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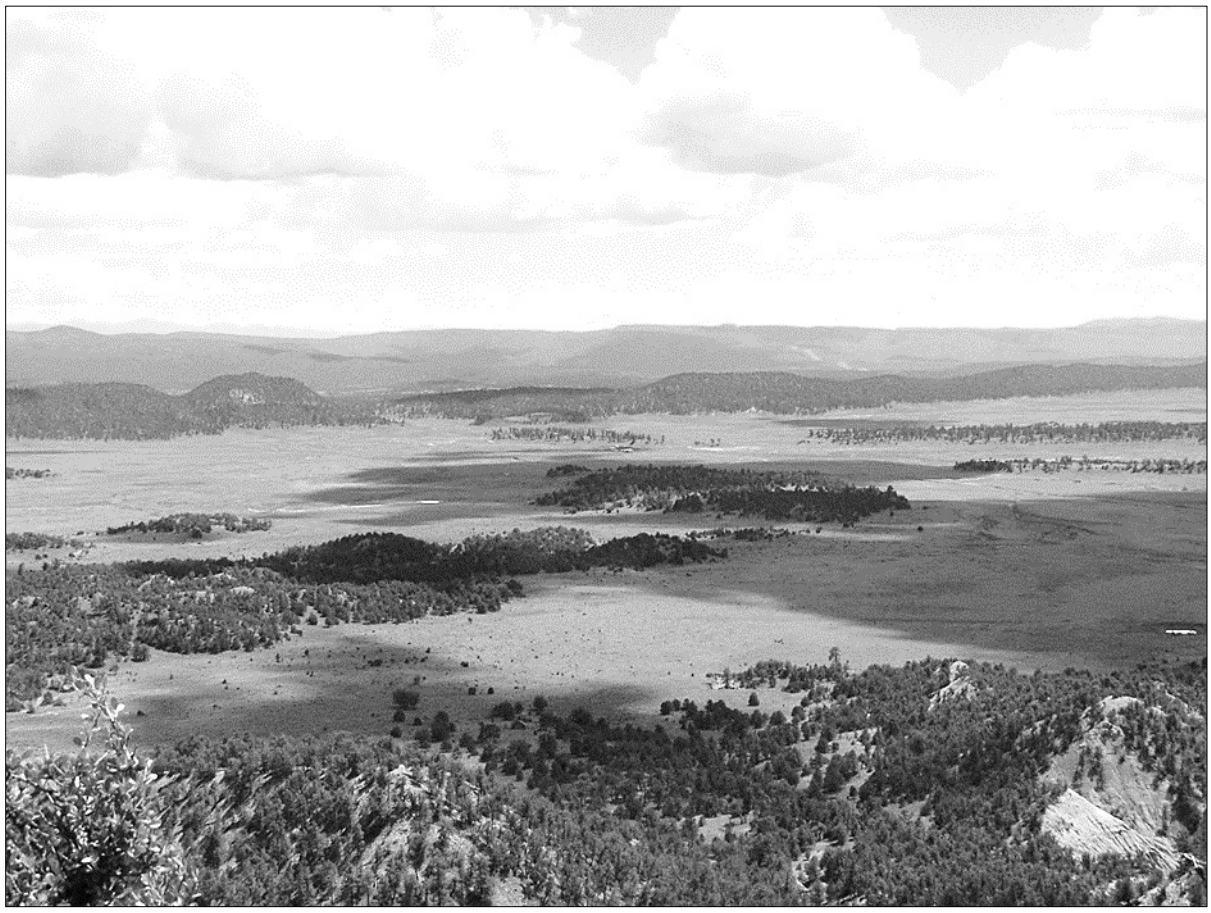
Luna Restoration Project

Errata to the Final Environmental Impact Statement



Forest Service Apache National Forest (Administered by the Gila National Forest
Quemado Ranger District November 2019

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Cover photo is from the northern portion of Luna planning area. View looking east and south of Spur Lake Basin taken from a point near Bill Knight Gap. To the left is Freeman and Dillon Mountains and to the right is Bishop Mountain. The ranch in the middle is part of the Spur Lake Cattle Company called Gribble Head Quarters.

Commonly Used Acronyms:

BA	basal area
DBH	diameter at breast height
DIA	diameter (for down trees or tree pieces)
DRC	diameter at root collar
VSS	vegetation structural stage

Luna Restoration Project
Final Environmental Impact Statement

Errata Sheet
November 2019

Introduction

The Luna Restoration Project Final Environmental Impact Statement was released in May 2019. This errata sheet documents corrections or more clarifying information identified in the instructions from the objection response letters to the published final environmental impact statement. This document should be reviewed along with the final environmental impact statement. Where it would assist the reader to more easily follow the additions or corrections to the final environmental impact statement tracked changes are used (underlined additions and crossed-out deletions), unless specified that entire sections are being added. There are no changes to the project or significant new circumstances or information identified in this errata sheet that affect the analysis and conclusion in the Luna Restoration Project Final Environmental Impact Statement.

Old Growth Stand Structure Attributes (Errata 1–4)

During the objection review process, there was concern regarding the definition of old trees in the ponderosa pine vegetation cover type to be 180 years old. This was considered inconsistent with other projects in the southwest, including 4FRI, which considered old trees to be 150 year or older. The final environmental impact statement was found to be lacking an explanation for the definition of old trees used in the Luna Restoration Project.

Although the Luna Restoration Project is not required to be consistent with other project plans and decisions, such as 4FRI, instructions were provided to: amend tables to include forest plan definitions for ponderosa pine old growth on high site forest lands; define and clarify the age of old trees, and retention and management treatments of old trees.

Errata 1 – Table Amendment: Chapter 1, Page 10, Table 6

Table 6. Existing and desired old growth structural attributes by cover type group expressed in percentage of area within Luna planning area

Old Growth Group	Minimum Criteria of Structural Attributes[1]	Percentage Existing Condition of Designated 20% Old Growth Area	Percentage Desired Condition of Designated 20% Old Growth Area
Ponderosa pine (live trees in main canopy)	Low Site: 20 live trees in main canopy at least 14 inches in diameter at breast height (DBH). Age (years) 180 High Site: 20 live trees in main canopy at least 18 inches DBH. Age (years) 180	68[2]	100

Old Growth Group	Minimum Criteria of Structural Attributes[1]	Percentage Existing Condition of Designated 20% Old Growth Area	Percentage Desired Condition of Designated 20% Old Growth Area
Ponderosa pine (dead trees)	Low Site: 1 standing dead tree per acre at least 14 inches DBH and at least 15 feet; 2 down dead pieces per acre at least 12 inches diameter (DIA) and at least 15 feet High Site: 1 standing dead tree per acre at least 14 inches DBH and at least 25 feet; 2 down dead pieces per acre at least 12 inches DIA and at least 15 feet	46[3]	100
Ponderosa pine (total basal area, square feet per acre)	Low Site: 70 square feet per acre total basal area High Site: 90 square feet per acre total basal area	98	100
Ponderosa pine (total canopy cover percent)	Low Site: 40% total canopy cover High Site: 50% total canopy cover	34	100
Ponderosa pine	~~Percent area simultaneously meeting all attributes~~[2] Simultaneously meeting all known old growth variables	12	100
Mixed-species (live trees in main canopy)	Low Site: 12~~-16~~ live trees in main canopy at least 18 inches DBH. Age (years) 150 High Site: 16 live trees in main canopy at least 20 inches DBH. Age (years) 150	45[2]	100
Mixed-species (dead trees)	Low Site: 2.5 standing dead tree per acre at least 14 inches DBH and at least 20 feet; 4 down dead pieces per acre at least 16 inches DIA and at least 15 feet High Site: 2.5 standing dead tree per acre at least 16 inches DBH and at least 25 feet; 4 down dead pieces per acre at least 16 inches DIA and at least 15 feet	85[3]	100
Mixed-species (total basal area, square feet per acre)	Low Site: 80 ~~to 100~~ square feet per acre total basal area High Site: 100 square feet per acre total basal area	100	100
Mixed-species (total canopy cover percent)	Low Site: 50% ~~to 60%~~ total canopy cover High Site: 60% total canopy cover	43	100
Mixed-species	~~Percent area simultaneously meeting all attributes~~[2] Simultaneously meeting all known old growth variables	19	100
Woodland (live trees in main canopy)	Low Site: 12 ~~to 30~~ live trees in main canopy at least 9 inches in diameter at root collar (DRC). Age (years) 150 High Site: 30 live trees in main canopy at least 12 inches DRC. Age (years) 200	99[2]	100

Old Growth Group	Minimum Criteria of Structural Attributes[1]	Percentage Existing Condition of Designated 20% Old Growth Area	Percentage Desired Condition of Designated 20% Old Growth Area
Woodland (dead trees)	Low Site: 0.5 ~~1~~ standing dead tree per acre at least 9 inches DRC and at least 8 feet; 2 down dead pieces per acre at least 9 inches DIA and at least 8 feet High Site: 1 standing dead tree per acre at least 10 inches DRC and at least 10 feet; 2 down dead pieces per acre at least 10 inches DIA and at least 10 feet	88[3]	100
Woodland (total basal area, square feet per acre)	Low Site: 6 ~~to 24~~ square feet per acre total basal area High Site: 24 square feet per acre total basal area	100	100
Woodland (total canopy cover percent)	Low Site: 20% ~~to 35%~~ total canopy cover High Site: 35% total canopy cover	97	100
Woodland	~~Percent area simultaneously meeting all attributes~~[2] Simultaneously meeting all known old growth variables	87	100

1 – Low site productivity values were used ~~as threshold~~ for each old-growth group for the Luna planning area.

2 – ~~Age and down dead trees are unknown for the group.~~ Tree age data was not collected; therefore, trees in main canopy may be younger or older than the age for minimum stand structural attributes.

3 – Down dead woody debris data was not collected; therefore, the amount present within the analysis area is unknown.

Errata 2 – Table Amendment: Chapter 3, Page 67, Table 36

Table 36. Percentage of designated 20% (identified) old growth area meeting minimum criteria of structural attributes by group from existing through 20 and 40 years under alternative A, no action

Old Growth Group	Minimum Criteria of Structural Attributes[1]	Percentage of Identified Old Growth Area – Existing Condition	Percentage of Identified Old Growth Area – 20 years	Percentage of Identified Old Growth Area – 40 years
Ponderosa pine (live trees in main canopy)	Low Site: 20 live trees in main canopy at least 14 inches in diameter at breast height (DBH). Age (years) 180 High Site: 20 live trees in main canopy at least 18 inches DBH. Age (years) 180	68[2]	91[2]	98[2]
Ponderosa pine (dead trees)	Low Site: 1 standing dead tree per acre at least 14 inches DBH and at least 15 feet; 2 down dead pieces per acre at least 12 inches diameter (DIA) and at least 15 feet High Site: 1 standing dead tree per acre at least 14 inches DBH and at least 25 feet; 2 down dead pieces per acre at least 12 inches DIA and at least 15 feet	46[3]	36[3]	61[3]
Ponderosa pine (total basal area, square feet per acre)	Low Site: 70 square feet per acre total basal area High Site: 90 square feet per acre total basal area	98	99	100

Old Growth Group	Minimum Criteria of Structural Attributes[1]	Percentage of Identified Old Growth Area – Existing Condition	Percentage of Identified Old Growth Area – 20 years	Percentage of Identified Old Growth Area – 40 years
Ponderosa pine (total canopy cover percent)	Low Site: 40% total canopy cover High Site: 50% total canopy cover	34	48	70
Ponderosa pine	~~Percent area simultaneously meeting all attributes[2]~~ Simultaneously meeting all known old growth variables	12	15	31
Mixed-species (live trees in main canopy)	Low Site: 12~~-16~~ live trees in main canopy at least 18 inches DBH. Age (years) 150 High Site: 16 live trees in main canopy at least 20 inches DBH. Age (years) 150	45[2]	59[2]	75[2]
Mixed-species (dead trees)	Low Site: 2.5 standing dead tree per acre at least 14 inches DBH and at least 20 feet; 4 down dead pieces per acre at least 16 inches DIA and at least 15 feet High Site: 2.5 standing dead tree per acre at least 16 inches DBH and at least 25 feet; 4 down dead pieces per acre at least 16 inches DIA and at least 15 feet	85[3]	40[3]	19[3]
Mixed-species (total basal area, square feet per acre)	Low Site: 80 ~~to 100~~ square feet per acre total basal area High Site: 100 square feet per acre total basal area	100	100	100
Mixed-species (total canopy cover percent)	Low Site: 50% ~~to 60%~~ total canopy cover High Site: 60% total canopy cover	43	51	64
Mixed-species	~~Percent area simultaneously meeting all attributes[2]~~ Simultaneously meeting all known old growth variables	19	12	12
Woodland (live trees in main canopy)	Low Site: 12 ~~to 30~~ live trees in main canopy at least 9 inches in diameter at root collar (DRC). Age (years) 150 High Site: 30 live trees in main canopy at least 12 inches DRC. Age (years) 200	99[2]	100[2]	100[2]
Woodland (dead trees)	Low Site: 0.5 ~~1~~ standing dead tree per acre at least 9 inches DRC and at least 8 feet; 2 down dead pieces per acre at least 9 inches DIA and at least 8 feet High Site: 1 standing dead tree per acre at least 10 inches DRC and at least 10 feet; 2 down dead pieces per acre at least 10 inches DIA and at least 10 feet	88[3]	99[3]	96[3]
Woodland (total basal area, square feet per acre)	Low Site: 6 ~~to 24~~ square feet per acre total basal area High Site: 24 square feet per acre total basal area	100	100	100
Woodland (total canopy cover percent)	Low Site: 20% ~~to 35%~~ total canopy cover High Site: 35% total canopy cover	97	97	99

Old Growth Group	Minimum Criteria of Structural Attributes[1]	Percentage of Identified Old Growth Area – Existing Condition	Percentage of Identified Old Growth Area – 20 years	Percentage of Identified Old Growth Area – 40 years
Woodland	~~Percent area simultaneously meeting all attributes~~[2] Simultaneously meeting all known old growth variables	87	96	95

1 – Low site productivity values were used ~~as threshold~~ for each old-growth group for the Luna planning area.

2 – ~~Age and down dead trees are unknown for the group~~. Tree age data was not collected; therefore, trees in main canopy may be younger or older than the age for minimum stand structural attributes.

3 – Down dead woody debris data was not collected; therefore, the amount present within the analysis area is unknown.

Errata 3 – Table Amendment: Chapter 3, Page 73, Table 42

Table 42. Percentage of designated 20% (identified) old growth area meeting minimum criteria of structural attributes by group in 1, 20, and 40 years post-harvest under alternatives B, C, and D

Old Growth Group	Minimum Criteria of Structural Attributes[1]	Percentage of Identified Old Growth Area – 1 year post-harvest	Percentage of Identified Old Growth Area – 20 years post-harvest	Percentage of Identified Old Growth Area – 40 years post-harvest
Ponderosa pine (live trees in main canopy)	Low Site: 20 live trees in main canopy at least 14 inches in diameter at breast height (DBH). Age (years) 180 High Site: 20 live trees in main canopy at least 18 inches DBH. Age (years) 180	68[2]	89[2]	95[2]
Ponderosa pine (dead trees)	Low Site: 1 standing dead tree per acre at least 14 inches DBH and at least 15 feet; 2 down dead pieces per acre at least 12 inches diameter (DIA) and at least 15 feet High Site: 1 standing dead tree per acre at least 14 inches DBH and at least 25 feet; 2 down dead pieces per acre at least 12 inches DIA and at least 15 feet	46[3]	37[3]	62[3]
Ponderosa pine (total basal area, square feet per acre)	Low Site: 70 square feet per acre total basal area High Site: 90 square feet per acre total basal area	95	95	96
Ponderosa pine (total canopy cover percent)	Low Site: 40% total canopy cover High Site: 50% total canopy cover	31	41	55
Ponderosa pine (total basal area, square feet per acre)	~~Percent area simultaneously meeting all attributes~~[2] Simultaneously meeting all known old growth variables	13	16	30
Mixed-species (live trees in main canopy)	Low Site: 12~~–16~~ live trees in main canopy at least 18 inches DBH. Age (years) 150 High Site: 16 live trees in main canopy at least 20 inches DBH. Age (years) 150	46[2]	59[2]	75[2]

Old Growth Group	Minimum Criteria of Structural Attributes[1]	Percentage of Identified Old Growth Area – 1 year post-harvest	Percentage of Identified Old Growth Area – 20 years post-harvest	Percentage of Identified Old Growth Area – 40 years post-harvest
Mixed-species (dead trees)	Low Site: 2.5 standing dead tree per acre at least 14 inches DBH and at least 20 feet; 4 down dead pieces per acre at least 16 inches DIA and at least 15 feet High Site: 2.5 standing dead tree per acre at least 16 inches DBH and at least 25 feet; 4 down dead pieces per acre at least 16 inches DIA and at least 15 feet	45[3]	48[3]	55[3]
Mixed-species (total basal area, square feet per acre)	Low Site: 80 ~~to 100~~ square feet per acre total basal area High Site: 100 square feet per acre total basal area	53	100	100
Mixed species (total canopy cover percent)	Low Site: 50% ~~to 60%~~ total canopy cover High Site: 60% total canopy cover	22	52	64
Mixed-species	~~Percent area simultaneously meeting all attributes[2]~~ Simultaneously meeting all known old growth variables	10	12	12
Woodland (live trees in main canopy)	Low Site: 12 ~~to 30~~ live trees in main canopy at least 9 inches in diameter at root collar (DRC). Age (years) 150 High Site: 30 live trees in main canopy at least 12 inches DRC. Age (years) 200	99[2]	100[2]	100[2]
Woodland (dead trees)	Low Site: 0.5 ~~1~~ standing dead tree per acre at least 9 inches DRC and at least 8 feet; 2 down dead pieces per acre at least 9 inches DIA and at least 8 feet High Site: 1 standing dead tree per acre at least 10 inches DRC and at least 10 feet; 2 down dead pieces per acre at least 10 inches DIA and at least 10 feet	88[3]	95[3]	97[3]
Woodland (total basal area, square feet per acre)	Low Site: 6 ~~to 24~~ square feet per acre total basal area High Site: 24 square feet per acre total basal area	100	100	100
Woodland (total canopy cover percent)	Low Site: 20% ~~to 35%~~ total canopy cover High Site: 35% total canopy cover	97	93	99
Woodland	~~Percent area simultaneously meeting all attributes[2]~~ Simultaneously meeting all known old growth variables	87	87	96

1 – Low site productivity values were used ~~as threshold~~ for each old-growth group for the Luna planning area.

2 – ~~Age and down dead trees are unknown for the group~~. Tree age data was not collected; therefore, trees in main canopy may be younger or older than the age for minimum stand structural attributes.

3 – Down dead woody debris data was not collected; therefore, the amount present within the analysis area is unknown.

Errata 4 – Definition and Treatments: Chapter 2, Page 21

Insert all of the following text after second full paragraph

As defined by the Gila Forest Plan as amended (1986), old ponderosa pine trees are considered to be 180 years old. For this project, a tree 180 years old is considered an old tree. The Luna Project is designed to retain old trees within and outside of old growth management areas. For old trees outside of old growth management areas, trees greater than 180 years old will only be cut where there are safety concerns (hazard trees) or where trees are highly infected by insect or disease.

For old trees in treatment areas selected for old growth management, the following would apply:

- Ponderosa pine low site – would be managed for 20 trees per acre greater than or equal to 14 inches DBH, and approximately 180 years of age or greater over time to a basal area of 70 square feet per acre. At least 1 dead standing tree 14 inches DBH and 15 feet tall and 2 down dead pieces (logs) 12 inches or larger in diameter and 15 feet long would be retained. If no standing dead tree is available, a dying tree would be retained. The target canopy cover is 40 percent.
- Ponderosa pine high site – would be managed for 20 trees per acre greater than or equal to 18 inches DBH, and approximately 180 years of age or greater over time to a basal area of 90 square feet per acre. At least 1 dead standing tree 14 inches DBH and 25 feet tall and 2 down dead pieces (logs) 12 inches or larger in diameter and 15 feet long would be retained. If no standing dead tree is available, a dying tree would be retained. The target canopy cover is 50 percent.
- Mixed species group low site – would be managed for 12 trees per acre greater than or equal to 18 inches DBH, and approximately 150 years of age or greater over time to a basal area of 80 square feet per acre. At least 2.5 dead standing trees 14 inches DBH and 20 feet tall and 4 down dead pieces (logs) 12 inches or larger in diameter and 16 feet long would be retained. If no standing dead tree is available, a dying tree would be retained. The target canopy cover is 50 percent.
- Mixed species group high site – would be managed for 16 trees per acre greater than or equal to 20 inches DBH, and approximately 150 years of age or greater over time to a basal area of 100 square feet per acre. At least 2.5 dead standing tree 16 inches DBH and 25 feet tall and 4 down dead pieces (logs) 12 inches or larger in diameter and 16 feet long would be retained. If no standing dead tree is available, a dying tree would be retained. The target canopy cover is 60 percent.
- Piñon-Juniper low site – would be managed for 12 trees per acre greater than or equal to 9 inches DRC, and approximately 150 years of age or greater over time to a basal area of 6 square feet per acre. At least 0.5 dead standing tree 9 inches DRC and 8 feet tall and 2 down dead pieces (logs) 9 inches or larger in diameter and 8 feet long would be retained. If no standing dead tree is available, a dying tree would be retained. The target canopy cover is 20 percent.
- Piñon-Juniper high site – would be managed for 30 trees per acre greater than or equal to 12 inches DRC, and approximately 200 years of age or greater over time to a basal area of 24 square feet per acre. At least 1 dead standing tree 10 inches DRC and 10 feet tall and 2 down dead pieces (logs) 10 inches or larger in diameter and 10 feet long would be retained. If no standing dead tree is available, a dying tree would be retained. The target canopy cover is 35 percent.

Even-Aged Regeneration Treatments (Errata 5)

During the objection review process, there was concern that even-aged management treatments for mistletoe or areas of high insect and other disease was not clearly described including what areas and under what conditions. Instructions are to provide clarification of conditions and associated treatment descriptions.

Errata 5 – Clarification: Chapter 2, Page 21

Insert all of the following text above "Grassland – Maintenance and Restoration"

Dwarf Mistletoe – Even-Aged Treatments

Based upon the stands sampled, dwarf mistletoe infection ranging from light to severe extends over approximately 50 percent of the planning area (Vegetation (Silviculture) Report, appendix 5). Even-aged prescriptions are recommended when treating moderately to heavily infected stands, where greater than 20 percent of the host trees or 25 percent of the area is infected. These prescriptions should provide an irregular spacing of leave trees, and can tend toward clumpy, groupy stand structures. Regeneration is not an objective until maturity or beyond.

- Even-aged prescriptions (intermediate thinnings) should generally focus on retaining the best dominant and codominant trees with the least amount of mistletoe. Improved growth and vigor of the best trees is a primary objective. Intermediate thinnings would hasten the development of larger trees—including larger infected trees often now deficient on the landscape. Eventually, some proportion of these stands would be regenerated and replaced and then, over time, converted to an uneven-age condition.
- Silvicultural prescriptions for moderately infested stands should be flexible. For example, for stands where infection is patchy and does not greatly exceed our suggested "break point" (20 percent infection rate, see above), any existing uneven-age structure could be maintained within uninfested portions. The terms even-age and uneven-age are scale dependent, and are often not ideal descriptions of stands or areas (Bradford 1992[1]).
- Intermediate (sanitation) thinnings are usually not recommended for severely infested stands, that is, where more than about 80 percent of the host trees or 90 percent of the area is infected. These stands are often best replaced or deferred from mechanical treatment. However, a third option for some stands is thin from below, which (to some extent) mimics the effect of low-intensity fire and does not greatly stimulate the mistletoe in the remaining trees.
- Shelterwood seed cuts are a good option for management of some heavily infested stands in the Southwest. These treatments generally retain the largest, most vigorous trees as a seed source for natural regeneration. Spacing of seed trees can be highly irregular, and groups of larger trees can be retained. Once the site has regenerated, the standard recommendation has been to remove all infected seed trees before the regeneration is 3 feet tall, or 10 years old, whichever comes first (Hawksworth and Wiens 1996[2]).

[1] Bradford, F.J. 1992. Quantifying edge effect and patch size for multiple use silviculture—a discussion paper. Forest Ecology and Management. 48(1-3): 249-264.

[2] Hawksworth, F.G.; Wiens, D. 1996. Dwarf mistletoes: biology, pathology, and systematics. Agricultural Handbook 709. Washington, DC: U.S. Department of Agriculture, Forest Service. 410 p.

Vegetation Structural Stage – Fine Scale Filter (Errata 6)

During the objection review process, concern was expressed that the vegetation structural stage (VSS) displayed in table 3 indicated a deficiency in stands of large, old trees, and a surplus of small, young trees. It was found that results displayed in table 3 used a broad scale filter of the data resulting in the values not reflective of conditions in the Luna planning area. Instructions were provided to describe the current and projected post-treatment forest structure at a finer scale plot level to better explain the current and future (post-treatment) VSS condition.

Errata 6 – Clarification: Chapter 3, Page 72

Add all of the following text and tables after the end of the Vegetation Structural Stage section

Vegetation Structural Stage – Fine Scale Filter

The previous vegetation structural stage section presents a broad scale filter discussion for the vegetative structural stage for the Luna planning area. It is based on average stand conditions and a subset of inventoried stands. The broad scale analysis does not evaluate species composition of the vegetation structural stage (VSS) classes and includes all species in the landscape percentages. Much of the understory vegetation (VSS 1 and VSS 2) in this area is dominated by piñon pine, juniper, gray oak, Gambel oak, New Mexico locust, and mountain mahogany, with little or no ponderosa pine regeneration present. A minor aspen, southwestern white pine, and Douglas-fir tree component may also be present adjacent to mixed conifer areas. To obtain the desired goshawk habitat structure over time in ponderosa pine forests, it is essential to have ponderosa pine represented in VSS 1 and VSS 2.

The broad scale analysis estimates that 60 percent of the area currently has an even-aged structure and 40 percent of the area currently has an uneven-aged structure but does not clarify how the ponderosa pine VSS classes are distributed in even and uneven-aged stands, which has a bearing on the distribution of VSS across the landscape. For instance, large localized openings VSS 1 created by stand-replacement wildfire or shelterwood and seed cuts would be considered even-aged structure, while small openings VSS 1 scattered across the landscape created by wildfire or selection and group selection cuts would contribute to uneven-aged structure. Even-aged stands with a VSS class of 1, 2, 3, 4, 5, or 6 would consist of the majority of trees in one or two of these classes while an uneven-aged stand would consist of a more diverse distribution of the VSS classes.

As species composition and even- and uneven-aged structures and management of these structures differ, information from a finer filter approach (Vegetation (Silviculture) Report appendix 4) is also being addressed.

The intent in managing forest structure is to move existing VSS distribution in the uneven-aged stands towards the desired distribution, and to convert all existing even-aged stands to uneven-aged stands with balanced VSS distribution over time by management treatments.

Existing Condition

When reviewing the fine scale data, which includes all sample plots including areas receiving no treatment, actual percentage of VSS differs from the broad scale analysis when all species are included. This is consistent with the landscape distribution of VSS displayed in the final environmental impact statement table 3, page 8. The percentage differences are due to scale of analysis and the exclusion of the 6 percent large even-aged stands created during the Wallow Fire.

When looking at all species, the Vegetation (Silviculture) Report appendix 4, table 01 shows a surplus in VSS 1, 3, and 4, while deficit in VSS 2, 5, and 6. In comparison, when looking at just ponderosa pine, the surplus is in VSS 3, 4, and 5 with deficits in VSS 1, 2, and 6.

Table 01. Luna project area – all sample plots (419 plots) in ponderosa pine goshawk habitat (fine scale analysis – includes no treatment plots)

Vegetative Structure Stage (VSS)	Tree Distribution All Species (% of plots)	Existing % VSS All Species	Existing % BA All Species	Tree Distribution Ponderosa Pine (% of plots)	Existing % VSS Ponderosa Pine	Existing % BA Ponderosa Pine
VSS 1 Grass/Forb/Shrubs (0.0–0.9 inches DBH/DRC)	37	*12	Not applicable	13	*5	Not applicable
VSS 2 Seedling/Sapling (1.0–4.9 inches DBH/DRC)	24	8	Not applicable	13	6	Not applicable
VSS 3 Young Forest (5.0–11.9 inches DBH/DRC)	77	25	40	69	28	39
VSS 4 Mid aged Forest (12.0–17.9 inches DBH/DRC)	82	27	37	77	31	39
VSS 5 Mature Forest (18.0–23.9 inches DBH/DRC)	55	18	15	51	21	16
VSS 6 Old Forest (24 inches + DBH/DRC)	30	10	8	23	9	6

* Does not include 6 percent (landscape level) created by the Wallow Fire.

Treatment Areas: VSS 3 and 4 would be targeted for creating openings. The remaining VSS classes would be targeted for thinning. During implementation when the trees overtopping VSS 1 and 2 are VSS 3 and 4, and the VSS 1 and 2 are healthy groupings of trees, the VSS 1 and 2 groupings would be released by cutting the VSS 3 and 4 trees in the overstory. VSS 5 and 6 are limited in the area; therefore, if VSS 1 and 2 are in the understory of VSS 5 and 6, the VSS 1 and 2 would most likely be cut and VSS 5 and 6 groupings thinned if appropriate (following guidance for old and large trees, appendix 3 of the Vegetation (Silviculture) Report). In areas where it is not feasible to remove the overstory to release VSS 1 and 2 trees, new regeneration openings would be created in VSS 3 or 4 adjacent to an adequate seed source of VSS 4, 5, or 6.

Tables in the Vegetation (Silviculture) Report appendix 4 show ponderosa pine even-aged treatment stands (table 02) with VSS 3 and 4 in surplus and VSS 1, 2, 5 and 6 in deficit; and show ponderosa pine uneven-aged treatment stands (table 03) with VSS 3, 4, and 5 in surplus and VSS 1, 2 and 6 in deficit.

Table 02. Luna project area – all sample plots (245 plots) even-aged treatment stands in ponderosa pine goshawk habitat (fine scale analysis)

Vegetative Structure Stage (VSS)	Tree Distribution Ponderosa Pine (% of plots)	Existing % VSS Ponderosa Pine	Existing % BA Ponderosa Pine
VSS 1 Grass/Forb/Shrubs (0.0–0.9 inches DBH/DRC)	*12	5	Not applicable
VSS 2 Seedling/Sapling (1.0–4.9 inches DBH/DRC)	15	6	Not applicable
VSS 3 Young Forest (5.0–11.9 inches DBH/DRC)	75	31	44
VSS 4 Mid aged Forest (12.0–17.9 inches DBH/DRC)	81	33	40
VSS 5 Mature Forest (18.0–23.9 inches DBH/DRC)	45	18	12
VSS 6 Old Forest (24 inches + DBH/DRC)	17	7	4

* Does not include 6 percent (landscape level) created by the Wallow Fire.

Table 03. Luna project area – all sample plots (160 plots) uneven-aged treatment stands in ponderosa pine goshawk habitat (fine scale analysis)

Vegetative Structure Stage (VSS)	Tree Distribution Ponderosa Pine (% of plots)	Existing % VSS Ponderosa Pine	Existing % BA Ponderosa Pine
VSS 1 Grass/Forb/Shrubs (0.0–0.9 inches DBH/DRC)	15	6	Not applicable
VSS 2 Seedling/Sapling (1.0–4.9 inches DBH/DRC)	12	5	Not applicable
VSS 3 Young Forest (5.0–11.9 inches DBH/DRC)	62	24	31
VSS 4 Mid aged Forest (12.0–17.9 inches DBH/DRC)	74	28	35
VSS 5 Mature Forest (18.0–23.9 inches DBH/DRC)	64	25	23
VSS 6 Old Forest (24 inches + DBH/DRC)	32	12	11

Post Treatment

In the Vegetation (Silviculture) Report appendix 4, post-treatment conditions are displayed for ponderosa pine species for both even-aged treatment stand plot data and uneven-aged treatment stand plot data (table 04 and table 05). Basal area information for ponderosa pine is given for post treatment (1 to 5 years following treatment), and VSS distribution is displayed for all post-treatment years.

In even-aged ponderosa pine stands at 1 to 5 years following treatment (table 04), VSS 1 would be at desired conditions; VSS 3 and 4 in surplus; and VSS 2, 5 and 6 in deficit. At 20 years following treatment, VSS 5 would be at desired conditions; VSS 3 and 4 in surplus; and VSS 1, 2, and 6 in deficit. At 40 years following treatment, VSS 3, 4 and 5 would be in surplus; and VSS 1, 2, and 6 in deficit.

Table 04. Luna project area – even-aged treatment stands in ponderosa pine goshawk habitat (fine scale analysis plot data) – 1 to 5 years; 20 years; and 40 years following treatment

Vegetative Structure Stage (VSS)	Desired Condition	% BA Ponderosa Pine 1 to 5 years Following Treatment	% VSS Ponderosa Pine 1 to 5 years Following Treatment	% VSS Ponderosa Pine 20 years Following Treatment	% VSS Ponderosa Pine 40 years Following Treatment
VSS 1 Grass/Forb/Shrubs (0.0–0.9 inches DBH/DRC)	10	Not applicable	10	7	Less than 1
VSS 2 Seedling/Sapling (1.0–4.9 inches DBH/DRC)	10	Not applicable	6	6	8
VSS 3 Young Forest (5.0–11.9 inches DBH/DRC)	20	36	27	29	30
VSS 4 Mid aged Forest (12.0–17.9 inches DBH/DRC)	20	44	29	30	31
VSS 5 Mature Forest (18.0–23.9 inches DBH/DRC)	20	16	20	20	23
VSS 6 Old Forest (24 inches + DBH/DRC)	20	4	8	8	8

In uneven-aged ponderosa pine stands at 1 to 5 years following treatment (table 05), VSS 1 would be at desired conditions; VSS 3, 4 and 5 in surplus; and VSS 2 and 6 in deficit. At 20 years following treatment, VSS 3, 4 and 5 would be in surplus; and VSS 1, 2, and 6 in deficit. At 40 years following treatment, VSS 3, 4 and 5 would be in surplus; and VSS 1, 2, and 6 in deficit.

Table 05. Luna project area – uneven-aged treatment stands in ponderosa pine goshawk habitat (fine scale analysis plot data) – 1 to 5 years; 20 years; and 40 years following treatment

Vegetative Structure Stage (VSS)	Desired Condition	% BA Ponderosa Pine 1 to 5 years Following Treatment	% VSS Ponderosa Pine 1 to 5 years Following Treatment	% VSS Ponderosa Pine 20 years Following Treatment	% VSS Ponderosa Pine 40 years Following Treatment
VSS 1 Grass/Forb/Shrubs (0.0–0.9 inches DBH/DRC)	10	Not applicable	10	7	Less than 1
VSS 2 Seedling/Sapling (1.0–4.9 inches DBH/DRC)	10	Not applicable	5	5	7
VSS 3 Young Forest (5.0–11.9 inches DBH/DRC)	20	28	22	23	24
VSS 4 Mid aged Forest (12.0–17.9 inches DBH/DRC)	20	34	25	26	27
VSS 5 Mature Forest (18.0–23.9 inches DBH/DRC)	20	26	25	26	29
VSS 6 Old Forest (24 inches + DBH/DRC)	20	11	13	13	13

Wells and Water Rights (Errata 7)

During the objection process, concerns were expressed regarding the permitting process and the need to clarify who would hold the water rights for the wells and purpose or use of the waters. The instructions provided for these concerns were to include the Forest Service Manual direction for clarifying the process for applying for water rights and who should be listed as the water right holder through New Mexico Office of the State Engineer. In addition, the Gila National Forest was to clarify the use or purpose of the waters.

Errata 7: Clarification, Chapter 2 Range Management Section, Page 28

Eleven of the proposed water systems include the installation of new wells (table 15). Installation of these improvements is contingent on the Gila National Forest's ability to meet the requirements of the New Mexico Office of the State Engineer. The improvements would require the appropriate licenses or water use agreements prior to implementation. The Forest Service will follow Forest Service Manual, Chapter 2540, to file applications to appropriate water, according to state procedures, and in the name of the United States. In New Mexico, assignment and enforcement of water rights is the sole responsibility of the Office of the State Engineer [19.26.2], following the State's application and review process. Beneficial uses of the waters would be both livestock and wildlife. In the event the Gila National Forest is unable to obtain a license, an alternative water source could be considered provided the effects of using that water source do not differ from the effects disclosed in this analysis.

Temporary and New Roads Best Management Practices (Errata 8)

During the objection process, concerns were expressed that construction of temporary or new roads is inconsistent with the Gila Forest Plan, in regards to protection of sensitive soils, to minimize or control erosion. Although sensitive soils were avoided and best management practices would be implemented for ground-disturbing activities including motorized routes (temporary and new), instructions were to provide additional information regarding best management practices and to include pertinent practices in the final environmental impact statement.

Errata 8 – Clarify and Expand: Chapter 2, Design Features Common to All Road Activities, Page 31

Replace the third bullet under Design Features Common to All Road Activities with all of the following text

- For road management activities, follow appropriate best management practices (BMPs) from the National Best Management Practices for Water Quality Management on National Forest System Lands, Volume 1: National Core BMP Technical Guide (FS-990a, April 2012) and more site-specific measures based on 33 Code of Federal Regulations 323.4(a)(6) of the Clean Water Act for construction or maintenance of forest roads and skid trails identified in Watershed, Soils, and Air Report appendix C. The purpose of best management practices are to avoid, minimize, or mitigate adverse effects to soil, water quality, and instream riparian resources that may result from road management activities, including planning, maintenance, stream crossings, decommissioning, and project equipment refueling and servicing. The following identified practices would be applicable to transportation-related activities within the planning area:
    - Permanent roads (for forestry activities), temporary access roads (for forestry activities), and skid trails (for logging activities) in waters of the United States will be held to the minimum feasible number, width, and total length consistent with the purpose of specific silvicultural operations, and local topographic and climatic conditions.
    - The road fill will be bridged, culverted, or otherwise designed to prevent the restriction of expected flood flows.
    - The fill will be properly stabilized and maintained during and following construction to prevent erosion.
    - Discharges of dredged or fill material into waters of the United States to construct a road fill will be made in a manner that minimizes the encroachment of trucks, tractors, bulldozers, or other heavy equipment within waters of the United States (including adjacent wetlands) that lie outside the lateral boundaries of the fill itself.
    - In designing, constructing, and maintaining roads, vegetative disturbance in the waters of the United States will be kept to a minimum.
    - The design, construction, and maintenance of the road crossing will not disrupt the migration or other movement of those species of aquatic life inhabiting the water body.
    - Borrow material will be taken from upland sources whenever feasible.

- The discharge will not take, or jeopardize the continued existence of, a threatened or endangered species as defined under the Endangered Species Act, or adversely modify or destroy the critical habitat of such species.
- Discharges into breeding and nesting areas for migratory waterfowl, spawning areas, and wetlands will be avoided, if practical alternatives exist.
- The discharge will not be located in the proximity of a public water supply intake.
- The discharge of material will consist of suitable material free from toxic pollutants in toxic amounts.
- All temporary fills will be removed in their entirety and the area restored to its original elevation.
- Treatment of Perennial, Intermittent, and Interrupted Drainages – These drainages support woody and herbaceous riparian vegetation. The potential for thinning of upland species from these areas would consider site potential and the resulting site temperature modifications. Watershed personnel would be involved in tailoring any proposed thinning treatments to each individual riparian system.
- Treatment of Ephemeral Drainages – Ephemeral drainages are recognized in the following ways. They form the lowest spot of the surrounding ground. They form obvious channel continuity along its length and join with more obvious channels downstream. They show evidence of having run water on previous occasions, i.e., litter and vegetation has moved, or there is a lack of litter in the channel. The following actions will be recommended for harvest activities around ephemeral drainages:
  - No skidding would be allowed down ephemeral channels or low points or swales.
  - No road construction would be allowed in or immediately adjacent to ephemeral streams.
  - Minimize the amount of logging debris deposited in ephemeral channels and remove excess debris by hand or endlining.
  - Do not cut trees where the root system is important in maintaining the integrity of the bank.
  - No log decks will be located within the ephemeral streams or depressions.
  - Minimize the number of skid trail and road crossings across these channels. If a skid trail or road crosses a channel, appropriate measures would be taken prior to the wet season to mitigate erosion and sediment transport into drainage.
- Landing Location – Log landings (decking areas) are prohibited in wet meadows.
- Log Landing Erosion Prevention and Control – Immediately after use, landings would be scarified as needed to eliminate compaction. Once scarified, log landings would be reseeded with a certified weed-free native seed mix. The seed mix and the application rate will be developed by Gila National Forest soil scientists and district range personnel. If a landing were located adjacent to a channel, appropriate measures would be taken prior to the wet season to mitigate erosion and sediment transport into the drainage.

- Staging Areas – Staging activities would be prohibited on sensitive soils (see sensitive soils map in project record) and in wet meadows and drainages except as authorized by district watershed personnel. After project completion, staging areas would be scarified as needed to eliminate erosion. Once scarified, areas would be reseeded with a certified weed-free native seed mix.
- Tractor Skidding Design – Skid trails will be designated or approved by the project administrator in conjunction with the project purchaser. To minimize soil disturbance by equipment use, trees would be felled to the lead and the project administrator would locate skid trails as far apart as possible to reduce the number of skid trails needed to harvest the unit. This will allow a faster rate of recovery of the soil from equipment impacts. Use existing skid trails where properly located.
- Designate new skid trails throughout the project area to prevent long, straight skid trails from running up and down slopes.
- Skidding of logs will be with the front end of the log suspended above the ground surface. Skidders would be required to stay on the skid trail system, except where other objectives take priority (like maximum site disturbance wanted for seed cuts, etc.).
- Proper skid trail design and skidding practices as mentioned above, along with timely implementation of erosion control practices will generally mitigate potential soil loss.
- Erosion Control on Skid Trails – Skid trails would be water barred, scarified and seeded as needed, with a certified weed-free native grass mix designed to control surface erosion.
- Depressions such as ruts and berms will be filled or removed, restoring skid trails to the natural grade of the slope where possible. In addition, slash generated from the project would be spread by hand in lieu of, or in addition to, water barring where conditions are favorable.
- Limit the Operating Season – Limiting ground-disturbing activities (tractor skidding, decking, and machine piling, etc.) to dry or frozen soil conditions to reduce compaction and soil displacement (rutting) that is associated with project activities when soils are wet or are saturated.
- Hauling and skidding is restricted on all soils by the project administrator during wet periods to prevent damage to the road system.

Effects Timeframes (Errata 9–10)

During the objection process, concerns were expressed that “short-term” and “long-term” timeframes were not defined in the effects section for both air quality and watershed and soils analyses. Instructions were provided to clarify the timeframes associated with those terms in the Air Quality and Watershed and Soils sections of the final environmental impact statement.

Errata 9 – Clarification: Chapter 3, Air Quality Section, Page 106

Add all of the following section before Alternative A-No Action section

General Assumptions

For this section, timeframes for short-term and long-term effects to air quality are described as follows:

- Short term, in relation to:
  - Fugitive dust is minimal, being hours to less than a day from ground-disturbing activities, depending on if sustained winds are present.
  - Prescribed burning is normally the length of the burn, which is 3 to 5 days.
- Long term, in relation to:
  - Smoke from wildfires may last until a season ending event, which may be upwards of 2 to 3 months depending on start time.

Errata 10 – Clarification: Chapter 3, Watershed and Soils Section, Page 109

Add all of the following text to the end of the General Assumptions section

- Short-term impacts to watershed and/or soils is considered to be a range of time extending from days up to 5 years, which is dependent upon the type and location of activity.
- Long-term impacts to watershed and/or soils is considered to be a period of time extending more than 5 years.