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April 15th, 2016

Jim Roden
Clackamas River Ranger District
595 NW Industrial Way
Estacada, OR 97023

RE: Hunter Integrated Resource Project scoping 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 supporters[1] who use the public land forests surrounding Mt. Hood, including the areas within the Hunter 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.

Through implementation of the Hunter Integrated Resource Project (Hunter), a 3,052 acre project within the Upper Clackamas Watershed, the Forest Service intends to pursue activities which emphasize "enhancing forest health and stand growth, improving critical habitat for northern spotted owl (NSO), enhancing Late-Successional Reserves and Riparian Reserves, and providing early-seral habitats. The project also includes changes to the transportation system to address areas of resource concern, improve road conditions along specific road segments, and identifying the maintenance level appropriate for project area roads." Over the years, Bark volunteers and supporters have visited the Hunter project area, and our recommendations arise from issues that we have found

[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.

while walking the parts of the project that were accessible and mapped early in the planning process.

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 Upper Clackamas watershed.

PUBLIC PARTICIPATION

The Hunter project is being planned by the Forest Service under Section 428 of the Consolidated Appropriations Act of 2012, which will use the new pre-decisional objection process (36 CFR 218) for "projects and activities implementing land management plans."

Bark has yet to experience the Forest Service as open and responsive to issues raised in pre-decisional objections. As such, it would benefit all parties for the following concerns and suggestions for Hunter to be substantively addressed as the project, and accompanying NEPA documentation, is developed, rather than when it is complete.

PUBLIC ACCESS TO HUNTER PROJECT AREA

The Hunter project area is located within the Upper Clackamas watershed, which covers approximately 101,000 acres of forest, much of it inaccessible during the first half of the public 30-day comment period due fluctuating snow levels. Bark volunteers noted their inability to access virtually any of the proposed treatment areas during the first week of this comment period. As with several other past projects proposed on the CRRD, Bark again points out that the ability of the public to observe this proposal and provide feedback to the Forest Service was impeded by both the size of the project and the timing of the comment period.

Bark requested copies of draft treatment area maps early in the Hunter planning process (9/23/2014) and received no direct response. During this time, the Forest Service had proposed treatment areas which they had mapped for the CSP field trips which Bark attended. The following day, Bark submitted a FOIA request for the information (9/24/2014), which still did not result in a map being shared. If we had access to the information being used by the agency at this early date, we could have field-checked the more area and provided more valuable site-specific comments during this important stage in planning. In the future, please share maps at the earliest possible date, so we can better understand where proposed actions are being planned, and how actions would affect those areas.

SYSTEM ROADS IN THE HUNTER PROJECT AREA

As stated in the Hunter scoping letter, the Forest Service has made several efforts since the mid-1990's to right-size the road system in the Upper Clackamas. This is a good thing, as there has been a 9% increase in the stream network in the watershed compared to its historic extent due to its high road density. Upper Clackamas Watershed Analysis (*WA) at 172.* As you know, this is just one of many impacts the Mt. Hood road system had and is still having on the forest, its users, and its inhabitants. Bark agrees with the agency that there remain opportunities to make additional reductions in the road system to "either reduce resource risks or maintenance costs".

Within the Hunter project area, much of the Upper Clackamas River corridor has been identified by the Forest Service as being analogous to Tier 1 Key Watershed. The Northwest Forest Plan (NFP) states that "(t)he amount of existing system and non-system roads within Key Watersheds should be reduced through decommissioning of roads." *NFP at B-19*.

In the 2005 Aquatic Restoration Strategy from Region 6, areas with road densities above 2.0 miles per square mile were considered indicators for prioritizing watershed restoration. Terrestrial wildlife is also greatly influenced by road density. Roads impact wildlife in a variety of ways including direct mortality from vehicle collisions, increased poaching, over-hunting, and over-trapping facilitated by access; reduced numbers of snags and down logs; increased negative edge effects; facilitated or hindered movement depending on species; and chronic negative interactions with humans.[2]

The Mt. Hood Land and Resource Management Plan at *FW-208* & *FW-209* states that by the year 2000, Deer and Elk summer range should not include open road densities of more than 2.5 miles/square mile. Open road densities should be determined during the NEPA planning process. *Id.*

The Pacific River Council's (PRC) recommended target road density of less 1.5 miles per square mile in 6th field watersheds is an additional example of a robust, science-based target for watershed restoration in Mt. Hood. PRC published these management recommendations after they were reviewed and contributed to by the Western Environmental Law Center, Friends of Mount Hood, Oregon Wild, Crag Law Center, the Columbia River Inter-Tribal Fisheries Commission,

[2] Wisdom MJ, Holthausen RS, Wales BC, et al. 2000. Source habitats for terrestrial vertebrates of focus in the interior Columbia basin: broad-scale trends and management implications. Volume 1 – Overview. Portland, OR: US Department of Agriculture, Forest Service, Pacific Northwest Research Station. General Technical Report PNW-GTR-485.

Clackamas River Providers, Oregon Trout Unlimited, Bark and several others. Currently, it is unclear what the current road density average for the Hunter project area is. Please ensure that the NEPA document includes this information.

Bark submits the following road comments to reinforce our previous recommendations of reducing the road system in the Clackamas River watershed. For past projects, we requested that the Forest Service reconsider the meaning of the word "decommission" to not include roads that may be reopened for any future timber sale. The Forest Service acknowledged this concern, and clarified that "when it is known that roads would be used again in the future they should be retained on the Forest's transportation system and not decommissioned." We appreciate this clarification. Under this new direction and definition, the agency proposes to decommission 1.4 miles of system roads and close 28 miles of roads through the Hunter project.

In 2015, the Forest Service released its Travel Analysis Report, 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".

In the Hunter Proposed Action, there are several of these "not likely needed" (Objective Maintenance Level being D-decommission) roads not included in the list of those to be decommissioned. Bark requests the Forest Service to consider additional road decommissioning in this project for the following roads:

- 4660-140 – This road was meant to be "Decommissioned" as part of Increment 2, but is now labeled on Hunter maps as open. Currently this road has a breached berm (Fig. 1), and accesses an area that Bark notified Law Enforcement Officers (LEOs) about an illegal hunting perch installed directly over bait. This road, if left as is, would also provide access to areas in which new roadbuilding is proposed in Hunter. Since the berm has been pushed in (and insufficient flat areas surround the berm for circumvention), reconstructing a larger berm with inclusion of boulders would suffice to block access during the time between Hunter project implementation and when this road actually becomes decommissioned.

Figure 1: Breached berm at FSR 4660-140

- 4660-170 – This road was meant to be "Decommissioned" as part of Increment 2, but is currently labeled on Hunter maps as open. Currently this road has circumvented berm, with a user-created road accessing the main system road (Fig. 2). The terrain around this closure is flat and open, making it difficult to block access to this road. However, reconstructing a larger berm and placing an additional berm (on unauthorized entrance) with boulder placement could suffice to block access around the original berm during the time between Hunter project implementation and when this road actually becomes decommissioned.

Figure 2: Circumvented berm at FSR 4660-170

- 4651-130 – This road accesses the Big Bottom wilderness area and includes a culvert in the wilderness itself. **This road is NEPA-ready for decommissioning.** The 4651-140 road leading to this road is currently closed with a berm (Fig 3), and we hope that this road will be decommissioned upon the completion of this project along with the 4651-130. After implementation of the Wall Timber Sale this road was left open for multiple seasons, opening up motorized access into the wilderness area.

Figure 3: Berm at FSR 4651-140

- 4680-124, 4680-125 – This road network intersects the upper reaches Fall Creek, in a Late Successional Reserve (LSR) and is "likely not needed" according to the TAR.
- 4640 at Switch Creek – This road, within LSR was meant to be "Decommissioned" as part of Increment 2, but is currently labeled on Hunter maps as open.
- 4650-012 at Granite Creek tributary crossing - This road was meant to be "Decommissioned" as part of Increment 2, but is currently labeled on Hunter maps as open, and is "likely not needed" according to the TAR.

Unauthorized roads, breached road closures

The following roads are currently closed, but due to unauthorized damage the closures are not functioning properly. Please re-close these roads upon completion of the Hunter project:

- 4660-120 – This road was “Decommissioned” as part of Increment 2 currently labeled on Hunter maps as closed. The road needs larger berm or other barricade to prevent further attempts at breaching (Fig. 4).

Figure 4: Berm at FSR 4660-120

- 5731-120 - “This road was “Decommissioned” as part of Increment 2 currently labeled on Hunter maps as closed. It has been circumvented by an OHV (Fig. 5), and needs additional barricades for the closure to be effective.

Figure 5: Berm at FSR 5731-120

The decommissioned road 4660-150 (off the -140 road) currently has a very small berm (Fig. 6) with fairly level terrain on the opposite side. We are concerned that reopening access to the 4660-140 during project implementation may invite users to access this road. We recommend reinforcing this barricade with a larger berm, making it harder for folks to access the road network behind it until it is actually fully decommissioned.

Figure 6: Berm at FSR 4660-150

Just to the southwest of the Big Bottom Wilderness, there appear to be some exploratory, unauthorized roads spurring off from the 4651 just south of Kansas Creek (Fig. 7 & 8). This activity highlights the need for more secured road closures in the area, especially those potentially accessing the wilderness. **We recommend that the FS rehabilitate and close these unauthorized "ghost roads" as part of the Hunter project.**

Figure 7: Exploratory, unauthorized road spurring off from the 4651 just south of Kansas Creek

Figure 8: Exploratory, unauthorized road spurring off from the 4651 just south of road in Fig. 7

Road surface as a vector for sediment

Elevated road use for log-haul greatly increases erosion and sediment delivery on unpaved roads. Research on logging roads has consistently documented that roads used by more than four logging trucks per day generated more than seven times the sediment generated from roads with less use and more than 100 times the sediment from abandoned roads[3]. The Forest Service's own summary of scientific information on roads[4] concluded that "rates of sediment delivery from unpaved roads are . . . closely correlated to traffic volume." Even with a road surface of crushed rock aggregate,[5] documented that elevated truck traffic increased sediment production by 2 to 25 times that on unused roads in western Oregon.

Primary mechanisms for increased erosion and sediment production from road use are the production of highly mobile fine sediment on road surfaces, road prism damage, disruption of gravel or aggregate surfaces, and rutting. On constructed and reconstructed roads, the highly elevated sediment production from roads used for haul is delivered to streams at stream crossings and other points of connectivity between streams and roads, such as gullies and relief drainage features that dump elevated road runoff laden with sediment to areas in relatively close proximity (e.g., less than 300 feet) to streams. This impact of log hauling at stream crossings, alone, will greatly elevate sediment delivery to the stream system. **The Hunter PA should include data regarding the projected increase of sediment from log haul on <u>all</u> roads used.** If it is likely that sediment would increase from wet-weather hauling (an action which has occurred in recent projects on the CRRD) the FS should also include these projections in the PA.

TEMPORARY ROADS

As in past projects, the Forest Service 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". Bark has

[3] Reid, L.M., Dunne, T., and C.J. Cederholm, 1981. Application of sediment budget studies to the evaluation of logging road impact. J. Hydrol (NZ), 29: 49-62.

[4] Gucinski, H., M.J. Furniss, R.R. Ziemer, and M.H. Brookes. 2001. Forest roads: a synthesis of scientific information. General Technical Report PNW-GTR-509. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 103 p. Available online at: http://www.fs.fed.us/eng/road_mgt/science.pdf

[5] Foltz, R.B. and Burroughs, E.R., Jr. 1990. Sediment production from forest roads with wheel ruts. In: Proceedings from Watershed Planning and Analysis in Action. Symposium Proceedings of IR Conference, Watershed Mgt, IR Div, American Society of Civil Engineers, Durango, CO, July 9-11, 1990. pp. 266-275.

long suggested that, while this approach sounds good on paper, it is not what always happens on the ground. For example, as Bark has been monitoring the implementation of the Bass & Drum timber sales, we have found many roads that were not properly winterized and/or closed after the work had been complete.

We request that the Hunter PA including a frank assessment of the Forest Service's ability to ensure that "existing" roads are rehabilitated in a way that improves actual conditions on the ground. In addition, please define exactly what "rehabilitated" means, and the timespan in which a re-built, and re-decommissioned, road becomes hydrologically recovered.

The current Hunter proposal includes:

- 2.0 miles of temporary road construction in locations where no road alignment previously existed (Rehabilitated following use);
- 3.1 miles of temporary road reconstruction on road alignments that were once temporary roads (Rehabilitated following use);
- 7.1 miles of temporary road reconstruction on road alignments that were once system roads (Rehabilitated following use); and
- 1.5 miles of temporary road reconstruction on road alignments that were once system roads (With entrance management).

On the Hunter scoping map, there appears to be no distinction between roads that will be "rehabilitated" and will only receive "entrance management". **We request that the FS identify which roads will receive which treatment in the PA.**

Figure 9: "Closed" road 4661-120, much of which is now passively decommissioned

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. [6],[7],[8]. Specifically, major reconstruction of unused roads can increase erosion for several years and potentially reverse reductions in sediment yields that occurred

[6] 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.

[7] 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.

[8] 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.

with non-use. *Id.* For these reasons, Bark is pleased to hear that there are some areas that the agency decided to not rebuild previously decommissioned roads when they could easily have done so, as in the case of decommissioned road 4600-290 (Fig. 10), which would have required rebuilding at least three stream crossings.

Figure 10: Decommissioned FSR 4600-290

Road construction is by far the greatest contributor of sediment to aquatic habitats of any management activity.[9],[10] Even temporary road construction can cause resource damage including erosion and sedimentation, exotic species spread and disruption of wildlife.[11] 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.

Much of the Forest Service's claim that the road building will not significantly impact the environment is built around its claim that the temporary roads would be decommissioned and revegetated immediately following completion of harvest operations. These claims are not reassuring. As noted above, Bark's post-logging monitoring has found numerous instances of temporary roads left open, with no erosion control measures, many seasons after logging had been completed, such as in the Swag, Dry, Bass, and Drum timber sales in the Clackamas River Ranger

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

[10] 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.

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

District. The problem is so systemic that when NMFS assessed the Jazz Timber Sale, it estimated that "…approximately 21% of the roads may not be decommissioned after project completion". *Jazz LOC at 25*. This does not provide much assurance that the Forest Service will, in fact, follow-through with the road work these projects require.

The commonly accepted definition of road *decommissioning* in scientific literature is defined as the physical treatment of a roadbed with a variety of methods to restore the integrity of associated hillslopes and flood plains and their related processes and properties[12]. The most common forms of road decommissioning include de-compacting the roadbed, restoring stream crossings, and fully recontouring the hillside.

In contrast, the temp road treatment in Hunter includes "rehabilitation" (typically including a berm, waterbars & decompaction/roughing as needed) and "entrance management" (typically including berms, water bars the entire length of the road, and roughing up the first 1/8th mile (Fig. 11). We feel it is important to differentiate between the scientific studies evaluating the effectiveness of road decommissioning in restoring hydrologic functions, and the Forest Service's proposed treatments which can be more akin to road closure than decommissioning or obliteration.

[12] Switalski, T.A., J.A. Bissonette, T.H. DeLuca, C.H. Luce, and M.A. Madej. 2004. Benefits and impacts of road removal. Frontiers in Ecology and the Environment. 2(1): 21-28. Available at: http://www.fs.fed.us/rm/pubs_other/rmrs_2004_switalski_t001.pdf

Figure 11: "Decommissioned" FSR 5731-118, with Entrance Management

Available scientific information shows that Hunter road activities, including 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.[13] 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.[14] After 50 years, a mile of obliterated road has 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.

[13] 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.

[14] 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.

Burnt Granite roadless area

Currently, MHNF operates under the Roadless Area Conservation Rule, which prohibits road construction, reconstruction and maintenance in inventoried roadless areas 5,000 acres or larger. In their white paper on water quality in Mt. Hood National Forest, The Pacific River Council published key management recommendations after they were reviewed and contributed to by the Western Environmental Law Center, Friends of Mount Hood, Oregon Wild, CRAG Law Center, the Columbia River Inter-Tribal Fisheries Commission, Clackamas River Providers, Oregon Trout Unlimited, Bark and several others.[15] The paper recommends that a road-building moratorium should be embedded into the Forest Plan to protect roadless areas greater than 1,000 acres. Several of these 1,000 acre areas have been identified across MHNF and should receive the same protections as 5,000 acre roadless areas to maximize the amount of landscape not contributing sedimentation to watersheds.

On the scoping map, it appears that most of the proposed *new* roadbuilding would be to access two of the native forest stands (units 213 & 214). Not only does Bark have concerns about the new roads entering an area with virtually no existing roads (contiguous 2135 acres surrounding Burnt Granite), this area to be accessed is native forest for which we have additional concerns about logging (see below). Bark requests that due to the imminent and obvious change in access, forest structure, habitat, and character, this **new roadbuilding be dropped from the Hunter proposal**.

AQUATIC/RIPARIAN HABITAT RESTORATION

Bark supports the itemized effort by the agency to address aquatic habitat in the Upper Clackamas watershed, which contains some of the most productive coho salmon habitat in the Forest, as well as recently reintroduced native bull trout. The Clackamas River watershed as a whole is one of the few refuges left for wild endangered stocks of fish in the region, and according to the Upper Clackamas WA is one of the few places that "can serve as a cornerstone in recovery efforts for this stock." *WA at 63*. This fact would seem to determine that future management should be geared toward aquatic restoration. 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.

[15] Pacific Rivers Council, 2013. Protecting Freshwater Resources on Mt. Hood National Forest: Recommendations for Policy Changes. Available online at: http://pacificrivers.org/prc-mt-hood-report-1

Replacing improperly functioning culverts is critical for both anadromous and resident fish populations. The proposed replacement at the Pot Creek crossing includes rearing habitat for juvenile coho below and just above FSR 46. There has also historically been beaver activity here which created ponds both above and below the road. The culvert currently cannot seemingly handle the amount of water accumulating at the upstream side of the road, causing water channelization parallel to the road (Fig. 12). The culvert is also dated and deteriorating. The crossing would benefit from more of an open arch style culvert which would allow a more naturally wide flow under the 46 and provide better connectivity for fish.

Figure 12: Pot Creek culvert (L) at north side of FSR 46

Bark also supports the proposed action to remove the existing culvert at the 4672 crossing at Lowe Creek to accommodate higher flows and allow for fish greater passage. At the Lowe Creek/4671 crossing is an open arch culvert that is being destabilized by the creek, causing erosion, and we support the proposed action is to stabilize this stream crossing through reinforcement of the culvert to prevent additional damage and erosion.

For the same reasons Bark supports the replacement of culverts in key fish habitat, we support proposed log placements for improvement of aquatic habitat in Lowe and Pot Creeks, which would address the current deficit of large woody debris in these areas. As some dispersed camp sites along the Upper Clackamas have been consistent cause of soil damage and erosion in listed fish habitat,

Bark supports rehabilitation of these areas, including actions to discourage forest users from rebuilding or creating additional unauthorized sites that would result in damage to water quality and habitat.

"FIRE-ORIGINATED" STANDS

During the years Bark has been monitoring timber sales in the Clackamas River watershed, we have witnessed the FS transition from planning old-growth timber sales to targeting younger forests, many in plantations, in order to achieve the annual volume targets. While this transition has mostly occurred due to public pressure and legal challenges and not agency-initiated management direction, maintaining older forests is a key step in improving the health of the Clackamas River watershed.

Figure 13: Legacy trees in Fire-Originated Stand Unit 203

We are surprised to hear that the FS is looking to thin in native forest stands for a significant amount of the project (260 acres). In the stands that Bark has visited so far, tree species, as well as ages and sizes, vary and legacy trees are common. This differs from what the Hunter scoping letter describes as "trees of mostly the same age class and with a single canopy layer."

Signs of past fire are evident on older snags, and on surviving Douglas firs (Fig. 13) and Western redcedars, some of which were upwards of between 50-60 inches DBH. There are numerous smaller down trees between 10-15 inches in diameter, suggesting that the stands are in the

process of self-thinning. Valuable large-diameter down wood also exists in several of these stands.

Fire-originated stands along FSR 4660 (on steep slopes ~35% which should require cable-logging) contain noticeable mammal burrows, signs of pileated woodpecker and sapsucker foraging, some natural canopy gaps, with surrounding heavily thinned forest (Y Thin) to the south & east, and surrounding suitable old forest habitat to north. It seems whatever the FS wishes to create in these stands, whether it be openings or old forest structure, already exists directly adjacent to the stands, or in the stands themselves (some of which are already complex and transitioning towards natural self-thinning).

Figure 14: Legacy trees in Fire-originated stand Unit 206

Stands that we have seen so far contain a mid-story of smaller hemlocks (important structural occlusion for arboreal mammals), but an understory that contains few herbaceous plants except in areas of gaps where trees have fallen (Fig. 15). We would expect more gaps like these to form stochastically, adding to the complexity of the stands and diversifying the understory.

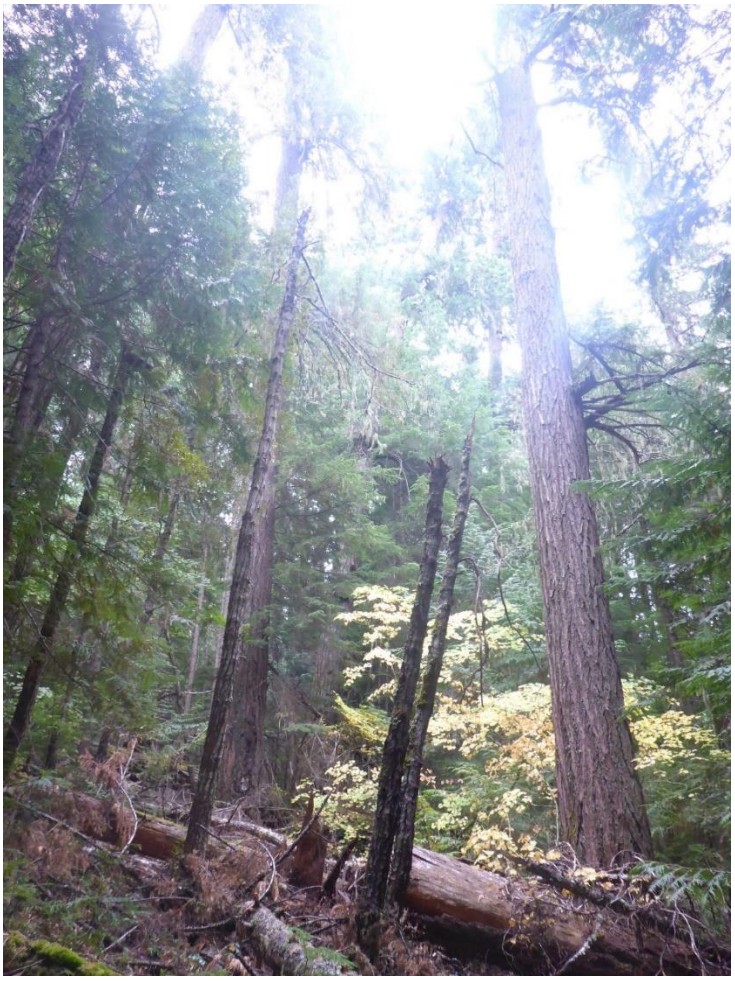

Figure 15: Gap in canopy with legacy trees and down wood at Fire Originated Stand Unit 203

Unnecessary loss of snags and effects of wildlife in fire-originated stands

Standing dead trees (snags) are important resources for vertebrate and invertebrate species in forested ecosystems worldwide. In the Douglas-fir and western hemlock forests of the Pacific Northwest, over 100 vertebrate species utilize snags for some part of their life cycle. Approximately 20 percent (34 species) of all bird species in the Pacific Northwest depend on snags for nesting and feeding and the abundance of snag-dependent birds is correlated with the density of suitable snags[16]. Studies show that, "cavity users typically represent 25 to 30% of the terrestrial vertebrate fauna in the forests of the Pacific Northwest."[17]. This study goes on to note that a "lack of cavity sites is the most frequently reported threat to "at-risk" species in the Pacific Northwest."

Past analysis that snags will be cut during harvest operations, temporary road construction, road decommissioning, road closure, and storm proofing due to safety considerations. The Forest Service often recognizes that thinning improves residual tree health and it may take longer for these residual trees to die in the Proposed Action scenarios than with No Action. Past evidence also suggests that thinning lowers snag density relative to un-harvested stands.[18] Windom and Bates also suggest no-harvest buffers around snags to increase

[16] Boleyn, P., Wold, E., and Byford, K., Created Snag Monitoring on the Willamette National Forest, USDA Forest Service Gen. Tech. Rep. PSW-GTR-181. 2002

[17] Bunnell, F.L., Kremsater, L.L., and Wind, E. 1999. Managing to sustain vertebrate richness in forests of the Pacific Northwest: relationships within stands. Environmental Review, 7: 97-146.

[18] 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.

retention rates. Plantation stands contain few large snags, and snag densities are far below historic levels, and have less than half of the desired snag density. Although the agency admits that timber harvest has undisputed negative effects on standing dead trees, it often claims that thinning will produce more structural diversity in the future. This claim is inherently inaccurate in regards to snag habitat, especially in native forest.

Because snags which are artificially created (through girdling) take years to provide any potential habitat (and the quality of this artificial habitat is uncertain), the Hunter 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 Forest Service management. Since large snags are required for the habitat requirements of Westside indicator species like flying squirrels and spotted owls[19], but are in short supply due to past and present management **the Forest Service should exclude stands with high snag densities** (both native and plantation) **from any logging and apply buffers on key snags.**

Impacts to northern flying squirrels in fire-originated stands

One of the initial motivations that CRRD had to actively manage these native stands seemed to be to accelerate forest succession towards suitable habitat for northern flying squirrels, and in doing so also benefiting northern spotted owls.

In these "Fire-Originated Stands" the prescription of variable density thinning is different than what the CSP discussed during the last field trip to the area this summer (small <1 acre gaps with no thinning in between). According to FS cited research, thinning these stands could "reduce the productivity of the site for the northern flying squirrels for 20-40 years." *Grove EA at 180.*

Northern flying squirrel (principal spotted-owl prey) populations in second growth forests decline after the stands are thinned and remain at low levels. Additional research has found that squirrel populations in un-thinned patches are larger than the thinned, and even those decline after adjacent areas are thinned[20]. Predation seems to be the most limiting factor – thinning seems to open the stands and result in a period of several decades when squirrels are too vulnerable to predation, so the population remains very low. Prescriptions that

[19] 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.

[20] 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.

retain visual occlusion in the mid-story layers would be best suited for maintaining squirrel populations.

Variable-density thinning appears to keep squirrel populations suppressed, and may do so for several decades until long-term ecological processes (which are often also suppressed during thinning) provide sufficient structural complexity in the mid-story and over-story favorable to squirrels. A strategy of maintaining adequate area and connectivity of dense, closed-canopy forests within managed landscapes by leaving areas of young forest un-thinned has been recommended by researchers to maintain northern flying squirrel populations[21].

Since recommendations for managing forest include retaining some areas of high stem density, retaining the mid-story, and retaining a contiguous closed canopy, we are concerned about the capacity of variable density thinning in native stands retaining these key features.

In a paper published in 2013 by Todd M. Wilson and Eric D. Forsman, the Management Considerations includes the idea that: "It may be possible to develop new thinning prescriptions that keep moderately high populations of arboreal rodents in young forests while still achieving long-term management objectives for the stand. In the case of Hunter, the long-term objective is the viability of Northern spotted owls. One such approach would be developing prescriptions that focus solely on skips (patches of trees left unthinned) and gaps (removal of patches of trees). This strategy is in marked contrast with most current prescriptions that typically thin throughout a stand (with or without delineated skips or gaps)."

It seems that the skip and gap only approach is what the FS originally had in mind for these stands. For this, Wilson and Forsman's research recommends keeping gaps small (100-400 m^2).[22] In August of 2015, the agency was still not sure how it would create the gaps. It seemed to Bark at the time that hand crews could potentially drop and leave some trees while still retaining some areas of high stem density, retaining the midstory, and retaining a contiguous closed canopy. Now however with the prescription of variable density thinning, **Bark does not support this type of active management in native stands, and**

[21] 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.
[22] Wilson, Todd M.; Forsman, Eric D. 2013. Thinning effects on spotted owl prey and other forest-dwelling small mammals. In: Anderson, Paul D.; Ronnenberg, Kathryn L., eds. Density management for the 21st century: west side story. Gen.Tech. Rep. PNW-GTR-880. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station: 79–90

requests the Forest Service fully analyzes an alternative that does not include logging in native forest stands.

Effects to northern spotted owls

According to the Upper Clackamas Watershed Analysis, there *were* 29 known spotted owl activity centers in the watershed at the time of the documents release. Where are these and owl home ranges located relative to treatment units? The WA includes the key recommendation of "Harvest outside of owl home range" WA at 61. The document goes on to predict that "(w)ithin 10 to 20 years conceivably at least seventeen of the Matrix owls could be subject to take. This could potentially affect 37% of the current owl population in the watershed." WA at 48. Where are we at now in terms of owls already taken in the Hunter project area?

The Hunter project area includes 54,890 acres (over half the watershed) of spotted owl critical habitat. Forest Service regulations require measures for preventing the destruction or adverse modification of critical habitat. *36 CFR § 219.27 (a)(8).* "Critical habitat" is defined in the ESA as "[t]he specific area within the geographic area occupied by a species . . . on which are found those physical and biological features (I) essential to the conservation of the species, and (II) that may require special management considerations or protections." Id. § 1532(5)(A)(i). "Destruction or adverse modification" of critical habitat is defined as "direct or indirect alteration that appreciably diminishes the value of critical habitat[,] . . . includ[ing], but . . . not limited to, alterations adversely modifying any of those physical or biological features that were the basis for determining the habitat to be critical." *50 C.F.R. § 402.02.* "Conservation" is further defined as "to use and the use of all methods and procedures necessary to bring an endangered species to the point at which measures provided pursuant to this Act are no longer necessary." *16 U.S.C. § 1533(3).* These statutes and regulations provide strict requirements for habitat protection that must not be violated under the proposed action.

Under the ESA, the Forest Service has the responsibility to "insure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat of such species." *16 U.S.C. § 1536.* Hunter, along with other thinning projects in the CRRD, could immediately exacerbate the degraded habitat conditions for this species that already exists in the watershed. The near absence of any recent

information from surveys or monitoring of this listed species makes a reasonable analysis of how this project and others proposed will cumulatively affect these species appear uncertain.

The condition of the species and its habitat prior to the proposed action is the "environmental baseline" for the species. *50 C.F.R. § 402.02.* The environmental baseline "includes all past and present impacts of all Federal, State, or private actions and other human activities in the action area; the anticipated impacts of all proposed federal projects in the action area that have already undergone formal or early section 7 consultation; and the impact of State or private actions which are contemporaneous with the consultation in progress." *50 C.F.R. § 402.02.* Without an adequate environmental baseline, FWS has no way of evaluating the present status of a listed species, and thus cannot rationally decide whether additional impacts on the species may not jeopardize its continued existence.

The ESA prohibits the Forest Service from going forward with the proposed sale without ensuring that the project will not result in jeopardy to the species. The failure to make a population-based analysis, combined with the failure to complete current surveys for listed species, creates a significant level of uncertainty regarding the level of impact that this project will have on listed species in the planning area**. NEPA requires that when data is not available, an agency should recognize the lack of data and explain why obtaining it was not feasible.** *40 C.F.R. § 1502.22.*

"DEER & ELK HABITAT ENHANCEMENT"

Native, early-successional forest ecosystems have unique characteristics, including high species diversity, complex food webs and ecosystem processes[23]. Compared to historic conditions, native early-seral habitat is lacking on the public forest landscape, mainly because of the decades federal agencies have suppressed fires, and programmatically "salvage" logged the areas where fire do occur and replanted conifers, quickly taking away any early-seral habitat value.

Fire alters an ecosystem by chemical processes while clearcutting is a mechanical process that results in much different outcomes. A tree removed by logging to emulate a natural disturbance has a different effect on soils, water,

[23] Swanson, M. E., et. al. 2010. The forgotten stage of forest succession: early-successional ecosystems on forest sites. Frontiers in Ecology and Environment: 10.1890/090157

wildlife habitat, and biodiversity than one killed by fire and left in the forest. Fire rapidly recycles nutrients, kills pathogens, and selectively favors fire-adapted species. "Regeneration harvest", which closely resembles clearcutting when viewed on the ground, typically leads to the loss of soil nutrients and organic matter and increases soil compaction, thereby reducing water infiltration. Fires do not leave a large road network in place, while logging creates roads that fragment habitat and generally increase human access, both of which affect the use of the land by the most sensitive wildlife species.

Recent burn at FSR 5731, across from junction with 5731-120 and Hunter Unit 70

"Regeneration harvest" tends to leave few or no snags[24], and even when logging retains snags, the usual prescription is to have a minimum per acre which can be considerably fewer than needed for cavity-nesting animals. As snags decay, they provide a long-term nutrient and water supply, and their removal obstructs nutrient cycling on the site. As such, clearcutting can reduce the species

[24] 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.

richness and key ecological processes associated with early-successional ecosystems.

The Hunter project proposes 98 acres of "regeneration harvest" for early-seral habitat for deer and elk. The Forest Plan does not appear to contain any deer and elk forage standards that the agency has to meet. What data does the Forest Service use that shows that deer and elk are in decline on the Forest? Or that lack of forage is harming these populations in the Clackamas drainage? If one were to borrow the Forest Service's oft-used phrase, they could argue that there is plenty of early-seral habitat in adjacent areas that will meet the needs of these species. Even in the Upper Clackamas there have been past attempts to increase forage accessibility. The Cloak EA included "big game enhancement areas", some of which are directly adjacent to proposed Hunter Units (Fig. 16). These areas are much smaller in size (1-5 acres) than the regeneration treatment proposed here.

Figure 16: Big game enhancement area included in Cloak EA within the Hunter project area

A more appropriate way to address the forage issue could be to reintroduce more 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. We encourage the agency to look to existing openings to take advantage of what forage opportunities these conditions provide, including identifying additional locations for prescribed burning.

Bark has visited some of the frost pockets proposed for "forage maintenance and enhancement" (Fig. 17), and found them to lack a viable conifer mix. As in other managed openings on the Forest, some of these openings have non-native plants present such as scotch broom which the agency is presumably planning on removing. Since one of the proposed actions is to remove encroaching conifers from these areas, would this include a diameter limit? We have seen some of these meadows that include larger live conifers within them, which could provide habitat for native species for several decades if left on site. Therefore we recommend only removing small encroaching conifers (<8 in diameter).

Figure 17: "Forage Enhancement" Unit 431

Bark has worked over the years to leverage public support in ending the destructive practice of clearcutting on Mt. Hood's forests, and interprets this

proposed action as a relapse to the type of traditional forestry that has led to the majority of human-caused, long-term impacts on the Forest today. **While Bark supports use of a prescribed burn on 11 acres of natural meadow, we do not endorse the use of large-scale "regeneration harvest" as part of this project, and do not believe it meets the goals of enhancing deer & elk habitat.**

HEMLOCK DWARF MISTLETOE UNITS

Figure 18: Mistletoe Unit 230

The Hunter scoping letter includes masticator treatment of 81 acres of forest within the project area that contain native dwarf mistletoe. In these stands the FS proposes to "remove brush as well as the stunted, small diameter hemlock trees and to plant the stands with species not susceptible to the parasite". The stands are located in critical habitat for the northern spotted owl, and the agency postulation is that they are not likely to develop into suitable owl habitat *without* this proposed activity.

We acknowledge and appreciate the agency's direction to actively promote forest structure which benefits owls. However, Bark also values - and must draw attention to - the variety of ecological benefits of mistletoe such as food, cover, and nesting platforms birds and other small animals[25]. Mistletoe has been a natural component of a healthy forest ecosystem for thousands, if not millions, of years.

During this project planning, the ecological benefits of mistletoe should not be under-estimated, and prescriptions should reflect these benefits. For example, it has been suggested that mistletoe is a "keystone species" in many vegetation communities. The abundance and diversity of birds is correlated with the degree of mistletoe occurrence, and avian vectors seem to prefer infected hosts.[26]

It has also been noted that mistletoe brooms provide important habitat for relatively high densities of flying squirrels (important prey for spotted owls and other carnivores).[27] This function of mistletoe brooms is quite valuable in typical stands that are deficient in large snags.

The fruit, foliage and pollen of dwarf mistletoe are a food source for numerous bird, mammalian and insect species. Dwarf mistletoe of all types alters the growth patterns of infected trees, creating structural complexity within forests in the form of witches brooms and snags, both which are used by numerous wildlife species (including some species of owls) for nesting, roosting and cover.

Research suggests that greater bird diversity is associated with increased mistletoe infestation; the key limiting resource for the birds in this situation may be snags. Management Strategies for Dwarf Mistletoe: Silviculture describes mistletoe control treatments in which infected trees were killed but left standing for woodpeckers and other cavity-nesting animals. Although these snags are used, they remained standing for only a few years. Studies of broom use by wildlife include work by Hedwall[28], and Garnett[29]. These studies identify which birds and mammals use witches' brooms, how they use it (for nesting and roosting), and what kinds of brooms are preferred. This information is useful to determine if retaining certain brooms is a potential benefit for a favored species.

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[25] Watson, D.M. 2001. Mistletoe — A keystone resource in forests and woodlands worldwide. Annu Rev Ecol Syst 32: 219-249.

[26] Aukema, J.E. 2003. Vectors, viscin, Viscaceae: Mistletoes as parasites, mutualists, and resources. Frontiers in Ecology I(3): 212-219.

[27] PNW Research Station. Rocky to Bullwinkle: Understanding Flying Squirrels Helps us Restore Dry Forest Ecosystems. Science Findings. Issue Eight. February 2006. http://www.fs.fed.us/pnw/sciencef/scifi80.pdf

[28] Hedwall, S. 2000. Bird and mammal use of dwarf mistletoe witches' broom in Douglas-fir in the Southwest. MSc Thesis, Northern Arizona university, Flagstaff, AZ.

[29] Garnett, G. N.; Chambers, C. L.; Mathiasen, R. L. 2006. Use of witches' brooms by Abert squirrels in ponderosa pine forests. Wildlife Society Bulletin 34:467–472.

Still lacking are specifics of how the number and distribution of snags and brooms relates to levels of mistletoe infestation, and to wildlife populations and the dynamics (rates of generation and loss) of these features.

Figure 19: Willow timber sale (Barlow district, Dalles Watershed) – 2nd mastication of ground cover

In other stands Bark has seen a masticator used (Fig 19), the treatment has required follow-up treatments in subsequent years to keep native shrubs low. The goal of this treatment is to remove sufficient hemlock and brush to reforest the stand with other species. Does the FS foresee multiple entries to the stands in order to successfully complete their work? What impact will this have on soil productivity and health?

Lastly, Unit 240 of the hemlock dwarf mistletoe treatment overlaps with a portion of the Burnt Granite #595. Bark values quiet recreation in the CRRD, and the contribution that this and other hiking trails offer the local recreation economy. How would the treatments in these stands affect this trail?

PROPOSED ACTION IN RIPARIAN RESERVES

The Upper Clackamas watershed contains 8,712 acres of Riparian Reserves, and the Hunter project includes an unspecified amount of commercial logging within this land allocation (Plantation thinning includes 400 acres in "Late Successional Reserves and Riparian Reserves", Fire-Originated Stand logging includes 20 acres in Riparian Reserves).

The Northwest Forest Plan established the Aquatic Conservation Strategy to "restore and maintain the ecological health of watersheds and aquatic ecosystems" and established land use designations, such as Riparian Reserves, to ensure heighted protection of ecologically sensitive lands. *NFP at B-9.* The Aquatic Conservation Strategy Objectives require that Forest Service-administered lands be managed to "[m]aintain and restore" nine indicators of watershed health, such as the physical integrity of the aquatic system, water quality, in-stream flows, and habitat for riparian-dependent species. *NFP at B-10.* The Northwest Forest Plan provides that "[c]omplying with the Aquatic Conservation Strategy objectives means that an agency must manage the riparian dependent resources to maintain the existing condition or implement actions to restore conditions." *NFP at B-10.* By contrast, "[m]anagement actions that do not maintain the existing condition and lead to improved conditions in the long-term do not 'meet' the intent of the Aquatic Conservation Strategy and should not be implemented.

The NFP's Timber Management standards and guidelines "[p]rohibit timber harvest . . . in Riparian Reserves, except as described [in three exceptions]." *NFP at C-31.* The relevant exception allows logging to "acquire desired vegetation characteristics needed to attain [ACSOs]." *Id.* Thus, the starting place is that commercial logging in Riparian Reserves is prohibited, unless the Forest Service makes an affirmative finding that it is needed to attain the ACS Objectives. As detailed below, the best available science shows that the logging and roadbuilding in Riparian Reserves in Hunter may not be needed to achieve the ACS objectives, in fact, these actions may even retard such compliance. It is the agency's burden to demonstrate (in their analysis) the contrary if they are to log in Riparian Reserves.

Bark's concerns regarding commercial logging in Riparian Reserves is based both on the clear direction of the Northwest Forest Plan and on new and developing

science as synthesized by the Coast Range Association[30]. In their key findings, the authors recommend that "(t)hinning and fuels reduction by means of mechanized equipment or for commercial log removal purposes should be generally prohibited in Riparian Reserves and Key Watersheds."

Along with this synthesis, several sources are now pointing to passive management as the best approach to achieve ACSOs in Riparian Reserves. Pollock and Beechie[31] 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 then 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.[32] 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, thinning with removal of trees 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,

[30] Frissell, Christopher A., R. J. Baker, D. DellaSala, R. M. Hughes, J.R. Karr, D. A. McCullough, R. K. Nawa, J. Rhodes, M.C. Scurlock, R. C. Wissmar. 2014. Conservation of Aquatic and Fishery Resources in the Pacific Northwest: Implications of New Science for the Aquatic Conservation Strategy of the Northwest Forest Plan . Coast Range Association, Corvallis, OR. 44 pp. (http://coastrange.org/documents/ACS-Finalreport-44pp-0808.pdf)

[31] 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

[32] 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

recruitment of dead wood to streams would likewise be reduced in conventionally thinned stands relative to un-thinned stands.

The topic of riparian thinning generally being at odds with the ACS has been far-reaching, with a recently circulated sign-on letter sent to the Secretary of Interior and the Secretary of Agriculture. This letter was signed by 31 organizations and urged careful consideration of any efforts to weaken aquatic protections in the area of the Northwest Forest Plan. This letter is significant to this comment because it demonstrates strong support for generally keeping timber harvest out of Riparian Reserves. One of the "key ecological reasons" cited in this letter was that *"Recent research underscores the original ACS presumption against timber harvest in aquatic emphasis areas, and now more clearly indicates that even harvest in the form of thinning and fuels reduction generally is inconsistent with attainment of aquatic objectives."*

Because of the scientific controversy surrounding Riparian Reserve logging, and the fact that the FS has not affirmatively demonstrated the need for commercial thinning to attain ACS objectives in this project, **Bark requests that the agency remove all commercial logging from Riparian Reserves unless it is demonstrated to be *needed* to achieve these objectives in the areas proposed.**

CONCLUSION

Bark has several suggestions for improving the Hunter Project, and requests that the agency review these suggestions and create alternatives that meaningfully incorporate these suggestions – singly or together – to assess their economic feasibility and ecological benefit:

1. Add additional miles of road closures and decommissioning to the Hunter project listed under "System Roads In The Hunter Project Area";
2. Rehabilitate and close unauthorized "ghost roads" referenced in these comments as part of the Hunter project;
3. Remove new roadbuilding proposed into the currently un-roaded Burnt Granite area;
4. Exclude stands with high snag densities (both native and plantation) from any logging and apply protective buffers to key snags;
5. Remove units which contain native, never-before-logged forest;
6. Remove regeneration harvest; and
7. Remove commercial logging from Riparian Reserves unless it is demonstrated to be needed to achieve ACS objectives in the areas proposed.

As the Forest Service is considering the optimal method of accomplishing the purpose and need for the Hunter 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 EA and the project itself.

Thank you,

Michael Krochta
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