliterate' these roads but rather fully decommission them (we would decompact the surface but would not require re-contouring to original grade). We believe the cost of constructing and decommissioning these roads would not be appreciably different than constructing new rocked permanent roads that are then put in storage after harvest. Culverts would need to be removed and the roads blocked regardless of road type; and while there would not be the cost of subsoiling the rocked permanent road, there would be the initial cost of rocking the road. Consequently we feel that temporary roads are the best option for management in this Key Watershed on LSR lands.

Comments from: Oregon Wild

Submitted by: Doug Heiken

Comments submitted by Oregon Wild covered a variety of general topics ranging from late-successional forest structure and habitat, to carbon storage. The comments below are those that appear to be specific to the Walker Creek Project. The BLM's response follows the comments. The comment letter also included three attachments which were reviewed to determine if there were any content that specifically applied to the Walker Creek Project. The attachments include a document produced by Oregon Wild and authored by Mr. Heiken, regarding the protection of old-growth and mature forests; a document, also produced by Oregon Wild, showing slides of some examples of forest stand modeling as it pertains to dead wood production after thinning; and lastly, a document Oregon Wild produced regarding forests, carbon, and global warming. None of the attachments contained comments specific to the Walker Creek Project therefore we did not provide responses to them.

1. *We are opposed to logging in stands over 80 years old because there is no science to support the contention that logging these stands and removing large structural elements from the forest will meet LSR objectives, "accelerate structural diversity," and provide net benefits to spotted owls, marbled murrelets.*

BLM Response: We relied on science and on-the-ground evidence that show that active

management of the Walker Creek forests can and will "accelerate structural diversity". There is a lot of science that shows that thinning will accelerate tree growth that results in very large trees in a shorter period of time; Poage and Tappeiner (2002) and Tappeiner et al. (1997) have shown that many old-growth stands developed at much lower densities than the Walker Creek Project stands are at currently thus indicating that fewer trees per acre is within the natural range of variability; there is much on-the-ground evidence that shade tolerant tree species will grow if underplanted and released; there is science that shows that created snags can be and are used by wildlife species for foraging and nesting (Hagar 2008). We don't doubt that there are some 80 year old forest stands in the Pacific Northwest that are on their way to becoming high quality late successional forests without intervention; the Walker Creek Project stands are not among them. The Salem District RMP, which is based on the Northwest Forest Plan, recognized that forests in northern Oregon Coast Range need active management even beyond 80 years old (NWFP ROD/S&G pp. C-12; D-15).

2. *The EA is not clear that these stands are in the AMA, which may allow logging in stands up to 110…*

BLM Response: The entire Walker Creek Terrestrial Restoration Project is within the Northern Coast Range Adaptive Management Area. Most of the AMA has a Late-Successional Reserve LUA laid over the top where LSR goals and objectives take precedent if there is a conflict with AMA goals and objectives. The LSR portion is generally coincident with northern spotted owl designated Critical Habitat. Most LSR's do not allow timber harvest in stands over 80 years old, however the LSR in the Northern Coast Range Adaptive Management Area is an exception where management activities that include the removal of trees are allowed up to 110 year age class (106 – 115 years old) (Salem District ROD/RMP p. 15). Approximately 355 acres of the Walker Creek treatment areas are in the LSR portion of the AMA.

Snags and Coarse Wood

3. *BLM's working definition of "structural complexity" is just to develop a midstory as soon as possible. A more accurate description of the goal in LSRs is to develop and enhance late successional old growth habitat, which includes abundant snags and dead wood.*

BLM Response: On page 25 of the EA we describe the objectives of the treatments which include variable spaced thinning to open the overstory to allow for the establishment of an understory layer and promote epicormic branching and complex crown development in overstory trees; underplanting with shade tolerant conifers where there is no seed source to allow for establishment of a second tree layer and reintroduce tree species diversity to the stands; and the maintenance and creation of *large down wood, snags and wildlife habitat structures associated with topping green trees*. We believe that all of these types of actions are needed at this time in order to "develop and enhance late successional old growth habitat" in the Walker Creek Project stands sooner than would occur without treatment.

4. *Snags and dead wood are part of the "structural diversity" equation, but BLM does not do enough to account for this. BLM's oversimplified definition of structural complexity hides a significant trade-off between dead wood and understory development*

BLM Response: The EA contains considerable discussion and analysis regarding snags and dead wood (EA pp. 22, 25, 33-34, 45-50, 55, 58, 86-87, 90-94, 100-101, 103, 105-106, 114). The EA used

available data to develop a strategy to lessen the impacts associated with the proposed action and to provide for snags and coarse wood now and over time that would be within the range of what could be expected from Coast Range stands 80-199 years old (Late Successional Reserve Assessment for Oregon's Northern Coast Range Adaptive Management Area [LSRA] p. 94). There is little coarse wood now, nearly all of which is in late decay stages, and empirical evidence from local older stands makes it clear there will be little coarse wood development for several decades. Also, the Walker Creek Project would only treat 8% of the acres in the nearly 7,400 acre analysis area while 22% of the analysis area would continue to contain stands over 80 years old that would not be treated (EA p. 55).

5. *BLM addressed the trade-off between large wood and developing a midstory of new trees by saying: "We have developed a strategy for protecting existing snags, creating additional snags and maintaining trees to become snags in the future. Most importantly however we also have a strategy for developing an understory stand that would become important in the more distant future for snag recruitment that otherwise is not expected to develop for a very long time without intervention." This is arbitrary and capricious. First, there is no scientific basis for saying that developing a mid-story is more important than developing abundant snags and dead wood, especially in a landscape where these are in short supply. Second, it is factually incorrect to suggest that developing a mid-story will offer net long-term benefits to snag recruitment.*

BLM Response: Every definition of old growth forest pertaining to the Pacific Northwest that we are aware of describes these forests as having "multi-layer canopies" as well as including "multi-species" composition (FEMAT p. IX 24; NWFP p. F4; SAT Report p. 513). Descriptions of spotted owl suitable habitat include the presence of multi-layered canopies. We did explain that there is expected to be some negative effects to the overall development of snags and coarse wood from the proposed action because of the reduced number of overstory trees remaining after treatment, but that does not suggest that snags and down wood would no longer be recruited at all (EA p. 55). The statement cited above is not described as part of the proposed action or of any of the effects analyses but rather it is one of our responses to a specific scoping comment about the consideration of processes that grow and recruit snags (EA p. 135). Our response regarding the importance of the development of an understory stand is not intended to rank the importance of biological features but rather to highlight the importance of the management action. We believe that in order for this project to be successful it is critical that we actively work to develop an understory by underplanting and managing that understory because it will not develop on its own for a very long time (EA p. 22). Snags and coarse wood will develop with or without intervention; the understory is not likely to. That is why we believe that it is most important to have a strategy for that action. What we did say regarding snags and the development of a second canopy layer is that it is critical for the development of small snags that cannot be provided for currently (EA p. 55).

6. *Artificial snag recruitment after logging is a very short-term and inadequate mitigation for the removal of thousands of potential future snags*

BLM Response: Snag creation following treatment will result in more snags of various sizes and types than currently occur in the project area. The current condition is one of low snag quantity and quality (EA pp. 49 – 50). We describe the expected impacts to snags and down wood as a result of the treatments on pages 54 and 55 of the EA.

7. *The EA touts the rate of increase in basal area as a result of treatment as an indicator of a*

desired trajectory for these stands. This is highly misleading. Basal area increase per se is not closely associated with pertinent late successional conditions.

BLM Response: One of the features of late-successional and old growth forests are very large overstory trees (FEMAT p. IX 24; NWFP p. F4; SAT Report p. 513) which is one of the objectives we described for the Desired Future Condition (EA p. 22). Basal area increase is an indicator that these trees are thrifty and able to respond to thinning and we expect to be able to achieve this feature of high quality late-successional forest sooner than without treatment. Basal area is a measurable metric which in and of itself, means nothing to spotted owls or other late-successional associated species.

8. *The EA (p 49) indicates that these stands have about 1/3 of the volume of dead wood as they should and most of that is in the late stages of decay and will not persist much longer. Logging will capture mortality and retard the natural process of wood recruitment.*

BLM Response: This comment is referring to stands 80 years and older, which have mostly been thinned before and are beyond the stage of suppression mortality (the type of mortality "captured" by thinning). Density independent mortality will continue to occur but may result in fewer snags over time than if thinning did not occur. The EA describes the adverse effects to coarse wood recruitment on pages 54-55.

9. *Salem BLM's Turner Creek EA (2011) provides an example of the kind of trade-offs that can help inform a decision about the best mix of treated and untreated areas "The loss of natural snag production for several to many decades on the thinned acres will reduce the potential for owl use due to the lack of suitable prey habitat. … Overall the No Action alternative would result in much more coarse wood in the next several decades as compared to the Proposed Action which would provide better overall habitat for small mammals which in turn may benefit the spotted owl. By not thinning the overstory now during this window of opportunity the trees would be less able to respond in the future and the development of a second canopy layer would be delayed by a few decades thus taking longer to reach the vertical diversity characteristic of late-successional stands."* http://www.blm.gov/or/districts/salem/plans/files/TC_EA.pdf. *The agencies can use this as a springboard to consider important landscape issues and to inform the critical question of how much of these forests should be treated to enhance dead wood and owl prey base, and how much should be thinned to accelerate complex canopy structure.*

BLM Response: Most of the Turner Creek Projects stands were less than 60 years old, in the later stages of stem exclusion and not previously thinned which are considerably different stands than those proposed for treatment in the Walker Creek Project. The northern Oregon Coast Range is a highly modified landscape that has been greatly impacted by humans. Habitat for late-successional species is very poor. Consideration of how much of these forests should be treated to enhance dead wood and owl prey base vs. how much should be thinned to accelerate complex canopy structure are not mutually exclusive; both can and should occur. As stated in the EA on page 55, the project would treat 8% of the forested acres in the 7,400 acre analysis area while 22% of the area would remain untreated and stocked with stands older than 80 years. Also, as part of the project we will be creating over 500 snags in areas outside of thinning areas. We believe this action to be a comprehensive project that will both enhance dead wood features and accelerate complex canopy structures.

Carbon Storage

10. *Logging stands over 80 years will cause serious adverse effects on a variety of forest values (NSO, marbled murrelet, snag recruitment, carbon storage), including the fact that it will exacerbate climate change by killing carbon-capture machinery of the forest, and accelerate the transfer of carbon from the forest to the atmosphere. This is a potentially significant issue requiring an EIS.*

BLM Response: After treatment the project area would remain forested, most of the trees would remain and accelerate in growth including the top 30% of largest trees that are automatically reserved because of diameter cut limits, and new trees would be underplanted and grow. The EA analyzed the potential effects to carbon cycling from the proposed action and compared it to the No-Action alternative which, in effect, would be the same as deferring harvest for the foreseeable future (EA pp. 120-122) which would not meet the Purpose and Need for the project which includes redirecting the currently stagnated stand development to a more complex structure characteristic of older forests and to increase the stand resiliency to the impacts of *Phellinus weirii* root disease where it is prevalent. The results of the analysis show that the proposed action would transfer more carbon to the atmosphere than the no action alternative but that the degree of transfer would be so small as to be undetectable at any scale which could influence climate change, which is an inherently global issue.

Marbled Murrelet

11. *BLM did not respond to our scoping comments showing that the marbled murrelet recovery plan recommended that stands like this be protected for recruitment habitat. 1997 Marbled Murrelet Recovery Plan, page 143; "Consistent with the Forest Plan Record of Decision, thinning within Late-Successional Reserves should be restricted to stands younger than 80 years.... 3.2.1.2 Protect 'recruitment' nesting habitat to buffer and enlarge existing stands, reduce fragmentation, and provide replacement habitat for current suitable nesting habitat lost to disturbance events. Stands (currently 80 years old or older) that will produce suitable habitat within the next few decades are the most immediate source of new habitat and may be the only replacement for existing habitat lost to disturbance (e.g., timber harvest, fires, etc.) over the next century. Such stands are particularly important because of the vulnerability of many existing habitat fragments to fire and wind and the possibility that climate change will increase the effects of the frequency and severity of natural disturbances. Such stands should not be subjected to any silvicultural treatment that diminishes their capacity to provide quality nesting habitat in the future. Within secured areas, these "recruitment" stands should not be harvested or thinned."*

BLM Response: We note that the next sentence from the Recovery Plan after the one you cite says: "*However, the Record of Decision also permits thinning within Late-Successional Reserves up to 110 in Coast Range lands administered by the Bureau of Land Management (Nestucca Block)…"* This project is within the Nestucca block and is specifically supported by the Marbled Murrelet Recovery Plan. The stands planned for treatment are not recruitment habitat and are many decades from beginning to show late-successional features as evidenced by other nearby 120 year old stands, also previously thinned, that are many decades from developing late-successional features. U.S. Fish and Wildlife Service biologist on the Level 1 consultation team have visited this project area and agree (EA p. 127).

Structural Complexity

12. *BLM says these stands need logging because they "do not show any propensity to develop into complex forest in the foreseeable future without treatment." This is not supported by the evidence. BLM suggests that these stands need intervention because they are stuck in a simplified structural state. BLM does not give enough credit to natural processes that continue to operate in these stands to add heterogeneity. In fact, removing large standing trees, removes an important source of potential energy to do ecological work.*

BLM Response: We have field data from stands within the analysis area that are 30-45 years older than the proposed treatment stands that show how simple and devoid of snags and other complex structural features 120 year old stands can be, especially after commercial thinning 40 years earlier. We show in the No Action alternative analysis that natural processes are occurring, but at a very slow rate. The objective of the project is to accelerate the development of some of the structural features of late-successional forest that are lacking in the analysis area. After treatment the remaining trees in the stand will continue to be an important source of potential energy to do ecological work

13. *BLM's interest in structural complexity is suspect when one considers the proposed logging in root rot pockets. These natural disturbances are a natural source of diversity and complexity and BLM is diminishing their contribution to diversity on the landscape. We urge BLM to drop logging of the root rot pockets, or retain an extra 10 created snags per acre in addition to the 20 live trees per acre.*

BLM Response: Laminated root rot (*Phellinus weirii*) is a diversifying agent on the landscape when occurring at reasonable levels. Treatments to address root rot would only occur in the AMA portion of the project area that does not include the LSR overlay and represents only 8% of the proposed treatment acres, in multiple widely scattered patches (EA p.27). All of the lands in the project are O&C lands, and in the AMA outside of the LSR one of the objectives is also to produce a sustainable supply of timber to the local economy. This is also expressed in the Purpose and Need for the project on page 6-7 of the EA. The part of the project where these treatments would occur are very heavily infected with *Phellinus weirii* fungus to a point where the ability of those acres to remain forested and produce a forest canopy are compromised. The treatment is designed to diminish the spread of the disease, not necessarily eliminate it. Leaving additional trees or snags of susceptible species (the only ones there now) would not accomplish the Purpose and Need to increase the stand resiliency to the impacts of *Phellinus weirii* root disease where it is prevalent.

In-Stream Wood

14. *The EA says that "small snags persist for only a short time and are of little value to terrestrial species or to stream dynamics." This is misleading. ALL the thinning in stands over 80 years (400+ acres) remove LARGE wood >20" dbh, and up to 33" dbh. Rosenfeld & Huato (2003) found that large wood formed pools more reliably than small wood. Wood >24" dbh formed pools 42% of the time, while wood 6-12" dbh formed pools 6% of the time. However, from this one can conclude that the cumulative influence of several pieces of small wood can approach the pool-forming function of large wood. For instance, seven pieces of small wood are just as likely to form a channel-spanning pool as a large piece of wood. - - Similarly, Bilby and Ward (1989) surveyed characteristics of large wood in western Washington streams and found*

that size of stable pieces of large wood increases with stream size. These publications show the direct and cumulative value of small wood (which is often captured and exported by logging). This means that the agency cannot ignore or discount the value of small wood recruitment to streams. In sum, NEPA analyses must account for the effects of logging on both the quantity and quality of wood. - - BLM has admitted that small wood can be functional in small streams. BLM 2014. Planning Criteria - Western Oregon RMP Revisions, p 49. http://www.blm.gov/or/plans/rmpswesternoregon/plandocs.php

BLM Response: The Walker Creek Project includes a minimum 100 foot no-harvest buffer on all perennial streams. McDade et al. (1990) finds that over 90% of in-stream wood comes from the first 100 feet of distance from the stream. The Walker Creek Project will have little possibility of affecting in-stream wood, small or large (EA p. 64). While small dead wood has some functionality in streams, Gordon Reeves acknowledges that without large wood, small wood flushes from stream systems (THINNING AND DEAD WOOD: "BEST AVAILABLE SCIENCE" Cheryl Friesen, Science Liaison, December 15, 2009, personal communication with Gordie Reeves). Also, as you point out, Rosenfeld and Huato found that wood smaller than about 12" formed pools in any streams, regardless of size, only about 6% of the time.

Red Tree Vole

15. *We are concerned that the survey protocol for red tree vole does not accurately determine the presence or absence of the species as required by the survey and manage ROD.*

BLM Response: Even though most of the stands did not meet the general habitat descriptions used to trigger survey protocols, we surveyed all of the stands 80 years old or older using the SURVEY PROTOCOL for the RED TREE VOLE *Arborimus longicaudus* (= *Phenacomys longicaudus* in the Record of Decision of the Northwest Forest Plan) v. 2.1, (October 2002). Version 3.0 of the red tree vole protocol was not available at the time of survey, however the survey techniques did not change from v. 2.1 to v. 3.0. These protocols include statistically rigorous methodologies. None of the proposed treatment areas contain any active red tree vole nests.

16. *This project is located in an area with rare subspecies of the red tree vole that is warranted for listing under the Endangered Species Act and this creates a duty for BLM to do better surveys.*

BLM Response: We are aware of the status of red tree vole in the northern Coast Range. The BLM Special Status Species policy (BLM Manual 6840 – Special Status Species Management) directs us to treat ESA Candidate species such as the northern Coast Range distinct population segment of the red tree vole as "Bureau Sensitive". BLM biologists previewed all of the stands in order to ascertain if surveys were needed. Many stands were eliminated from treatment consideration because biologists determined that they probably would not benefit from treatment, some were surveyed for red tree voles anyway. The architecture of the tree crowns in the treatment stands is very simple and the crowns are easy to see into. Very few structures were observed and all trees with observed structures were climbed. Surveys were conducted using the SURVEY PROTOCOL for the RED TREE VOLE *Arborimus longicaudus* (= *Phenacomys longicaudus* in the Record of Decision of the Northwest Forest Plan) v. 2.1, (October 2002) and ten acre management areas were established for the few active nests that were located, all of which are excluded from proposed treatment units.

Riparian Reserve Treatments

17. *The agency must carefully explain why they think it's OK to thin stands over 80 years old in riparian reserves but not in LSRs when the goals are similar. Two of the main authors of the Northwest Forest Plan recently stated that "Riparian Reserves which have similar structural goals as the LSRs … A maximum thinning age of 80 years was used here." Johnson & Franklin 2009.*

BLM Response: Density management thinning is permitted in stands up to the 110 year age class (106-115 years) in the Late-Successional Reserve inside of the Northern Coast Range Adaptive Management Area (RMP/ROD 1995 p. 15). Riparian Reserves overlay other land use allocations based on proximity to streams. The planning documents do not prescribe age limits for treatments in Riparian Reserves.

18. *If the agency intends to log in riparian reserves to increase some nebulous goal like "vegetation diversity and complexity," then please explain why the biophysical indicators for the ACS objectives do not include any mention of vegetation diversity or complexity.*

BLM Response: ACS Objective #8: "Maintain and restore species composition and *structural diversity of plant communities* in riparian areas and wetlands…"

19. *Recommendations related to thinning in riparian reserves must be reconsidered in light of new information showing that logging does NOT increase the recruitment of large wood, and any increase in very large wood is very minor and comes at great cost in terms of a significant reduction in recruitment of functional wood in size classes smaller than "very large." In January 2013, the Science Review Team Wood Recruitment Subgroup reported their "Key Points" regarding the effects of commercial thinning on wood recruitment in riparian reserves:*

BLM Response: By and large the Key Points do not apply to our project. The key points focused on young plantations, mostly thinned to water's edge (we have minimum 100 foot buffers), or with clearcuts adjacent to the buffers (our project maintains at least 63% canopy cover outside of the buffers which is far different than a clearcut), or are model simulations of stands not at all similar to our stands. Growing very large trees is a secondary objective of the proposed action whereas the development of a multi-layered complex forest structure (which includes large overstory trees) is the primary objective. We have not claimed in the EA that the proposed action would increase the recruitment of large wood to streams. Our analysis shows that the proposed action is unlikely to have any effect on the recruitment of any wood to streams because of the project design features including stream buffers on perennial streams of at least 100 feet (EA pp. 64-66).

Key Points

The Commenter presented the 15 Key Points from the Riparian Science Papers. We used the Riparian Science Papers to help inform the analysis in the EA. While the Key Points have little relationship to our project we will respond to those Key Points where the commenter added comments or suggestions. The portions of the Key Points comments that are in *[brackets]* were added by Oregon Wild.

20. *Key Point 2. Results may not be applicable to all stand conditions. For this synthesis, many of*

our conclusions were based on modeling the effects of thinning 30 to 40 year old Douglas-fir plantation stands that range in density from 200 to 270 trees per acre (tpa). We consider such stands moderately dense, as young plantation stand densities range from less than 100 to greater than 450 tpa. In terms of dead wood production, higher density stands are likely to see more benefits from thinning, and lower density stands less benefits. [Portions of this project are probably less dense and less in need of thinning, compared to the very dense, very young stands addressed in this report.]

BLM Response: This key point would only apply to those Walker Creek stands less than 80 years old, all of which have high to very high relative densities (EA p. 48). All of the stands older than 80 also have high to very high relative densities but all also have less than 200 trees per acre. This demonstrates that the metric of trees-per-acre is overly simplistic and not a good measure of stand density, or relative need for thinning.

21. *<u>Key Point 3.</u> Accurate assessments of thinning effects requires site-specific information. The effects of thinning regimes on dead wood creation and recruitment (relative to no-thinning) will depend on many factors including initial stand conditions, particularly stand density, and thinning prescription—it is difficult to generalize about the effects of thinning on dead wood without specifying the particulars of the management regime and stand conditions. [The NEPA analysis needs to provide a site-specific, quantitative analysis to show that silviculture is needed to meet ACS objectives in these riparian reserves.]*

BLM Response: The EA describes site specific stand histories and current stand attributes on pages 46-49. The EA discloses site specific effects expected from both the proposed action and the no action alternatives on pages 50-55. The ACS objectives are qualitative and do not prescribe quantities or targets. We feel that we have adequately presented a rationale for why we would treat stands in Riparian Reserves and what we expect the impacts to be (EA p. 25, pp. 126-127).

22. *<u>Key Point 4.</u> Conventional [i.e., commercial] thinning generally produces fewer large dead trees. Thinning with removal of trees (conventional thinning) will generally produce fewer large dead trees across a range of sizes over the several decades following thinning and the life-time of the stand relative to equivalent stands that are not thinned. Generally, recruitment of dead wood to streams would likewise be reduced in conventionally thinned stands relative to unthinned stands. [This result is highly relevant to the proposed logging to meet ACS objectives.]*

BLM Response: This Key Point is not relevant to the Walker Creek Project. We are aware of the modeling that shows that thinning reduces the numbers dead trees in the long term relative to not thinning. We also note that the authors readily admit that there are no empirical studies showing the relationship between thinning and dead wood production and that there are problems matching the modeling output with existing empirical stand data. Interestingly, two of the models used do not show much of a difference in the production of snags between 20 – 40 inches between the thinned and unthinned stands. This is much more relevant considering that pileated woodpeckers, perhaps the most important primary excavator (and considered by some to be a keystone species), require snags at least 25 inches for foraging and nesting and at least 43 inches for roosting and resting (DecAid 2009). Also, The Walker Creek Project would include at least 100 foot no-harvest buffers on all perennial streams, a distance at which McDade (1990) found that over 90% of in-stream wood comes from.

23. *<u>Key Point 5.</u> Conventional [i.e., commercial] thinning can accelerate the development of very large diameter trees. In stands that are conventionally thinned, the appearance of very large diameter dead trees (greater than 40") may be accelerated by 1 to 20 years relative to unthinned plantations, depending on thinning intensity and initial stand conditions. Trees of such sizes typically begin to appear 5 to 10 decades after thinning 30 to 40 year old stands. [Note: any small gains in very large trees, comes at the expense of large numbers of large trees, so net benefits to ACS objectives are highly unlikely.]*

BLM Response: As stated in the previous response, the only real difference in model runs occurs in *small* snags 10-20 inches, not large snags as you infer. There is little difference in 20-40 inch snag production between thinned and unthinned model runs of these young plantations where the data used were the means of three stands (not the empirical data from a range of stands). This Key Point is not relevant to the Walker Creek Project.

24. *<u>Key Point 6.</u> Nonconventional [i.e., non-commercial] thinning can substantially accelerate dead wood production. Stands thinned with prescriptions that leave some or all of the dead wood may more rapidly produce both large diameter dead trees in the short-term and very large diameter dead trees (especially greater than 40") in the long-term, relative to unthinned stands. Instream wood placement gets wood into streams much sooner than by natural recruitment, and can offset negative effects of thinning on dead wood production.*

BLM Response: Pages 8 and 9 of the EA show what work the BLM has or proposes to complete within the Walker Creek analysis area. This work includes in-stream wood placement in both Walker Creek and the mainstem Nestucca River which were completed in 2012 and 2014. Also approximately 30 whole trees have been felled into several streams adjacent to some of the Walker Creek density management units in 2014 (EA - figure 8, p. 35). Coarse wood prescriptions have been developed for all of the density management stands (EA pp. 33-34), including adding some coarse wood to nearby stands older than 120 years. We understand that if trees are cut and left in place dead wood production would be accelerated. Our prescriptions would conduct thinning while leaving *some* down wood in place for coarse wood purposes. Leaving all of the trees proposed for cutting would not meet the Purpose and Need for the project because it would preclude understory planting of shade tolerant trees and may result in an unacceptable build-up of bark beetles resulting in additional stand damage (EA pp. 6-7).

25. *<u>Key Point 9.</u> 95% of near-stream wood inputs come from within 82 to 148 feet of a stream. The distance of near-stream inputs to streams varies with forest conditions and geomorphology. Empirical studies indicate that 95% of total instream wood (from near-stream sources) comes from distances of 82 to 148 feet. Shorter distances occur in young, shorter stands and longer distances occur in older and taller stands. [Don't forget: riparian reserves were established to serve both aquatic and terrestrial objectives, and many terrestrial wildlife depend on abundant snags and dead wood.]*

BLM Response: We recognize that Riparian Reserves are designated to serve both aquatic and terrestrial species. Serving a riparian associated species, the spotted owl (Anthony 2013, Riparian Science Papers; *Effects of Riparian Thinning on Marbled Murrelets and Northern Spotted Owls*), is the primary objective of this project (EA p. 6 and p. 18). The analysis in the EA also shows that there

is little likelihood that the proposed project would have any negative effects to the potential for in-stream wood recruitment (EA pp. 64-66).

26. *<u>Key Point 10.</u> Thinning can increase the amount of pool-forming wood under certain conditions. Thinning can increase the amount of pool-forming wood only when the thinned trees are smaller in diameter than the average diameter of pool-forming wood (which varies with stream size). [Smaller wood is functional in smaller streams, which means that thinning any commercial-sized trees near small streams is unlikely to advance ACS objectives.]*

BLM Response: The proposed action includes no harvest buffers on all perennial streams wide enough to assure that over 90% of the potentially recruitable trees would remain (EA pp. 64-66). Diameter cut limits would assure that the largest 25 – 30% of trees would be reserved automatically, and crown closure is expected to be at least 63% after treatment (Table 10, EA p. 53). For these reasons we believe that the proposed project would have little possibility to affect actual in-stream wood recruitment and therefore this Key Point is not relevant to the Walker Creek Project.

27. *<u>Key Point 14.</u> Variation in thinning is essential (i.e. don't do the same thing everywhere). Variation in thinning prescriptions will produce more variable forest and wood recruitment conditions, which may more closely mimic natural forest conditions. Using a variety of treatments is also consistent with the tenets of adaptive management in situations where the outcomes of treatments are uncertain.*

BLM Response: We expect thinning from below to a basal area target at the plot level, along with diameter cut limits, will result in variable spaced stands. Many stands within the analysis area have been excluded from harvest and the proposed treatment units are relatively small (for stands older than 80 the largest is 58 acres, average is 23 acres) and interspersed among older and younger stands. The prescriptions as designed would create a heterogeneous mosaic of stand ages and conditions in the southern portion of the Headwaters Nestucca subwatershed.

28. *The statement in #5 that "thinning can accelerate development of very large diameter trees" should be kept in proper perspective:*

- *The alleged gain in very large trees is very minor, compared to not logging;*
- *The alleged gain in very large trees is overwhelmed by the significant loss of functional wood in smaller size classes (including "large" wood), and even "medium " and "small" wood that serves vital functions in small streams that are typical in most projects; and*
- *The alleged gain in very large trees is in the distant future and more speculative; while the loss of smaller functional wood is in the near-term and more certain. Predicting future mortality in thinned stands is difficult. If the trees do not die and fall down there is no benefit in terms of down wood.*

BLM Response: See response to *23* above. This is not relevant to the Walker Creek Project which includes no-harvest buffers adjacent to all streams.

29. *The apparent dissonance between the fact that thinning reduces wood recruitment (#4), but also has the potential to increase production of the very large trees (#5) might be resolved by looking to the right mix of different treatments as suggested in #14 – with some riparian reaches*

left unthinned to provide for recruitment of large amounts of wood in a range of sizes, some areas thinned non-commercially, and some riparian patches thinned to produce those very large trees. Also, the statement in #10 that thinning can increase pool-forming wood depending on stream size, needs more explanation. Most riparian thinning occurs near small streams where small wood can be pool-forming.

BLM Response: Most riparian stands in the vicinity of the treatment units are excluded from harvest. Your comments have focused only on those riparian reserve stands in the analysis area that are planned for thinning while most will not be thinned. As for thinning non-commercially, to fall and leave enough trees to effectively open the canopy for the establishment of an understory would make underplanting these areas effectively infeasible which would negate an important objective of the project. The project will leave a supply of snags and down wood and create more after treatment. Our plan would meter coarse wood over time to limit unintended negative impacts associated with bark beetle infestations which could limit future options.

30. *Thinning to produce very large wood in the distant future at the expense of more abundant wood recruited over time is not advised. The SAT Report, upon which the ACS is founded, was clear that continuous input of wood is important. "Riparian zones along larger channels need protection to limit bank erosion due to trampling, grazing, and compaction, to ensure an adequate and continuous supply of large wood to channels …" 1993 SAT Report. Ch 5, p 455.*

BLM Response: Thinning to produce very large wood in the distant future is not a primary objective of this project (although that will be a byproduct). As stated previously the objectives of the project can be found on page 25 of the EA and they include creating forest structural diversity on the landscape and complex habitat for the northern spotted owl. Very large overstory trees and large coarse wood are components of this complex habitat described in the EA. Riparain *zones* and riparian *reserves* are not the same thing. All riparian zones are excluded from the project except where roads cross creeks. The project design features would prevent the possibility of bank erosion due to trampling, grazing or compaction that in any way would contribute to the reduction in an adequate and continuous supply of large wood to channels.

31. *The agency often claims that logging in riparian reserves is necessary to improve attributes other than large wood. However, these benefits are often minor and transitory, and do not outweigh the significant long-term adverse effect of logging on recruitment of dead wood. The agency must focus on the most significant contributions of vegetation toward ACS objectives and the most significant effects of logging on the ACS objectives.*

BLM Response: Diverse, multispecies, multilayered forest structures are hallmarks of late-successional and old-growth forests and are not minor or transitory. We acknowledge that dead wood is an important component of functioning old forest systems, and that there would be some near term negative effects from the proposed action, but the current condition is poor and as pointed out in the EA not expected to improve in the next several decades (EA pp. 33, 47, 49, 54-55). The prescriptions for treatments in Riparian Reserve are intended to improve the future development of these forests for riparian associated terrestrial species, particularly the spotted owl, while also allowing for the continued function of the near stream forests as they relate to water quality and stream dynamics.

32. *The Northwest Forest Plan and its supporting documentation make clear that the primary value*

of riparian vegetation is as a source of large wood and shade, not vegetation diversity and canopy layering, as often asserted by the agency to justify logging in riparian reserves.

BLM Response: The NWFP says "Under the Aquatic Conservation Strategy, Riparian Reserves are used to maintain and restore riparian structures and functions of intermittent streams, confer benefits to riparian-dependent and associated species other than fish, enhance habitat conservation for organisms that are dependent on the transition zone between upslope and riparian areas, improve travel and dispersal corridors for many terrestrial animals and plants, and provide for greater connectivity of the watershed.". We think that since over 50% of federal lands in the coast range are within the Riparian Reserve land use allocation, and that spotted owls are considered riparian associated species by Eric Forsman, et al. (in Anthony, 2013, Riparian Science Papers; *Effects of Riparian Thinning on Marbled Murrelets and Northern Spotted Owls*), that the proposed action objectives of developing complex forest habitat in Riparian Reserves is an important goal completely consistent with Riparian Reserve objectives.

Bryophytes

33. *FEMAT page IV-109 says that logging in riparian reserves stands older than 80 years is not appropriate. Such stands were presumed to remain unharvested as mitigation for Bryophytes and other species that prefer dense forest cover and abundant dead wood.*

BLM Response: See previous comment. There is not abundant dead wood anywhere in the project area. While the crown closure in the proposed treatment stands is high, the forest cover at the lower and mid canopy layers is nearly non-existent. The Salem District RMP provides for the treatment of Riparian Reserve stands to reestablish and manage stands and acquire desired vegetative characteristics needed to attain ACS objectives which include the restoration of species composition and structural diversity of plant communities. The Walker Creek Project would establish a new trajectory for such restoration. Surveys for bryophytes have been completed and known sites of S&M and special status species have been protected.

The Effects of Thinning on Crown Development

34. *Aquatic/Riparian Ecosystem Dynamics and Associated Management Implications - Recent Findings. Powerpoint, 32.6M. This topic was presented at the Regional Interagency Executive Committee meeting on January 7, 2003.* http://www.reo.gov/library/presentations/Szaro_present_Aquatic_Rip_Final.ppt

BLM Response: Chan, in the powerpoint presentation you cite, finds that crown development *is* significant after thinning. The findings indicate that thinning maintains and promotes live crown size, old growth stands are characterized by large live crowns, and unthinned stands lose live crown. Chan's conclusion is that canopy development responds quickly to thinning. The findings are that 8 years after thinning to 100 trees per acre the amount of available light reaching the forest floor was not different than the control.

35. *Stimulating the development of a diverse understory is often used as a justification for thinning, but this may not be justified in stands older than about 40 years.*

BLM Response: The brush and forb layers of the stands proposed for treatment are already fairly diverse. What is lacking is a developing understory tree layer moving into the mid-story (EA. pp. 46-47). We believe that after several decades the understory will be more diverse than currently and be beneficial to late-successional species. (EA. pp. 52-55, 92-94).

Density-Dependent versus Density-Independent Mechanisms

36. The agencies often emphasize that mortality is not a significant contributor to instream wood recruitment, implying that the effect of thinning on density dependent mortality may not be a big deal. However, the agencies also need to recognize that thinning in potential wood source areas significantly reduces the total amount of wood available for natural processes to act upon.

BLM Response: All perennial streams in and adjacent to proposed treatment units have at least 100 foot no-harvest buffers on them which will provide for over 90% of in stream wood recruitment potential (EA p. 65). Additionally we used LiDAR data to identify areas upslope of no-harvest buffers that have higher debris flow potential and excluded them from the treatment areas (EA p. 38).

37. Since natural disturbance occurs in both thinned and unthinned stands, the proper comparison is not between density-dependent versus density-independent sources of dead wood, but rather the total recruitment of dead wood from all sources in thinned versus unthinned areas.

BLM Response: We analyzed the potential effects of the Walker Creek Project to coarse wood for both the no action and proposed action (EA pp. 22, 25, 33-34, 45-50, 55, 58, 86-87, 90-94, 100-101, 103, 105-106, 114) which is the same as comparing thinning vs. not thinning. We did not compare density dependent vs. density independent sources of wood other than to explain the difference between the two, how they occur and the types of stands they are likely to occur in. An important fact to keep in mind is that the project would only treat 8% of the analysis area and that 22% is currently over 80 years old and would not be treated. Considering that the large majority of the project stands have been previously thinned, are currently quite stable, and of an age where mortality is expected to be low, there is little recruitment of dead wood occurring now. The dead wood conditions are currently poor; we explained that we expect a potential negative effect from the action over the next few decades but that mortality would still occur and that over time we expect conditions to improve to a point where conditions are within the range of those expected in natural stands (EA p. 55).

38. Also, thinning increases the spacing between trees which means that tree fall events tend to remain isolated rather than triggering small scale contagious tree-fall events that help introduce heterogeneity and recruit more dead wood. Each standing tree has potential energy that could do work on other trees, and stands with fewer trees are capable of doing less work in terms of self-thinning and small scale contagious disturbance.

BLM Response: The proposed treatments would result in variable spacing where parts of the stands would be denser than others and may be more prone to stand or tree damage resulting from the falling of individual trees. Also, thinning has the potential to increase windthrow in otherwise very stable stands within units that are quite small and located adjacent to unthinned stands that may be affected by windthrow from the adjacent thinned stands. These factors are part of the reason we would evaluate the level and type of coarse wood that develops naturally five years post-harvest to determine which additional treatments should be implemented to best meet the desired future

condition (EA p. 33). Again, as stated above and on page 55 of the EA, we are only treating 8% of the analysis area; the other 92% would continue to be subject to damage from tree fall.

Disclose and Consider The Effects of Thinning on Late Successional Species.

39. *The agency must focus the NEPA analysis on species that are most likely to be adversely affected by logging— in most cases that is wildlife associated with relatively dense, closed-canopy forest conditions and those associated with snags and dead wood, for instance: American marten, Northern goshawk, Pileated woodpecker, and various species of late successional birds.*

BLM Response: The purpose of NEPA is to assess the potential for a proposed action to significantly affect the quality of the human environment. The Council on Environmental Quality regulations directs that "…NEPA documents must concentrate on the issues that are truly significant to the action in question…" (40 CFR 1500.1). We have focused the impact analysis on those species that have such status that the question of whether there is a potential for significant effects needs to be addressed. Martens are not known to occur in the northern coast range, there are very few documented nesting occurrences of goshawks in the coast range, and pileated woodpeckers, which are mentioned on page 92 of the EA for their role in cavity development, are fairly common and do not have a status that warrants discussion for a project of this nature. Because there is no evidence that any of the species you mention would be affected by the proposed project and no issues were raised during scoping, we did not analyze impacts to those species.

40. *Logging almost always opens up the forest canopy, reduces vegetation cover, and reduces the current and future abundance of dead standing trees and down wood. Adverse effects are therefore likely to occur for species associated with these habitat conditions.*

BLM Response: An important objective of the thinning is to open the canopy to allow for the establishment of an understory of shade-tolerant trees. We explained that there would be an effect to the understory vegetation that would be transitory and that over time the understory would return to pre-harvest levels (EA p. 52). See responses to comments 4, 5, 37, and 39 above regarding impacts to current and future coarse wood and analyzing effects to species associated with coarse wood.

41. *Tree canopy cover is the single best correlate of flying squirrel population density, "with an apparent threshold of 55 percent canopy cover separating low- from high-density populations." PNW Research Station. Rocky to Bullwinkle: Understanding Flying Squirrels Helps us Restore Dry Forest Ecosystems. Science Findings. Issue Eight. February 2006. http://www.fs.fed.us/pnw/sciencef/scifi80.pdf*

BLM Response: All of the proposed treatments would maintain at least a 63% canopy cover post-treatment (EA p. 53). All of the stands proposed for treatment have high canopy cover now and flying squirrel populations appear to be critically low based on the relative dearth of snag habitat useful to flying squirrels (EA pp. 49-50) and the fact that of all of the arboreal nests that were climbed and checked during red tree vole surveys, none were determined to be those of flying squirrels (EA p. 91). Todd Wilson's findings that you reference below are better indicators of flying squirrel habitat in these wet forests than those referenced in the paper you cite above (eastside dry, fire prone forests).

42. *The NEPA analysis must consider and disclose the effects of thinning on birds associated with late successional forests. A study of forest thinning on BLM lands in SW Oregon has "found fewer bird species in thinned areas" says the Medford Mail Tribune, September 17, 2003.*

BLM Response: See response to comment 39 above. We note you reference a newspaper article and not the actual research, which we could not find. Hagar et al. 2009, found bird species richness increased for over a decade after thinning. Also, Cahill et al. found an initial negative response to thinning by hermit warblers that only lasted 6 years then returned to pre-treatment levels. It is well known that changes in forest structure, whether through management or natural succession, will affect wildlife species composition with some species benefitting and others not. None of the species referenced in the newspaper article are uncommon and since the Council on Environmental Quality regulations directs that "…NEPA documents must concentrate on the issues that are truly significant to the action in question…" (40 CFR 1500.1), we have not analyzed the effects to birds other than those that may be affected through the Migratory Bird Treaty Act regulations (EA pp. 100 – 102).

Thinning Effects on Flying Squirrels

The Commenter provided multiple statements and quotes from Todd Wilson and others work regarding the effects of thinning on northern flying squirrel habitat. We are aware of the science cited by the commenter and used the science to help develop the Walker Creek project. Comments that appear to have specific relevance to the Walker Creek Project are addressed below.

43. *The EA understates the magnitude of impacts to flying squirrels, saying "dense closed canopies but very little vertical occlusion due to the lack of a shade tolerant understory." This is misleading because visual occlusion is provided by trees boles as well as mid-story trees. This project will remove a significant portion of the tree boles that currently protect flying squirrels from predators. The EA should have considered alternatives that retained more trees and more visual occlusion, such as a diameter limit of QMD MINUS 20%, instead of QMD +20%.*

BLM Response: Because 70% of the project area has been thinned before, tree boles are not a significant source of visual occlusion, especially considering the great height distance between the brush layer and the canopy layer (EA. p. 47). We specifically chose the proposed action stands for treatment because, despite their age and size of trees, are very poor flying squirrel habitat. During surveys for red tree voles very few nest structures of any kind were located in these stands, and none of the structures examined were identified as flying squirrels (over 90 structures examined). These are examples of the stands that Wilson describes as being poor habitat decades after thinning precisely because it is very easy to see great distances through the mid-story. A QMD – 20% diameter cut limit prescription would remove only a few trees from the stands, concentrated on the smallest, which would further homogenize the stand and would not open the canopy making understory development infeasible thus not meeting the Purpose and Need for the project.

44. *Given the importance of flying squirrels to the diet of the spotted owl, managers must ensure that thinning does not significantly reduce the flying squirrel population, but recent evidence shows that thinning does in fact lead to a multi-decade decline in the number of flying squirrels. The agencies must leave significant untreated skips in order to mitigate for this significant adverse effect.*

BLM Response: Only the very youngest stands proposed for treatment could be considered reasonable flying squirrel habitat based on having moderately high midstory visual occlusion. These stands are so dense, however, that they are not at all suitable for spotted owl habitat. All of the older stands are considered poor flying squirrel habitat based on high ground to crown distances and the lack of visual occlusion at the lower and mid-canopy levels (EA p. 90). As stated previously, the proposed action would only treat 8% of the analysis area while leaving 22% of the analysis area covered by stands older than 80 that would not be treated.

45. *The finding that thinning reduces, for a couple decades at least, populations of flying squirrels, an important prey for spotted owls throughout their range, reinforces the importance of finding the optimal mix of thinned and unthinned areas within stands and across the landscape (not just for flying squirrels but also for dead wood recruitment and other ecological values). The agencies' current approach does provide a mix, but NEPA analyses fail to seek or find the optimum mix.*

BLM Response: It is not the purpose of NEPA to develop plans for landscape management (i.e. "find an optimal mix"), but rather to assess what the impacts those plans may have on the quality of the human environment.

46. *Wilson & Forsman 2013 state ("thinning reduces the abundance of some tree-dwelling rodents, especially Northern Flying Squirrels (Glaucomys sabrinus) and Red Tree Voles (Arborimus longicaudus), that are important prey species for Northern Spotted Owls (Strix occidentalis caurina)." Wilson, Todd M.; Forsman, Eric D. 2013.*

BLM Response: We are aware of this scientific work and used it to help inform the proposed project design and to assess the potential effects of the action (EA pp. 91, 93).

47. *When collecting baseline data in among the young stands in the Fort Lewis study, Andy Carey and Wilson found that stands which had been previously thinned had fewer flying squirrels than those that had not been thinned. After another round of thinning, preliminary results from a few years post-thinning indicated that flying squirrel populations initially declined after thinning, but at the time (a few years ago) they seemed to be rebounding. Now the longer data set shows that the rebound was part of a temporary fluctuation, and the long-term trend shows that the squirrel population continued to decline and remains at very low levels almost two decades after thinning.*

BLM Response: As we noted in the EA we do not believe that the Walker Creek project area contains appreciable flying squirrel habitat, especially in the 70% of the project area that has been thinned four decades ago. It is precisely because of Wilson's finding that we believe that it is critically important to establish an understory that will contribute to the development of better flying squirrel habitat sooner than without treatment.

48. *Thinning opens the stands and results in a period of several decades when squirrels may be relatively vulnerable to predation and the population is held to very low levels until a new cohort of vegetation grows up to occlude the 10 meter intercept. Unthinned stands are better for*

squirrels in the short term because there may be some visual occlusion and cover provided by tree boles, tall shrubs, suppressed trees, hardwoods, etc. Wilson said that simple visual occlusion might be a good indicator of quality habitat for flying squirrels. If you can see a long ways (as you can after thinning) then it's probably not very good squirrel habitat because there's not much cover form predators, but if you can't see very far into a stand then it may indicate higher quality squirrel habitat.

BLM Response: Wilson estimates that seeing beyond about 20 meters is an indication of poor habitat. In most of the stands proposed for treatment one can see 75 meters or more with little trouble. One of the main objectives of the project is to establish an understory that will address this problem.

49. Stands that supported high abundances of flying squirrels were comprised of two general forest conditions: (1) a "ground-to-crown" multi-species forest with a multi-layered canopy, variable midstory and patchy understory and (2) dense, closed-canopy forest with high bole density and little or no understory or mid-story.

BLM Response: The stands proposed for treatment currently have neither mid-story canopy layer nor high bole density, low understory closed canopy forest. Our project is designed to grow a second canopy layer (which would eventually result in more boles and mid-story occlusion).

50. Without midstory canopies, tree boles become the sole source of occlusion at this vertical layer. In competitive exclusion forest, high densities of relatively small boles (from both live and dead trees) can be sufficiently high to provide substantial occlusion

BLM Response: There are not high densities of tree boles within the proposed project area. Bole densities on the scale that Wilson speaks of are associated with younger forests that are moving through the stem-exclusion stage. That situation is only relevant to about 35 acres of dense Douglas-fir plantation in section 17 of the Walker Creek project.

51. A patchy understory, resulting from complex midstory and overstory layers may provide the best balance among protective cover, food resources, and a squirrel's ability to move undetected on the forest floor.

BLM Response: The Desired Future Condition section of the EA (p. 22) describes just such a condition.

52. An important key to the success of variable-density thinning in accelerating squirrel habitat may be focusing early on stimulating mid-story development throughout the stand.

BLM Response: This is a primary objective of the proposed project.

53. Some have tried to assert that the spotted owl may benefit from increased access to flying squirrels as a result of thinning. This is a flawed interpretation of the recent science indicating that logging makes flying squirrels vulnerable to predation.

BLM Response: Our analysis indicates that there are few if any flying squirrels in the project area and that there are no spotted owls. We have disclosed the potential effects of the proposed project on

flying squirrels as prey for owls (EA. pp. 93-94).

Manage For Decadence – Retain Untreated "Skips" For Recruitment of Mortality

The Commenter provided many quotes and statements regarding forest structure and composition and how some forest thinning affects these structures. Comments that appear to be relevant to the Walker Creek Project are addressed below.

54. It is the cycle of structural development through plant growth, and the retention of structural complexity via legacy, that characterizes natural forests in the Coastal Northwest. Intensive wood production practices may alter this cycle both by truncating succession before large structures develop and by removing most existing structures during harvest. Planting and thinning may further promote uniformity in tree species, size, and spacing.

BLM Response: Your reference to intensive wood production practices seems to pertain to regeneration harvest, which is not part of the proposed action. The proposed action is designed to create and further develop structural complexity on the landscape (EA pp. 6-7, 11, 22-23).

55. "Dead wood in the form of snags and downed logs is generally common or abundant. Although a notable part of old-growth stands, such material is actually common in unmanaged stands in all successional stages in the Douglas-fir region." Franklin & Spies 1983. CHARACTERISTICS OF OLD-GROWTH DOUGLAS-FIR FORESTS. Reprinted New Forests for a Changing World. Proceedings of the 1983 SAF National Convention http://andrewsforest.oregonstate.edu/pubs/pdf/pub120.pdf

BLM Response: The stands where the proposed action would occur are highly managed. Most have been previously thinned, were burned multiple times by people since the mid-1800s and were grazed for several decades, consequently snags and down logs are rare, not common (EA p. 33).

56. Many natural young and mature stands have some of the attributes of old-growth stands that may not be present in young, managed stands. Perhaps the greatest difference between natural and managed stands is the lower number and volume of large snags and logs in managed plantations (Spies and Cline 1988). Many young natural forests less than 80 years old have high amounts of carry-over of woody debris.

BLM Response: See previous response.

57. The NEPA analysis should help illuminate trade-off between snag quality (snag size) and snag quantity (number of snags) that follows from the choice between thinning and not thinning. This critically important trade-off may be amenable to quantitative analysis if the agency would conduct a stand simulation model. This is one of the key functions of NEPA to illuminate the consequences of alternative management approaches. With respect to dead wood habitat, what mix of treated and untreated areas will result in the best mix of thinned areas with later-fewer-larger snags, and unlogged areas where dead wood recruitment is more rapid, more abundant, only slightly smaller?

BLM Response: The EA disclosed the expected effects to snag resources from treatment versus

no treatment on pages 49-50 and 54-55. The large majority of discussion regarding thinning, snags, and modeling pertains to young stands undergoing stem exclusion. The snags formed under these conditions are small, come from the suppressed cohort and do not persist. Many small snags cannot replace the function of a large snag, whereas large snags can perform some of the function of small snags. Also, as pointed out in responses to comments 22 and 23, stand modeling shows very little difference in the numbers of 20-40 inch snags (the ones that really matter) between thinned and unthinned stands. Stand simulation models were not designed to model mortality per se, other than to record mortality as stands age. They are not meant to represent which trees die, only that some die, mostly from competition triggered by indices loaded into the model. The death of larger trees associated with density independent causes is only triggered randomly based on stand data that support the model, the vast majority of which is from young stands less than 80 years old. Stand simulation models are not especially well suited to modeling stands like those proposed for treatment in the Walker Creek Project.

58. *Thinning is often presumed to accelerate attainment of multiple attributes of mature & old-growth forests. This is partially true. Thinning does accelerate the growth rate of the trees that are retained, but thinning has limited effects on canopy structure [1] and generally has adverse effects on snags and dead wood. The NWFP ROD highlighted the importance of dead wood accumulation as young forests develop into mature & old-growth: "Desired late-successional and old-growth characteristics that will be created as younger stands change through successional development include: (1) multispecies and multilayered assemblages of trees, (2)* ***moderate-to-high accumulations of large logs and snags****, (3) moderate-to-high canopy closure, (4) moderate-to-high numbers of trees with physical imperfections such as cavities, broken tops, and large deformed limbs, and (5) moderate-to-high accumulations of fungi, lichens, and bryophytes." 1994 ROD p B-5. Thinning will truncate this important ecological process and degrade the quality of future late-successional habitat. When the logs are removed from the site, this adverse effect can be long-lasting.*

BLM Response: The Walker Creek Project is mainly designed to address (1) above: *multispecies and multilayered assemblages of trees* which are the attributes of mature and old-growth forest most lacking in the analysis area. Large logs and snags are also addressed in the EA. With treatment there will be fewer overstory trees that could become coarse wood in the future but we still expect that there will be adequate numbers to meet objectives (EA p. 55) and since we are only treating 8% of the subwatershed, that other areas not being treated will continue to provide snag and large log habitat, which is inherently a landscape habitat feature anyway (rather than an acre-by-acre feature). Conifer trees respond to growing space by enlarging tree crowns, producing epicormic branches along the tree bole exposed to added light, and retaining lower branches that are otherwise lost from lack of light due to tight closed canopies. All of these characteristics produce additional complexity in the upper canopy layer.

59. *Natural processes and disturbances such as windthrow fire and the effects of pathogens and insects are also part of old forest development that thinning does not mimic."*

BLM Response: The natural processes you refer to will continue to operate on the landscape regardless of whether density management occurs or not. Root disease will continue to result in low levels of mortality, as would periodic insect outbreaks. The coarse wood treatments, which include felling and topping trees, would produce outcomes similar to those caused by wind. The Walker

Creek Project is designed to reconfigure the selected stands to have a better opportunity to become high quality late-successional habitat in a shorter period of time, rather than to specifically mimic natural processes.

60. *Mid-seral stands that result from past clearcutting leave few if any legacies from the previous stand. Natural young stands tend to have abundant snags and dead wood, but clearcut stands are artificially deprived of dead wood several decades. At the age of thinning, such stands are starting to experience suppression mortality and will tend to accumulate snags and dead wood over time if left unthinned. However, thinning will perpetuate the artificial shortage of snags and dead wood for another several decades. This is a long-term cumulative impact that needs to be addressed in the NEPA analysis.*

BLM Response: With the exception of about 35 acres in section 17 (unit 17-2, 38 years old), the stands proposed for treatment in the Walker Creek Project did not originate from past clearcutting, but rather originated after repeated fires, grazing, and in most areas, thinning. There are no legacies remaining. The large majority of the proposed treatment areas are beyond the suppression mortality stage by several decades. Those acres where suppression mortality is occurring are producing very small snags of very little volume. The NEPA analysis did analyze the potential impacts on snags and down wood associated with the Walker Creek Project (EA pp. 22, 25, 33-34, 45-50, 55, 58, 86-87, 90-94, 100-101, 103, 105-106, 114).