Rim Fire Reforestation (45612)

Stanislaus National Forest

Range Report

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Prepared by_____ Date_____

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RIM FIRE REFORESTATION – RANGE REPORT

Analysis Framework: Statute, Regulation, Forest Plan and Other Direction

Legislative authorities for administration of the National Forest System range program are shown in FSM 2201 and objectives, policies, and responsibilities are in the FSM 2202 through 2204 and FSM 2230 through FSM 2238 (USDA 2005a). Forest Plan Direction (USDA 2010a) provides current management direction for the range program.

The Forest Plan Compliance (project record) document identifies the Forest Plan Standards and Guidelines that specifically apply to this project and related information about compliance with the Forest Plan.

Effects Analysis Methodology

Assumptions Specific to Range

- The authorization for livestock grazing and the administration of allotments will not change with any of the alternatives.
- The area proposed for reforestation, thinning, and noxious weed eradication activities reflects the relative degree of impact each alternative will have on permitted grazing in the project area.
- Monitoring will occur during project implementation to inform livestock managers about project effects on grazing use and rangeland resource conditions. Adjustments are not anticipated, but if needed would occur through the regular permit administration process and be coordinated with affected permittees.
- Given sufficient notice, grazing permittees have the ability to manage livestock in ways that minimize potential adverse impacts of project activities (herbicides, site preparation and release) on grazing operations.

Data Sources

The following information was used to describe existing condition and analyze effects on rangeland resources.

- Field visits to project area
- Local professional knowledge
- Project treatment information
- Allotment and unit/pasture boundaries
- Land ownership data
- Post-fire capable rangeland
- Rangeland infrastructure data
- Transportation data

Range Indicators

The following indicators were used to assess the effects of each alternative on rangeland resources.

- Proposed treatment area in each allotment (percent of allotment proposed for treatments)
- Proposed treatment area in capable rangelands within each allotment
- Amount of range infrastructure encompassed by proposed treatments

Range Methodology by Action

Quantitative and qualitative comparisons of the anticipated impacts of each alternative on rangeland resources and the expected potential for moving existing conditions toward Forest Plan desired conditions were used for determining the effects on rangeland resources.

Affected Environment

Existing Conditions

The 2013 Rim Fire affected thirteen grazing allotments to varying degrees depending on the proportion of the allotment burned or fire severity in the burned areas. The following information applies to grazing allotments within the Rim Fire Reforestation project area.

Rangeland Vegetation

Current rangeland vegetation conditions are the combined result of pre-fire conditions and fire effects on the landscape. Some vegetation types burned more severely (chaparral), but species that dominate these plant communities are well adapted to recover from fire. Unburned areas and areas that burned at low severity are in a condition similar to that before the fire. Burned areas are naturally recovering following the Rim Fire, and vegetation condition has shown gradual improvement, even in severely burned areas. The degree of recovery is varied based on environmental factors such as climate, soils and land management activities. Recognizing differences in vegetation types, identifying the stages of recovery and being responsive through changes in management are crucial to facilitating recovery of the burned landscape. Fire can cause a large scale vegetation type conversion to predominantly non-forest vegetation types, with many areas often dominated by brush within a few years following fire. The post-fire flush of palatable and nutritious forage helps to reduce utilization percentages and improve overall rangeland vegetation condition as recovery progresses.

Capable rangeland describes areas of land that can sustain domestic grazing and generally represent the portions of the landscape assumed to be most commonly used by cattle (USDA 2004a). Capable rangeland can be used to compare the relative amount of available grazing lands within allotments. Livestock may graze incidentally in any area of an allotment while moving between capable grazing areas, but tend to spend a larger proportion of time in capable areas. Deerbrush (*Ceanothus integerrimus*) is the predominant local forage species used by livestock in the mid-elevation range of 3,500 to 6,000 feet. Riparian areas and meadows, which occur as patches within the forest mosaic, are also preferred by livestock due to the availability of water, shade and high quality forage. Livestock also feed in forested areas and forest openings where sufficient understory forage exists.

Due to the dramatic increase in shrub-dominated transitory range following fire, capable range has increased significantly in the project area. Forage production has increased dramatically in some areas in large part due to the abundance of deerbrush and other brush species in burned previously forested areas. This increase in livestock browse is desirable from a grazing standpoint, but is generally considered to be temporary as shrubs eventually grow above browse height and parts of the landscape transition over time towards tree-dominated plant communities (Crotteau et al. 2013).

Noxious Weeds

Throughout the United States, weeds in rangeland settings cause an estimated loss of $2 billion annually (Quimby et al 1991). Noxious weeds, such as leafy spurge, knapweed, and yellow star-thistle, can significantly reduce the carrying capacity of grazing lands. Forage can be reduced between 35 and 90% on weed-infested rangelands (USDI 1985). Ecologic costs of weed infestations are many. Weeds can reduce plant diversity, reduce wildlife habitat and forage, alter fire frequency, increase erosion, displace rare or sensitive plant species, and deplete soil moisture and nutrient levels (DiTomaso 2000). High severity fires increase the potential for weed invasion and spread (Keeley et al. 2003). Weed infestations in the project area impact livestock grazing primarily by reducing the quantity and quality of forage. Numerous weed species occur within the project area (3.06 Invasive Species). Table 3.07-1 shows those species with the highest potential to negatively impact rangelands. Johnsongrass, only recently introduced into the project area, is highly invasive and can be toxic to cattle (DiTomaso et al. 2013). Klamathweed, also known as Common St. Johnswort, is known to be toxic, causing photosensitization in most livestock (DiTomaso et al. 2013). Barbed goatgrass and

medusahead grass are not toxic, but can cause mechanical injury to livestock, deer and other animals (Peters et al. 1996).

Table 3.07-1 Estimated Acres of Invasive Species in Grazing Allotments

Allotment	Medusahead Grass	Johnson Grass	Barbed Goatgrass	Yellow Star-thistle	Tocalote	Klamathweed	Totals[1]
Jawbone-Rosasco	3,091	385	11	865	444	1	**4,797**
Hunter Creek	62	0	2	8	212	1	**285**
Duckwall	0	0	0	0	0	1	**1**
Middle Fork, Meyer-Ferretti, Curtin	783	44	3	1,364	199	2	**2,395**
Bonds, Bower Cave, Bull Creek	74	0	0	5,313	1,276	12	**6,675**
Westside, Lower Hull, Upper Hull	1	0	1	0	0	0	**2**
Totals (acres)	**4,011**	**429**	**17**	**7,550**	**2,131**	**17**	**14,155**

[1] Totals include overlapping acres.

Allotment Administration

Forest Plan Direction provides standards and guidelines designed to provide for resource conservation and sustainable use of rangelands. Range monitoring is conducted as needed to ensure that grazing management strategies meet objectives for desired conditions. Administration of grazing allotments involves travel on and off roads by Forest Service staff and permittees. Administration of grazing allotments in a post fire landscape may require more frequent travel to and from key areas and range infrastructure. Dead and down trees pose a threat to human safety and make access more difficult for Forest staff and grazing permittees.

Rangeland Infrastructure

Rangeland infrastructure includes fences, water developments (troughs), cattleguards, gates and corrals designed to control livestock movements (timing, duration, and intensity of grazing). Some improvements in the project area, particularly fences, are still damaged and need repair. Over time, dead trees are likely to fall and damage range infrastructure, even after it has been repaired. Dead trees adjacent to fences and troughs pose a safety risk for Forest staff and permittees responsible for repairing and maintaining improvements. Allotment management is more difficult without functioning infrastructure.

Livestock Movements

Livestock move through the allotments throughout the grazing season to find available forage and water. In many burned areas dead standing trees are abundant and have begun to fall. Fallen dead trees have the potential to “jackstraw” inhibiting livestock movements and reducing forage availability. Defective trees may also pose some risk to livestock, as cattle may be injured or killed by falling trees or by an excess of unburned fuel and debris. An abundance of dead material also impedes the ability of permittees to herd livestock and achieve proper distribution.

The allotments in the project area are open range allotments. Livestock frequently travel across and along roads. When vehicles approach, the cattle generally move off of roads and out of the way of the oncoming vehicle. To some extent, fallen dead trees along roadsides have the potential to cause or contribute to vehicle and cattle interactions or collisions.

Environmental Consequences

Direct effects on rangeland resources are directly caused by project implementation. Indirect effects on rangeland resources are in response to the direct effects of treatments or, as with Alternative 2 (No Action), a lack of treatment. Project management requirements (2.02 Alternatives Considered in Detail; 2.03 Management Requirements Common to All Action Alternatives) are designed to mitigate the direct and indirect effects of the project on rangeland resources.

Alternative 1 (Proposed Action)

DIRECT AND INDIRECT EFFECTS

Table 3.07-2 provides a summary of the Alternative 1 treatments within each allotment.

Table 3.07-2 Alternative 1: Treatments in Grazing Allotments

Allotment	Deer Habitat Enhancement	Natural Regeneration	Noxious Weed Eradication	Reforestation	Thin Existing Plantations	Totals[1]
Jawbone-Rosasco	3,814	951	4,699	9,661	3,813	18,239
Hunter Creek	0	29	247	1,640	5,005	6,674
Duckwall	0	256	56	0	95	351
Middle Fork, Meyer-Ferretti, Curtin	0	2,473	1,594	9,418	2,382	14,273
Bonds, Bower Cave, Bull Creek	0	36	19	13	684	733
Westside, Lower Hull, Upper Hull	0	288	1	190	300	778
Totals (acres)	**3,814**	**4,033**	**6,616**	**20,922**	**12,279**	**41,048**

[1] Totals include overlapping acres

Rangeland Vegetation

Activities proposed for Alternative 1 would have short and long-term impacts to rangeland vegetation. Generally, fuel reduction activities may result in direct short-term negative impacts to understory vegetation, but would result in long-term beneficial effects because they reduce the potential for future high severity fire. Natural regeneration is expected to improve short-term vegetation condition because these areas would be monitored for five years, and reforestation treatments that damage understory vegetation (site preparation and release) would be used only if natural regeneration is inadequate. Deer habitat enhancement treatments would affect only the Jawbone allotment, and may result in short-term negative impacts from site prep, release, and prescribed burning treatments which damage vegetation and can create openings for weeds. Similarly, weed treatments may result in short-term impacts to vegetation because even desirable, non-target species may be killed by burning, grubbing, and herbicides.

Reforestation activities, other than burning, generally negatively affect rangeland vegetation on both a short and long-term basis because they damage understory vegetation within treatment units and favor growth and establishment of trees, which will eventually significantly reduce the shrubs and herbaceous species that are used by livestock. Table 3.07-3 shows reforestation treatments would reduce capable rangeland by 14,089 acres (15.5% of total capable rangeland) in the project area.

Table 3.07-3 Reforestation in Capable Rangeland

Allotment	Capable	Reforestation	Percent Capable
Jawbone-Rosasco	25,670	6,845	27
Hunter Creek	5,667	854	15
Duckwall	3,192	0	0
Middle Fork, Meyer-Ferretti, Curtin	26,506	6,248	24
Bonds, Bower Cave, Bull Creek	10,063	5	0
Westside, Lower Hull, Upper Hull	19,946	137	1
Totals (acres)	91,044	14,089	15.5

[1] Totals include overlapping acres

Reforestation activities would have the most negative affect on rangeland vegetation, including forage production and range capability. Site preparation and release treatments, including subsoiling, would directly reduce forage production and indirectly lead to dominance by tree species. Herbicide applications would kill competing vegetation that could otherwise be used by livestock. Herbicide use would dramatically reduce forage production within reforestation units and potentially in natural regeneration units should these treatments be needed. Reduced forage production may result in localized impacts to rangeland vegetation because livestock use may become somewhat more

concentrated in untreated areas; thus, untreated areas are likely to see increased grazing use to some extent. Rangeland vegetation in the Jawbone, Hunter Creek, Rosasco, Middle Fork and Curtin grazing allotments is most likely to be affected by reforestation treatments because the proportions of the allotment areas to be treated are the highest. The effects of reduced forage production within each unit are not likely to significantly negatively impact range vegetation in untreated areas. As stated in the management requirements (2.02 Alternatives Considered in Detail; 2.03 Management Requirements Common to All Action Alternatives), no more than 20% of capable range would be treated in any allotment per year. Because a majority of the project area would not be treated, there should be sufficient available forage in untreated areas to meet livestock nutritional needs.

Alternative 1 includes a planting strategy that limits planting around meadows. No planting would occur within 25 feet of a meadow, and clumps of planted conifers would be evenly dispersed and offset into increasing densities further away from the meadow edge. This would reduce conifer encroachment into meadows and suppression of herbaceous meadow species that may result from competition with planted trees. This meadow planting strategy is an improvement from past reforestation practices that resulted in plantations adjacent to and within meadows and natural openings. Meadow buffers will positively affect rangeland vegetation on a site specific basis.

In general, Alternative 1 has the potential to negatively affect forage production and reduce capable range on a relatively high proportion of capable range within the Jawbone, Hunter Creek, Rosasco, Middle Fork, and Curtin grazing allotments. The overall effects of this alternative on existing rangeland vegetation are detrimental. It should be noted, however, that while the current abundance of early seral shrubs and herbaceous vegetation is considered to be the existing condition, these areas were generally forested before the Rim Fire. Reforestation would occur under this alternative on up to 25,331 acres, whereas about 36,000 acres were forested before the Rim Fire and now have little overstory. While project activities would cause short-term negative impacts to shrubs and grasses in planting units, once the trees are established and release activities stop, these open grown stands will continue to provide far more forage than the more dense mature forest that existed prior to 2013. Rangeland vegetation conditions for grazing would still be a vast improvement over pre-fire conditions due to the abundance of shrubs and herbaceous vegetation both inside and outside planted areas.

Noxious Weeds

Site prep and release activities can dramatically reduce ground cover and temporarily create openings for weeds, but management requirements for noxious weeds would minimize the risk of weed introduction and spread from project activities. Noxious weed eradication, primarily with herbicides applied to larger weed infestations, may be detrimental to desirable range vegetation on a short-term basis.

Table 3.07-4 Alternative 1: Noxious Weed Eradication in Capable Rangeland

Allotment	Medusahead Grass	Johnson Grass	Barbed Goatgrass	Yellow Star-thistle	Tocalote	Klamathweed	Totals[1]
Jawbone-Rosasco	3,091	385	1	241	443	1	**3,777**
Hunter Creek	28	0	2	7	186	1	**224**
Duckwall	0	0	0	0	0	1	**1**
Middle Fork, Meyer-Ferretti, Curtin	772	44	2	499	131	1	**1,449**
Bonds, Bower Cave, Bull Creek	1	0	0	16	1	0	**18**
Westside, Lower Hull, Upper Hull	0	0	0		0	0	**0**
Totals (acres)	**3,892**	**429**	**5**	**763**	**761**	**4**	**5,854**

[1] Totals include overlapping acres.

Table 3.07-4 shows acres of noxious weed eradication using herbicides within capable rangeland under Alternative 1. In particular, noxious weed eradication on the Jawbone Lava Flat have the potential to significantly reduce annual forage production temporarily because Medusahead grass, the

main target species, occupies a large expanse of the lava cap and comprises a significant portion of the plant community in some areas. The longer term impacts of noxious weed control and eradication, however, are hugely beneficial to rangeland vegetation condition because native species and other preferred vegetation would be favored by these treatments. Noxious weed eradication is expected to create a more desirable species composition in rangeland plant communities, which is likely to improve forage quantity and quality, vegetation condition, and ecosystem function.

Allotment Administration

Alternative 1 would indirectly impact allotment administration during project implementation. Treatments (herbicide application and mechanical treatments) may require increased efforts on behalf of affected permittees to avoid activities that may alter livestock movements and to ensure proper distribution. During this time, more frequent monitoring may be required to ensure that range standards and guidelines are being met. Fuel reduction activities would result in short-term impacts, but would be beneficial in the long-term because they improve access for permittees and forest staff to perform grazing program administration.

The herbicides proposed for use in Alternative 1 are generally considered safe (when applied according to product labels) for application where livestock use is anticipated; however, grazing restrictions may apply to some herbicides, Clethodim in particular. Clethodim would mainly be used on the Jawbone lava cap, where medusahead grass has invaded a large expanse of annual grassland. Permittees would be provided with herbicide product labels and a schedule of planned treatments. If herbicide grazing restrictions apply, permittees would have the ability to avoid specific areas of herbicide application by timing, herding, salting, or use of temporary fences to prevent livestock grazing in treated areas immediately following application of Clethodim or other herbicides. Herbicides should generally be applied as early in the growing season as possible for maximum effectiveness, which would also maximize the amount of time between application and the beginning of the grazing season. The most likely potential impact to livestock movements and grazing operations would be a voluntary delay in livestock entry onto the allotments to minimize the risk of herbicide exposure or ingestion by livestock. No more than 20% of the capable range within an allotment would be treated per year, and permittees would be given advance notice of herbicide application 8 weeks prior to implementation. Appendix D gives more information about herbicide application rates and Appendix N provides the schedule for noxious weed applications. Overall, Alternative 1 would increase the need for allotment administration, which may indirectly result in reduced capacity for grazing program administration on other allotments on the Forest.

Rangeland Infrastructure

Alternative 1 poses some risk that project activities involving fire or heavy equipment would damage range infrastructure. The potential for damage to range improvements is mitigated by management requirements and project administration. Contracts should include language requiring project activities to avoid damaging functioning range fences and to repair fence damage that results from implementation activities. Infrastructure maintenance needs are not likely to change, but the functioning condition of range infrastructure may improve under Alternative 1 because access may be made easier by site preparation treatments. Site preparation adjacent to range infrastructure would improve safety conditions for persons responsible for infrastructure maintenance and have a positive effect on grazing management.

Livestock Movements

Alternative 1 may result in short-term impacts to livestock movements as a result of activities that may scare livestock (mechanical equipment, crews of workers) and those that are detrimental to rangeland vegetation. During project implementation, livestock are likely to avoid areas where herbs and shrubs have been killed by chemical or mechanical treatment. Noise from heavy equipment operations may cause livestock to be skittish or stressed, making herding and gathering more challenging. This has the potential to disrupt normal livestock movement patterns, but this effect

would be localized to areas where activities are occurring. Livestock may either avoid or be attracted to burned areas, depending on site specific recovery, proximity to water, and abundance of palatable forage. Long-term effects to livestock movements would be limited primarily to reforested areas because livestock are less likely to move into or through established plantations in search of forage. Long-term effects are not likely to significantly alter livestock movement patterns because cattle would have the ability to move freely through the allotments and tree spacing would not preclude livestock movements within plantations. Site preparation and prescribed fire treatments would remove downed wood which can impede livestock movement, thereby improving livestock dispersal. The majority of reforestation activities would affect the Jawbone, Rosasco, Hunter Creek, Middle Fork and Curtin allotments because a higher proportion of capable rangeland within these management units would be reforested under this alternative.

CUMULATIVE EFFECTS

Present and reasonably foreseeable actions that affect range are shown in Appendix B and include timber sales, restoration projects, fuels treatments, and herbicide use on public and private lands in the project area. Timber harvest on about 4,000 acres may cause livestock stress, damage understory vegetation, and increase the potential for weed introduction and spread, but longer term effects would be beneficial by reducing the potential for future high severity fire, improving watershed health, and increasing the potential for understory forage production. Recreation and special use activities are unlikely to noticeably affect grazing activities. Fuels treatments would result in short-term site forage loss and can increase the potential for weed spread, but may also increase forage production for several years following treatment and would reduce the risk of future high severity fire. Planned herbicide use on private (15,479 acres) and public lands (up to about 26,500 acres for Alternative 1 would temporarily negatively affect understory vegetation, may require more intensive management by range permittees, and may increase the potential for livestock exposure to chemicals. Restoration actions (aspen stand improvement, meadow restoration, conifer removal, gully, repair, etc.) are generally beneficial for range, but meadow exclosures (fences/barriers) restrict livestock access to forage and/or water and can result in localized negative impacts. Cumulatively, the multitude of projects occurring in the project area would increase the need for program administration and livestock management. Because the effects of these activities are both positive and negative, the cumulative effects of Alternative 1 are expected to be neutral or slightly positive overall for grazing management and rangeland vegetation.

Alternative 2 (No Action)

DIRECT AND INDIRECT EFFECTS

The following information describes the indirect effects of taking no action under Alternative 2.

Rangeland Vegetation

Alternative 2 would not cause short-term effects to rangeland vegetation from chemical and mechanical treatments that damage rangeland vegetation. Capable rangeland and forage production would not be reduced by treatments that kill competing vegetation or by reforestation. Conversion of rangelands to forests is likely to occur naturally over a longer timeframe in the absence of fire or other disturbance. In areas not utilized by livestock, shrubs may grow rapidly above browse height and become unavailable to livestock. A lack of site preparation, prescribed fire, and plantation thinning increases the potential for indirect detrimental effects to rangeland vegetation, because these treatments reduce the amount of fuels and vegetation that could burn in a high severity fire.

Noxious Weeds

The absence of noxious weed eradication in Alternative 2 is likely to negatively affect rangeland vegetation because weed populations in the project area would continue to expand unabated. Johnsongrass was only recently introduced in the Rim Fire area and has the potential to expand considerably, displacing native species and negatively affecting previously weed-free ecosystems. On

the Jawbone Lava Flat, large expanses of noxious weeds will continue to negatively impact plant diversity, wildlife habitat, forage quality, and ecosystem function.

Allotment Administration

Alternative 2 is not likely to affect allotment administration activities. Site preparation activities, which would benefit allotment administration by improving livestock movement, would not occur; however, there would be no need for increased allotment administration as a result of project activities that damage vegetation and affect livestock movement. The capacity for allotment administration outside of the project area would not be reduced.

Rangeland Infrastructure

A beneficial effect of Alternative 2 would be no potential impacts to infrastructure during implementation. Conversely, safety conditions for persons responsible for infrastructure maintenance would not be improved and the existing hazards (standing dead trees) would not be treated during site preparation activities.

Livestock Movements

Alternative 2 would not implement activities that can scare livestock and disrupt livestock movement patterns; however, treatments that would improve livestock access (site preparation, plantation thinning, and prescribed fire) would not occur. The overall effects on livestock movements would be neutral.

CUMULATIVE EFFECTS

Present and reasonably foreseeable actions may cause livestock stress, damage understory vegetation, and increase the potential for weed introduction and spread, but longer term effects would be beneficial. Recreation and special use activities are unlikely to noticeably affect grazing activities. Rim Recovery fuels treatments will result in short-term site forage loss and can increase the potential for weed spread, but may also increase forage production for several years following treatment and would reduce the risk of future high severity fire. Herbicide use on private (15,479 acres) would temporarily negatively affect understory vegetation, may require more intensive management by range permittees, and may increase the potential for livestock exposure to chemicals. Restoration actions (aspen stand improvement, meadow restoration, conifer removal, gully, repair, etc.) are generally beneficial for range, but meadow exclosures (fences/barriers) restrict livestock access to forage and/or water and can result in localized negative impacts. Cumulatively, the multitude of projects occurring in the project area would increase the need for program administration and livestock management. Because the effects of these activities are both positive and negative, the cumulative effects of Alternative 2 would generally be neutral or beneficial for grazing management and rangeland vegetation because additional chemical and mechanical treatments that damage vegetation, reduce forage, and stress livestock would not occur. Potential negative cumulative effects are associated with dramatically reduced or lack of reforestation and noxious weed eradication.

Alternative 3

DIRECT AND INDIRECT EFFECTS

Alternative 3 would treat same acres as Alternative 1, but would not use any herbicides to accomplish reforestation or noxious weed eradication, only hand applications. Table 3.07-2 provides a summary of the Alternative 3 treatments within allotments.

Rangeland Vegetation

Alternative 3 would negatively affect capable rangeland vegetation on up to 14,871 acres. Site preparation and release activities using hand grubbing or mechanical equipment are generally more detrimental to rangeland vegetation than herbicides because they not only kill shrubs and herbaceous vegetation, but they negatively affect soil structure and create bare soil. Whereas chemical site preparation, release, and weed eradication treatments kill vegetation, mechanical treatments remove

the vegetation, exposing bare soil and creating the potential for erosion and establishment of early seral or undesirable species. Even with management requirements, Alternative 3 is likely to result in soil loss and reduced soil productivity in addition to weed introduction and spread, which may translate into reduced forage production and range capability.

Alternative 3 also differs from Alternative 1 in terms of fuelbreak planting design: Alternative 3 fuelbreaks would be 250 feet wide and average 151 trees per acre, whereas under Alternative 1 fuels breaks would be 330 feet wide and average 176 trees per acre. Release would be accomplished by hand grubbing to remove competing vegetation and the fuelbreaks would be maintained with mastication where brush got above one-foot tall. Wider fuelbreaks with fewer trees are more likely to support understory vegetation once trees are established and release treatments are no longer necessary. Since ridges tend to be a drier landscape position and cattle use of these areas is often limited, the wider fuelbreaks are not likely to contribute in meaningful ways to forage production or vegetation condition.

Similar to Alternative 1, Alternative 3 is likely to negatively affect forage production and reduce range forage on a relatively high proportion within the Jawbone (59.1%), Hunter Creek (51.7%), Rosasco (43.7%), Middle Fork (39.5%) and Curtin (32.1%) grazing allotments. The overall effects of Alternative 3 on rangeland vegetation are detrimental.

Noxious Weeds

Table 3.07-5 shows Alternative 3 would treat only a third of the acreage of noxious weeds as Alternative 1. Noxious weeds in the Duckwall, Bonds, Bower Cave, Bull Creek, Westside, Lower Hull and Upper Hull allotments would not be treated under this alternative. Non-chemical weed eradication methods are less likely to be effective in eradicating target weed populations than a treatment program including chemicals. In addition, due to the larger acreage treated by heavy equipment, Alternative 3 would result in an increased potential for weed introduction and spread. Management requirements are aimed at minimizing the potential for weed introduction and spread; however the potential for weed introduction and spread for Alternative 3 is higher than described for Alternative 1. Alternative 3 is both more likely to introduce weeds and less likely to reduce or eradicate weeds, and so would not be as beneficial as Alternative 1 in controlling or eradicating rangeland weeds.

Table 3.07-5 Alternative 3: Noxious Weed Eradication in Capable Rangeland

Allotment	Medusahead Grass	Johnson Grass	Barbed Goatgrass	Yellow Star-thistle	Tocalote	Klamathweed	Totals[1]
Jawbone-Rosasco	2,589	13	1	177	1	1	**2,782**
Hunter Creek	1	0	1	0	1	1	**4**
Duckwall	0	0	0	0	0	0	**0**
Middle Fork, Meyer-Ferretti, Curtin	1	0	2	0	0	1	**4**
Bonds, Bower Cave, Bull Creek	0	0	0	0	0	0	**0**
Westside, Lower Hull, Upper Hull	0	0	0	0	0	0	**0**
Totals (acres)	**2,591**	**13**	**4**	**177**	**2**	**3**	**2,790**

[1] Totals include overlapping acres.

Allotment Administration

Alternative 3 would indirectly impact allotment administration during project implementation. Treatment activities may require more frequent monitoring to ensure that range standards and guidelines are being met. Mechanical treatments may require increased efforts on behalf of affected permittees to ensure proper distribution and avoid treatments that damage vegetation and alter livestock movements. Fuel reduction activities would result in short-term negative impacts, but would be beneficial in the long-term because they improve access for permittees and forest staff to perform grazing program administration.

Permittees may avoid specific areas of mechanical disturbance by using grazing management techniques, including timing, herding, or salting. No more than 20% of the capable range within an allotment would be treated per year, and permittees would be given an implementation schedule to facilitate avoidance of project activities, if needed.

Rangeland Infrastructure

Range infrastructure is more likely to be damaged by Alternative 3 due to the increased use of heavy equipment to implement site prep and release treatments, but repairing damaged facilities is required under this alternative and is standard for all Forest Service contracts.

Livestock Movements

Alternative 3 may impact livestock movements because project activities could scare livestock and damage rangeland vegetation. Due to the increased use of heavy equipment, this alternative is the most likely to stress and disturb livestock. Otherwise, the effects of Alternative 3 on livestock movements are the same as described for Alternative 1.

CUMULATIVE EFFECTS

The cumulative effects of this Alternative are similar to those described under Alternative 1. The use of heavy equipment is more likely to contribute to altered livestock movements when combined with other actions. Alternative 3 also treats fewer acres of noxious weeds while increasing the potential for weed introduction and spread. Alternative 3 is slightly less beneficial and slightly more detrimental than Alternative 1 from a cumulative effects standpoint.

Alternative 4

DIRECT AND INDIRECT EFFECTS

Table 3.07-6 provides a summary of the Alternative 4 treatments within allotments.

Table 3.07-6 Alternative 4: Treatments in Grazing Allotments

Allotment	Deer Habitat Enhancement	Natural Regeneration	Noxious Weed Eradication	Reforestation	Thin Existing Plantations	Totals[1]
Jawbone-Rosasco	445	0	3,447	1,376	3,813	**9,081**
Hunter Creek	0	0	12	13	5,005	**5,030**
Duckwall	0	0	1	0	95	**96**
Middle Fork, Meyer-Ferretti, Curtin	0	0	249	1,445	2,382	**4,076**
Bonds, Bower Cave, Bull Creek	0	0	1	0	684	**685**
Westside, Lower Hull, Upper Hull	0	0	1	22	300	**323**
Totals (acres)	**445**	**0**	**3,711**	**2,856**	**12,279**	**19,291**

[1] Totals include overlapping acres

Rangeland Vegetation

The effects of Alternative 4 on rangeland vegetation would be the same as described for Alternative 1, but would occur on only 20% of the area. The effects to rangeland vegetation from site preparation and release with glyphosate would be the same as described for Alternative 1, but would occur on only up to 4,012 acres. Because the treatment activities would be much less extensive, livestock concentration in untreated areas is much less likely to occur. Also, because far fewer acres would be converted to plantations, negative effects on long-term forage production would be dramatically reduced from Alternatives 1 and 3. Unplanted early seral areas would eventually regenerate naturally into forests in the absence of disturbance, but this would take longer without active reforestation treatments. The increased use of prescribed fire would increase the potential for short-term damage to rangeland vegetation, but would be beneficial in the long-term by maintaining early seral understory vegetation types in burned areas, which tend to provide nutritious and palatable forage for livestock.

Noxious Weeds

Because Alternative 4 treats noxious weeds without the use of herbicides, the effects of this alternative are the same as described for Alternative 3.

Allotment Administration

The effects of Alternative 4 on allotment administration would be the same as described for Alternative 3, but would occur to a lesser extent because only about 20% of the area would be treated. The need for allotment administration would increase only slightly, and effects to livestock management would be minimal.

Rangeland Infrastructure

The effects of Alternative 4 on range infrastructure are similar to those described for Alternative 1, but Alternative 4 affects only 20% of the area as other alternatives and so is 80% less likely to result in damage to range infrastructure. This alternative poses a greater risk that prescribed fire may damage range infrastructure, but the intensity of prescribed fires is assumed to be less likely to cause damage than an uncontrolled fire such as the Rim Fire. Like the other alternatives, infrastructure that is damaged by project activities would be repaired.

Livestock Movements

Alternative 4 may result in short-term impacts to livestock movements. Livestock are likely to avoid areas where vegetation is killed by mechanical treatment. Heavy equipment operations may cause livestock stress, making herding and gathering more challenging. Because this effect is localized to areas where activities are occurring, and because there would be significantly fewer acres treated with mechanical equipment, this alternative is less likely to significantly alter livestock movements than Alternatives 1 or 3. Alternative 4 includes more prescribed fire than other alternatives. Livestock may either avoid or be attracted to burned areas, depending on site specific recovery, proximity to water, and abundance of palatable forage. Long-term effects to livestock movements would be limited primarily to reforested areas because livestock are less likely to move into or through established plantations in search of forage. Long-term effects are not likely to significantly alter livestock movement patterns because cattle would have the ability to move freely through the allotments.

CUMULATIVE EFFECTS

The cumulative effects of reforestation activities for Alternative 4 are similar to those described for Alternative 1, but occur on a much smaller scale due to the smaller acreage that would be treated. The cumulative effects of noxious weed eradication for Alternative 4 are similar to those described for Alternative 3. Alternative 4 treats fewer acres with herbicides and converts fewer acres to plantations, dramatically reducing the cumulative impacts to range.

Alternative 5

DIRECT AND INDIRECT EFFECTS

Alternative 5 includes the same treatment areas within allotments as Alternative 1 (Table 3.07-2).

Rangeland Vegetation

The effects of Alternative 5 on rangeland vegetation are similar to those described for Alternative 1, with the exception of range vegetation adjacent to meadows. Alternative 5 differs from Alternative 1 in that the planting strategy around meadows would result in a 7 by 14-foot spacing of planted conifers 25 feet from meadows. This planting strategy does not provide for meadow vegetation or meadow hydrology as much as the Alternative 1 meadow buffer planting strategy. While the 25 foot buffer is beneficial for rangeland vegetation, the denser planting outside of the 25 foot buffer is more likely to contribute to conifer encroachment and other long-term negative effects to meadows and herbaceous vegetation. This alternative would, however, create the desired tree numbers during thinning at year 7 if the surviving trees exceed this amount adjacent to meadows. This would help prevent negative effects to rangeland vegetation adjacent to meadows.

Noxious Weeds

Same as Alternative 1.

Allotment Administration

Same as Alternative 1.

Rangeland Infrastructure

Same as Alternative 1.

Livestock Movements

The effects of Alternative 5 on livestock movements are similar as described for Alternative 1, with the exception that Alternative 5 does not include prescribed fire in new plantations. The lack of prescribed fire is more likely to negatively affect livestock movements than other action alternatives.

CUMULATIVE EFFECTS

Same as Alternative 1.

Summary of Effects Analysis across All Alternatives

The effects of each alternative are compared against the relative area proposed for treatment within grazing allotments and the amount of capable range in treatment areas. Table 3.07-7 displays a summary of this information for all alternatives.

Table 3.07-7 Comparison of Alternatives: Treatments within Allotments and Capable Rangelands

Treatments	Alternative 1 **Allotment**	Alternative 1 **Capable**	Alternative 2 **Allotment**	Alternative 2 **Capable**	Alternative 3 **Allotment**	Alternative 3 **Capable**	Alternative 4 **Allotment**	Alternative 4 **Capable**	Alternative 5 **Allotment**	Alternative 5 **Capable**
Deer Habitat Enhancement	3,814	2,936	0	0	3,813	2,936	3,571	2,750	3,814	2,936
Natural Regeneration	4,033	2,377	0	0	4,033	2,377	0	0	4,033	2,377
Noxious Weed Eradication	6,616	5,182	0	0	3,711	3,117	3,711	3,117	6,616	5,182
Reforestation	20,922	14,089	0	0	20,922	14,089	2,955	1,953	20,922	14,089
Thin Existing Plantations	12,279	7,824	0	0	12,279	7,824	12,279	7,824	12,279	7,824
Totals[1] (acres)	**47,664**	**32,408**	**0**	**0**	**44,758**	**30,343**	**22,516**	**15,644**	**47,664**	**32,408**

[1] Totals include overlapping acres

Alternative 4 is generally the most beneficial action alternative from a range standpoint because it favors shrubs and herbaceous vegetation. On the other hand, while Alternatives 1 and 5 would result in more damage to shrubs and herbaceous vegetation, these alternatives are more likely to be effective in controlling and/or eradicating weed populations. Alternative 3 has the potential to be most detrimental because the emphasis on mechanical treatments is more likely to disturb livestock and damage range vegetation, and at the same time is more likely to result in weed introduction and spread and less likely than other alternatives to control or eradicate noxious weeds. All action alternatives would to some extent reduce the risk of future high severity fire by removing fuels through site preparation, creating fuel break structures during initial planting or pre-commercial thinning, and using prescribed fire. While project site preparation, release, and weed treatments will result in short-term negative impacts to rangeland vegetation and program administration, none of the alternatives are likely to result in significant long-term changes because a majority of the project area would not be treated and historically these acres were forested with very little vegetation in the understory. Even with these negative impacts, the range condition would remain improved and forage would be more abundant than pre-fire conditions.