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Grasshopper Restoration Project

Visual Analysis Report

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Hood River Ranger District
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1.0 Introduction

This report analyzes the effects to scenic resources associated with the management activities proposed to take place within the Grasshopper Project boundary. Section 2.1 of the report includes review of applicable Forest Plan management direction for scenery, including visual quality objectives (VQOs), distance zones, management areas (MAs), designated viewsheds, and trail sensitivity levels. Applicable management direction beyond the scope of the Forest Plan was also reviewed, including scenery requirements for the Mt Hood National Recreation Area (NRA), the Inventoried Roadless Areas (IRA), and the White River Wild and Scenic River (WSR).

Review of management direction helped inform the parameters for conducting an ArcGIS-based viewshed analysis. Section 2.3 discusses the viewshed analysis methodology that was utilized, including the identification of "visible" or "not visible" portions of the project area, as seen from key viewing routes/points identified by the Forest Plan and other management direction. Such routes/points included established viewer positions for designated viewsheds (Road 48 and Rock Creek Reservoir), Sensitivity Level I trails accessing Wilderness (Three Mile - 466, Mud Spring – 466A, South Fork Three Mile – 466.1), the White River WSR corridor, and developed recreation sites (Boulder Lake Campground/Trailhead, Bonney Crossing Campground, Badger Creek Trailhead, Rock Creek Campground). Viewshed analysis determined that, in general, the proposed Grasshopper treatment units would not be visible from sensitive viewer positions due to a combination of topography and distance zones, and where visible at isolated locations, that the visible details of the proposed management activities would be minimal. In this way, the viewshed analysis provided important information that helped inform the scenery effects analysis for the two proposed alternatives (Alternative 1 – known as the "Proposed Action" and Alternative 2 – known as the "Shelterwood Alternative"), as discussed in Section 3.0.

Many direct, indirect, and/or cumulative effects brought about by either action alternative would result in positive outcomes for the desired future condition of scenic resources, including the creation of a "natural appearing forest landscape…[with a] pleasing diversity of tree and shrub species…"(USDA 1990) Negative impacts to scenic resources, such as unnatural forms/lines in the composition of the forest or human created markings would be minimal and short-term (less than 10 years) and would be mitigated through the implementation of specific scenery project design criteria (PDC) at the time of project activities. By incorporating PDCs to reduce negative impacts to scenic resources, the activities proposed by either Alternative 1 or Alternative 2 would be consistent with the Forest Plan and other applicable management direction over the long term (more than 10 years) following completion of project activities.

2.0 – Analysis Framework

2.1 – Management Direction

2.1.1 – Visual Quality Objectives

Several documents are used when conducting a visual analysis, providing guidance and means for measuring proposed activities' suitability for implementation. Among these the Forest Plan provides direction for visual resource management for each of the management areas (MA) within the Grasshopper project boundary.

Each MA has a minimum level of visual quality standards that must be met when the landscape is altered by constructing roads/buildings, building utility corridors, harvesting timber, fire treatments, etc. The Forest Plan states that "…visual quality objectives prescribed in management direction represent the minimum level that shall be achieved in long term visual resource management." (USDA 1990) The Forest Plan gives authority to the Visual Management System (VMS) and associated Visual Quality Objectives (VQOs) to influence decisions and make visuals an important piece of the planning process. The following VQOs pertain to MAs within or immediately adjacent to the Grasshopper project area:

> **Preservation**, "…allows ecological changes only…Management activities, except for very low visual – impact recreation facilities, are prohibited." (USDA 1974)
>
> **Retention**, "…provides for management activities which are not visually evident…activities may only repeat form, line, color, and texture…reduction in form, line, color, and texture contrast in order to meet Retention should be accomplished either during operation or immediately after." (USDA 1974)
>
> **Partial Retention**, "…management activities remain visually subordinate to the characteristic landscape…reduction in form, line, color, and texture…should be accomplished as soon after project completion as possible or at a minimum within the first year." (USDA 1974)
>
> **Modification**, "…management activities may visually dominate the original characteristic landscape. However, activities of vegetative and land form alteration must borrow from naturally established form, line, color, or texture…reduction in form, line, color, and texture should be accomplished in the first year or at a minimum should meet existing regional guidelines." (USDA 1974)

2.1.2 – Distance Zones

The potential viewing distance a person may have of the surrounding landscape is impacted by several factors. Examples include views from an established road, trail, Wild and Scenic River or designated viewpoint. Vegetation and fuels management methods can affect the scenery by maintaining, reducing, or eliminating vegetative screening that may exist between such key observation points (KOP) and areas of proposed project activities. Another important factor to consider is duration of view, since a stationary observer will be able to perceive more landscape details, including details at greater distances, than will a driver traveling at highway speeds, who will only glimpse the same details for a moment.

For this visual analysis study, viewing distance zones include: foreground (0 to ½ mile from viewer), middleground (1/2 to 5 miles from viewer), and background (5 miles to horizon from viewer).

2.1.3 – Management Areas and Designated Viewsheds

The following are primary MAs identified in the Forest Plan that are associated with this project, their accompanying viewing distance zones, and the VQOs that should be met at those distances. The Forest Plan states that "…VQOs apply only to lands within the indicated [MAs]." (FW-554)

> **A5** – Unroaded recreation: Foreground = Retention, Middleground = Retention, and Background = Retention
>
> **A6** – Semi primitive roaded recreation: Foreground = Retention, Middleground = Retention, and Background = Retention
>
> **B4** – Pine – Oak habitat area: Foreground = Modification, Middleground = Modification, and Background = Modification
>
> **C1** – Timber emphasis: Foreground = Modification, Middleground = Modification, and Background = Modification

Secondary MAs and/or designated viewsheds overlay several of the primary management areas. Primary land use allocations A5, A6, B4, and C1 all have associated with them the secondary land use allocation B5.

> **B5** – Woodpecker/pine marten habitat: Foreground = Modification, Middleground = Modification, and Background = Modification

It is important to mention this land use allocation layer as it helps inform the importance of another type of habitat and visual measure to account for. Noted in the Forest Plan, "…the VQOs which provide the highest level of visual quality protection predominate." (FW – 554). With that said, B5's relevance occurs only with B4 and C1 since those MAs would otherwise have less – restrictive VQO requirements.

This would also be the case when considering the three designated viewsheds in the immediate vicinity, Forest Road 48 and Rock Creek Reservoir designated viewsheds as well as the White River Wild and Scenic River designated viewshed.

Another layer of consideration is trail sensitivity levels I – III. In the near foreground (NFG, first 660 feet, either side of trail tread) and far-foreground (FFG, second 660 feet, either side of trail tread), each of these three trail types place another VQO on the surrounding landscape. The following are the trail types and their associated VQOs for NFG and FFG.

Sensitivity Level I Trails: NFG – Retention, FFG – Partial Retention

Sensitivity Level II Trails: NFG – Partial Retention, FFG – Modification

Sensitivity Level III Trails: NFG – Modification, FFG – Modification

A final layer and one that is more specific to the Grasshopper restoration project, is the consideration of national recreation area and inventoried roadless area land designations.

2.1.4 – Mt Hood National Recreation Area

The Mt Hood National Recreation Area (NRA), created by the Omnibus Public Land Management Act of 2009, designated certain forest land, "…to provide for the protection, preservation, and enhancement of recreational, ecological, scenic, cultural, watershed, and fish and wildlife values…" (Omnibus 2009) This Act was applied to the Forest Plan by means of a Forest Supervisor amendment letter, titled by the subject line "Forest Plan Conformance to the 2009 Omnibus Act". In this letter, it states, "The Mt. Hood National Recreation Area (NRA) will be overlaid over all Forest Plan and Northwest Forest Plan LUAs. All management actions within the NRA will follow the standards and guidelines for the underlying LUAs." (USDA 2016) It goes on to say that the most stringent of standards and guidelines, if there are multiple for certain parts of the landscape, would apply to provide the management direction. The Mt Hood NRA is incorporated into the Grasshopper Project through units 15, 54, 55, 56, 57, 58, 59, 65, 66, 67, 68, 79, 97, 104, 260, 261, 262, 263, 264, and 265. Some units are in A5/A6 management areas and need to meet VQO Retention, others are in C1 management area that need to meet VQO Modification.

2.1.5 – Inventoried Roadless Areas

Through an October 2018 direction by the Chief, the Regional Forester was given the authority to approve certain exceptions to the 2001 roadless rule. Grasshopper's proposed treatments were approved in September 2019 on the basis that they would, "…maintain and restore the characteristics of ecosystem composition and structure, such as to reduce the risk of an uncharacteristic wildfire by moving the stands towards the natural fire return interval" (§ 294.13(b)1(ii). Areas proposed for treatment that are within the IRA are all within the C1 Forest Plan land use allocation, which are associated with VQO Modification. More specifically, IRA is incorporated partially in units 1, 2, 3, 4, 5, 22, 24, 44, 62, 95, 221, 250, and fully in unit 251.

Table 1. Resource indicators and measures

Resource Element	Resource Indicator	Measure (Quantify if possible)	Source Forest Plan Standards and Guides
Designated Viewsheds	Evaluation of land use associated with management activities as compared to visual management requirements for designated viewsheds in the Forest Plan.	Degree to which management activities meet required VQO in each distance zone for the designated viewshed, regardless of the baseline management area prescription.	Forest Plan (Pgs. Four 110 – Four 112)
Distance Zones: Foreground (FG), Middleground (MG), and Background (BG)	Evaluation of visibility of management activities at different distances from specific observer positions.	Degree to which management activities meet required VQO within ½ mile (FG), between ½ mile and 5 miles (MG), and beyond 5 miles (BG) from the observer position.	Forest Plan (Pgs. Four 109 and Four 111)
Distance Zones: Near Foreground (NFG) and Far Foreground (FFG)	Evaluation of visibility of nearby management activities from specific observer positions along trails.	Degree to which management activities meet required VQO within first 660 feet (NFG) and second 660 feet (FFG) on each side of the trail.	Forest Plan (Pg. Four 116)
Management Area Prescriptions	Evaluation of land use associated with management activities as compared to baseline visual management requirements for different management areas in the Forest Plan.	Degree to which management activities meet required VQO in each distance zone for each management area.	Forest Plan (Pgs. Four 107 – Four 117 and Four 136 – Four 335)
Potential Seen Areas	Evaluation of visibility of management activities from specific observer positions in a bare earth scenario.	Degree to which management activities would be visible from an observer position if the screening provided by existing vegetation was no longer present.	LiDAR – based digital elevation model (DEM) seen area mapping for selected observer positions.
Trail Sensitivity Levels	Evaluation of land use associated with management activities as compared to visual management requirements for trails in the Forest Plan.	Degree to which management activities meet required VQO in each distance zone for Sensitivity Level I, II, and III trails, regardless of baseline management area prescription.	Forest Plan (Pgs. Four 115 – Four 117)

Resource Element	Resource Indicator	Measure (Quantify if possible)	Source Forest Plan Standards and Guides
VQO – Preservation	Looking at form, line, color, and texture.	Met by management activities, except for very low visual impact recreation facilities existing, being prohibited.	Forest Plan (Pgs. Four 157 – Four 294) Visual Management System (Pg. 29)
VQO – Retention	Looking at form, line, color, and texture.	Met by management activities that are not visually evident.	Forest Plan (Pgs. Four 157 – Four 294) Visual Management System (Pg. 30 - 31)
VQO – Partial Retention	Looking at form, line, color, and texture.	Met by management activities that remain visually subordinate to the characteristic landscape.	Forest Plan (Pgs. Four 157 – Four 294) Visual Management System (Pg. 32 – 33)
VQO – Modification	Looking at form, line, color, and texture.	Management activities may visually dominate the original characteristic landscape, but vegetative and land form alteration must borrow from naturally established form, line, color, or texture.	Forest Plan (Pgs. Four 157 – Four 294) Visual Management System (Pg. 34 – 35)
National Recreation Area (NRA)	Evaluation of land use associated with NRA special designation as compared to visual management requirements for NRA as defined in the Forest Plan or relevant supporting documentation.	Degree to which management activities meet required VQO in each distance zone, as defined by NRA designation/regulations.	Omnibus Public Land Management Act of 2009 (PDF Pgs. 23 – 24) Forest Supervisor Letter titled "Forest Plan Conformance to the 2009 Omnibus Act" dated March 10, 2016 (PDF Pg. 4) Forest Plan (Pgs. Four 157 – Four 294) Visual Management System (Pg. 30 - 31)
Inventoried Roadless Area (IRA)	Evaluation of land use associated with IRA special designation as compared to visual management requirements for IRA as defined in the Forest Plan	Degree to which management activities meet required VQO in each distance zone	Roadless Area Conservation Rule dated January 12, 2001 Forest Plan (Pgs. Four 291 – Four 294) Visual Management System (Pg. 34 – 35)

2.2 – Existing Condition

2.2.1 – Management Areas

Of the management areas that are located within the project's boundaries, most of the project area is classified as C1 land (approximately 74%). Expressed in percentage of total acres, the other MAs are considerably less: A5 (13%), A6 (2%) and B4/B5 (2%). Each management area's existing condition is generally consistent with the Forest Plan.

2.2.2 – Visual Quality Objective – Preservation

The Badger Creek Wilderness is in the A2 MA, immediately to the north of several proposed units. This MA is required to meet the Preservation VQO, meaning that no evidence of treatment activities would be visible. However, the Preservation VQO requirement only applies to areas within the A2 MA as viewed from within Wilderness, not to areas outside this MA designation, even though they may still be visible from Wilderness.

2.2.3 – Visual Quality Objective - Retention

The A5 and A6 MAs are required to meet "Retention" VQO in all distance zones, as seen from open roads, trails, high recreational use areas, and water bodies within A5 and A6 boundaries. Both currently do not meet this condition as seen from the viewer positions identified above.

The following are full units or portions of units that either fall within the A5 or A6 MA designation:

A5: 15, 54, 55, 56, 58, 59, 65, 66, 104, 260, 261, 262

A6: 54, 55, 56, 57, 58, 59, 141, 260, 261, 262

Sensitivity Level I Trails are required to meet "Retention" VQO, 660 feet on either side of the pathway, in NFG. This VQO would apply to the areas that are visible when viewing out from these types of classified trails. Trails marked with this classification level and within the project's boundaries include: South Fork Three Mile (466.1), Three Mile (466) and Mud Spring (466A).

Units partially falling within this NFG distance include:

4, 76, 81, 110, 141, 147, and 151

2.2.4 – Visual Quality Objective – Partial Retention

Partial Retention objectives are not as strict as the Retention VQO. However, they still require that any treatments or activities do not visually dominate the surrounding landscape. These treatments and activities should borrow from the form, line, color, and texture present in the surrounding landscape. New characteristics that are found rarely, or those from a different landscape entirely, can be introduced, but need to work with the existing character and not overshadow it.

For this project, no proposed treatment areas would occur under this visual quality objective designation except for portions of units that may be visible in the Middleground or Background

of the Rock Creek Reservoir and White River Wild and Scenic River designated viewsheds. Partial retention could also apply in portions of units that may be visible in the FFG of Sensitivity Level I trails or the NFG of Sensitivity Level II trails. Trails marked with Sensitivity Level II classification and within the project's boundaries include: Boulder Lake (463), Forest Creek (473), and Crane Creek (478).

Portions of units found in FFG of Sensitivity Level I trails include:

4, 76, 80, 111, 141, 147, and 151

Full units found in FFG of Sensitivity Level I trails include:

81 and 110

Portions of units found in NFG of Sensitivity Level II trails include:

54, 67, 97, 263, 264, and 265

The underlying MA direction for units 54 (half), 67, 97 263, 264, and 265 is C1, associated with VQO Modification.

2.2.5 – Visual Quality Objective – Modification

B4/B5 and C1 land needs to meet this VQO. Sensitivity Level II trails in FFG and Sensitivity Level III trails in all viewing distances also need to meet VQO modification. Under "modification", the landscape can be altered in such a way where treatments and activities reduce the natural character of the landscape. However, the remaining vegetation or landforms should still look and function as the similar, surrounding landscape does. More focus will be given to these land use designations and VQO due to most of the project's acreage being under these three classifications (mainly referring to C1 land as its percentage of total project acres is substantially higher than B4/B5). Methods to integrate this land type with the others will be explored, together with meeting the primary objectives of this project. The same process of analysis described for the other pertinent VQO to the Grasshopper project will be applied to this VQO. Once the project is completed, one year or a different deadline that is agreed to by interested parties is given to achieve this visual quality objective.

All remaining project units not mentioned in either section 2.2.3 or 2.2.4 are defined by MA C1 with a VQO of Modification. Mentioned in 2.1.4, certain NRA units need to meet VQO Modification, apart from some needing to meet VQO Partial Retention, detailed above.

The following are the NRA units needing to meet VQO Modification:

Portions of units 54, 67, 97, 263, 264, and 265

Full units 68 and 79

Two other units found in the NRA that have conflicting MAs are units 65 and 66. The underlying MA for both units is A5, VQO Retention. Nearby Sensitivity Level III trails, Rocky Butte (475) and Rock Creek (906 and 910), view either of these units in any of their viewing distance zones meaning they could be assigned a VQO Modification. Again, due to the NRA taking the higher quality MA and thus associated VQO, these two units keep the A5 MA and associated VQO of Retention.

2.3 - Methodology

Completion of a comprehensive visual analysis involved a specific methodology utilizing the parameters set forth by the Forest Plan. This methodology also used a nationally recognized visual management system in an ArcGIS format. It included other information such as project boundaries, individual vegetation management units, heavy equipment, prescribed timber and fuels treatments, road, trail, waterbody, and recreation site locations. It also considered a digital elevation model (DEM) which looks at the earth's topography without existing vegetation. The DEM was used to create maps involving what a potential viewer could see, or not see, in the landscape along a route (i.e. roads and trails) or from a chosen point (i.e. site or trailhead). The DEM factors in the distance (i.e. foreground, middleground, and background viewing distance zones) a viewer can see from one point and/or various points along a route. Together with the information mentioned above, all contributed to showing the areas of a project that need visual integrity protected, as well as areas where modification is expected. This influences method of vegetation treatments used and the aesthetics of the area following operations. It also influences how this new landscape fits into the surrounding local and regional landscape patterns, forms, and systems.

Viewing distance zones are the final 'lens' applied in visual analysis. These create another layer by which to study a project's impact on the landscape. Whether hiking on a trail, or driving in their vehicles to a recreation area, people see not only the landscape in front of them, but from a certain vantage points, further into the distance. For the Grasshopper project, several established routes and sites have been identified to use as the study's main areas the public could be viewing the landscape from.

The routes chosen for this project are Forest Service roads 4880, 4860, 4811, 4811 – 140, and 2710 as well as trails #466, #475, and #910. For sites, Boulder Lake campground and trailhead, Bonney Crossing campground, and Badger Creek trailhead were all taken into consideration of places where the public could potentially see into the project area. The White River Wild and Scenic viewshed along with two other Forest Plan designated viewsheds, Road 48 and Rock Creek Reservoir were also considered in this part of the visual analysis.

Mentioned earlier in this report, the landscape is broken up into three viewing distance zones. In each zone, still within the project's boundaries, VQOs need to be met. All four of the land use allocations meet one specific VQO which doesn't change when viewing distance zones are added.

The viewing distance zone layer of analysis also introduces “Visible” and “Not Visible” areas. Created by running a specific operation in the program ArcGIS, these two areas are obtained from inputting the mentioned routes and sites against a (DEM). The program creates many points along the chosen route or uses the one point for a site. From every point, or just the one, the program analyzes what parts of the DEM are “Visible” or “Not Visible”. After the program operation completes, two colors are displayed over the DEM; green representing the “Visible” and red representing the “Not Visible” areas. The importance of running this function is to show the landscape areas, including certain treatment units of the Grasshopper project that need to be given more attention. This is due to the public having a higher chance of seeing them at any given point along the route, or from a single point at a site. Identifying the locations of these visible areas helps focus suggestions and ensures that desired conditions, visual quality objectives, and land use allocation requirements are met. The impacted landscape is then consistent with the surrounding environment. This also provides the public with a more natural scene than one that has been altered.

Determinations made for each unit considered the associated proposed vegetation treatments, and were made by reclassifying key viewing routes as ‘visible’ and ‘not visible’ visual analysis data into three new categories. This was done to separate the areas of high visibility from low to moderate visibility areas, found in the overall ‘Visible’ data. Otherwise, if all layers were laid on top of the project area, much of it would be ‘Visible’. The goal is to locate areas of high visibility that may translate into high levels of concern by the public. Identifying these areas will better inform managers regarding where to focus minimizing treatment impacts on visuals.

Reclassifying the count values found in each key viewing route’s attribute table, categories are: low to moderate (0 to 100,000th integer); high (100,000th integer to 1,000,000th integer); and no visibility (1,000,000th integer to the highest number displayed for the ‘Not Visible’ output). The value 1 represents the low to moderate group, 2 the high group, and 3 the no visibility group.

When overlaying all the key viewing routes’ group value ‘2’ much of the project area continues to remain covered and ‘visible’. Zooming in to each unit further definition could occur by visually splitting the units into quadrants (NW, NE, SW, SE), determining each quadrants’ visibility rating (low, medium, high), and unseen rating (very low, low, medium, high). Quadrants, all or some, may have both ratings. For example, a high visibility scale in quadrants NW, SW, and SE might have a low or very low unseen scale in quadrants NE and SE. This means that most, if not all, of the NW and SW quadrants could be ‘visible’; while most, if not all, of the NE quadrant could be ‘not visible’. As for the SE quadrant, most of the area could be ‘visible’ with some low to very low ‘not visible’ areas mixed in. Analyzing these units in this manner occurred because of the variability that the visibility data created. There were not clearly defined, rational, boundaries between what a potential viewer could see or not see while being in the project area.

Section 5 “Appendix” lists units by proposed vegetation treatment method and lists the results of the visual study conducted for each unit. It should be noted that key viewing sites, such as Boulder Lake trailhead and campground, Badger Creek trailhead, and Bonney Crossing

campground, were not included in this reclassification exercise because the units produced as being 'visible' were those closest to these sites. This is due to the topography as well as the distance between western and eastern campgrounds/trailheads. All the central units were primarily categorized as 'not visible'. Reclassifying these key viewing sites would have been redundant to the information gained from the initial visual analysis.

The three designated viewsheds (Road 48, White River, and Rock Creek Reservoir/Campground) mentioned earlier in this section are not considered further in this analysis. This is because when the Grasshopper units are viewed from each designated viewshed, units are "not visible" in the middleground or background. This is due to the distance each designated viewshed is from the project area as well as the great change in topography between the low lying designated viewshed viewing areas/routes to the higher in elevation Grasshopper project.

2.3.1 Sapling Thinning Units

Units proposed for sapling thinning treatment are mostly located on C1 designated land. A portion of units 57, 58, and 59 are almost equally located between A5 and A6 land. Finally, unit 262 is mostly located on A6 land with a small northwesterly portion on A5 land.

Regarding the units on C1 land, when viewed from a key viewing route or site, many are located within foreground and middle-ground zones. Exceptions exist when viewing from either the far east key viewing sites (Bonney Crossing Campground and Badger Creek Trailhead) or the far west sites (Boulder Lake Campground and Trailhead). Moving further away from these sites, units begin to fall into the background viewing distance zone. The same is true for these routes: 2710, 4811 – 140, and 4880. For all three viewing distance zones, VQO 'modification' needs to be met, except for the units that fall within NFG and FFG of Sensitivity Level I trails or NFG of Sensitivity Level II trails (discussed earlier throughout section 2.2 "Existing Conditions").

When viewing from Boulder Lake Campground and Trailhead, 'visible' units include a westerly portion of 15 and a little more than half of 68. Moving further east, the rest of the project is 'not visible' from these two key viewing sites. Topography change is the reason for the above-mentioned units to be 'visible', while the rest of the project area remains 'not visible'. The key viewing sites listed are in a valley with the treatment areas being either adjacent to or above these sites. On the other side of the project area, when viewing from Bonney Crossing Campground and Badger Creek Trailhead, all the sapling thinning units are 'not visible'.

The key viewing routes used were FS Rd's 4880, 4860, 4811, 4811-140, and 2710 as well as FS trails 466, 475, and 910.

Units found on A5 designated land (i.e. half of 57, 58, and 59 as well as the small north western portion of 262) are 'not visible' from many key viewing routes and sites. Only from two forest service routes are units 'visible'. When viewing from forest service road 4860 units 57, 59, and 262 are 'visible'; falling into the middle-ground viewing distance zone. Unit 58 is 'not visible' from this key viewing route. From forest service road 4880, units 57, 58, 59, and 262 are 'visible'; falling into the foreground viewing distance zone.

Being on A5 land and within foreground/middleground viewing distance zones, VQO ‘retention’ needs to be met. Regarding the other half of the same units, as well as the rest of unit 262 (excluding the small northwest portion), viewing distance zones, and VQO ‘retention’ also apply when looking at A6 designated land.

2.3.2 Intermediate Thinning Units

Commercial thinning proposed by Alternative 1 includes two methods: variable density thinning and intermediate thinning. Alternative 2 proposes these in addition to shelterwood treatments. For details about proposed activities see the Environmental Analysis and the Silviculture/Vegetation Report which is incorporated by reference and available on the project website.

Totaling about fourteen units, nine of the intermediate thinning units would be found on C1 land and need to meet VQO ‘modification’ for all three viewing distance zones, except for the units that fall within NFG of Sensitivity Level II trails (discussed earlier throughout section 2.2 “Existing Conditions”). Unit 54 appears to be in three MAs. Most of its southern half is in C1, with a large amount of its northern half in A6, and the remaining in A5. The southern half needs to meet ‘modification’ standards, unless found in NFG of Sensitivity Level II trails, in which case VQO “Partial Retention” should be met. The northern half needs to meet ‘retention’ standards for either the A5 or A6 portion, regardless of being in any viewing distance zone. Units 55, 56, 260, and 261 predominantly fall on A5 land. However, small portions of each unit also get thrown into the A6 classification. All units found in A5 and A6 are required to meet VQO ‘retention’ for all three viewing distance zones.

C1 units mostly have high visibility ratings (See Appendix Table 3 – Intermediate Thinning Units: Visible and Not Visible Areas). Unit 53 is rated as ‘completely seen’, units 67 and 264 are rated as ‘medium’, while Unit 54 has a low visibility and a high unseen rating. In A5 and A6 units, 55 and 56 have high visibility ratings; unit 260 would be ‘completely seen’, while unit 261 has a medium visibility rating.

When viewed from the two, far eastern, key viewing sites none of the intermediate thinning units would be ‘visible’. However, moving over to the two key viewing sites on the western side; a little over half of unit 67, all of unit 79, a small eastern part of unit 97, and a small western part of unit 261 would all be ‘visible’.

2.3.3 Variable Density Thinning from Below Units

Most of the variable density thinning from below units fall on C1 land. Regardless of the viewing distance zone, all units would be required to meet VQO ‘modification’ standards. The same holds true for several units on B4/B5 land, receiving identical treatment. Units 221, 228, 250, 251, and the eastern half of 1 should also meet VQO ‘modification’ when found in foreground, middleground, or background viewing zones. Considering the data presented in the table below, many of the units have high visibility, and low to very low, ‘unseen’ ratings.

This means, from the key viewing routes identified earlier in the sapling thinning section, many variable density thinning units may be visible to the public travelling or recreating on the routes used for this study. Unit 30 could be completely 'visible'.

Units found on B4/B5 land have a slightly varied high visibility rating range. Unit 251 is low, units 221 and 228 are medium, while the east portion of units 1 and 250 are high. Viewing from either the Badger Creek trailhead or the Bonney Crossing campground, only more eastern parts of units 221, 228, and 251 would be 'visible'. This would, again, be due to topography as those two sites are situated in a valley. The public would be looking up to view those units. Areas over the ridge and further away would be masked by the topography or existing vegetation. Moving to the other side of the project area, and viewing from the other two key viewing sites, these B4/B5 units would be completely 'not visible'.

2.3.4 Shelterwood Units

Alternative 2 proposes shelterwood instead of variable density thinning within the following units: 151, 163, 173, 184, 191, 201, 219, 223, 226, and 272. All units are within the C1 land use allocation and the same visibility narrative that applied to the variable density thinning from below units applies to these units as well. Being viewed and visible from key viewing areas/routes requires these C1 MA units to meet VQO "Modification" in all viewing distance zones. VQO "Modification" applies to all proposed shelterwood units except unit 151 and a northern portion of 163. When viewed from the South Fork Three Mile (466.1) trail, VQO "Retention" and "Partial Retention" need to be met in the NFG and FFG, respectively. This means that half of unit 151 needs to meet VQO "Retention" while the other half and a northern portion of unit 163 needs to meet VQO "Partial Retention".

3.0 – Analysis of the Alternatives

3.1 – Environmental Consequences

3.1.1 No Action

If no action were taken, the existing visual condition of the landscape would continue to persist; meeting VQOs in the Grasshopper project areas in the short term. In the long term, conditions in some areas may become overstocked, cluttered, similar in texture, not diverse in age and species, and have minimal sight distance into the forest, which would not meet desired future conditions for visual resources according to the Forest Plan (USDA 1990, Four 7-8). The look of overstocking and cluttering would continue as the forest produced vegetation, tree species and age would grow as they are with no change, and sight distance into the forest would worsen as areas continued to be overstocked and cluttered. In the short term, there would be no direct, or indirect effects to visual resources if no action were taken and generally most areas would meet Forest Plan management objectives for visual resources Moving to the long term and beyond, these same areas would generally meet objectives, except in those areas where the above

conditions exist. In those areas, the visuals would only continue to degrade and being able to meet Forest Plan objectives wouldn't occur.

3.1.2 Action Alternatives

The two action alternatives may impact the landscape character differently. Both action alternatives propose vegetation and fuels treatments. Vegetation treatments proposed by Alternative 2 are identical to Alternative 1 except that it proposes shelterwood treatment on approximately 289 acres instead of VDT proposed by Alternative 1 for those same acres. Using the indicators mentioned earlier, together with the "Visible" and "Not Visible" maps developed in ArcGIS, this section of the visual analysis will discuss the direct and indirect effects of the proposed vegetative and fuel reduction treatments. This section illustrates that either action alternative along with project design criteria (PDC) would be consistent with Forest Plan requirements for visual resources. Integration with the surrounding landscape character would occur. The PDCs have been developed to minimize the impacts to visual qualities in the area and have been included for consideration in this analysis because they are part of proposed activities for both action alternatives.

Recreation PDC number 6 states "A 100-foot no cut buffer would be retained on either side of the non-motorized trails within the planning area…" This buffer requirement would also enable the proposed action to be consistent with visual resources management direction by maintaining a natural appearance where portions of the project area would be potentially visible from trail corridors. After conducting a visibility study for Sensitivity Level I, II, & III trails within or adjacent to the project area, the potentially visible landscape along such trail corridors was determined to be 100 feet or less on either side of the trail. In addition to vegetative screening provided by the existing forest canopy, topography plays an important role in limiting the portions of the surrounding landscape that would be visible from the trail corridors, even in the absence of vegetation. Similar to the VQO requirements for nearby designated viewsheds, only the visible portions of the landscape along trail corridors would be subject to the more-restrictive VQO requirements assigned by the Forest Plan to the Near Foreground (NFG) and Far Foreground (FFG) distance zones along Sensitivity Level I & II trails. Because the visibility study concluded that the landscape would generally not be visible beyond 100 feet from trails, project activities would only be subject to NFG VQO requirements rather than FFG VQO requirements, since they would only apply to areas beyond 660 feet from trails. In the NFG, VQOs of Retention and Partial Retention need to be met for viewer positions along Sensitivity Level I and II trails respectively. All of the NFG distance zone along Sensitivity Level I and II trails throughout the project area currently meets these VQO requirements and would continue to do so under either Alternative 1 or 2 through the incorporation of the no cut buffer discussed above. Beyond the no cut buffer, VQOs associated with the underlying MA would apply, since those portions of the project area would not be visible from the trail corridors. The following sections of this report discuss the direct and indirect effects of Alternative 1 or 2 on visual resources.

3.1.2.1 - Direct and Indirect Effects of Alternative 1 ("Proposed Action")

Proposed treatments and resulting stand structures impact to visual resources vary across the planning area, but overall would be positive and continue to meet Forest Plan direction. The following paragraphs will discuss this further as well as draw support using Forest Plan desired future conditions for the Mt Hood NF, pages four – 7 to four – 8 for visuals.

Sapling and intermediate thinning, proposed for units in VQO Retentionand Modification, would have no negative effects on either landscape's associated VQO in the long-term. These proposed treatments would directly impact VQO Retention stands by making their species composition and spacing more characteristic of other similar areas that haven't been managed. Keeping larger diameter trees that could provide the surrounding area with interesting colors throughout the season as well as more open spacing would all create visual intrigue. These outcomes would be in line with VQO Retention standards in the foreground and middleground. In the short term, slight detraction of meeting VQO Retention standards would occur upon implementation because proposed treatments would change the stands and human involvement would be most evident. This is necessary as these stands don't appear natural in character to begin with (i.e. more emphasis on qualities found in an unmanaged, characteristic landscape of the area). In the long term, the presence of human involvement in these stands would become less evident. They would increasingly become more natural appearing over time and move more to meeting VQO Retention standards. Integration with other parts of unmanaged forest would occur more easily for VQO Retention units because VQO Modification units have been managed to a lower visual quality standard over a longer period. Human involvement thru management activities is slightly more evident with the Forest Plan direction in these MAs, while VQO Retention units would have had MAs that focus on emphasizing natural characteristics thru management activities over these same time periods. Indirectly, implementation of these two proposed treatments would make these units match better with the unmanaged as well as similarly managed units of the area, resulting in a more contiguous/harmonious/consistent landscape character across and adjacent to the project area. From a more regional scale, grouping these areas together would create a larger network of forest that had more naturally prevalent characteristics with minimal human evidence for people to recreate in and enjoy.

Direct impacts of these proposed treatments on VQO Modification units are like VQO Retention units in that the same treatments and results would occur. Stand character would look healthier, more varied in terms of species and age, and be more open in some areas while closed in others. Again, resulting in increased diversity and enhanced recreational experience for the Forest visitor as an indirect effect. All of this would contribute positively to the visual aesthetics and make for a more visually appealing landscape. The difference is the baseline visual standards are lower as VQO Modification allows for more human activity to be evident through treatments, so long as those treatments reflect the surrounding landscape character. Slight detraction would occur in VQO Retention units because the proposed treatment results don't immediately meet those standards whereas in VQO Modification units, these proposed treatments create a landscape that immediately meets Modification standards. This also means that VQO Modification units would meet those standards in the short term, while in the long term, they would slowly start to meet Partial or even Retention standards. Indirectly, this would

impact the surrounding area in a positive way by establishing higher visual quality related areas for people to view and be immersed in. Being more in abundance, visitors traveling through the forest would have more area to visually enjoy rather than these areas being split up and less in acreage. Again, more contiguous/harmonious/consistent landscape character with the surroundings would improve people's recreational experiences.

Another type of thinning, variable density thinning from below, is proposed for units needing to meet VQO Modification. The direct impact to visual resources this proposed treatment would have are again positive. Removing trees of various sizes at different thinning intensities would increase diversity of edges and textures as well as make more evident the natural patterns found in other parts of the forest matching this landscape character. These units along travel routes would no longer have the basic visual look of being dense and cluttered, enforcing minimal site distances into the forest. Instead, visitors traveling along any of the project related routes would have different viewing distances into the forest, depending on the level of thinning intensity. Overall, this would indirectly increase visual intrigue as edges, textures, forest structure all differ and add more variety rather than there being more similar views that overall make a landscape look stagnant. This change in viewing distances would also increase diversity of the overall travel experience along project involved routes. Meeting VQO Modification standards immediately, as would be the case for the other two proposed treatments, variable density thinning from below in all viewing distances would have a landscape that looked slightly altered and managed by humans, but blended in a way where textures, edges, and patterns matched better with the surrounding natural characteristics of unmanaged forest. In the short term, the evidence of human management activities would be noticed by forest visitors as well as the positives surrounding the results of these activities. These positives being more open spaces and differing forest structures involving tree ages and species as well as more color from some of these species. Moving out to the long term, these results would only get more defined and overshadow any evidence of management activities/human involvement.

3.1.2.2 Direct and Indirect Effects of Alternative 2 ("Shelterwood Alternative)

Alternative 2 proposes the same treatments as Alternative 1 except that for some units, Alternative 2 proposes shelterwood instead of variable density thinning. Therefore, implementation of Alternative 2 would have the same effects as described above except for the shelterwood units. If alternative 2 were chosen, the proposed units to be switched would include: 151, 163, 173, 184, 191, 201, 219, 223, 226, and 272.

The following points are about the findings presented earlier in the variable density thinning paragraph, as they pertain to this visual analysis:

- Units remain on C1 land as well as in their associated viewing distance zones;
- VQO 'modification' still applies along with the addition of several units needing to meet VQO 'retention' and 'partial retention';
- The main method of treating the forest in these ten units would change, producing new direct and indirect impacts to the visuals of this landscape.

If alternative 2 is chosen it is important to examine the direct and indirect visual impacts of this proposed treatment, as it more drastically alters the landscape. Direct visual impacts would be even larger areas of general open space with sparse vegetation, in comparison to the open space created by variable density thinning that thins at varying degrees. Forest visitors viewing the results of this proposed treatment would see an abrupt change in forest character continuity after travelling through other nearby areas. The drastic change in landscape would at first be a detraction in visual quality. Human evidence through management activities would be more prominent upon implementation with a larger, more open disturbed area contrasting against treated areas that blended better with the surrounding unmanaged forest and exhibited fewer stark changes in Forest structure. The concentration of these proposed shelterwood treatment units would also amplify these detractions as they are focused in a certain area of Grasshopper. Indirectly, this would depreciate the experience for a Forest visitor as they viewed these less continuous and consistent with other parts of the landscape changes and inferred the existence of human management. In the short term these results would persist. Looking out towards the long term, as the stands moved towards the proposed treatment's desired conditions, these units' stark contrasts would begin to fade and visually incorporate themselves with the surrounding results of the other proposed treatments. Visual quality would increase as well as people's experience. People visiting this part of the forest would once again see it being in a more natural state and able to provide a landscape fit for their recreational needs.

The above circumstances and effects exist in many of the proposed shelterwood treatment areas. Effects from implementation of the proposed shelterwood treatment would be acceptable because they occur in areas where VQOs allow management activities to be more evident. An area of concern regarding the shelterwood treatment implementation would be around the Sensitivity Level I trail, South Fork Three Mile (466.1). More specifically, where the South Fork Three Mile trail is in proposed unit 151. As stated in the existing conditions section 2.2.3, the NFG needs to meet VQO "Retention" while the FFG needs to meet VQO "Partial Retention". Implementing the shelterwood treatment in areas that need to meet VQO "Modification" and even "Partial Retention" would be acceptable due to both VQOs allowing management activities to be evident if natural characteristics are borrowed from elements that define the surrounding local landscape (i.e., treatment implements line patterns, textures, and/or forms found in unmanaged or similarly managed forested areas). VQO "Retention" is stricter and requires management activities to be visually not evident. Meeting this VQO standard in the NFG area, in proposed unit 151, would require the use of a buffer. Implementation of a buffer would directly keep visual resources in the NFG from further degradation, meeting the component of VQO "Retention" that management activities be visually not evident while the proposed shelterwood treatment would occur in the rest of unit 151. Forest visitors traveling this section of trail would be able to enjoy the uninterrupted natural qualities kept by implementing the buffer and indirectly, this would create a positive experience sought after by someone choosing a trail that eventually enters a wilderness area.

3.2 - Cumulative Effects

Cumulative effects are impacts on the environment that result from the incremental impact of an action when it is added to other past, ongoing, and reasonably foreseeable future actions. A cumulative effects analysis for each resource considers activities relevant to the resource which overlap in time and space. If proposed activities would have little or no effect on a given resource element, a more detailed cumulative effects analysis is not necessary because there are no effects to cumulate. The interdisciplinary team listed projects and activities that should be considered in the cumulative effects analysis. This information is included in the project record. The following paragraphs detail the cumulative visual impacts that this project, when combined with surrounding projects that overlap in time and space, would have on the visual resource. "Time" defines recent past (0 –5 years), present, and near future (0 –10 years) projects that could impact the Grasshopper project visuals. "Space" is the analysis area for cumulative effects that includes areas within the same viewshed assessed for the action alternatives that may be seen from a foreground, middleground, and/or background perspective and measured by their associated distances.

When viewing from the middleground/background distance zones from a location that encompasses both projects, the Rocky Restoration and proposed Grasshopper Restoration projects' alternative 1 impact on the forested landscape would cumulatively improve the overall visuals and positively improve a visitor's experience. Both projects' aim to improve their respective forested stands health through thinning activities. Moving these forested stands from an overstocked condition that exhibited less variation in age/species and being more closed rather than more variably opened to a healthier condition that includes a richer diversity of ages, species, open conditions compared to closed, textures, patterns, and edges would benefit visuals. Each of these changes in forest structure would create visual intrigue as these stands have more variety in the conditions listed. Close in proximity, Rocky's carried out treatment results with Grasshopper's proposed alternative 1 treatment results would compound, forming a continuous/harmonious/consistent working scenic landscape. This would provide a visitor with more uninterrupted, naturally appearing, forested stands to recreate in and enjoy.

Alternative 2, the proposed shelterwood treatment of Grasshopper, would have no cumulative impact looking at both projects. On a local, project scale, there would be some visual detractions as stated in section 3.2.3 of this report. Moving to a larger scale to include the impacts of both projects, these local visual detractions fade as landscape variability increases. For visitors looking out into the middleground and/or background viewing distance zones, where both projects could be viewed instead of the foreground, landscape variety along with the topography of the area would help not focus a person's view on this short term, local detraction. A visitor's view would instead see the many changes in the landscape, including these two projects, and find visual intrigue, not degradation.

The other projects/events, listed after this paragraph, would have the same cumulative visual impacts with Grasshopper's proposed alternative 2, specifically with the proposed shelterwood treatment. No further discussion is needed as the other projects/events are further away, enlarging the viewshed, fading even more the local visual detractions of the proposed treatment among the rest of the forest viewed in the middleground and background viewing

distances. Cumulatively, the proposed shelterwood treatment of alternative 2 and the other projects/events would have no impact on the landscape other than what was described in the discussion involving the Rocky Restoration project.

The White River Fire, a natural fire occurrence, burned many acres of forested landscape and produced forested stands characteristic of the area. Burning unevenly throughout the landscape, the White River fire created uneven patterns and edges as well as favoring more fire tolerant, healthier species. Proposed alternative 1 would do something similar, but on a smaller scale and through several, controlled management activities implemented by humans. From a larger viewshed scale, looking at both the fire event and proposed alternative 1 from the middleground and/or background, these two entities would work to create another naturally appealing scene characteristic to the area. Variability in patterns, edges, open vs. closed, and tree age/species composition as well as the driving process for these results differing (natural vs. human) would make a dynamic landscape. Visitors looking out to see both the White River Fire and proposed alternative 1 project areas would find interest in the scene before them as they viewed the natural patterns, textures, and other defining characteristics created by both these processes.

The White River Fire Recovery projects (Roadside CE, Salvage CE, Reforestation CE) and proposed alternative 1's cumulative impact would again be a positive one. All projects would create a landscape that emphasizes the natural qualities of the area through proposed treatments implemented and planned by humans. Areas in VQO Retention would have slightly more evidence that management activities occurred compared to the other two, less restrictive VQOs. That is necessary for those areas in VQO Retention as it would be for all stands in any VQO to start the process towards achieving natural characteristics (more variation between spaces being open and closed, diversity in species and age, uneven edges, and non-uniform patterns). From a larger viewshed scale, at the middleground and/or background viewing distances, all proposed projects would add variations and emphasize the natural qualities found in the surrounding unmanaged landscape to create an even more dynamic/visually intriguing scene.

Taking into consideration two past projects, Sapling Thinning (TSI) and Eastside Mastication CEs, (whose impacts still exist on the landscape, they are just less pronounced) with the current proposed alternative 1 project, the cumulative impact of all three would be positive. All three aim to increase stand diversity in age and species as well as have variability between open and closed forest structure through thinning activities. The results gained from these past two thinning projects with the proposed treatment results of alternative 1 would create a visually interesting and vibrant area of the Mt Hood National Forest that blended more seamlessly with the unmanaged or similarly managed forested landscape. Viewing all three of these projects from the middleground and/or background, a visitor on any travel route would see a change in forest canopy texture, pattern, and edge as the level of thinning varied from unit to unit. Instead of having a scene of solid, uninterrupted forest canopy, these projects would breakup this monotony, providing areas that are more open and have more color. Together these projects

would also continue the continuity of these types of landscapes, giving more connected, natural areas to recreate in and enjoy.

Overall, since the changes to scenery would be minimal with either proposed action alternative, and visual quality objectives would be met for both alternatives and other projects, cumulative effects would not be substantial.

3.3 - Consistency with Management Direction

The incorporation of specific PDC as part of the proposed activities associated with Alternatives 1 and 2 would allow for consistency with the following Forest Plan standards and guidelines pertaining to visual quality:

FW – 560: Units in retention zones would meet these VQOs by following associated Visual PDC 1 - 4.

FW – 562 through FW – 566: Visual PDC 1 – 6 when applied to respective VQOs would help meet the varying degrees of a treatment area being "visually disturbed" along with other resource PDC.

FW – 568 through FW - 570: Visual PDC 5 and soils PDC would make sure landings work with the VQO prescribed during and after project implementation.

FW – 571: Visual PDC 4 would keep tree stumps at an acceptable height throughout the specified foreground areas of the project where VQOs Retention and Partial Retention occur.

FW – 581: Visual PDC 6 and fuels PDC would keep burn piles in acceptable areas as well as taken care of in a timeframe that meets the associated VQO the pile is located in.

Along with meeting the above Forest wide management directions through PDC incorporation, several other management directions are still met if the implementation of either proposed alternative 1 or 2 are chosen to treat the stands involved with the Grasshopper project.

A5: Visual PDC 1 – 6 when applied to VQO "Retention" areas would not further degrade conditions.

A6: Visual PDC 1 – 6 when applied to VQO "Partial Retention" areas would not further degrade conditions.

B4/B5: Visual PDC 1 – 6 when applied to VQO "Modification" areas would not further degrade conditions.

Inventoried Roadless Areas: Because activities proposed in IRA by both action alternatives were approved (see section 2.1.5) and because activities are consistent with the C1 land use allocation including standards for visual resources, this project is consistent with direction for IRA.

Mt. Hood National Recreation Area: Per the 2009 Omnibus Public Law 111-11, management actions within the Mt. Hood National Recreation Area (NRA) would not degrade the protection, preservation, and enhancement of values for which it was established including scenic values. Applied to the Mt Hood National Forest Plan through a Forest Supervisor's letter (USDA 2016), NRAs had been given the underlying management areas as direction. For the Grasshopper planning area these include A5, A6, and C1. Any management activities occurring in the NRAs would need to meet various standards and guidelines from each resource, including visuals through VQOs. Findings through the viewshed analysis process show little to no impact on VQOs with the implementation of either alternative.

Designated Viewsheds Defined by the Forest Plan (Forest Road 48, White River WSR, Rock Creek Reservoir/Campground): Through the viewshed analysis process, it was determined the Grasshopper project would not impact these viewsheds because varied terrain and not being close in proximity to the project area made Grasshopper units not visible from these viewsheds. No Wild and Scenic River standards and guidelines or other not previously mentioned standards and guidelines would apply due to this outcome.

3.4 – Summary of Effects

Alternative 1 and Alternative 2 would have the following impacts:

- **VQO Preservation:** No impacts to this VQO would occur since no alternatives suggest proposed treatments in Wilderness. As stated in section 2.2.2, this VQO only applies to areas within its associated MA as viewed from within Wilderness, not to areas in other MAs. The Grasshopper project would be visible from the Wilderness, but that would not impact the standards and guidelines of Wilderness from a visual standpoint.

- **VQO Retention:** Slight detraction in visual quality for the MAs needing to meet this VQO would occur due to implementation of either alternative's suite of proposed treatments, not including shelterwood. The proposed shelterwood treatment would not impact VQO Retention as it is proposed only for MAs that need to meet VQO Modification. This slight detraction would be acceptable as the stands currently exhibit fewer natural qualities compared to unmanaged areas or similar areas needing to meet VQO Retention. Through the implementation of the proposed treatments as well as associated PDCs, these stands would be moved to a condition exhibiting more diversity in tree species and age, variability in being more open vs. closed or vice versa, and blending better with the surrounding unmanaged or similarly treated forested landscape. Exhibiting these conditions, visual intrigue as well as the ability to provide a better recreational experience would both increase.

- **VQO Modification:** The proposed treatments of either alternative 1 or 2 would positively impact the proposed units needing to meet VQO Modification. Allowing the evidence of management activities to occur and slightly deviate more from the landscape having natural characteristics, the proposed treatments would meet visual standards faster than the other two VQOs. These proposed treatments would also make

these stands more diverse in species and age, variability in being open vs closed or vice versa, and overall increase stand health. Meeting VQOs at the beginning of the short term, visual differences might not be as apparent compared to the way they would be in VQO Retention and Partial Retention areas. Changes, in the positive direction, would be apparent. A forest visitor would not only benefit recreationally as the land better met their needs, but they would also see how the stands differed among the characteristics mentioned before, increasing visual intrigue. Having the same proposed treatment results as VQO Retention and Partial Retention areas, these VQO Modification areas would have higher visual quality in the long term. Higher visual quality for these areas would translate into working better with the other MAs' VQOs. Landscape continuity would be more prevalent with this outcome, letting a visitor experience more of a contiguous and harmonious forest. Slight differences due to the underlying MA would create variability in the scenery, increasing again, visual intrigue.

A drastic detraction in visuals would occur with the implementation of the proposed shelterwood treatment. Visual quality would degrade having the proposed shelterwood treatments grouped together in one area. Forest visitors traveling along any of the project related routes by these proposed shelterwood treatment units would gain a quick understanding of the changes that occurred in these stands due to the number of differences expressed in a short distance and duration of time. These changes in landscape character would be drastic but acceptable as they occur in areas that need to meet VQO "Modification" and "Partial Retention". These two VQOs allow, to a certain degree and amount of time, for management activities to be more evident as long as the resulting forms, lines, and/or textures borrow qualities characteristic of unmanaged or similarly managed landscapes. In the short term, the results of this proposed treatment would be amplified as forest visitors viewed these stark contrasts in a short distance and time duration against the less visually disturbed results of the other proposed treatments. As these stands matured and gained more natural characteristics that are typical of the area, these stark contrasts would lessen and fade into working with the surrounding proposed treatment results. Looking to the long term, these stands would eventually gain higher visual quality as natural qualities overtook the evidence of management activities. A visitor's recreational experiences would increase throughout the short term to the long term as the stands opened up to provide more areas to recreate in and gained positive differences, mentioned several times throughout this report.

The only area these circumstances and effects described above don't apply would be along the NFG section of trail 466.1 (South Fork Three Mile) that is in proposed unit 151. Implementation of a buffer would keep visuals meeting VQO "Retention". The remaining landscape in the proposed 151 unit would experience effects outlined in the paragraph above.

- **Trail Sensitivity Levels I, II, and III:** Establishing a 100-foot no cut buffer on both sides of trails that are located within or adjacent to the project area would maintain a natural

appearance and enable project activities to meet the Forest Plan-prescribed NFG VQOs (Sensitivity Level I = Retention, Sensitivity Level II = Partial Retention, & Sensitivity Level III = Modification). The 100-foot buffer wouldbe consistent with management direction for visual resources since visibility studies have determined that the potentially visible portions of the landscape along trail corridors are generally limited to 100 feet or less on either side of the trail. As such, project areas beyond the 100-foot buffer would not be visible from the trail due to a combination of topography and existing vegetative screening and would therefore not be subject to the more-restrictive NFG and FFG VQO requirements specified by the Forest Plan for the different trail sensitivity levels. Instead, those portions of the project area beyond the 100-foot buffer would only be subject to VQOs associated with the underlying MA. The direct and indirect effects of Alternatives 1 and 2 on the areas beyond the buffer zone are discussed in the bullets above.

- **Designated Viewsheds Defined by the Forest Plan (Forest Road 48, White River WSR, Rock Creek Reservoir/Campground):** No impact to these designated viewsheds would occur. Looking at the findings from the viewshed analysis, no viewer positions along any of these routes or from a specified, single point would view any proposed unit of Grasshopper. All units, due to proximity to these routes/points and varying terrain differences, would not be “visible”. Higher VQOs established by these designated viewsheds would not apply with these proposed units not being “visible”, so all the proposed treatments would not impact the visuals of these viewsheds.

- **Mt.Hood National Recreation Area:** Gaining visual quality objectives by assuming the most stringent underlying MA’s direction, the NRAs would see slight visual quality degradation. In the short term this would be due to the proposed treatments’ results. Needing to meet VQO Retention, and/or Partial Retention, management activities would be apparent. This would be acceptable as these stands aren’t meeting assigned VQOs to begin with. Through the implementation of the proposed treatments, natural characteristics associated with VQO Retention/Partial Retention would be gained. Over the long term these natural characteristics would be amplified as they integrate and work better with the other similarly managed units and/or surrounding unmanaged areas. In areas where VQO Modification need to be met, the proposed treatments would create stand conditions that meet visual quality standards. Having the same results, the proposed treatments would move these stands to exhibiting characteristics associated with VQO Partial Retention and even VQO Retention. The difference is these beginning VQO modification stands would not have their natural qualities amplified in the long term. as these stands have not been managed for higher visual quality. In the end, all VQO standards would be met and, in some instances, exceeded. Alternatives 1 and 2, excluding the proposed shelterwood treatment, would ultimately create positive impacts on NRA’s.

- **Inventoried Roadless Areas:** Visual quality objectives are not directly assigned to these unique areas. Unlike NRAs that gained all their characteristics from the most stringent underlying MA, there is no such direction for IRAs. Since VQOs are tied to MAs this

report considers the C1 land use allocation because IRAs proposed for treatment are in C1 for which the VQO is Modification. This VQO would be met and results would positively impact visual quality.

4.0 - References Cited

Omnibus Public Land Management Act of 2009. Pub. L.111-11, H. R. 146. March 2009 (Cited in text as (Omnibus 2009))

Special Areas; Roadless Area Conservation; FinalRule. Fed. Reg. Vol 66, No. 9 (January 12, 2001) (to be codified at 36 C. F. R. pts. 294) (Cited in text as (Special Areas 2001))

USDA Forest Service. 1974. "National Forest Landscape Management Volume 2, Chapter 1: The Visual Management System." Washington, D.C. (Cited in text as (USDA 1974))

USDA Forest Service. 1990. "Land and Resource Management Plan: Mt Hood National Forest." Gresham, Oregon. (Cited in text as (USDA 1990))

USDA Forest Service. 2016. Final Omnibus Land Use Allocations Letter. Retrieved November 1, 2021 from https://www.fs.usda.gov/main/mthood/landmanagement/planning (Cited in text as (USDA 2016))

5.0 – Appendix

Sapling Thinning Units (Alternatives 1 and 2) - Visibility Rating Table

Appendix Table 1. 'Visible' and 'Not Visible' areas

Unit	Visibility Rating	Quadrants	Unseen Rating	Quadrants
14	High	All quadrants	Low	NW, NE, SE
15	Medium	NE, SE, SW	Medium	All quadrants
16	Low	SW, NE, SE	High	NW, SW, NE
17	High	All quadrants	Very Low	SW, NE, SE
26	High	All quadrants	Very Low	SW, SE
29	Completely Seen	All quadrants	N/A	No quadrants
31	Medium	NW, SW, NE	Medium	SW, NE, SE
33	Low	NW, SE	High	All quadrants

Unit	Visibility Rating	Quadrants	Unseen Rating	Quadrants
34	High	NW, NE, SE	Low	SW, NE
35	Low	NW, NE, SE	High	NW, SW, SE
36	Medium	All quadrants	Medium	All quadrants
38	High	All quadrants	Very Low	All quadrants
41	Medium	All quadrants	Medium	All quadrants
43	Medium	NW, NE, SE	Medium	NW, SW, NE
44	High	NW, SW, NE	Low	NW, SW, SE
45	High	All quadrants	Low	NW, SW, NE
46	High	All quadrants	Low	NE, SE
51	Medium	All quadrants	Medium	All quadrants
52	High	All quadrants	Very Low	NW, SW
57	Medium	NE, SE, SW	Medium	NW, SW
58	Low	NW, SW, SE	High	NE, SE, SW
59	High	All quadrants	Low	NW, SW
60	High	All quadrants	Low	NE, SE
61	High	NW, SW, SE	Low	NE, SE
62	High	All quadrants	Very Low	NW, SW, NE
65	Low	All quadrants	High	All quadrants
66	Low	All quadrants	High	All quadrants
68	High	All quadrants	Low	NE, SE
73	Medium	All quadrants	Medium	All quadrants
74	Completely Seen	All quadrants	N/A	No quadrants
78	Low	NW, NE	High	All quadrants
80	High	All quadrants	Very Low	NW, SW

Unit	Visibility Rating	Quadrants	Unseen Rating	Quadrants
81	High	All quadrants	Very Low	NE, SE
82	High	All quadrants	Very Low	SW, NE
83	Completely Seen	All quadrants	N/A	No quadrants
86	High	All quadrants	Low	NW, SW
88	High	All quadrants	Low	NW, NE
92	High	All quadrants	Low	NW, NE
95	High	All quadrants	Low	NW, SE
96	High	All quadrants	Very Low	NW, NE, SE
98	High	All quadrants	Low	NW, SW, NE
99	Medium	NE, SE	Medium	NW, SW, SE
100	Medium	SW, SE	Medium	NW, NE, SE
101	Low	NW, NE, SE	High	SW, NE, SE
102	Low	NW, NE	High	All quadrants
103	High	All quadrants	Low	NW, SW
104	Medium	All quadrants	Medium	All quadrants
106	High	All quadrants	Very Low	NW, NE
107	High	All quadrants	Very Low	NE
109	Low	SW, NE, SE	High	NW, SW, SE
110	High	All quadrants	Very Low	NW
111	Completely Seen	All quadrants	N/A	No quadrants
112	Completely Seen	All quadrants	N/A	No quadrants
113	Completely Seen	All quadrants	N/A	No quadrants
114	Completely Seen	All quadrants	N/A	No quadrants
115	Medium	NW, SW, NE	Medium	NW, NE, SE

Unit	Visibility Rating	Quadrants	Unseen Rating	Quadrants
116	Medium	SW, SE	Medium	NW, NE, SE
117	Medium	SW, SE	Medium	NW, NE
118	Medium	NW, SW, SE	Medium	SW, NE, SE
119	Medium	NW, NE, SE	Medium	SW, NE, SE
120	Low	NW, NE, SE	High	NW, SW, NE
121	High	All quadrants	Low	NE, SE
122	Low	NW, NE	High	NW, SW, NE
123	High	SW, NE, SE	Low	NW, NE
126	High	All quadrants	Low	SW, SE
127	High	All quadrants	Low	SW, SE
128	Medium	NE, SE, SW	Medium	All quadrants
131	Medium	NE, SE	Medium	NW, NE, SE
134	Medium	NW, SW, SE	Medium	SW, NE, SE
136	High	All quadrants	Very Low	NW, NE
138	Low	NW, NE, SE	High	All quadrants
139	High	All quadrants	Very Low	SW, SE
166	High	NW, SW, SE	Very Low	NE
262	Medium	All quadrants	Medium	All quadrants
263	Low	NW, SW, SE	High	NE, NW, SW
265	High	All quadrants	Low	NE, SW

Variable Density Thinning from Below Units (Alternative 1) and Shelterwood Units* (Alternative 2) - Visibility Rating Table

Appendix Table 2. 'Visible' and 'Not Visible' areas

Unit	Visibility Rating	Quadrants	Unseen Rating	Quadrants
1	High	SW, NE, SE	Low	NW, NE
2	High	All quadrants	Very Low	NE
3	High	NW, NE, SE	Low	SW, NE
4	High	All quadrants	Very Low	SW
5	High	NW, SW, SE	Low	NE, SE
6	High	All quadrants	Low	SW, NE, SE
7	Medium	NW, SE	Medium	SW, NE
8	Low	SW, SE	High	NW, NE, SE
9	High	All quadrants	Very Low	SW
10	High	All quadrants	Low	SW, SE
11	High	All quadrants	Very Low	NW
12	High	All quadrants	Low	SW, SE
13	High	NW, NE, SE	Low	SW, NE, SE
21	Low	All quadrants	High	All quadrants
22	High	All quadrants	Very Low	SE
23	High	NW, NE, SE	Low	NW, SW, SE
24	Medium	SW, NE, SE	Medium	NW, NE, SE
27	Low	NE, SE	High	NW, SW
28	Low	All quadrants	High	All quadrants
30	Completely Seen	All quadrants	N/A	No quadrants
40	Low	SE	High	NW, SW, NE
42	High	NW, SW, NE	Low	NW, SW, SE
75	High	NW, NE, SE	Low	SW
76	High	All quadrant	Low	NE, SE

Unit	Visibility Rating	Quadrants	Unseen Rating	Quadrants
77	High	All quadrants	Very Low	SE
84	High	All quadrants	Low	NE
91	High	All quadrants	Very Low	NW, NE
93	High	All quadrants	Very Low	SW, NE, SE
94	High	NW, SW, SE	Low	NW, NE
135	High	NW, NE, SE	Low	SW
141	High	NW, SW, NE	Low	SW, SE
147	High	All quadrants	Low	SW, SE
148	Medium	NW, NE	Medium	SW, SE
149	Medium	NE, SE	Medium	NW, SW
150	High	All quadrants	Low	SW
151*	High	All quadrants	Very Low	NW, NE, SE
155	High	SW, NE, SE	Low	NW, NE, SE
157	High	All quadrants	Low	NW, SW, SE
159	High	All quadrants	Low	NW, SE
161	High	All quadrants	Low	NE, SE
163*	High	All quadrants	Low	SW, SE
168	High	All quadrants	Low	NW
173*	High	All quadrants	Low	NW, SW
180	High	All quadrants	Very Low	SE
182	High	All quadrants	Low	NW, SE
184*	High	All quadrants	Low	NW, SW, NE
186	High	All quadrants	Very Low	NE
187	High	All quadrants	Low	NW, SW, NE

Unit	Visibility Rating	Quadrants	Unseen Rating	Quadrants
190	High	All quadrants	Low	NW, SW
191*	High	All quadrants	Low	SW, SE
193	High	All quadrants	Very Low	NW, SW, NE
195	Low	NW, SW	High	NE, SE
201*	High	All quadrants	Low	NW, SW
203	Low	SE	High	All quadrants
204	High	All quadrants	Very Low	SW
205	Medium	NW, NE	Medium	SW, SE
206	Medium	NE, SE	Medium	NW, SW
208	High	NW, NE	Very Low	SW, SE
210	High	All quadrants	Low	SW, SE
211	High	SW, SE	Low	NW
213	Medium	NW, SW, NE	Medium	NW, SW, SE
214	High	NW, SW, SE	Low	NE
219*	High	All quadrants	Low	NW, SW
220	High	All quadrants	Very Low	SW, NE
221	Medium	NW, SW	Medium	NE, SE
222	High	All quadrants	Low	NE, SE
223*	High	All quadrants	Very Low	NE
226*	High	All quadrants	Low	NE, SE
228	Medium	SW, SE	Medium	NW, NE
231	High	All quadrants	Low	SW, NE, SE
232	Medium	All quadrants	Medium	All quadrants
235	Low	SW	High	NW, NE, SE

Unit	Visibility Rating	Quadrants	Unseen Rating	Quadrants
250	High	All quadrants	Very Low	NW
251	Low	SW	High	NW, NE, SE
270	High	All quadrants	Very Low	All quadrants
271	High	All quadrants	Very Low	NW, SW
272*	High	All quadrants	Very Low	All quadrants
273	Low	SW, NE, SE	High	NW, SW, SE
276	High	All quadrants	Very Low	NW, NE
277	Medium	NW, SW	Medium	NW, NE, SE

Intermediate Thinning Units (Alternatives 1 and 2) - Visibility Rating Table

Appendix Table 3. 'Visible' and 'Not Visible' areas

Unit	Visibility Rating	Quadrants	Unseen Rating	Quadrants
18	High	All quadrants	Low	All quadrants
20	High	All quadrants	Low	All quadrants
32	High	All quadrants	Very Low	SW, NE
53	Completely Seen	All quadrants	N/A	No quadrants
54	Low	All quadrants	High	All quadrants
55	High	All quadrants	Very Low	NW, SW
56	High	All quadrants	Low	NW, SW
67	Medium	SW, SE	Medium	NW, SW, NE
79	High	All quadrants	Very Low	NW, NE, SE
90	High	All quadrants	Very Low	NW, NE, SE
97	High	All quadrants	Low	All quadrants
260	Completely Seen	All quadrants	N/A	No quadrants

Unit	Visibility Rating	Quadrants	Unseen Rating	Quadrants
261	Medium	SW, NE, SE	Medium	NW, SW
264	Medium	SW, NE, SE	Medium	NW, NE, SE