

**BARK**

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April 10th, 2019

Jim Roden
Clackamas River Ranger District
Mt. Hood National Forest
595 NW Industrial Way
Estacada, OR 97023

RE: North Clack Integrated Resource Project PA comments

Dear Jim,

As you are aware, Bark's mission is to bring about a transformation of public lands on and around Mt. Hood into a place where natural processes prevail, where wildlife thrives and where local communities have a social, cultural, and economic investment in its restoration and preservation. Bark has over 25,000 supporters¹ who use the public land forests surrounding Mt. Hood, including the areas within the North Clack project area, for a wide range of uses including, but not limited to: clean drinking water, hiking, nature study, non-timber forest product collection, spiritual renewal, and recreation. We submit these comments on behalf of our supporters. We request that you actively engage with the substance of these comments and use both the scientific and site-specific information herein to create a better restoration project for the North Fork Clackamas watershed.

PUBLIC PARTICIPATION

We appreciate the time and resources that went into creating the online map of the North Clack project which allows users to access information about units,

¹ Supporters in this case is defined as significant donors and petition-signees which Bark has identified as being active users of Mount Hood National Forest.

land allocations, and more. Bark used this page when writing NEPA comments and prioritizing units and roads to field-check. Hopefully this accessible platform can be used as a model when the MHNH is planning projects in the future for which it wishes to solicit meaningful, site specific comments.



Rd 4614-120 becoming impassible at Unit 148. At the time this photo was taken in summer of 2018, it appeared that several forest users had attempted to breach and circumvent this section of road which evidently acts as a closure

Related to accessibility, we do however have concerns about the physical accessibility of stands under analysis. In the past, Bark has expressed concerns regarding meaningful public input for projects of this size and distance across the landscape. In the case of North Clack, *16 proposed units* and a large percentage of the analysis area overall are not accessible to the public to visit due to roads which are only entered through Weyerhaeuser property. Bark requested access to these stands from Weyerhaeuser and the FS, who indicated that this was not possible (Weyerhaeuser referred us to the FS who then responded that the road is “closed to the public”). The 4614-120 is not passable once it enters Unit 148 from the east, cutting off access to all units west of this point and north of the North Fork Clackamas River. This effectively excludes the public from seeing these units during the planning process.

Bark has engaged with BLM projects in the past where project planners and specialists have offered, as part of the scoping process, temporary access to areas behind locked gates, and even accompaniment to stands of interest if they require passing through private land. If the FS is interested getting more public engagement and participation in the future, we encourage the FS to look to this model when planning projects which are not physically open to the public to enter or provide site specific feedback on.

IMPACTS TO EXISTING AND FUTURE DEAD WOOD

The North Clack project as proposed would create reduced levels of both large and small snags and down wood compared to No Action. A total of 49 snag associated animal species potentially occur in the North Fork Clackamas watershed. Large snags (as well as dense forest surrounding them) are habitat requirements of Westside indicator species like flying squirrels and northern spotted owls², and are currently in short supply due to past management. According to the North Fork Clackamas Watershed Analysis, due to this past management there has been a lack of snags leading to a “snag lag” (for large snags specifically) which could continue until approximately 2026. Because there are significantly less snags (as compared to historic numbers) in the planning area and too few to meet Forest Plan standards in many areas, [In Scoping](#) Bark recommended that the Forest Service protect legacy snags where they currently exist.

Project Design Criteria often do not fully incorporate these recommendations, as they create a large loophole that would allow for felling legacy snags. The PDCs often state “All snags would be retained where safety permits. If snags must be cut for safety reasons they would be left on site.” *Rocky Preliminary Environmental Assessment (PEA) at 23.*



Unit 18 - One of many legacy snags within old (~70+ years) plantation

While we recognize that the Forest Service needs to protect worker safety, we believe it has options beyond felling danger snags. OSHA Regulations specifically state that if a danger tree is not felled or removed, it shall be marked, and no work shall be conducted within two tree lengths of the danger tree unless the employer demonstrates that a shorter distance will not create a hazard for an employee. 29 C.F.R. § 1910.266(h)(1)(vi). In short, the Forest Service has the option to buffer danger snags, not cut them.

In order to both meet the Forest Plan standards for snag retention, and to meaningfully protect wildlife habitat in the planning area, please exercise this option and

adopt a PDC to state **“All legacy snags would be retained by creating adequate safety buffers, as needed.”**

The FS has in the past asserted that thinning improves residual tree health and that it may take longer for the residual trees to die (reducing snag density) in the Proposed Action scenarios compared with No Action. Research has shown that thinning lowers snag density relative to un-harvested stands.³ Interestingly, while the agency recognizes that timber harvest has undisputed negative effects on snag density, it often claims that thinning will produce more structural diversity in the future. This claim does not completely reflect ecological processes regarding future snag recruitment.

In the North Clack PA, the agency estimates that in plantations, tree diameter in 50 years with thinning would be 23.2 inches. With thinning, these same trees would be 24.9 inches. Until recently, few studies have examined the effects of variable density thinning (VDT) at longer time scales. [A study of 14-year growth response of residual trees in thinned and un-thinned VDT sub-treatments in five young mixed-conifer stands located on the Olympic Peninsula in western Washington](#) revealed that thinning was not significantly effective at stimulating growth of upper canopy trees. In this size class neither diameter growth nor crown length increased significantly compared to trees in un-thinned patches.⁴ This research does not provide support the FS’s common claim that thinning will accelerate growth of residual trees, leading to larger snags in the distant future. [In Scoping](#), we encouraged the FS to read this report and incorporate its findings into the PA for North Clack.

As the agency knows, thinning of maturing forest has been shown to significantly delay attainment of MHN’s snag objectives.⁵ The LRMP requires that dead wood be maintained to support 60% of maximum biological potential of cavity nesting species (FW-215). According to the FS, this standard and others often cannot be met because of the purpose and need for the project and the on-the-ground conditions present within the stands. In that case, the LRMP requires that any

³ Windom, M. and Bates, L. 2008. Snag density varies with intensity of timber harvest and human access. *Forest Ecology and Management* 255(7) pp. 2085-2093.

⁴ Willis, John L.; Roberts, Scott D.; Harrington, Constance A. 2018. Variable density thinning promotes variable structural responses 14 years after treatment in the Pacific Northwest. *Forest Ecology and Management*. 410: 114-125. <https://doi.org/10.1016/j.foreco.2018.01.006>.

⁵ USDA Forest Service. 2007. Curran Junetta Thin Environmental Assessment. Cottage Grove Ranger District, Umpqua National Forest. June 2007. Using data from stand exams modeled through FVS-FFE (West Cascades variant) the Umpqua NF found that the actual effect of heavy thinning is to capture mortality and delay recruitment of desired levels of large snag habitat for 60 years or more.

new timber harvest project include wildlife tree prescriptions to compensate for the deficiency.

In short, the significant role played by large snags in the healthy functioning of the forest ecosystem is well documented. Recently, both the role of logging on the numbers of large snags and the ineffectiveness of current artificial snag creation has also been documented. The impact of logging on large snag density⁶ clearly shows that the lack of large snags across a managed forest landscape relates to the logging of that landscape. Further, the usefulness of artificially-created snags has been thrown into doubt.⁷ This project as currently proposed has a strong likelihood of adversely impacting legacy forest features, which in turn will have a significant impact on the healthy functioning of the remaining forest ecosystem.

Because snags that are artificially created through girdling take years to provide any potential habitat (and the quality of this artificial habitat is uncertain), the North Clack project could easily result in an immediate net reduction of snags across the landscape and contribute to the larger issue of a regional snag deficit resulting from previous FS management. Since large snags are required for the habitat requirements of Westside indicator species like flying squirrels and spotted owls⁸, but are in short supply due to past and present management, the **FS should exclude stands with high snag and large living tree densities from any logging and apply buffers on key snags and relatively large trees within proposed units.**

THINNING IN LATE SUCCESSIONAL RESERVES

The North Clack project includes 191 acres of “variable-density thinning with skips and gaps” in Late-Successional Reserves (LSRs). According to the Northwest Forest Plan (NWFP), LSRs are to be managed to protect and enhance conditions of late-successional and old-growth forest ecosystems, which serve as habitat for late-successional and old-growth dependent species, including the northern spotted owl. *NWFP Standards & Guidelines, C-11*. Thinning and other silvicultural treatments inside reserves are subject to review by the Regional Ecosystem Office (REO) to ensure that the treatments are beneficial to the

⁶ [Issue 42](#) (March 2002) Dead wood all around us: think regionally to manage locally, by Janet Ohmann and Karen Waddell

⁷ USDA Forest Service Gen. Tech. Rep. PSW-GTR-181. 2002

⁸ Cline, S.P., Berg, A.B., Wight, H.M., 1980. Snag characteristics and dynamics in Douglas-fir Forests, Western Oregon. *Journal of Wildlife Management* 44, 773–786.

creation of late-successional forest conditions. *NWFP Standards & Guidelines, C-13*. Has this review with the REO occurred?

The purpose of any silvicultural treatment within LSRs must be to benefit the creation and maintenance of these late-successional forest conditions. *NWFP at C-12*. As there is a general prohibition on commercial logging in LSRs, it is the burden of the agency to show that the proposed actions are clearly needed and will not prevent the LSR from providing the habitat for which it was created.



North Clack Unit 54 stand conditions with areas of mature trees

In LSR **Unit 54**, Bark volunteers found that larger diameter trees were not uncommon and that the unit was not consistently “overstocked” as agency documents often assert. Large snags and down wood were however lacking overall - structures which would be put at a long-term deficit if thinning occurred in a stand such as this. In no circumstance should large trees be removed from LSR stands like this one. Additionally, Bark has hydrological concerns about this unit that will come up later in these comments.

[In our scoping comments](#), we requested specific stand information for units proposed for logging within LSRs, and rationale for the actions proposed within these stands, beyond increasing live tree diameters. This has not yet been provided. **Please provide this rationale for LSR units under analysis in the Decision, or drop these units if no rationale can be defined.**

EXISTING LATE SUCCESSIONAL STAND CHARACTERISTICS

Bark has observed that old-growth components, such as large trees, snags, multiple layers, and slope stability, are emerging in proposed North Clack units. Scientific literature demonstrates how “(s)ites that do not have the full complement of old-forest characteristics can partially function as old forests for those attributes that are present.”⁹ When these characteristics are in such short supply, as they are in the North Clack project area, they act as important “life boats” that will carry closed-canopy dependent wildlife through the habitat bottleneck created by decades of overcutting.



North Clack “Plantation” Unit 92 - 50.5” DBH Doug fir (L), 56” DBH Doug fir (R)

In North Clack, many units contain late successional stand characteristics which should be retained as part of this proposal if it has a goal of promoting habitat dependent on these stand qualities. Of units that Bark has visited, we have particular concerns of late successional structure (large living trees, snags, dead wood) being impacted in units **6, 88, 90,**

92, 94, 102, 106, 112, 124, 132, 142, 144, 146, 176, 178, 190, 194, 196, 198, 200, 202, 203, 204, 206 and 212. Some of these units we recommend dropping, and some will ultimately see acres dropped to protect RTV nests, but in the stands that remain, there should be extra care to buffer all legacies and prioritize placing skips over areas of complex structure. This will also be a requirement that the FS must adhere to if they are to truthfully stand by the

⁹ Everett, R., P. Hessburg, J. Lehmkuhl, M. Jensen, and P. Bourgeron. 1994. Old Forests in Dynamic Landscapes: Dry-Site Forests of Eastern Oregon and Washington. *Journal of Forestry* 92: 22-25.

claim that there will be no proposed habitat removing or degrading treatments within suitable owl habitat.

[As we noted in Scoping](#), it isn't just fire-origin units that include mature forest habitat characteristics. Several "plantation" units Bark has visited also include legacy trees and snags, among other structural components of a healthy forest. Where these exist (large down wood, large snags, large live trees, minor trees), **Bark recommends retaining no less than 40% of the canopy cover, retaining as much mid-story component of the stand as is feasible, retaining the largest trees in the stand, as well as retaining all legacy features.**

IMPACTS TO NORTHERN SPOTTED OWL HABITAT

The North Clack project area contains one historic northern spotted owl nest site as well as three additional home ranges which cross into the area. According to the FS, this project May Affect, but are Not Likely to Adversely Affect, nesting spotted owls.

The 'thin-owl emphasis' units are commercial thinning treatments with the objective to move the stands towards suitable habitat on a faster trajectory. To the best of our understanding, they would include a light variable density thinning from below that will include skips and gaps and a post treatment canopy cover of 60-70%, with all large legacy trees being retained.

[In our scoping comments](#), we recommended that within units in the historic home range of the spotted owl (if any exist *outside* of the 'thin-owl emphasis' stands:

- Retaining an average canopy cover of *at least* 40% to maintain dispersal owl habitat
- Limiting gaps to 1/4 acre in size with less than 10% of the total stand area in gaps
- Prohibiting cutting of trees larger than 20 inches in diameter (at a height of 4.5 feet).
- Removing Riparian Reserve logging from consideration (See *WA at 1-16; 2-55*).

According to the North Fork Clackamas Watershed Analysis, Riparian Reserves in this area are especially important to support creation and retention of suitable habitat characteristics, as they are some of the first stands to become suitable

habitat in the future. *WA at 2-55*. “Over the long term, late seral habitat in the North Fork watershed would be found primarily in the Riparian Reserves, which comprise 32% of federal land in the watershed.” *WA at 1-16*. In the PA, the agency asserts that without any treatment, stands in the area would gradually grow and many areas providing dispersal habitat now would grow into suitable habitat in the next 50-70 years. And in the long term, these stands would have a larger amount of snags and down wood.

The North Fork’s role in the NWFP’s connectivity strategy is within the RRs, as well as small late seral blocks. However, the North Clack project includes 934 acres of “variable-density thinning with skips and gaps” in Riparian Reserves. Along with our other concerns about thinning in Riparian Reserves (elaborated below) this specifically concerns us when considering habitat connectivity for the northern spotted owl.

Impacts to northern flying squirrels

The PA acknowledges a likely short-term impact to NSO prey species, namely flying squirrels. [In our scoping comments](#), Bark expressed concern about impacts to northern flying squirrels (a principle spotted-owl prey), and we bring this concern up again here.

According to agency research, variable-density thinning of Douglas fir stands can reduce the suitability of the site for the northern flying squirrels for 30 to 100 years, until long-term ecological processes provide sufficient structural complexity in the mid-story and over-story favorable to squirrels. Northern flying squirrel populations in mature and second growth forests decline after the stands are thinned and remain at low levels. Research has found that squirrel populations in un-thinned patches are larger than in thinned, and even those decline when *adjacent* areas are thinned.¹⁰ [As we noted in Scoping](#), prescriptions that retain visual occlusion in the mid-story layers are best suited for maintaining squirrel populations.

Since wildlife biologists’ recommendations for managing forests for flying squirrels include retaining some areas of high stem density, retaining the mid-story, and retaining a contiguous closed canopy, Bark has expressed concern about the impact of thinning on retaining these key features. A strategy of maintaining adequate area and connectivity of dense, closed-canopy forests

¹⁰ Wilson, T.M. 2010. Limiting factors for northern flying squirrels (*Glaucomys sabrinus*) in the Pacific Northwest: a spatio-temporal analysis. Ph.D. dissertation. Cincinnati, OH: Union Institute & University.

within managed landscapes by leaving areas of young forest un-thinned has been recommended by researchers to maintain northern flying squirrel populations¹¹.

Logging increases negative interactions with barred owls

[We previously described](#) in-depth our concerns re: this project's effect on future prevalence of barred owls. The FS has acknowledged in the Wildlife Specialist Report for North Clack that "(v)egetation management activities can also benefit barred owls indirectly by providing habitat and prey species that are not necessarily preferred by the northern spotted owl." The Wildlife Specialist Report also acknowledges that "overall northern spotted owl population densities have decreased, specifically in areas where habitat reduction is concentrated and where barred owls are present (USDI 2011)." Research has shown^{12, 13, 14, 15} that the existence of a new and potential competitor like the barred owl makes the protection of existing and future habitat even more important, since any loss of habitat (present and future) will likely increase competitive pressure and result in further reductions in spotted owl populations. Increased predation pressure on traditional prey of the northern spotted owl by the barred owl could indeed result in a local decline of species present in the North Clack project such as northern flying squirrels and red tree voles. Furthermore, reduced numbers of burrowing small mammals could lead to subsequent declines in the rates of decomposition of organic matter and litter and mixing of forest soil. **Please assess these impacts and mitigate them in the Final EA.**

THINNING IN RIPARIAN RESERVES

There are several areas where Bark has concerns about the FS's proposal to log in Riparian Reserves. This land allocation overlaps with units directly adjacent to the North Fork of the Clackamas River, which also contain rocky & steep slopes, and lots of large woody structure in some areas. One of these units is

¹¹ Manning, T.; Hagar, J.C.; McComb, B.C. 2012. Thinning of young Douglas-fir forests decreases density of northern flying squirrels in the Oregon Cascades. *Forest Ecology and Management*. 264: 115 –124.

¹² Forsman, et.al, 2011, published for Cooper Ornithological Society.

¹³ Dugger, K.M., R.G. Anthony and L.S. Andrews. 2011. Transient dynamics of invasive competition: barred owls, spotted owls, habitat composition and the demons of competition present. *Ecological Applications* 21(7): 2459-2468.

¹⁴ Pearce, J., and L. Venier. 2005. Small mammals as bioindicators of sustainable boreal forest management. *Forest Ecology and Management* 208:153–175.

¹⁵ Holm, S.R., B.R. Noon, J.D. Wiens and W. J. Ripple. 2016. Potential Trophic Cascades Triggered by the Barred Owl Range Expansion. *Wildlife Society Bulletin*; DOI: 10.1002/wsb.714

Unit 146, which includes several unmapped seeps wherever it is flat enough for standing water to occur. In these areas there is ample dead wood and large trees. Bark believes that logging and temporary roadbuilding (some roads requiring stream crossings on steep slopes) in these types of areas would not be consistent with the objectives of the Aquatic Conservation Strategy (ACS), and would put steep, unstable terrain at risk of increased erosion.



North Clack Unit 146 (above) – displaying multilayered canopy, down wood and large diameter trees



North Clack Unit 90 in Riparian Reserve

Unit 90 includes a section within Riparian Reserves that displays diverse forest structure, including dead wood and large trees. This is a unit that includes a multitude of issues (including impacts to riparian areas from temporary road construction) prompting Bark to recommend its removal from the Proposed Action.

Bark is also concerned that on the FS's North Clack online map, there are regeneration harvest units which partially overlap with the Riparian Reserve land allocation. This is a clear contradiction of the ACS and these acres should be removed without question from the **units 165, 170, 204, and 94**. If any parts of these units are to move forward, the 15% retention should NOT come from areas like Riparian Reserves where the prescription in general so blatantly clashes with the land allocation.

As you know, Riparian Reserves are a part of the NWFP's broad ACS. This system was established to "restore and maintain the ecological health of watersheds and aquatic ecosystems."¹⁶ The FS often asserts that logging is needed in Riparian Reserves because they are "overstocked" with relatively uniform trees with low levels of diversity, and that they do not have mature and late-successional stand conditions. Bark's experience groundtruthing timber sale units has made it clear that this is often a drastic oversimplification of the local conditions. Many Riparian Reserves in older plantation (>60 years old) and fire origin stands are in healthy, functioning condition, currently meeting the ACS objectives. A logging prescription that removes existing canopy, decreases structural complexity, and adversely impacts soil stability does not meet the purpose and need of this project or comply with the ACS.

Riparian Reserves on the Clackamas River Ranger District (including all reaches of Winslow Creek) are currently below the Forest Plan standards for large woody debris in streams (which correlates to ACSO #3 and #8). Given that many of

¹⁶ Klamath Siskiyou Wildlands Ctr. v. U.S. Forest Serv., 373 F. Supp. 2d 1069, 1092 (E.D. Cal. 2004).

these forests are entering the stem-exclusion phase, where trees naturally begin to die, and structural diversity increases, No-Action would lead to more available LWD. However, the FS has again characterized the “no-action alternative” as though it is stuck in time, in contrast to the action, in which time moves; not fully acknowledging that no-action will effectively allow natural processes to prevail.

Several sources point to passive management as the best approach to achieve ACSOs in Riparian Reserves. Pollock and Beechie¹⁷ reviewed the sizes of deadwood and live trees used by different vertebrate species to understand which species are likely to benefit from different thinning treatments. They examined how riparian thinning affects the long-term development of both large diameter live trees and dead wood. Ultimately, they used a forest growth model to examine how different forest thinning intensities might affect the long-term production and abundance of live trees and dead wood. In Pollock and Beechie’s study, passive management created dense forests that produced large volumes of large diameter deadwood over extended time periods as overstory tree densities slowly declined.

Pollock and Beechie’s results showed that the few species that utilize large diameter live trees exclusively may benefit from heavy thinning, whereas species that utilize large diameter dead wood can benefit most from light or no thinning: “because far more vertebrate species utilize large deadwood rather than large live trees, allowing riparian forests to naturally develop may result in the most rapid and sustained development of structural features important to most terrestrial and aquatic vertebrates.”

Similarly, Spies et al.¹⁸ concluded that thinning produces unusually low-stem-density forests and causes long-term depletion of snag and wood recruitment that is likely detrimental in most Riparian Reserves. According to this work, commercial 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

¹⁷ Pollock, Michael M. and Timothy J. Beechie, 2014. Does Riparian Forest Restoration Thinning Enhance Biodiversity? The Ecological Importance of Large Wood. *Journal of the American Water Resources Association (JAWRA)* 50(3): 543-559. DOI: 10.1111/jawr.12206

¹⁸ Spies, T., M. Pollock, G. Reeves, and T. Beechie. 2013. Effects of riparian thinning on wood recruitment: A scientific synthesis. Science Review Team, Wood Recruitment Subgroup, Forestry Sciences Laboratory, Corvallis, OR, and Northwest Fisheries Science Center, Seattle, WA. 28 January 2013. 46pp.
<http://www.mediate.com/DSConsulting/docs/FINAL%20wood%20recruitment%20document.pdf>

relative to un-thinned stands. However, the in the North Clack PA, the FS broadly asserts that thinning in Riparian Reserves would accelerate the development of late successional conditions (except when it comes to dead wood and complex structure).

Even if the FS can adequately demonstrate how commercial logging in riparian reserves is *necessary*, the action still must comply with all nine of the ACSOs, on both short- and long-term timeframes. Complying with the ACSOs means that the FS must manage riparian-dependent resources to maintain the existing condition or implement actions to restore the conditions. While some aquatic degradation, standing alone, does not constitute ACS noncompliance, the FS must avoid degradation that leads to the non-attainment of ACS objectives at both the short-term, localized scale and the long-term, watershed scale.¹⁹ To make a finding that the logging “meets” or “does not prevent attainment” of the ACSOs, the NWFP requires the FS to describe the existing conditions of the watersheds within the project area, the natural variability of important physical and biological components, and explain *how* the proposed logging would maintain or restore the conditions of the watershed.²⁰ ACS Objective #8 recognizes that logging in the Riparian Reserves will thwart compliance, not improve it.

In the Decision, the FS should provide a summary of current stand conditions in Riparian Reserves, rationale for active management, and predicted short and long-term results of this treatment. This should be done after the agency drops areas within Riparian Reserves that already contain complex forest structure, and areas with regeneration harvest proposed within this land allocation. If rationale and short and long term predictions cannot be provided, the units should be dropped.

NORTH FORK CLACKAMAS RIVER CORRIDOR

The North Fork Clackamas River Corridor contains areas of steep, wet, and unstable terrain marked by active and old landslides. We raise concern about these areas due to their high probability of producing additional slides, sediment, and long-term detrimental soil conditions.

We encourage the FS to look to the “Opportunities and Constraints” map in the NFCRWA, Map 3-2. The agency should take note and act according to the document’s recommendations regarding the areas identified as “constraint to

¹⁹ Pac. Coast Fed’n of Fishermen’s Ass’ns v. NMFS, 265 F.3d 1028, 1037 (9th Cir. 2001).

²⁰ Klamath Siskiyou Wildlands v Forest Service, 373 F. Supp. 2d.

opening size”, which are mostly near steep slopes leading down to the main fork of the Clackamas, but some also include areas leading down to the North Fork.

We also request that the FS prevent ground impacts in all areas with “landform stability concerns”, especially those shown within the North Fork corridor. A recommendation from the document includes: “Landform with areas of potential instability need field verification by geomorphologist during project planning” *WA at 3-10*. Some areas in the watershed are “inherently unstable and merit special attention during project planning:”

- At the headlands of tributaries with steep gradients. Historically, many such areas have experienced debris flows, and those presently filled or filling with colluvium may fail with the slightest provocation. These conditions are most likely to be met within the RRSS, IRSS, and WRSS landform types.” *WA at 2-6*.

Bark has concerns about the amount of logging and roadbuilding included within the North Fork Clackamas corridor, since we have observed these units to be steep (50-70+% slope) rocky, unstable, and wet. That temporary roadbuilding is proposed in areas with “landform stability concerns” is especially concerning to us. Some units of top concern that we have visited are **40, 36, 142, 146, 16, 18, 4, and 6**. These units should receive larger buffers that are matched for their instability near riparian areas.

We appreciate the extended buffers applied in Units 4 and 6. However in **Units 36 and 40**, there have been numerous major slope failures in the past all along that portion occupying the last couple of hundred vertical feet above the river. Even higher in the units, the slopes are unstable, with a mostly thin layer of soil over cobble. Large patches of red alder throughout are likely due to past slides and often saturated soils. These characteristics are common throughout the units directly adjacent to the N. Fork corridor and raise concern for Bark.



(Above) Landslides within Unit 16

Related to this concern and according to the WA, 1,264 acres of soil types exhibit low relative productivity in the watershed. These are potentially screen 4 (Determination of Land Not Suitable for Timber Production, Daoust et al, 1984) soil types. They may not be able to adequately stock a stand w/n 5 yrs after complete removal of overstory (USFS, R-6 stocking standards), and should be identified within the EA if there are proposed commercial activities on these acres.

The North Fork Clackamas River is an eligible Scenic River and therefore carries a VQO of retention in the foreground and partial retention in the middle ground as seen from the river (FW-497). Management should protect outstandingly remarkable values and free flowing nature until designation is made or released

from consideration – includes ¼ mi buffer on either side of high-water mark. Scenic section should appear as predominantly natural landscape where human activities are not evident to visitors (FW-512).

UNMAPPED RIPARIAN AREAS WITHIN PROPOSED UNITS

In past projects, Bark has observed instances where sale contract maps did not reflect all wet areas within proposed units, which resulted in ground-based logging occurring over areas with riparian components. We submitted some initial findings regarding unmapped riparian areas in our [scoping comments](#) and provide additional information below.

Unmapped riparian areas within North Clack Units:

Unit	Location	Notes
6	45.22666, -122.21576	seep
6	45.22616, -122.21482	seep
16	45.21000, -122.20316	seep
43	45.183806, -122.120231	
43	45.183669, -122.120281	
44	45.182639, -122.118331	wet plant assoc.
44	45.182147, -122.113747	
54	45.17434, -122.10879	pond
54	45.17485, -122.11011	
54	45.17461, -122.11082	seep
54	45.17526, -122.10961	seep
54	45.17504, -122.10978	seep
54	45.17479, -122.11021	
54	45.17409, -122.10869	stream
74	45.206347, -122.096439	
74	45.207069, -122.092383	seep
88	45.202853, -122.136469	intermittent stream
92	45.201767, -122.130553	intermittent stream
92	45.201506, -122.132917	seep
92	45.201556, -122.131761	intermittent stream
94	45.202447, -122.128053	seep
94	45.202447, -122.128053	seep
102	45.204753, -122.118858	seep
112	45.206372, -122.105061	two streams join
112	45.206553, -122.105011	
118	45.209153, -122.103964	

146	45.214220, -122.161690	
146	45.21413, -122.16158	
176	45.210688, -122.151013	intermittent stream
176	45.211406, -122.148228	
178	45.210831, -122.146283	stream
178	45.211281, -122.146408	intermittent stream
194	45.222231, -122.115554	
194	45.221387, -122.116717	
194	45.217264, -122.118811	
194	45.217372, -122.118925	seep
194	45.217553, -122.119239	high water table
194	45.218922, -122.120481	
300	45.195206, -122.082989	

Many of these unmapped riparian areas are in headwaters. Northwest Research Station stated in a 2015 PNWRS issue of Science Findings: “Managing for healthy riparian areas in head-waters provides many downstream benefits... (d)ownstream productivity, water temperature, and instream habitat are tied to the health of the headwater stream-riparian system.” Of the 15 vertebrates recorded the recent study of headwater streams, most have strong associations to features specific to small headwater streams.²¹



Pacific giant salamander (Dicamptodon tenebrosus) in Unit 178

In North Clack Units 190 and 70, volunteers noted presence of a Northwest Salamander (*Ambystoma gracile*). And in Units 88 and 178, volunteers found individuals of Pacific giant salamander (*Dicamptodon tenebrosus*). While these are not an uncommon species within its range, it is rarely seen on the Clackamas district, and the FS should take care to protect its habitat, which are the upper reaches of streams. Cope’s

²¹ USDA Pacific Northwest Research Station. 2015. Heed the Head: Buffer Benefits Along Headwater Streams. Science Findings #178. <http://www.fs.fed.us/pnw/science/scifi178.pdf>

giant salamander (*Dicamptodon copei*), red-legged frog (*Rana aurora*), *Corydalis aquae-gelidae*, and *Huperzia occidentalis* are all agency sensitive species, and riparian dependent species which occur within the project area, making this riparian habitat even more critical in its intact state.

The PA states that “(r)iparian features that are not perennial or intermittent streams such as seeps, springs, ponds or wetlands would be protected by the establishment of protection buffers or skips that incorporate the riparian vegetation.” **To ensure these habitats are to be protected, please include buffers on these riparian areas on the project Decision maps in the form of unit boundary adjustments and make subsequent acreage adjustments.**

REGENERATION HARVEST

The North Clack Proposed Action includes 255 acres²² of “regeneration harvest” to “Create Early-Seral Habitat while Providing Forest Products”. In the PA, the FS has also included an “Alternative 2” which would increase the amount of “regeneration harvest” from 255 to 371 acres. Among other reasons, Bark sees the decision to give the public this option as imprudent given that the FS knows that some of the new units proposed contain several red tree vole nests and will need to be dropped.²³

[As we brought up in scoping](#), agency research has shown²⁴ found that for several microclimatic and ecological attributes, as well as public perceptions of scenic beauty, 15-percent green-tree retention resulted in responses to harvest that are not significantly different from those in a clearcut. The FS in the past stated

²² The “regeneration harvest” unit boundaries displayed in the North Clack interactive map show adjustments in size that are not reflected in the acres listed in the Proposed Action

²³ Some currently proposed "regeneration harvest" units include active RTV nests which would require adequate buffers, and as part of "Alternative 2", additional "regeneration harvest" units were even placed in areas currently occupied by this federally protected species.

²⁴ PNWRS Science Findings: Green-tree retention in harvest units: Boon or bust for biodiversity, Issue 96, 2007



Old growth trees in regen harvest unit 132

that forage has declined in large part due to the continued policy of full fire suppression on the District, as fire is the historic source of forage openings. There has not been an effort by the FS to provide evidence that increased acres of regeneration logging will result in increased forage across the landscape in North Clack compared to that which was created by the 36 Pit Fire.

Furthermore, [recent OSU research](#) has found that in the Pacific Northwest overall, early-seral habitat isn't declining as much as widely assumed, and that species dependent on late-seral habitat continue to suffer greater population declines compared to early-seral species. In contrast to generalization that the reduction of clearcutting on federal lands has negatively

affected the creation of early-seral ecosystems, the area of diverse early-seral ecosystems on federal land has remained more or less constant. Increases in areas of large, high-severity wildfires appear to have compensated for any decline in early-seral ecosystems created through harvest.

Projections of vegetation change and fire in the Pacific Northwest point to increased prevalence of wildfire and expansion of conditions suitable for hardwoods. These changes could create more habitat for species associated with early-seral ecosystems and suggest that active management (including “ecological forestry”) may be less needed where these processes occur. In the PA, the FS has not disclosed the numbers of early seral vs. late seral species. Given that older forests—particularly old-growth forests of moist regions of the Pacific Northwest—can take centuries to develop and that populations of associated species continue to decline, the priority for conservation and restoration should be older forests.

Some “regeneration harvest” units Bark surveyed contain mature and legacy trees/snags, as well as other indicators of a healthy stand. Units like 132, 116 and 107 (Alt. 2) contain old growth trees that red tree voles currently occupy, which will need to be appropriately buffered. In some stands, such as Unit 96, numerous gaps in the canopy already exist, and there is no lack of understory vegetation across the entire unit. However, this existing vegetation might not be what the FS is hoping to promote – dense sword fern, Oregon grape, and Western hemlock.



Mag Unit 184 linear “gap” which entirely overlaps a Riparian Reserve component of the unit

While the FS has stated that no “regeneration harvest” would occur in Riparian Reserves, Bark is also specifically concerned about the sections of units where the regeneration harvest currently does overlap with Riparian Reserve land allocation. We see these two things as conflicting and request that the FS remove any acres within regeneration harvest units from overlapping Riparian Reserves.

“Regeneration harvest” tends to leave few or no snags,²⁵ and even when it does retain snags, the usual prescription is to have a minimum per acre which can be considerably fewer than needed for cavity-nesting animals, and these snags often fall over from wind exposure. When snags decay, they provide a long-term nutrient and water supply and their removal obstructs nutrient cycling on the site. As such, this kind of logging will reduce the species richness and key ecological processes associated with early-successional ecosystems.

According to the FS the units proposed for regeneration harvest in North Clack would provide what they call “early-seral habitat” for approximately 20 years. And according to the silviculture report would be replanted at a density *higher* than existing plantations.

[Results of current research on streamflow deficits](#) suggests that reported trends of streamflow reduction in recent decades could be caused as much or more by cumulative effects of clearcut logging than by climate change.²⁶ This is especially troubling since over 50% of the North Fork is within transient snow zone, resulting in increased risk of landslides because of canopy removal on steep

²⁵ Lindenmayer, DB and McCarthy MA. 2002. Congruence between natural and human forest disturbance: a case study from Australian montane ash forests. *Forest Ecol Manag* 155: 319–35.

²⁶ Perry, T.D & Jones, J.A. (2016) Summer streamflow deficits from Regenerating Douglas Fir forests in the Pacific Northwest, USA. *Ecohydrology*, doi:10.1002/eco.1790.

slopes. In terms of hydrologic recovery, the FS asserts that regeneration harvests would set the stand back to zero. Afterward, hydrologic recovery would take approximately 35 years.

This logging prescription as proposed would require an exception for FW-306 because four “regeneration harvest” units have not culminated. FW-307 explains that exceptions to this may be made where resource management objectives or special resource conditions require earlier harvest. The FS goes on to state that “regeneration harvest” is needed to enhance forage where palatable browse plants are present, and to reduce the spread of western hemlock dwarf mistletoe (habitat structure for several species of songbirds) and “reduce the stand’s western hemlock component.” The FS has not demonstrated how mistletoe and the presence of western hemlock are such dire issues within the watershed that they require aggressive logging prohibited by the LRMP.

As an alternative to clearcutting these stands, we recommend reintroducing fire back into the landscape (as the agency is with the meadow burning prescriptions in this project), which would improve deer & elk forage while also benefiting a host of other species.

Without any “regeneration harvest” North Clack will still include hundreds if not thousands of acres of openings in the form of gaps, heavy thins, landings, road building, and fuel breaks. Along with these openings, clearcuts continue to dominate the broader landscape that North Clack occupies, as the project area is surrounded by private land on two sides. We encourage the agency to look to existing openings, or those created in thinning units as landings or “gaps” to take advantage of what forage opportunities these conditions provide, including identifying additional locations for prescribed burning as recommended in the WA.

FORAGE BURN

As stated in [our scoping comments](#), Bark supports returning fire to the landscape at Boyer Creek, and elsewhere, to promote native forage plants and to help regulate non-native plant species which have been present in the meadow for years. This situation and recommended action are written in the North Fork Clackamas Watershed Analysis at 5-7. [Bark furthermore suggested in scoping](#) that the FS take another look at the watershed to assess if there are additional prescribed burning opportunities to fulfill its Purpose and Need. MAP 3-4 of the WA includes additional areas for recommended “Retain & Improve Meadow Habitat” – with management direction being to “Explore options to reduce exotic plant species...Burn if necessary and/or possible.” WA at Table 3-2.

Fire has historically been the dominant stand-replacing event that created early-seral habitats within the watershed and, as Bark has previously pointed out, this process has clear benefits when compared to regeneration harvest and other techniques which put a stand at a long-term deficit for dead wood and other components of complex habitat. Focusing on existing openings where conifers have not and may not establish seems to be a great place to start reintroducing fire, along with under-burning in stands which have a low likelihood for a fire reaching the crown.

Depending on the species the FS is targeting in this meadow (to both increase and decrease), the agency should take steps to not inadvertently bring in additional noxious weeds, and to maximize the impact on the species they are targeting. [The Use of Prescribed Fire to Control the Spread of Four Dominant Invasive Plant Species in the Great Lakes Region](#) has some good suggestions for controlling thistle, species of which are present in the Boyer meadow. The authors found that repeated late spring burns reduced abundance of thistle. Dormant season burns reduced flowerhead, seed production, and relative abundance. Early spring burns may increase cover by increasing sprouting and reproduction. [In our scoping comments](#) we provided a table that further summarizes resources the authors used to complete their project.

The FS should take extra care to not promote further invasion by oxeye daisy. Prescribed burning is usually not recommended for controlling oxeye daisy, as fire may increase vulnerability of a site to invasion by exposing bare mineral soil.

FIRE HAZARD REDUCTION

[In scoping](#), we brought up the 150 acres of piling and burning of slash along Road 4610 and northern Forest property lines. [MHNF's Strategic Fuel Treatment Placement Plan](#) makes a recommendation for a fuel break along the 4610, but not elsewhere within the watershed. Bark requested more rationale for the fuel break along the northern Forest boundary (much of which has been recently clearcut on private land), and how it interacts with the Strategic Fuel Treatment Placement Plan.

Recent findings suggest intensive plantation forestry characterized by young forests and spatially homogenized fuels, rather than pre-fire biomass, are significant drivers of wildfire severity. This has implications for perceptions of wildfire risk, shared fire management responsibilities, and developing fire

resilience for multiple objectives in multi-owner landscapes.²⁷ These findings were not addressed within the fuels specialist report or the PA.

The satellite imagery available for the North Clack area shows the amount of clearcut land adjacent to the Forest, and since this imagery was taken there continues to be more clearcutting completed within the timeframe of this project. If a fuel break along the Forest boundary is implemented, we again recommend that the FS should coordinate with landowners, so the effort is not duplicated unnecessarily, or made futile by private forest management actions.

NORTH CLACK BOTANY FINDINGS

Bark volunteers noted two species within proposed units which Bark recommends buffering from ground-based logging operations - *Allotropa virgata* and *Usnea longissima*. Our findings are included in the table below, as well as in the Botany Specialist Report. We expect that the locations of these species will be placed in skips during sale layout, as the PA suggests.

Unit	Species	Species Code	Taxa Group	Status	Lat, Long
70	<i>Usnea longissima</i>	USLO53	Lichen	S&M	45°11'44.11"N, 122° 5'16.35"W
76	<i>Allotropa virgata</i>	ALVI23	Plant	former S&M; Table C-3 species (1994)	45°12'15.31"N, 122° 5'36.41"W
79	<i>Allotropa virgata</i>	ALVI15	Plant	former S&M; Table C-3 species (1994)	45°12'12.61"N, 122° 5'30.83"W
79	<i>Allotropa virgata</i>	ALVI16	Plant	former S&M; Table C-3 species (1994)	45°12'13.01"N, 122° 5'30.32"W
92	<i>Usnea longissima</i>	USLO54	Lichen	S&M	45°12'9.66"N, 122° 7'59.13"W
92	<i>Usnea longissima</i>	USLO55	Lichen	S&M	45°12'8.75"N, 122° 7'59.11"W
94	<i>Usnea longissima</i>	USLO50	Lichen	S&M	45°12'6.67"N, 122° 7'40.49"W
96	<i>Usnea longissima</i>	USLO51	Lichen	S&M	45°12'13.68"N, 122° 7'32.99"W
112	<i>Allotropa virgata</i>	ALVI17	Plant	former S&M; Table C-3 species (1994)	45°12'24.65"N, 122° 6'11.29"W
112	<i>Allotropa virgata</i>	ALVI18	Plant	former S&M; Table C-3 species (1994)	45°12'27.01"N, 122° 6'7.90"W
114	<i>Allotropa virgata</i>	ALVI2	Plant	former S&M; Table C-3 species (1994)	45°12'31.49"N, 122° 6'13.54"W

²⁷ Harold S. J. Zald et al, Severe fire weather and intensive forest management increase fire severity in a multi-ownership landscape, Ecological Applications (2018). DOI: 10.1002/eap.1710
<https://phys.org/news/2018-04-high-wildfire-severity-young-plantation.html#jCp>

114	<i>Allotropa virgata</i>	ALVI3	Plant	former S&M; Table C-3 species (1994)	45°12'30.35"N, 122° 6'8.78"W
118	<i>Allotropa virgata</i>	ALVI19	Plant	former S&M; Table C-3 species (1994)	45°12'30.65"N, 122° 6'8.61"W
140	<i>Usnea longissima</i>	USLO50	Lichen	S&M	45°12'29.70"N, 122° 9'6.33"W
178	<i>Allotropa virgata</i>	ALVI14	Plant	former S&M; Table C-3 species (1994)	45°12'49.33"N, 122° 8'36.52"W
179	<i>Allotropa virgata</i>	ALVI4	Plant	former S&M; Table C-3 species (1994)	45°12'50.28"N, 122° 8'43.82"W
184	<i>Allotropa virgata</i>	ALVI3	Plant	former S&M; Table C-3 species (1994)	45°13'24.11"N, 122° 8'11.14"W
191	<i>Usnea longissima</i>	USLO52	Lichen	S&M	45°13'4.27"N, 122° 7'50.10"W
191	<i>Usnea longissima</i>	USLO53	Lichen	S&M	45°13'4.31"N, 122° 7'50.13"W
191	<i>Allotropa virgata</i>	ALVI19	Plant	former S&M; Table C-3 species (1994)	45°13'8.42"N, 122° 7'43.57"W
191	<i>Allotropa virgata</i>	ALVI20	Plant	former S&M; Table C-3 species (1994)	45°13'9.23"N, 122° 7'43.25"W
192	<i>Allotropa virgata</i>	ALVI5	Plant	former S&M; Table C-3 species (1994)	45°12'48.60"N, 122° 7'37.66"W
192	<i>Allotropa virgata</i>	ALVI6	Plant	former S&M; Table C-3 species (1994)	45°12'49.87"N, 122° 7'37.37"W
192	<i>Allotropa virgata</i>	ALVI7	Plant	former S&M; Table C-3 species (1994)	45°12'47.47"N, 122° 7'36.91"W
192	<i>Allotropa virgata</i>	ALVI8	Plant	former S&M; Table C-3 species (1994)	45°12'48.46"N, 122° 7'47.77"W
192	<i>Allotropa virgata</i>	ALVI9	Plant	former S&M; Table C-3 species (1994)	45°12'50.36"N, 122° 7'45.72"W
192	<i>Allotropa virgata</i>	ALVI10	Plant	former S&M; Table C-3 species (1994)	45°12'49.10"N, 122° 7'44.37"W
192	<i>Allotropa virgata</i>	ALVI11	Plant	former S&M; Table C-3 species (1994)	45°12'50.32"N, 122° 7'43.12"W
192	<i>Allotropa virgata</i>	ALVI12	Plant	former S&M; Table C-3 species (1994)	45°12'50.40"N, 122° 7'42.39"W
192	<i>Allotropa virgata</i>	ALVI13	Plant	former S&M; Table C-3 species (1994)	45°12'51.55"N, 122° 7'41.44"W
194	<i>Allotropa virgata</i>	ALVI5	Plant	former S&M; Table C-3 species (1994)	45°13'5.75"N, 122° 7'10.99"W
198	<i>Allotropa virgata</i>	ALVI2	Plant	former S&M; Table C-3 species (1994)	45°13'34.28"N, 122° 7'1.32"W
202	<i>Allotropa virgata</i>	ALVI21	Plant	former S&M; Table C-3 species (1994)	45°13'39.93"N, 122° 7'30.28"W
202	<i>Allotropa virgata</i>	ALVI22	Plant	former S&M; Table C-3 species (1994)	45°13'32.38"N, 122° 7'32.60"W
202	<i>Usnea longissima</i>	USLO56	Lichen	S&M	45°13'39.98"N, 122° 7'39.10"W
204	<i>Allotropa virgata</i>	ALVI4	Plant	former S&M; Table C-3 species (1994)	45°13'44.22"N, 122° 7'4.85"W

Allotropia virgata

A. virgata was formally designated a “C-3 species” under the Northwest Forest Plan. See Table C-3. It is currently a Forest Service Sensitive species in the Intermountain Region.

The habitat in which *A. virgata* is found may primarily be a function of the requirements of the fungus with which it associates, with important factors being those of the soil environment and the availability of host trees. Buried, rotten wood is one important aspect of *A. virgata* habitat, probably because it retains moisture and provides organic substances essential to the associated fungus.

Dependence of *A. virgata* on its conifer host suggests that anything that destroys the tree component or severs the mycorrhizal relationship²⁸ will result in death of the plant. Plants on the margins of canopy openings produced by logging may also be adversely affected by the increased insolation.

Although *A. virgata* no longer has any conservation status as a Region 6 sensitive or strategic species or a Survey and Manage species, **Bark recommends that sites be protected from logging disturbance due to the species’ obvious affinity to intact, healthy soils in mature forest as well as its overall rarity on the CRRD and the Mt. Hood National Forest.**

Usnea longissima

U. longissima is currently a Survey and Manage Category F species under the Northwest Forest Plan. Although it has a large range and was once common, *U. longissima* is now considered rare in the United States. *U. longissima* is a declining species with sporadic distribution on the Clackamas River Ranger District and throughout the Northwest Forest Plan area. It has been extirpated from all of its range in Europe and Scandinavia due to habitat loss and air pollution, except for parts of Norway and Italy where it is “red-listed” as an endangered species.²⁹ It is also listed on the “Red List of California Lichens” and is valued and used medicinally for its reputed anti-bacterial, anti-viral, and anti-cancer properties.

Populations of *U. longissima* occur predominantly in riparian areas, hanging from trees growing along or nearby rivers and tributaries, but populations can also occur in upland forest. Falling or limbing of trees on which *U. longissima* is

²⁸ Furman, T.E. and J.M. Trappe. 1971. Phylogeny and ecology of mycotrophic achlorophyllous angiosperms. Quarterly Review of Biology 46:219-225.

²⁹ Storaunet, K.O., J. Rolstad, M. Toeneiet, & E. Rolstad. 2008. Effect of logging on the threatened epiphytic lichen *Usnea longissima*: a comparative and retrospective approach. Silva Fennica 42(5): 685-703.

growing would destroy populations of the lichen. It cannot survive on fallen trees, branches, or the forest floor. *U. longissima* is vulnerable to changes in tree density and canopy closure.^{30,31}

In the North Clack project area specifically, past project planning documents have stated that “trees with these lichens would be marked as leave trees.” *No Whisky EA* at 76. **Bark recommends that this action be taken in the case of North Clack, with the option of expanding this provision to retaining trees with canopies that touch trees containing *U. longissima*.**



U. longissima in Unit 140 at 45.2082530, -122.1517560 (left) , and Unit 96 at 45°12'13.68"N, 122° 7'32.99"W (right)

RED TREE VOLES

Since scoping, Bark in partnership with NEST have submitted data to the FS on the locations of 42 red tree vole nests within proposed treatment units. These nests were not located through FS transect-style surveys, and the agency will need to apply sufficient buffers required for the species, and these buffers must

³⁰ Sillett, S.C. & Goslin, M.N. 1999. Distribution of epiphytic macrolichens in relation to remnant trees in a multiple-age Douglas-fir forest. *Canadian Journal of Forest Research* 29: 1204–1215.

³¹ Dettki, H. & Esseen, P.A. 1998. Epiphytic macrolichens in managed and natural forest landscapes: a comparison at two spatial scales. *Ecography* 21:613–624

be identified in sale and NEPA documentation before the agency can truly determine No Impact on Survey and Manage Species as they do in the PA.³²

In the PA, the FS did not fully apply the deletions resulting from the presence of RTVs on unit maps or acres changed in the Proposed Action. Bark believes that for transparency (and for a higher probability of reaching resolution over this project) it is important to display the areas dropped for RTV protection in EA unit boundary maps, and show the acreage change in the final EA. As described further below, the EA should also include a PDC that is designed to protect RTV nests and surrounding habitat when additional nests are found post-Decision.

Red tree voles are Category C Survey and Manage species under the Northwest Forest Plan, and according to the IUCN Red List are “near-threatened”. Threats to this species include loss of forest habitat and forest fragmentation³³. This species has limited dispersal capabilities, and early seral stage forests may be a barrier to dispersal.

³² The first of NEPA’s dual purposes is to insure informed decision-making. 40 C.F.R. § 1500.1(b) (“NEPA procedures must insure that environmental information is available to public officials . . . before decisions are made and before actions are taken.”). NEPA’s second purpose is to insure meaningful public participation. Because FS did not adequately establish baseline conditions, the public was not able to comment on either the results of the baseline findings or the methodology used in reaching those results. 40 C.F.R. § 1500.1(b) (“NEPA procedures must insure that environmental information is available to . . . citizens[,] . . . [and] [t]he information must be of high quality. Accurate scientific analysis, expert agency comments, and public scrutiny are essential to implementing NEPA.”). *Oregon Natural Desert Association v. Zinke*, 250 F.Supp.3d 773 (D. Or. 2017).

As the Ninth Circuit has explained, NEPA works “through the creation of a democratic decisionmaking structure that, although strictly procedural, is ‘almost certain to affect the agency’s substantive decision[s].’” *Or. Nat. Desert Assoc. v. BLM*, 531 F.3d 1114, 1120 (9th Cir. 2008) (quoting *Robertson*, 490 U.S. 332, 350). By requiring agencies “to place their data and conclusions before the public...NEPA relies upon democratic processes to ensure – as the first appellate court to construe the statute in detail put it – that ‘the most intelligent, optimally beneficial decision will ultimately be made.’” *Id.* (quoting *Calvert Cliffs’ Coordinating Comm.*, 449 F.2d 1109, 1114). This process, in turn, ensures open, honest and public discussion “in the service of sound decisionmaking.” *Id.* at 1143.

³³ Linzey, A.V. & NatureServe (Scheuering, E. & Hammerson, G.). 2008. *Arboremus longicaudus*. The IUCN Red List of Threatened Species 2008: e.T42615A10729936.



North Clack Unit 124 – one of several RTV nest trees (flagged) not located through FS transects

Several North Clack units met the stand-level criteria as described in the Red Tree Vole Protocol described by Huff et al,³⁴ however a low percentage of nests were found through the surveys carried out by the FS. These findings have demonstrated that the agency's chosen method of running transects and looking for nests visible from the ground is not an

adequate method to locating the species. The red tree vole survey protocol allows for "individual tree examination" which would have been the most appropriate method given the mixed aged stands in North Clack. A tree vole nest can be the size of a fist to upwards of 90cm cubed. While 90cm cubed nest *may* be visible from the ground if it is in the lower third of the canopy, it is not visible if one cannot see into the canopy (which is the case for most of the legacy trees in this project), and a fist-sized nest is never visible from the ground. Research by Eric Forsman and James Swingle indicate that RTV nests are usually in the upper 3rd of the canopy, thus not likely to be easily visible. These findings align with the data from these 42 nests. Most of these nests are not only in the upper 3rd, but they're at the very top of the tree when it's a broken top.

Simply having selected individual trees with broken tops for climbing would have yielded far more results than doing a traditional ground survey where only visible nest trees are marked. Relying on ground surveyors to find visible nests is a technique that leads to low detection rates in mixed aged stands with legacy trees. After the data submitted by NEST is verified in the field and appropriate buffers are in place, we recommended that the FS resurvey all the units over 80 years old that NEST has not submitted data on for legacy trees, with individual tree examination. The agency has recognized this need during email

³⁴ Huff, R., K. Van Norman, C. Hughes, R. Davis and K. Mellen-Mclean. 2012. Survey Protocol for the Red Tree Vole, Version 3.0. Portland, OR. U.S. Department of the Interior, Bureau of Land Management, Oregon/Washington, and U.S. Department of Agriculture, Forest Service Regions 5 and 6. 52 p.

correspondence and in CSP meetings, where they made a commitment to buffer all nests identified by us, as well as resurveying stands over 80 years old using the new draft regional survey protocol, which requires more climbing surveys to be conducted.

Bark acknowledges and appreciates the deletion of Unit 80, and parts of units 76, 132, and 142 from the Proposed Action, resulting in dropping approximately 94 acres of proposed treatments. Unit 80 contains suitable habitat for northern spotted owls, as well as multiple red tree vole nests. On 11/15/2018, Bark submitted via email an updated set of GPS points which included locations of found RTV nests, as well as legacy trees within units where RTV presence is likely. We recommended that these un-climbed trees be climbed by the FS since it is likely at least some of them will contain nests. We recommend that the FS start with the trees we identified in units 194, 196, 198, 200, 203, and 206.



Two red tree vole nest trees in Unit 116; several of these trees are visible from the 4610 road

Further, we support the FS's commitment to continue to consider new information regarding red tree voles in their planning process after the Decision for this project is signed. "Red tree vole surveys have been completed to protocol. However, there is the possibility that new red tree vole sites may be found, even after a decision is made for this project. As they are confirmed and validated, additional deletions or buffers would be incorporated where appropriate." *PA at 25.* New information regarding the presence of red tree voles should be included in a supplemental NEPA effort, and appropriate no-cut buffers should be immediately applied: **a 10-acre surrounding buffer where no ground disturbing activities can occur.**

At the time of these comments being written, RTV nests have been found in units **106** (2 active, 1 inactive), **112** (5 active, 4 inactive), **116** (3 active, 1 inactive), **124** (7 active, 3 inactive), **132** (3 active, 1 inactive), **176** (5 inactive), **198** (1 active), **200** (1 active, 1 inactive) **80** (1 active) and **90** (3 inactive). These findings necessitate at least another 100 acres of no-cut buffers to protect this species and its habitat.

In the Final EA maps, please show how these and newly identified nests are buffered through altered unit boundaries, and the number of acres removed in the Proposed Action. A PDC alone does not give total assurance that all these acres will be protected due to lack of transparency and the possibility of differing interpretations of the PDC in sale layout.

The above nest locations and suggestions for appropriate buffers are included in the maps inserted on the following pages:



North Clack Integrated Resource Project Red Tree Vole Survey Detail Map

For stands with >10 active and inactive RTV nests, a polygon is created encompassing a total of 10 acres, with one site potential tree distance (160 ft/ 47m, dotted line circular buffers) between the tree and the edge of the buffer.

Riparian area buffers:
30ft /9m buffers for intermittent streams
60ft /18m buffers for perennial.

Polygonal Habitat Buffer

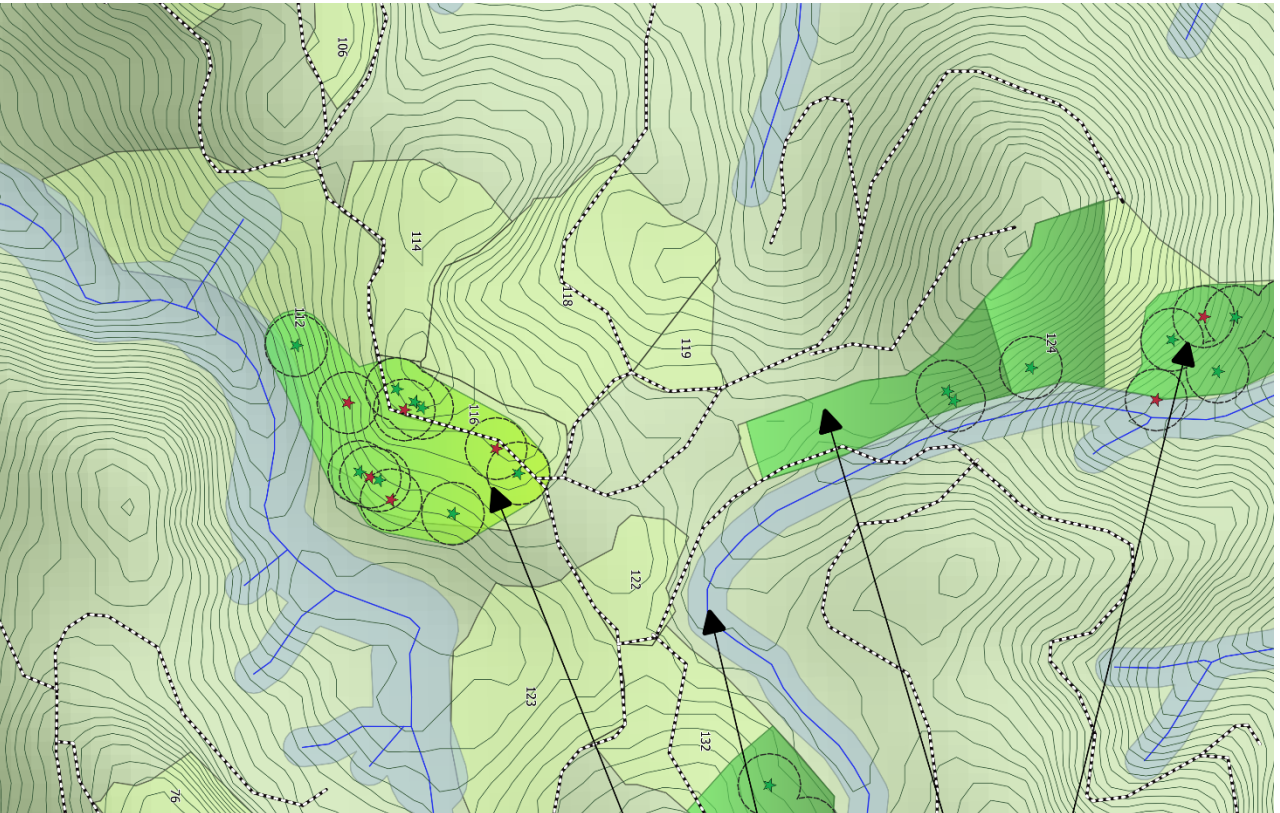
For stands with >10 active and inactive trees, a polygon is created between active and inactive nest trees then buffered by site potential tree distance.

Field data for this project was collected by volunteers working with the Northwest Ecosystem Survey Team (NEST) and BARK:
<https://nestsacadia.wordpress.com/> and <https://www.bark-out.org/>

Roads and Stream data provided by USFS:
<https://data.fs.usda.gov/geodata/>

Topographic and Hillshade data derived from data elevation model (DEM) courtesy of USGS Earth Explorer
<https://earthexplorer.usgs.gov/>

Buffers created according to management practises outlined in "Management Recommendations for the Red Tree Vole" published by the Bureau of Land Management in accordance with the Survey And Manage guidelines detailed in the Northwest Forest Plan.
<https://www.blm.gov/or/plans/surveyandmanage/MK/RedTreeVole/RTV.pdf>



SPECIFIC UNIT RECOMMENDATIONS

Recommend drop (priority): **132** (unit includes old growth trees, high density of large snags, at least 4 red tree vole nests), **124** (un-logged “Upper” EA unit, late successional forest habitat, steep and rocky slopes bordering riparian - N. Fork Clackamas and tributary, 10 red tree vole nests), **90** (access to this unit requires roadbuilding through sensitive riparian area, unit includes high density of legacy features, and 3 red tree vole nests), **71** (rebuilding 4612-130 road through riparian area is not worth accessing this small unit after dropping Unit 80, Unit 300 can presumably be treated without road access), **125, 126, 130** (extensive work required on 4610-150 to allow haul from units that are largely riparian with small timber. Especially not worth the access after dropping Units 124, 132), **58** (access road 4611-019 is unstable and within Wilderness), **west corner of 202** (the part of this unit on the west side of 4613-130 - centered on **45.22908, -122.12906** - is an old growth stand in healthy condition).

Units of high concern to consider dropping: **146** (steep and rocky slopes leading down to N. Fork Clackamas, large riparian component, old trees and structure make incompatible with RR land allocation), **194** (steep slopes with extensively high water table, many trees suitable for RTVs), **54** (LSR and mature trees means less acreage will be available, largely riparian – several unmapped seeps throughout unit), **176** (5 inactive RTV nests, large tree live trees and several legacy features present, high wildlife use, and network of seeps), **196** (steep slopes with extensively high water table, many trees suitable for RTVs), **203** (old stand with at least one tree suitable for RTV, intact complex riparian structure), **94** (center of unit includes large sensitive area of seeps, intermittent streams, and large old trees. Western section of the unit has been already been recently thinned – “Dry” #23. Accessing unit from the old landing off 4610 could invite more unauthorized off-roading as previously occurred just across the road after that stand was thinned.)

SYSTEM ROADS

The FS is proposing to “Maintain and Repair” **63 miles** of FS System Roads, **7 miles** of active and passive road decommissioning, **26.2 miles** of road closures, and **1.2 miles** of road-to-trail conversion (the end of the 4611 road).

Bark generally supports and appreciates the emphasis on reducing the road network in the North Clack project area, including all proposed road decommissioning and the road-to-non-motorized trail conversion.

This project violates LRMP standards for open road density. The Forest Plan specifies that the open road density for large game wintering areas (which encompasses the planning area) must not exceed 1.5-2 miles/miles² (B-10 vs. general Winter Range). The WA recommends that OHV trails should be included in this road density calculation, which it was in the PA. *WA at 4-10*. With the Proposed Action, the open road densities would change from 2.9 mi/sq mi to 2.1 mi/sq mi in Winter Range, which is still above the density spelled out in FW-208. The FS states that an exception is needed for this standard because no additional roads were identified that were suitable for closure. Bark remains very concerned about both road densities that exceed LRMP road density targets as well as any planned road construction within areas that already exceed these LRMP Standards and Guidelines.

Given that the FS is considering changes to a number of miles of roads within the North Clack project area, and given the large geographic scale of this project, the FS has recognized that it must consider its Travel Analysis Report (TAR) for the Forest, and identify the Minimum Road System (MRS).³⁵

In 2015, the FS released its TAR, a synthesis of past analyses and recommendations for project-level decisions regarding changes in road maintenance levels. Included in this report was a [list of roads “not likely needed”, with the objective maintenance level being “D-decommission”](#).

Bark commends the FS for starting this work through the release of the [roads table on the North Clack project page](#). This is a great way for the public to see which roads are “Needed” or “Not Needed” according to the TAR, as well as where the information gaps reside.

To identify the minimum road system, the FS must consider whether each road segment the agency decides to maintain on the system is needed to meet certain factors outlined in the agency’s own regulation.³⁶ Here, the FS should consider whether each segment of the road system within the project area is needed to:

- Meet resource and other management objectives adopted in the relevant land and resource management plan;
- Meet applicable statutory and regulatory requirements;
- Reflect long-term funding expectations; and

³⁵ 36 C.F.R. § 212.5(b)(1) (“For each national forest . . . the responsible official must identify the minimum road system needed for safe and efficient travel and for administration, utilization, and protection of National Forest System lands.”).

³⁶ 36 C.F.R. § 212.5(b)(1). *See also* Attachment A (“analyze the proposed action and alternatives in terms of whether, per 36 CFR 212.5(b)(1), the resulting [road] system is needed”); (“The resulting decision [in a site-specific project] identifies the [minimum road system] and unneeded roads for each subwatershed or larger scale”).

- Ensure that the identified system minimizes adverse environmental impacts associated with road construction, reconstruction, decommissioning, and maintenance.

In assessing specific road segments, the FS should also consider the risks and benefits of each road as analyzed in the TAR, and whether the proposed road management measures are consistent with the recommendations from the travel analysis report. To the extent that the final decision in this project differs from what is recommended in the travel analysis report, the FS must explain that inconsistency.

MHNF staff have expressed to Bark that while considering road work in proposed project areas, it is appropriate to recommend that the FS consider changes in maintenance levels on roads with *high combined resource risk* along with those recommended by the TAR for decommissioning. Please explain rationale for NOT closing roads which have high combined resource risk, if any are not already identified for closure.

SITE SPECIFIC SYSTEM ROADS COMMENTS

We submitted several comments re: system roads in the North Clack project area in [our scoping comments](#), which are summarized in the table below. Not all these comments were addressed in the PA – Bark includes them here again since some will be roads that we will be bringing up again via the Pre-decisional Objection process if not addressed in the final EA:

FSR #	Notes	Recommendation
4610022	Breached closure, proximity to illegally built trails, crosses riparian areas	Effectively block with boulders and slash, do not use for accessing Unit 90
4610011	Fully decommissioned, drops off steeply towards N. F. Clackamas, wet and rocky terrain would be accessible to nearby OHV use	Allow no road rebuilding or log haul on the already decommissioned portion of the road
4614120	Scoping roads map lists “Already Closed” but berm has been breached	Decommission
4613160	Scoping roads map lists “Already Closed” but no closure exists	Close with Entrance Management
4613130	Gully erosion occurring near north junction with 4613	Close with entrance management with waterbars
4613130	Poorly-drained soils where water pools and runs down road toward Whisky Creek, culvert aging	Decommission from south end to beyond Whisky Creek
4613016	Access to illegal trail, deteriorating stream crossing dumping sediment	Decommission

4613140	Severe gully erosion	Close with entrance management with waterbars
4614160	Severe gully erosion	Decommission starting just before the 4614-150 Fall creek crossing
4610150	Several hydrological and access issues (see Bark's scoping comments)	Storm proof and closed at the minimum (decommission if possible)
4610155	Breached berm	Re-close road with entrance management
4610153	Unstable bridge, damage to streambank	If no requirement to permanently keep access to the inholding, actively decommission
4613200	Not needed beyond the junction with the 4613-205 due to its redundancy (by 4613-013 and 4613-140)	Decommission
4611	Unauthorized access and poor road conditions leading to Huxley Lake, existing trailhead hard to locate	Convert road-to-trail at Unit 62 to extend Trail #521

[In scoping](#), we brought up that FSR **4610-150** has significant hydrological and access issues that would require work to address if the agency wants to use this road for haul. Unfortunately, there wasn't mention of this road in the PA. After looking at what this road accesses, we recommend that the road be stabilized with culverts replaced, storm proofed and closed at the minimum (decommissioned if possible, as recommended in scoping), and that no haul occur on this road as part of this project. Units 126 and 130 are mostly riparian and steep, and under their prescriptions they would not access much timber to make the logging systems and road access worth the effort. Units 340 and 342 being non-commercial treatments adds to this predicament. Unit 124 contains 9 red tree vole nests and will likely need to be dropped entirely.



FSR 4614-120 crossing with Whisky Creek tributary – water seen flowing over roadbed and back into stream channel

4614-120 was brought up by Bark in our scoping comments because of the deteriorating culvert at Whisky Creek - the crossing which is actively dumping road fill and sediment into the creek at this crossing. Additionally, past this crossing there is a tributary of Whisky Creek that is directly flowing over the roadbed and cutting into the road surface, actively dumping road fill into the creek there. The Proposed Action includes closing this road with entrance management, however Bark believes the hydrological issues are significant enough to remove these two culverts and decommission the road. This 0.91 mile road segment terminates at Weyerhaeuser land, and decommissioning would improve aquatic habitat without cutting off access to more than one small and very lightly used dispersed camp between the two unstable stream crossings.



Ineffective closure at FSR 4610-040

The closed FSR **4610-040** is located at Lookout Springs where there are remains of the foundation of the historic guard station. At this spot, Bark found that there is an ineffective road closure where vehicles can and have driven up and around the berm to access the top of an opening that often contains trash and other signs of vehicular use. Bark recommends re-closing this road with a larger berm, boulders and slash to prevent this from occurring again.

Bark and others expressed concern about reopening the **4612-130**, which is currently closed and with the release of the PA is no longer proposed for reopening. This road is bermed at the 4612, and shortly beyond the berm it becomes perforated with wet ground, and some sections include Aplodontia holes and aquatic vegetation and stream crossings. In the Boyer creek meadow, Bark noted the presence of water running through the unit (both above and below ground) and hitting the old temporary road alignment directly below. Bark had concerns about this temporary road being rebuilt because of the generally wet conditions along its route and its proximity to Boyer Creek. MAP 2-3 of the WA describes this road as containing “High Road Sediment Delivery”. Furthermore, reopening this road would only access one small unit (71), since Unit 80 was dropped, and 300 will likely not require road access. We recommend dropping Unit 71 and leaving the current road closure on 4612-130 intact.

When walking unit 179, we noticed that the **4613-205** crossing of Dry Creek is no longer functional, and in fact has deteriorated into the creek, providing much needed large woody debris. The ground around this old crossing is wet containing sensitive soils and should not be re-utilized to access the bottom of the unit. The PA lists 4613-205 as being decommissioned at MP 0.18. We recommend this end section of the road be left as is - since it will not be rebuilt for accessing 179 and active decommissioning could do more harm than worse at the Dry Creek crossing.



4613-205 crossing of Dry Creek

The PA adds decommissioning **4613-200** at the junction with 4613-205 to the Proposed Action, which Bark recommended in Scoping, and support now due to the road's redundancy and parallel proximity to the North Fork Clackamas River.

North Clack Unit 58 (LSR) is accessed from the top by an overgrown and unstable road **4611-019**, which appears to be within the Wilderness area. The road is situated on a steep slope and displays signs of active geologic movement and erosion, including the consistent presence of red alders along the slope. Because this road is within wilderness and displays these characteristics, Bark recommends keeping the road closed during project implementation – and not using it to access the small LSR unit.



FSR 4611-019 accessing Unit 58 from what is now Wilderness

TEMPORARY ROADS

Since Scoping, Bark expressed concern about the amount of temporary roadbuilding the agency states is required to achieve their Purpose and Need in the North Clack project area. The very first aquatic recommendation of the North Fork Clackamas Watershed Analysis on 5-1 is to “Avoid New Roads”, with a further recommendation on 5-2 to “allow no new roads or motorized trails through riparian reserves”.

The FS states that after they examined each proposed temporary road segment, some were shortened or eliminated for a total reduction of about one mile. Contrary to the FS summary on this topic it appears that there has been a slight overall increase in proposed roadbuilding. 19.5 (an overall increase from Scoping) miles is more mileage than Bark has seen proposed by the District in one project, and as the agency is well aware, these roads are vectors for stream sediment, illegal activity, disruption of wildlife, noxious weeds, and more.

As in past projects, the FS is planning to re-use previously decommissioned roads, and since many of these roads have been passively decommissioned, the agency will likely claim it will be achieving a net reduction in road density after the project when these roads are “rehabilitated”. Although in different stages of recovery, every single road segment has recovered some degree of hydrologic function, and with this project could lose the benefit from years of the recovery.

Bark brought up several concerns about temporary roadbuilding [in our scoping comments](#). It is well-documented that road construction vastly elevates erosion for many years, particularly in the first two years when the construction causes

a persistent increase in erosion relative to areas in a natural condition.^{37,38,39} Specifically, major reconstruction of unused roads can increase erosion for several years and potentially reverse reductions in sediment yields that occurred with non-use. *Id.*

Available scientific information shows that reconstruction of closed and abandoned roads, could persistently elevate erosion and sediment delivery in several ways. Reconstructed roads cause elevated erosion and sediment for many years after decommissioning.⁴⁰ The USFS Region 5 method for estimating cumulative watershed effects indicates that even 10 years after road decommissioning, a mile of decommissioned road is equivalent to 0.2 miles of new road in terms of adverse cumulative effects.⁴¹ After 50 years, a mile of obliterated road still has impacts equivalent to 0.1 mile of new road. Thus, as it is apparent that decommissioning will not instantaneously eliminate the persistent impacts of roads on erosion and sediment delivery, building these roads will likely have adverse impacts to the aquatic and terrestrial environment.

Road construction is by far the greatest contributor of sediment to aquatic habitats of any management activity.^{42,43} Temporary road construction can cause resource damage including erosion and sedimentation, exotic species spread and disruption of wildlife.⁴⁴ Unpaved roads and stream crossings are the major source of erosion from forest lands contributing up to 90% of the total sediment production from forestry operations.

Another concern that Bark has about the proposed roadbuilding is increased access. In scoping, Bark recognized the "existing" temporary road into North

³⁷ Potyondy, J.P., Cole, G.F., Megahan, W.F., 1991. A procedure for estimating sediment yields from forested watersheds. Proceedings: Fifth Federal Interagency Sedimentation Conf., pp. 12-46 to 12-54, Federal Energy Regulatory Comm., Washington, D.C.

³⁸ Rhodes, J.J., McCullough, D.A., and Espinosa Jr., F.A., 1994. A Coarse Screening Process for Evaluation of the Effects of Land Management Activities on Salmon Spawning and Rearing Habitat in ESA Consultations. CRITFC Tech. Rept. 94-4, Portland, Or.

³⁹ Beschta, R.L., Rhodes, J.J., Kauffman, J.B., Gresswell, R.E., Minshall, G.W., Karr, J.R., Perry, D.A., Hauer, F.R., and Frissell, C.A., 2004. Postfire Management on Forested Public Lands of the Western USA. Cons. Bio., 18: 957-967.

⁴⁰ *Id.*

⁴¹ Menning, K. M., D. C. Erman, K. N. Johnson, and J. Sessions, 1996. Aquatic and riparian systems, cumulative watershed effects, and limitations to watershed disturbance. Sierra Nevada Ecosystem Project: Final Report to Congress, Addendum, pp. 33-52. Wildland Resources Center Report No. 39, Centers for Water and Wildland Resources, University of California, Davis.

⁴² Meehan, W.R. (ed.). 1991. Influences of Forest and Rangeland Management on Salmonid Fishes and Their Habitats. Am. Fish. Soc. Special Publication 19.

⁴³ Robichaud, P.R., L.H. MacDonald and R.B. Foltz. 2010. Fuel management and erosion. Ch. 5 in: W.J. Elliot, I.S. Miller and L. Audin (eds.). Cumulative Watershed Effects of Fuel Management in the Western United States. USDA For. Serv. Rocky Mtn. Res. Sta. Gen. Tech. Rep. RMRS-GTR-231. Fort Collins, CO.

⁴⁴ Trombulak, S.C. and C.A. Frissell. 2000. Review of ecological effects of roads on terrestrial and aquatic communities. Conservation Biology 14:18-30.

Clack Unit 89 as originally accessing No Whisky Unit 21, and in scoping comments shared observations and recommendations that were copied from a 2013 FS BMP monitoring form.

Since this road is to be used again for the North Clack project, we felt it was a good example to bring up, so the FS can move forward more successfully this time around with contract oversight and implementation, relating to temporary road building specifically.

Bark noted that the berm closing off the temporary road accessing North Units 16 and 18 (and No Whisky Unit 5) is at this barely effective at preventing motorized access from straying off the main 4610. We recommended a much larger berm with deep slash and boulders be placed after any re-use of this road as a temporary road for North Clack.

The FS states that a feasible route for a new temporary road that extends from the end of Road 4613-140 was identified to access Unit 174. This alignment is on a ridgetop above the head scarp of a dormant landslide and is likely the only feasible route that protects the stability of the earthflow. When walking this section of forest where the alignment is proposed, we observed steep drop offs on each side of the ridgetop, and the ridge itself being very narrow and rocky – surely being difficult terrain to maneuver a loaded log truck across. We request more information on what measures will be used to protect the geology of this area and prevent additional landslides from occurring due to its current rocky steep conditions (unit-specific PDCs).

We again encourage the FS to consider these recommendations, including significantly reducing temporary roadbuilding, as they select their alternative, as this will assist the agency moving forward with the best project possible for the North Fork Clackamas River watershed.

OHVs and UNAUTHORIZED MOTORIZED ROUTES

In addition to impacts from the proposed action, significant additional impacts come from illegal OHV use in the North Clack project area. NEPA requires the agency to address the impacts “on the environment which result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions...cumulative impacts can result...by collectively significant actions taking place over a period of time.” 40 C.F.R. § 1508.7. The cumulative effects of OHVs and timber harvest – including that proposed here, which may include construction of new skid trails and other roads needs considered in the subsequent analysis.

Bark is concerned that building or rebuilding numerous roads for logging in North Clack could result in an increase of OHV access and would undo the restoration work done to remedy the damage done by the original entries.

The Proposed Action mentions “preemptively blocking roads and skid trails created by logging that might otherwise become OHV routes.” The methods mentioned include “constructing blockages to motor vehicles, piling slash and root wads on routes, decompacting and stabilizing, using mechanized construction equipment such as excavators or backhoes. Root wads that are generated from road and landing construction would be hauled to staging areas and would be available for use to block unauthorized OHV routes where needed.”

Some road closure and trail rehabilitation projects completed recently within the District’s Goat Mountain project area have been effective in reducing unauthorized target shooting, OHV use, and garbage dumping in stands proposed for thinning. Effective restoration actions already implemented in the North Clack project area have included boulders and slash being placed along the road, large berms, re-contouring/de-compacting, re-vegetating, and the removal of trash. We believe these actions, where implemented, have been effective and support these types of strategies within the North Clack project.

Since we brought up several examples of unauthorized off-roading in scoping, either the FS or the public has blocked off a couple routes we identified off the 4610 using easily moveable wooden barricades and FS-issue closure signs. While we appreciate this action, the barricades used may not be the most effective in the long-term and we encourage the FS to implement some of the actions referenced above to deal with these problem areas.



*New closure placed at **45.20371, -122.13255** off **FSR 4610***



*New closure placed at **45.20403, -122.13369** off **FSR 4610***

Recent vandalism of similar barricades at the La Dee Flats OHV staging area highlights how easy these barricades can be taken down (see below).



While North Clack is under contract, roads constructed for the project could provide unregulated motorized access over the course of multiple years, as roads may be needed for more than one season.

Bark requests a commitment from the agency to enforce effective barricades on roads built or rebuilt for this project when operations are not occurring. *This includes time when the area is still under contract but outside the normal operating season.*

We suggest that any final decision mitigate potential risks associated with future road development by: 1) continuing to firmly limit construction of new roads; 2) ensuring controlled access during the project implementation; and 3) ensuring timely & secure road closure upon the project's completion.

Specific Recommendations for reducing impacts from unauthorized recreational use in the North Clack project:

To restrict access to temporary roads and skid trails built or rebuilt for this project when operations are not occurring (including between the normal operating seasons if work in sale unit in question is not complete in one season), please consider the following recommendations:

- Between operating seasons *and* at the conclusion of the contract, include seasonal erosion control measures such as waterbar placement, and diversion ditch creation;
- Between operating seasons *and* at the conclusion of the contract, include piling slash on the first few hundred feet of temporary road or skid trail, and placing boulders at the entrance to units from main road;
- Incorporate skips to help obstruct unauthorized OHV use in thinned units. Leave a thick, “vegetated screen” along roads in areas where OHV use is expected based on past and current use. If there are areas within the units in question that would benefit ecologically from skips (such as seeps or other riparian areas), *do not* remove these in exchange for the vegetated screens, but look to achieve both the visual and ecological goals of the skips in these units;
- Provide adequate Sale Administration staffing for workload, so that coverage is available when the assigned Sale Administrator is not working;
- Require the Sale Administrator to discuss all requirements with contractor at pre-work meeting, review all pre-work discussions with contract representatives on site, and reemphasize as unit completion is eminent;
- Require inspection by Sale Administrator before contractor’s equipment is moved offsite;
- Require implementation and effectiveness monitoring of PDCs by both Sale Administrator and other specialists, including during the harvest activities; and
- After project implementation and before conclusion of the contract, fully implement and monitor effectiveness of the aforementioned activities in order to impede further damage from unauthorized motorized access to units after thinning has taken place.

We believe these recommendations to be especially relevant during re-use of established OHV trails as temporary roads (as is the case with converted 4610-115, accessing several units), as well as when new roads are built in proximity to existing OHV trails (as is the case with converted 4611-121, 4611-125, and

4611-130 roads accessing Unit 42). We encourage the FS to prioritize use of existing trails as temporary roads when there is a risk of expanding the illegal trail network. We requested and request again that the agency provide rationale for their decision to build a new road into the forest when OHV trails are available to re-use.

Existing illegal routes

The North Clack Proposed Action includes 7 miles of rehabilitation of unauthorized OHV routes. In scoping, Bark submitted locations of illegal trails found within the North Clack project area (some of which the FS has knowledge of). The table below includes routes that we recommend obliterating through the North Clack project. Not all these comments were addressed in the PA – Bark includes them here again since some will be roads that we will be bringing up again via the Pre-decisional Objection process if not addressed in the final EA:

Observation/entry point	Location
Trail #802	45.20595, -122.20720
FSR 4610	45.20349, -122.13246
Unit 304	45.21625, -122.22001
FSR 4610	45.20369, -122.16691
Trail #802	45.21414, -122.22047
Trail #802	45.20479, -122.21444
Trail #802	45.20896, -122.21930
Unit 212	45.242543, -122.1263
FSR 4613120	45.24345, -122.12686
FSR 4613120	45.24309, -122.12445
FSR 4613	45.23585, -122.11934
Unit 44	45.18128, -122.11681
Converted 4611-002	45.18321, -122.12349
Unit 178	45.21232, 122.14738
Unit 200	45.22189, -122.11846

In addition to the trails listed above, there is a trail visible off the 4610 road, going uphill on the north side of the road and into Unit 16 at **45°12'28.87"N, 122° 6'8.24"W**.

The guardrail (**45.20734, -122.14830**) at the closed 4613-200 at 4613 (North Fork crossing) is rigged to be easily moved to the side so motorists can drive up

the road. The screws connecting the rails have been removed and a gap has been placed on a wooden block that can be moved (see below).



The guardrail (45.20734, -122.14830) at the closed 4613-200 at 4613 (North Fork crossing)

Unit 42 has a network of unauthorized trails which connect with Trail #805 and #806 and intersect with the proposed new roadbuilding within the unit. It will be important for the agency to inventory and rehabilitate these trails as they could, combined with the roadbuilding, increase illegal access to several areas within these stands. The locations of trails in this unit are summarized in the table below. However, since the unit is so large, Bark was not able to document all the trails within due to the scale of the issue.

Easting, Northing	Notes
567144, 5004098	
567098, 5003992	
567058, 5003980	
567091, 5003956	Fork in trail
567126, 5003935	
567213, 5003879	meets trail #805
567158, 5003644	
567137, 5003477	meets trail #806
566864, 5004007	
566783, 5003981	
566771, 5004028	

566645, 5004168	
566732, 5004240	
566798, 5004297	
566893, 5004345	



Unauthorized trails in Unit 42

SOILS

Bark is concerned that in the North Clack PA, exceptions to Forest Plan standards and guidelines FW-022 and FW-028 are proposed. These standards and guidelines direct the FS to not bring detrimental impacts to soil above 15% of the activity area (FW-022), and have these impacts remaining post-logging (FW-028). If these conditions exist, they should be rehabilitated to a level of less than 15% impaired.

The FS states that many units already exceed 15%, and that the project would increase it in some areas. The cumulative effects of the action alternatives when added to existing conditions would result in detrimental soil conditions that would range from 8% in stands that have not been logged before to 28% where ground-based logging has occurred before and is proposed again. In regeneration harvest units, the impact would range from 10 to 27% even after the proposed decompaction of primary skid trails.

Deep soil tillage is being proposed for some of the primary skid trails (and existing road alignments and landings) on several units to bring the project area closer to meeting FW-028. How many acres is this being proposed and how does it factor into the estimated total acres as it relates to the above estimated detrimental soil conditions?

We observe that the Proposed Action has been “designed to minimize additional detrimental soil impacts. The project design criteria and contractual specifications would be employed that aim to contain the extent of detrimental soil conditions.” The “Clackamas River Ranger District Standard Project Design Criteria (PDC) 3/2019” document provided with the PA addresses soil impacts in a way that appears to be more conditions-based than previous PDC documents Bark has seen which exist more within specific work windows and measurable limits to operations outside these work windows.

Operating requirements are usually based on calendar dates (June 1 – October 31). However, the actual conditions on the ground may or may not be consistent with desired conditions within and outside of the calendar operating dates as a result of changing weather patterns and climate change. Any conditions-based approach which streamlines the current system of winter waivers (as is being tested on the HRRD) must create clear expectations of communication between the specialists, sale administrator and contractor.

This approach should work to include the following project design criteria and mitigation measures:

- During conditions normally requiring a wet-weather waiver, contractors must receive approval from Forest Service staff before operations begin. In general, the sale administrator should discuss all requirements with contractor at pre-work meeting, review all pre-work discussions with contract representatives on site, and reemphasize as unit completion is eminent.
- Forest Service Sale Administrator should require a site inspection before contractor’s equipment is moved offsite.
- Reduce potential for soil compaction. If winter operations are considered, frozen ground may be appropriate. Soil temperature should ensure soil is frozen to a substantial enough depth.
- In the final Proposed Action as well as in contract language, please specify how the maximum soil saturation for winter operations to continue will be determined under different soil types.
- In the Proposed Action, please specify how soil moisture be measured in the field, who will measure it and when, and how will this be shared with the Forest Service if staff are not on-site.
- Reduce risk of sedimentation and ensure placement of erosion control devices. Place sediment traps and relief culverts along haul route as needed. If there are any visual signs of sedimentation do not haul or conduct operations.
- Develop a set of “trigger points” where winter operations shall cease, which should include both daily precipitation limits and antecedent precipitation

limits over multiple days. These limits should reflect local soil types and their responses to precipitation intensity.

- If cumulative rainfall exceeds these trigger points according to RAWs data or rain gauges installed in close proximity, then do not haul or conduct operations.
- Leave roads in the same condition or improved hydrological condition post-treatment. Add aggregate base to roads as needed to support hauling. Conduct ditch cleaning as needed.
- Monitor the condition of roads. If roads appear to be distressed or damaged as a result of activity, then do not haul or conduct operations.

AQUATIC/RIPARIAN HABITAT RESTORATION

We've observed that the proposed culvert work was removed from the information sheet which was provided with the PA and are curious about the status of this work and if there have been changes to it. There was also little mention of specific culvert actions to be completed in the PA itself.

In scoping, Bark supported the itemized effort by the agency to address aquatic habitat in the North Fork Clackamas watershed. Obstruction of passage for aquatic organisms, the deficit of large woody debris, an oversized road network, and unauthorized user access are all examples of threats which currently impede aquatic recovery in the watershed.

Bark supports replacing and/or removing culverts that are barriers to fish and aquatic organism passage and/or causing other ecological harm to the aquatic system. Bark also supports adding large woody debris in streams where it is lacking due to past management to enhance water quality and aquatic diversity. The North Fork Clackamas Watershed Analysis at 5-1 recommends that "Fish restoration should concentrate on increasing instream LWD through short and long term recruitment throughout the watershed."

Bark has specifically observed the culvert deteriorating, and water bringing road fill and sediment directly into **Whisky creek at the crossing with 4614-120**. We support the replacement of this culvert before any kind of haul occurs, but also have doubts that this haul will have anything but negative impacts on this part of Whisky Creek. Upon driving over the creek once, sediment was observed washing directly into the stream. The FS will need to design strict PDCs (including no wet-weather haul) to address this ecologically damaging crossing carefully so it doesn't fail during project implementation.

Along with the other culvert replacements, Bark supports replacing the culvert at **Road 4611 at Winslow Creek**. Currently there are two culverts which are not

functioning properly, and one is severely deteriorated and appears to be polluting the water downstream with its own decay. [In scoping we asked if the FS will be ripping and replacing both culverts.](#)

The **4613 culvert at Bedford Creek** is receiving more water than it is built for. The culvert is aged and needs to be replaced with something bigger. The **4613 culvert at Dry Creek** is becoming undercut at the upstream end of the road, and at the downstream end is causing a plunge into a pool below, cutting off connectivity for aquatic habitat. The culvert needs to be replaced with the slope of the creek in mind, so this issue is addressed.

RESTORING BEAVERS TO THE NORTH FORK CLACKAMAS WATERSHED

Again, Bark supports that in the context of climate change's expected effects on our region the FS is pursuing the reintroduction of beaver and restoration of its habitat within the North Clack project area.

Historically, beaver-created wetlands were common in the Clackamas watershed. Beaver activity creates productive and complex slow-water habitats for fish, helps moderate both base flows and peak flows, traps sediment and nutrients, and helps maintain riparian hardwood plant communities.

According to one researcher, abandoned beaver meadows contained about 736,000 metric tons of stored carbon—about 8% of the total stored in the soils of their study area. But if all the beaver dams were occupied with their wetlands intact, beaver meadows would be storing about 23% of the area's soil carbon, an estimated 2.7 million metric tons of organic carbon. Extrapolated to all areas of North America where beavers have traditionally lived and then placed in the context of a preindustrial world, the study suggests that beavers—as well as their relatively sudden removal from the landscape by trappers in pre-Colonial times—may have had a substantial effect on global climate.⁴⁵

Historic photos reveal that Tumala Meadows had wider extent of flooding than it does today which was likely influenced by a beaver population. By damming the stream which meanders through the meadow, beaver increased species and habitat diversity.

The removal of beavers from the watershed has likely resulted in altered ecosystem processes and functionality including higher erosion and sediment delivery into streams, changes in riparian plant community composition,

⁴⁵ Wohl, E. (2013). Landscape-scale carbon storage associated with beaver dams. *Geophys. Res. Lett.*, 40, 3631 – 3636, doi:10.1002/grl.50710.

changes in stand conditions, lack of presence of hardwood-dependent species, degraded fish habitat, and more. While beaver ponding was once significant within the Forest boundary, it is no longer, and parts of many streams and wet areas that formerly supported cottonwood dominated communities do not now. In some places, conifers have invaded and replaced the hardwoods as a result of beaver removal.

Several species in the North Clack project area depend on these riparian hardwoods including yellow warblers, red-eyed vireos, and downy woodpeckers. Black cottonwoods are especially important to downy woodpeckers for cavity excavation. The lack of beavers within the Forest has been correlated to the lack of large cottonwood and alder.

Beaver dams and the habitat they create are considered the foraging habitat for the peregrine falcon, a R6 Sensitive Species. As a R6 Sensitive Species, current policy guides the FS to manage for suitable nesting and foraging habitat for the peregrine falcon. As beaver populations increase with development of beaver dams and ponds, waterfowl populations increase, which in turn provides increased prey species for the peregrine falcon.

Bark visited the meadow with the FS in July of 2017 to find that there was recent beaver activity, but no dams or lodges. Bark supports the installation of beaver dam analogues (BDAs), to simulate beaver dams and to encourage beavers to build dams in incised channels and across potential floodplain surfaces. We are also pleased to hear that the relocation of beaver to Tumala Meadows in coordination with Oregon Department of Fish and Wildlife, may also be part of this project if they do not reestablish on their own. Bark supports this goal and encourages MHNH to explore the tools relating to the process of beaver restoration that we provided in our [scoping comments](#).

In addition to the previously shared resources, we recommend looking at strategies (such as various flow devices and BDAs) employed by [Beaver Solutions LLC](#), the [Beaver Institute](#), and more locally [Beavers Northwest](#), and [Beaver State Wildlife Solutions](#). There may be an option to both protect the culvert at the meadow as well as jumpstart the habitat through the installation of a diversion-style dam. This would be a BDA structure placed where it would encourage resident beavers to build at a location that would flood areas away from the road – essentially the most favorable location which would also moderate overall water flow to the culvert and instead store the water onsite.

CLIMATE CHANGE ANALYSIS

In the PA, the FS states that “Public comments received suggested a project-specific quantitative carbon analysis. A quantitative carbon analysis was not conducted for this project because it would not likely lead to changes to the proposed actions or to the creation of other alternatives that achieve the purpose and need.”

Bark has observed that the FS has made a choice not to pursue a quantitative carbon analysis, or address current [OSU forest carbon research and its recommendations](#) which were provided to them in multiple ways during Scoping, and since that time have been supported by the [Oregon Global Warming Commission's Forest Carbon Accounting Project Report](#). These findings highlight the importance of project-level tracking of carbon emissions, and question whether converting standing timber into wood products can be an effective strategy for maintaining or increasing overall forest carbon storage.

To this end, we again encourage the FS to engage with and include [Land use strategies to mitigate climate change in carbon dense temperate forests](#)⁴⁶, a paper released in 2018 which explores PNW forests’ role in the regional carbon cycle.

In this paper, reforestation, afforestation, lengthened harvest cycles on private lands, and restricting harvest on public lands increase net ecosystem carbon balance 56% by 2100, with the latter two actions contributing the most. Resultant co-benefits included water availability and biodiversity, primarily from increased forest area, age, and species diversity. Increasing forest carbon on public lands reduced emissions compared with storage in wood products because the residence time is more than twice that of wood products. Hence, temperate forests with high carbon densities and lower vulnerability to mortality have substantial potential for reducing forest sector emissions.

The FS asserts that utilizing trees to create long-lived wood products *sequesters* carbon, and that using wood to build houses has a more favorable carbon balance when compared to other building materials such as steel, concrete or plastic. To be clear, while some carbon can be stored temporarily in wood products, these products don’t *sequester* carbon.

Pacific temperate forests can store carbon for many hundreds of years, which is much longer than is expected for buildings that are generally assumed to outlive their usefulness or be replaced within several decades. Recent analysis suggests

⁴⁶ Land use strategies to mitigate climate change in carbon dense temperate forests. Beverly E. Law, Tara W. Hudiburg, Logan T. Berner, Jeffrey J. Kent, Polly C. Buotte and Mark E. Harmon PNAS March 19, 2018. 201720064; published ahead of print March 19, 2018. <https://doi.org/10.1073/pnas.1720064115>

substitution benefits of using wood versus more fossil fuel-intensive materials may have been overestimated by at least an order of magnitude. While product substitution reduces the overall forest sector emissions, it cannot offset the losses incurred by frequent harvest and losses associated with product transportation, manufacturing, use, disposal, and decay.

The agency claims that the "Forest Plan, as amended, does not contain direction related to climate change." While this may be true, environmental law arguably does.

In responding to comments, the Forest Service claimed that "climate change is a global phenomenon" with the implication that it is impossible to assess the impact of any given project. This excuse was thoroughly rejected by the Ninth Circuit, which found the fact that **"climate change is largely a global phenomenon that includes actions that are outside of [the agency's] control . . . does not release the agency from the duty of assessing the effects of its actions on global warming within the context of other actions that also affect global warming."** The impact of greenhouse gas emissions on climate change is precisely the kind of cumulative impacts analysis that NEPA requires agencies to conduct. *Ctr. for Biological Diversity v. Nat'l Highway Traffic Safety Admin.*, 538 F.3d 1172, 1217 (9th Cir. 2008).

The Ninth Circuit established a rule in *Hapner v. Tidwell* that NEPA analyses must consider a project's "impact on global warming in proportion to its significance," 621 F.3d 1239, 1245 (9th Cir. 2010). Because of the importance of mature Cascadian forests to the carbon cycle, local forest management decisions on MHNH have a disproportionately high impact on climate change. Indeed, studies have found that decreasing logging on National Forests in the Pacific Northwest is one of the top land use strategies to mitigate climate change.

In 2016, the Council on Environmental Quality (CEQ) released final guidance for federal agencies on how to consider the impacts of their actions on global climate change in their NEPA analysis. This final guidance provides a framework for agencies to consider both the effects of a proposed action on climate change, as indicated by its estimated greenhouse gas emissions, and the effects of climate change on a proposed action.

However, on March 28, 2017 the Trump Administration issued an executive order titled "Presidential Executive Order on Promoting Energy Independence and Economic Growth" which attempts to relieve agencies from the requirement to consider the effects of GHG emissions and climate change. Among other things, this executive order rescinds the CEQ guidance regarding consideration

of climate change in federal decision-making, but the E.O. also recognizes that “[t]his order shall be implemented consistent with applicable law” and “all agencies should take appropriate actions to promote clean air and clean water for the American people, while also respecting the proper roles of the Congress and the States concerning these matters in our constitutional republic.” While the guidance was finalized in August 2016, it followed a series of court rulings addressing the issue of greenhouse gases and NEPA, which found that whenever greenhouse gases are significant or rise from the project, either directly or indirectly, they must be analyzed in a NEPA document. **Thus, despite the E.O., the FS must continue to carefully consider the effects of GHG emissions and climate change in all its decisions.**

The FS makes an unsupported claim that “Rapidly growing forests are recognized as a means of carbon sequestration” (the source “FAO 2007”, is not included in the References). This unsupported claim is also false. Removal of biomass from any forest limits its ability to sequester carbon for a period after the disturbance and subsequently turns the forest into a carbon source.⁴⁷ Not only that, but also the act of removing trees requires carbon emissions. Moreover, reducing tree densities increases weatherization of dead biomass, which would increase the rate of carbon emissions from decay.

The Oregon Global Warming Commission states in its 2018 Forest Carbon Accounting Project Report: “Based on credible evidence today, forest harvest does not appear to result in net carbon conservation when compared to carbon retention in unharvested forests...Current analysis suggests that treatments which include medium to heavy thinning result in reduced carbon stores that do not recover in any meaningful time periods.”

The FS has often claimed the short-term carbon emissions and the difference in long-term carbon storage that could be attributable to the Proposed Action are of such small magnitude that they are unlikely to be detectable at global, continental or regional scales. Additionally, it has asserted that changes in carbon stores are unlikely to affect the results of any models now being used to predict climate change. The same thing could be, and is, said about every individual timber sale in National Forests in the Pacific Northwest. The failure of federal agencies to place projects within the context of emissions from logging on a regional or statewide level has led the public to thinking that the forestry sector is no longer a contributor to global greenhouse gas emissions.

⁴⁷ Mitchell SR, Harmon ME, O’Connell KEB. 2009. Forest fuel reduction alters fire severity and long-term carbon storage in three Pacific Northwest Ecosystems. *Ecological Applications*, 19:3; 643-655.

Again, the FS insists that the scale of climate impact is inherently global, missing the fact that local actions have an impact on global climate trends. However, it is absolutely possible to quantify the amount of carbon sequestered in the North Clack project area (see, for example, the [BLM's Hole in the Road EA](#) in which did just that).

To take a hard look at climate change, the questions that the FS should be answering are: How many tons of carbon will the North Clack Timber Sale emit into the atmosphere during and after project implementation from logging operations and decay? How much carbon sequestration does the project area currently sequester? How much sequestration capacity will be lost, and for how long? How will the forests' resiliency to a changing climate be affected by the logging and road building?

The FS should quantify climate change emissions from its projects and take the analysis a step further to examine the carbon tradeoffs, including carbon emitted from the project and the loss of future carbon sequestration because of the project.

The aforementioned CEQ guidance also requires the FS to **consider alternatives that would make the action and affected communities more resilient to the effects of a changing climate**. The FS should also choose mitigation measures to reduce action-related GHG emissions or increase carbon sequestration in the same fashion as they consider alternatives and mitigation measures for any other environmental effects.

A very recent California case discussed the government's failure to take a hard look at how a changing climate exacerbates the adverse impacts of the proposed project, finding that to meet the hard look requirement, "NEPA requires an evaluation of the impact of climate change." *AquAlliance v. U.S. Bureau of Reclamation*, 287 F.Supp.3d 969, 1028 (E.D. Cal. 2018). The court in *AquAlliance* found that failure to consider climate change is a "failure to consider an important aspect of the problem" facing the proposed action. *Id.* at 1032, citing *Wild Fish Conservancy v. Irving*, 221 F.Supp.3d 1224, 1233 (E.D. Wa. 2016) (Biological Opinion was arbitrary and capricious for failing to adequately consider impacts of climate change). In the current case, the Forest Service similarly failed to recognize that mature forests are the most climate-resilient ecosystems and provide important habitat refugia for organisms stressed by a changing climate. In this context, old-growth forests take on new significance, thus logging them has greater impact.

Human-caused climate change will not only affect natural systems, it will also intensify the impacts of human activities such as off-road vehicles, roadbuilding and logging. Looking at climate impacts in National Forests, one report concluded that, “climate change will directly affect the ecosystem services provided by national forests and will exacerbate the impacts of current natural and anthropogenic stress factors.”⁴⁸ Climate change is predicted to result in more flood events and fires across the Pacific Northwest.⁴⁹ Many Oregon streams will experience higher winter flow and reduced summer flows as temperature rises and the variability of precipitation increases. The well documented shift from snow to rain, coinciding with increases in temperature, affects hydrologic trends. Snow cover typically accumulates at temperatures close to the melting point, and thus is at risk from climate warming because temperature affects both the rate of snowmelt and the phase of precipitation. With a projected 2°C winter warming by mid-century, almost 10,000 km² of currently snow-covered area in the Pacific Northwest could receive winter rainfall instead.⁵⁰

Climate change, combined with effects from past management practices, is exacerbating changes in forest ecosystem processes and dynamics to a greater degree than originally anticipated in the NWFP.⁵¹ This includes changing patterns of fire, insect outbreaks, drought, and disease.⁵² Land managers need to consider this uncertainty and how best to integrate knowledge of management-induced landscape pattern and disturbance regime changes with climate change when making spotted owl management decisions.

In a recent study, the influence of weather and climate on spotted owl populations was evidenced in northern California, Oregon, and Washington. Climate related factors accounted for 84% and 78% of the temporal variation in population change of spotted owls in the Tyee and Oregon Coast Range study areas, respectively. Climate and barred owls together accounted for nearly all (~100 percent) of the changes in spotted owl survival in the Oregon Coast Range.⁵³ The presence of high-quality habitat appears to buffer the negative effects of cold, wet springs and winters on survival of spotted owls as well as ameliorate the effects of heat. The high-quality habitat might help maintain a stable prey base, thereby reducing the cost of foraging during the early breeding season when energetic needs are high. In general, climate change can increase the success of introduced or invasive species in colonizing new territory. Invasive

⁴⁸ Blate, G.M., et. al, Adapting to climate Change in United States national forests, *Unasylva* 231/232, Vol. 60, p57, 2009.

⁴⁹ USDA Forest Service, Pacific Northwest Region, Aquatic and Riparian Conservation Strategy, p. 30 (2008).

⁵⁰ Heejun Chang, Julia Jones, *Climate Change & Freshwater Resources in Oregon*, Oregon Climate Change Research Institute, Oregon Climate Assessment Report, College of Oceanic and Atmospheric Sciences, Oregon State University, Corvallis, OR (2010) at 84.

⁵¹ Revised Recovery Plan for the Northern Spotted Owl, Recovery goal, objectives, criteria and strategy II-11.

⁵² *Id.* at III-5.

⁵³ Revised Recovery Plan for the Northern Spotted Owl, Recovery goal, objectives, criteria and strategy III-9.

animal species are more likely to be generalists, such as the barred owl, than specialists, such as the spotted owl and adapt more successfully to a new climate than natives.⁵⁴

Instead of considering alternatives that would make the action and affected communities more resilient to the effects of a changing climate, the Forest Service has instead added an alternative which includes additional clearcutting. Along with removing this activity from the Proposed Action, the FS should take a hard look at the climate science and design an alternative which uses precaution as a guiding principle, along with the prioritization of protecting climate refuges, as well as identifying forest types vulnerable to ecosystem change.

CONCLUSION

Bark has several suggestions for improving the North Clack project, and requests that the agency review and create alternatives that meaningfully incorporate these 21 suggestions – singly or together – to assess their ecological benefit and to create a project that better achieves the purpose & need for the North Clack project:

- Exclude stands with high snag and large living tree densities from any logging and adopt a PDC to state “All legacy snags would be retained by creating adequate safety buffers, as needed.”
- In the PA, please provide specific stand information for units proposed for logging within LSRs and RRs, and rationale for the actions proposed within these stands;
- Consider expanding owl gaps technique to more acres within the owl’s home range, in replacement of proposed thinning, wherever deemed more appropriate to achieve improved habitat for the owl;
- Where down wood, large snags, large live trees, and minor trees exist retain no less than 40% of the canopy cover, retain as much mid-story component of the stand as is feasible, retain the largest trees in the stand, and retain all legacy features;
- Continue to engage with Bark’s information regarding unmapped riparian areas, and to ensure these habitats are to be protected, please include buffers on project Decision maps in the form of unit boundary adjustments and make subsequent acreage adjustments;
- Include larger no-cut buffers on units 40, 36, 142, 146, 16, and 18;
- Remove regeneration harvest from the Proposed Action;

⁵⁴ *Id.*

- Protect individuals of rare botanical species located by Bark in the project area from ground disturbance;
- Resurvey for red tree voles in stands over 80 years old using either the draft Regional protocol or Individual Tree Examination;
- Appropriately buffer red tree vole nests located by Bark and NEST and include these unit deletions and acreage changes in the final EA maps and Proposed Action;
- Drop units 132, 124, 90, 71, 125, 126, 130, 58, west corner of 202, 146, and consider dropping 194, 54, 176, 196, 203, and 94 for reasons previously included in these comments;
- Look for additional opportunities provided by Bark to reduce the road network in the watershed and include more miles of road decommissioning in the Proposed Action;
- Engage with Bark's site-specific system roads comments;
- Significantly reduce the mileage of "temporary" road construction;
- Reduce OHV impacts by 1) limiting construction of new roads; 2) ensuring controlled access during the project implementation; and 3) ensuring timely & secure road closure upon the project's completion;
- Engage with Bark's site-specific unauthorized trail comments;
- To reduce unnecessary impacts on soils, consider Bark's recommendations for soil-protection PDCs;
- Replace and/or remove culverts that are barriers to fish and aquatic organism passage and/or causing other ecological harm to the aquatic system;
- Add large woody debris in streams where it is lacking due to past management to enhance water quality and aquatic diversity;
- Pursue beaver habitat restoration in the North Clack project area and elsewhere; and
- Provide a robust, quantitative carbon analysis as part of the EA.

As the FS is considering the optimal method of accomplishing the purpose and need for the North Clack project, please consider that active management is not always the best avenue to achieve forest health. In the comments above, Bark has provided ample suggestions to improve this project – based on our survey of both the project area and the scientific literature pertaining to aquatics, wildlife, roads, and forest health. We anticipate a thorough review of these comments and look forward to the necessary changes made to both the forthcoming decision and the project itself.

Thank you,



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