CHAPTER FOUR - ENVIRONMENTAL CONSEQUENCES

The overall scientific and analytic basis for comparison among the five alternatives is presented in this chapter of the Environmental Impact Statement (EIS), along with the probable consequences (impacts or effects) of each alternative on selected environmental resources. This chapter offers an analysis of effects on the following:

- Vegetation Resources (Issue 1) (Section 4.2)
- Wildland Urban Interface (WUI) (Section 4.3)
- Sagebrush Steppe Ecosystem (Issue 2) (Section 4.4)
- Wildlife Resources and Federally-listed Threatened and Endangered (T&E) and BLM-Sensitive Species (Section 4.5)
- Air Quality (Section 4.6)
- Soils (Section 4.7)
- Water Resources (Section 4.8)
- Livestock Grazing Management (Section 4.9)
- Recreational Resources (Section 4.10)
- Wilderness Resources (Section 4.11)
- Visual Resources (Section 4.12)
- Cultural Resources (Section 4.13)
- Native American Tribal Concerns (Section 4.14)
- Socioeconomics (Section 4.15)

Lastly presented are the non-fire, fuels, and vegetation management related cumulative effects (Section 4.16).

These resources address the most critical resources affected by the treatment levels proposed in the alternatives. Each resourceis organized by field office to illustrate the differences in ecological issues and effects across the planning area.

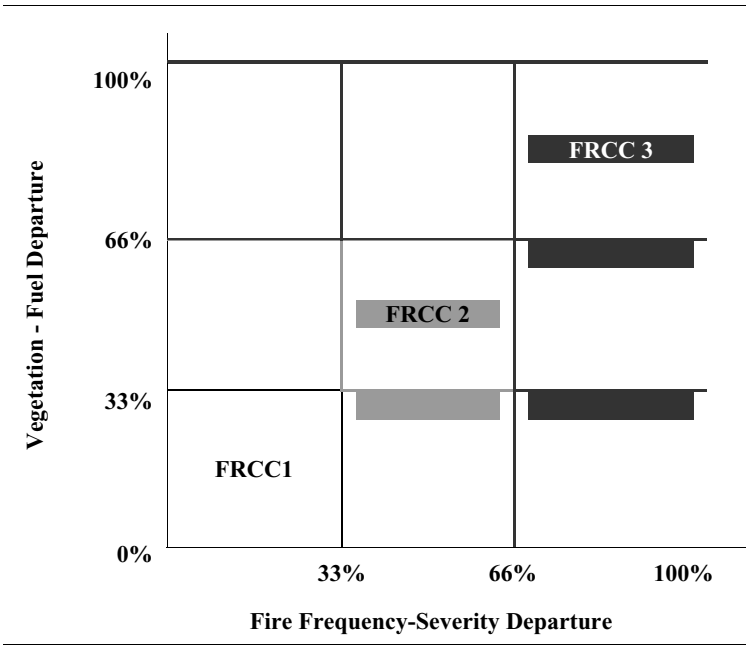
The analysis of effects in this chapter includes treatments considered within the Craters of the Moon National Monument and Preserve (Monument) in an effort to display the full range of direct and indirect effects resulting from changes in wildland fire management on the upper Snake River plain. The analysis is not specific to the Monument but rather is done by field office or planning area depending upon specific resources and or uses. Monument effects are included in the Shoshone Field Office (SFO) effects or planning area effects. Retaining the direct and indirect effects analysis facilitates the cumulative effects analysis. Fire management planning decisions for the Monument have been made through the Monument (National Park Service [NPS]/ Idaho Bureau of Land Management [BLM]) planning process (Chapter 1, Section 1.8.2).

4.1 INDICATORS AND GENERAL METHODOLOGY

In Sections 4.2 and 4.4 (Issues 1 and 2 respectively), the impacts of Alternatives A, B, C, D, and E were assessed using the indicators listed below. Section 4.3 impacts were assessed using only Footprint-acres.

- Footprint-acres - Footprint-acres indicate the levels of soil disturbance relative to the five alternatives.
- Percentages of sage grouse Source Habitat affected - Source Habitat indicates the relative proportion (percent) of sage grouse Stronghold and Isolated Habitat disturbed by each alternative.
- Desired Future Condition (DFC) (expressed as a percentage) - DFC is used as a long-term management objective for vegetation cover types. DFC can be compared to current conditions, as well as the relative merits of each alternative to achieve DFC within 30 years. For DFC analysis, vegetation cover types were split into different age classes (years since last fire) or seral stages to analyze the effects of the five alternatives.
- Fire Regime Condition Class (FRCC) 1 through FRCC 3 - FRCC is a landscape-level fire risk assessment index of to what extent current conditions deviate or depart from historical conditions in the areas of vegetation and fuels structure and composition and fire frequency. FRCC is used to compare the long-term effects of the five alternatives at 30 years after implementation. FRCC 1 indicates conditions that are within the range of historical variability, while FRCC 2 and 3 indicate how far current conditions depart from the historical range.

Figure 4-1 illustrates how the two types of departure are used to determine a single FRCC for each type. Departures of 0 percent to 33 percent are considered within the natural range of variability (FRCC 1) and are desirable, meaning that wildland fires that occur would display normal fire frequency severity and vegetation fuels conditions. Departures of 34 percent to 100 percent are considered outside the natural range of variability (FRCC 2 and 3). Moving toward and achieving FRCC 1 for each vegetation type is the most desirable condition.



Percent departure values within the white area are within the range of natural variability. The shaded area identifies percent departure values outside the range of natural variability.

Figure 4-1. FRCC 1, 2, and 3, representing the percent departure from the natural range of variability for fire frequency-severity and vegetation-fuels.

In Figures 4-2 through 4-26 below, FRCC is the product of both the x-axis, which indicates the departure of current fire frequency from the natural fire rotation, and the y-axis, which indicates the departure of current vegetation and fuels structure and composition from DFC. For each vegetation cover type, departure of fire frequency (x-axis) was based on the planning area's 32-year wildland fire history between 1970 and 2001. The departure of vegetation and fuels from DFC (y-axis) was determined by using age class/seral stage distributions and adding the percentages that each age class/seral stage contributes to DFC. FRCC categories are as follows:

- FRCC 1 = 0 percent to 33 percent departure from historical conditions
- FRCC 2 = 34 percent to 66 percent departure from historical conditions
- FRCC 3 = 67 percent to 99 percent departure from historical conditions

Note: The terms "age class," "seral stage," and "successional stage" are referenced throughout this chapter. Current and desired conditions were analyzed for each vegetation type using these concepts. Age class was estimated using fire occurrence data to determine time since disturbance. "Age Class" or time since disturbance was then equated to seral or successional stage. For example, in Low-elevation Shrub acres that have not burned within the last 15 years equate to early seral/successional. It is recognized that "time since disturbance" and seral/successional stages are not identical but for any one vegetation type, especially at the landscape scale, there are rough correspondences between age and seral/successional stage. At the scale of this analysis, the best data available to correlate with successional stage is "years since last fire". In this analysis, age class was determined using "years since last fire" and is used

to roughly approximate seral/successional stage percentages across the planning area. This data was used for the purpose of alternative comparison.

4.2 ANALYSIS OF EFFECTS ON VEGETATION RESOURCES (ISSUE 1)

This section details the effects of treatment levels on vegetation and fire ecology across the alternatives, including those treatment levels that are higher than what is proposed in Alternative B. In doing so, this section addresses Issue 1 as described in Section 1.4.1, Issues Driving Development of Alternatives.

Impacts described in this chapter were identified with the use of best professional judgment and were assessed quantitatively wherever possible. In those resources or actions where the effects could not be reasonably quantified the following intensity criteria were used to describe those impacts:

- Negligible – impacts would not be detectable through standard observation or readily apparent. Actions would result in frequencies and magnitudes of disruption that would be well within the natural range of variability.
- Minor – actions could result in a change to the resource but the change would be local or small. Effects would be detectable. Frequencies and magnitudes or disruption would be expected to remain within the natural range of variability.
- Moderate/Intermediate – Actions would result in a change to the resource that would be of consequence, yet would still be small. Changes would be noticeable in a local area and the frequencies and magnitudes of disruption would be outside the natural range of variability for short periods of time, but would return to the natural range of variability.
- Major – Actions would result in a dramatic change to the resource and the amount of disturbance would be large. The frequencies and magnitudes of disruption would be outside the natural range of variability for short to long periods of time.

In most instances major and moderate/intermediate effects are measurable and effects are quantified. In situations where this is not possible these terms have been utilized to describe the resulting effects within a common framework to adequately compare effects.

4.2.1 ANALYSIS OF EFFECTS FOR THE UPPER SNAKE FIELD OFFICE (USFO)

4.2.1.1 Low-elevation Shrub, Perennial Grass, and Invasive Annual Grass

4.2.1.1.1 Short-term Effects

Alternative treatment levels for these cover types of the USFO range from approximately 4,300 acres (Alternative A) to 474,000 acres (Alternative D and E; Table 4-1). The goal is to improve vegetation structure and composition, as well as reduce frequency intervals and decrease fire size.

TABLE 4-1. VEGETATION COVER TYPES AND THEIR ACREAGES IN THE UPPER SNAKE FIELD OFFICE (USFO)

Cover type	Total Acres in USFO	Alternatives (footprint-acres)[1]				
		A	B	C	D	E
Low-elevation Shrub	913,183	2,500	101,500	55,200	216,790	216,790
Perennial Grass	470,003	1,750	52,600	172,000	257,000	257,000
Invasive Annual Grass	36[2]	0	0	36	0	0
Mid-elevation Shrub	231,518	16,500	56,990	161,700	78,220	78,220
Juniper	5,380	0	2,200	3,300	900	900
Salt Desert Shrub	27,410	0	0	0	0	0
Aspen/Conifer	10,276	200	6,100	500	0	500
Dry Conifer	20,132	1,000	4,950	800	0	800
Mountain Shrub	13,036	200	5,080	1,530	9,730	9,730
Riparian	15,690	320	0	429	0	0
Wet/Cold Conifer	14,094	220	0	1,075	0	1,075
Vegetated Rock/Lava	304,793	100	5,780	0	0	0
TOTAL	**2,025,551**	**22,790**	**235,200**	**396,570**	**562,640**	**565,015**

[1] Footprint-acres describe broad treatment levels over 10 years for rehabilitation and restoration.
[2] As mapped (100% coverage of Invasive Annual Grass).

The USFO has most of the Low-elevation Shrub cover types in the planning area. A minor proportion (less than 5 percent) of sagebrush steppe has been converted to Invasive Annual Grass. Aerial seeding of sagebrush would have negligible impacts on native vegetation. Fire would remove the biomass and canopy structure of sagebrush steppe. On the other hand, Perennial Grass wildland fires rarely burn at high intensity; thus, for Perennial Grasses, forbs, and shrubs that re-sprout, mortality is unlikely. Therefore, Perennial Grass would be expected to begin recovery during the growing season following a fire.

Rehabilitation and/or hazardous fuels reduction actions would seed shrubs and grasses to speed succession back to sagebrush steppe. Areas where cheatgrass (*Bromus tectorum*) has become established would also be seeded with Perennial Grasses and forbs to restore a healthy herbaceous understory. BLM would use approved chemicals to control cheatgrass and noxious weeds. Short-term effects of treatments would include the mortality of non-target plants due to herbicide use and from seeding methods that cause soil surface disturbance, affecting shallow-rooted species.

While Alternative A would treat the fewest acres (see Table 4-1) and have the least short-term impacts, Alternatives D and E would treat large areas (approximately 34 percent) of sagebrush steppe (sum of Low-elevation Shrub, Perennial Grass, and Invasive Annual Grass). Alternatives B and C would treat approximately 11 percent and 16 percent of this cover type, respectively, and would have intermediate effects.

4.2.1.1.2 Long-term Effects

Treatments applied to poor condition Low-elevation Shrub would be positive, resulting in cover types with sagebrush canopy and a diverse, perennial understory. Alternatives B, C, D, and E would treat approximately 12 percent, 20 percent, 26 percent, and 28 percent of the existing sagebrush steppe, respectively, much of which is lacking in perennial understory and is at risk of encroachment by cheatgrass. Alternatives D and E would make the most progress toward creating a more resilient landscape. Alternative A would do little to improve or rehabilitate the Low-elevation Shrub cover type in the USFO.

Treatments in Perennial Grass would have long-term positive effects by reestablishing a shrub canopy and herbaceous understory on sagebrush steppe sites. Alternatives D and E would seed sagebrush on approximately 55 percent of this cover type, while Alternatives B and C would seed approximately 11 percent and 37 percent of this cover type, respectively (see Table 4-1). Alternatives D and E would better facilitate succession to a later successional state than the other alternatives. Alternative A would treat only a fraction of Perennial Grass acreage and would not affect succession and reestablishment of sagebrush in continuous or connected blocks.

Treatments in Invasive Annual Grass, Perennial Grass, and Low-elevation Shrub cover types would be directed toward achieving DFC, consistent with percentage values in Table 4-2. DFC consists of a plant mixture of different species and age classes/seral states with some allowable uncharacteristic vegetation. In Table 4-2, cheatgrass is considered an uncharacteristic species and could remain part of the cover type because it is not expected to be completely eradicated.

TABLE 4-2. VEGETATION/AGE CLASS, DESIRED FUTURE CONDITION (DFC), CURRENT CONDITION, AND EFFECTS OF FIVE ALTERNATIVES FOR LOW-ELEVATION SHRUB, PERENNIAL GRASS, AND INVASIVE ANNUAL GRASS, UPPER SNAKE FIELD OFFICE (USFO)

Vegetation/Age Class[1]	DFC	Current	Alternatives Over 30 Years			
			A	B	C	D and E
Perennial Grass <15-year	14%	29%	25%	31%	24%	27%
Grass/Shrub 15-30-year	14%	1%	27%	32%	29%	29%
Shrub/Grass >30-year	52%	48%	37%	28%	40%	41%
Crested Wheatgrass	NA[2]	1%	1%	1%	1%	1%
Invasive Annual Grass in Understory[3]	<20%	21%	11%	9%	7%	3%

[1] Age Class is the number of years since last fire, which is used as an approximation of seral stage in this analysis.

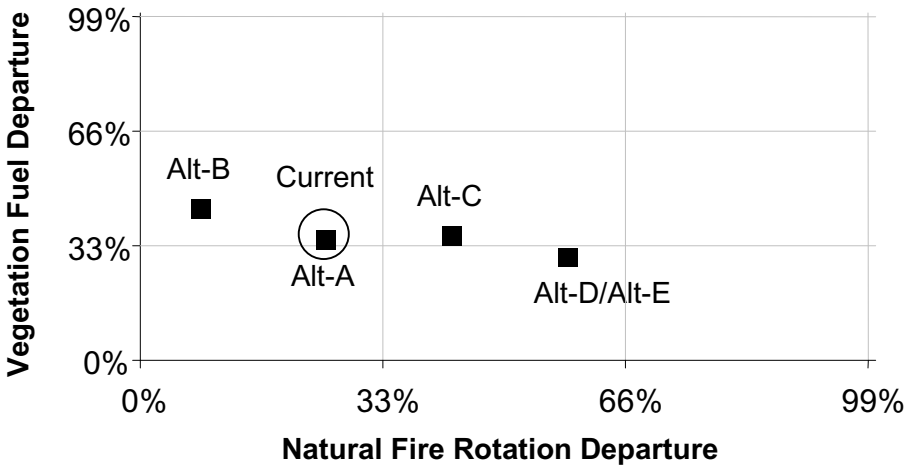
[2] Not applicable; no DFC objective was set for Crested wheatgrass. Crested wheatgrass percentages remain constant across the landscape over time due to the success of overseeding shrub species and through succession these areas become shrub dominated while minimal acres are seeded with Crested wheatgrass.

[3] Although absence of cheatgrass is desirable, these percentages have been deemed acceptable, since complete eradication of cheatgrass is impossible.

All alternatives would improve the overall condition Low-elevation Shrub, Perennial, and Invasive Annual Grass cover types in the USFO but to varying degrees. All alternatives improve the proportions of <15-year and 15-year to 30-year age class cover types and reduce >30-year

age class grass/shrub cover types. All alternatives assume some further loss of mature sagebrush steppe while Perennial Grass is reduced and early grass/shrub cover types are established. None of the alternatives would achieve DFC within 30 years of implementation because wildland fires would continue, though with reduced intensities, severities, and frequencies.

Under all alternatives, Low-elevation Shrub, Perennial Grass and Invasive Annual Grass would remain within the range of FRCC 2 after 30 years, and no alternative would achieve FRCC 1 (Figure 4-2). Alternative A would not change the current condition (i.e., no change in fire rotation or vegetation and fuels structure and composition). Alternative B would improve (lengthen) fire rotation, but would not improve vegetation and fuels structure and composition. Alternatives C, D, and E would reduce the frequency of wildland fires and produce fire rotations longer than the natural fire rotation; therefore, departures for Alternatives C and D/E show increases above 40 percent and 55 percent, respectively. Alternative C would maintain current vegetation and fuels structure and composition, while Alternatives D and E would slightly improve it.



Current FRCC condition is identified by the symbol - ○. Note: FRCC 1 = 0-33%; FRCC 2 = 33-66%; FRCC 3 = 66-99%.

Figure 4-2. The effects of each alternative on Fire Regime Condition Class (FRCC) rating for Low-elevation Shrub, Perennial Grass, and Invasive Annual Grass in the Upper Snake Field Office (USFO).

Alternatives C, D, and E would not affect early successional stages. They would, however, increase the proportion of mid-successional stages and substantially decrease the proportion of uncharacteristic vegetation. Vegetation and fuels structure and composition would most closely approach DFC under Alternatives D and E. In the USFO, longer fire frequency in these cover types would help reduce habitat fragmentation and/or aid the restoration of large areas of sagebrush steppe in adjacent portions of the planning area as well as reduce the potential for uncharacteristic vegetation to establish following wildland fire.

4.2.1.2 Mid-elevation Shrub and Juniper

4.2.1.2.1 Short-term Effects

Alternative treatment levels for these cover types of the USFO range from approximately 16,500 acres (Alternative A) to 165,000 (Alternative C) acres of Mid-elevation Shrub and Juniper, which includes areas of juniper encroachment (see Table 4-1), with the goal of improving vegetation structure and composition, as well as reintroducing fire in areas where juniper encroachment is a problem.

The Mid-elevation Shrub cover type has been affected by reduced wildland fire frequencies, juniper invasion in some areas, increased shrub densities, and the impoverishment of the herbaceous understory in other areas. This has reduced the quality of sagebrush steppe habitats. Treatments in Mid-elevation Shrub would focus on prescribed fire (RxFire) and wildland fire use (WFU), as well as mechanical methods, to reduce shrub and juniper density. Areas with invasive or noxious weeds would receive chemical treatments to reduce or eliminate infestations. Chemical treatments would also be used for selective thinning of shrub cover or to eliminate immature encroaching junipers within the Juniper cover type. Seeding could occur after fire and/or mechanical treatments in areas where the understory has been depleted.

Short-term effects of RxFire and WFU would include the reduction of shrub and tree canopy, as well as the temporary reduction in herbaceous cover due to the removal of biomass. Wildland fire could result in greater mortality and more continuous removal of canopy due to higher heat intensities than with RxFire. Herbaceous cover, particularly annual species, should increase within two growing seasons following a fire. Chemicals would be used to control invasive or noxious weeds on burned areas. Chemical treatments could result in the mortality of non-target species.

Mechanical treatments would be used in areas or situations where RxFire or WFU is not appropriate or effective, or where selective vegetation removal is desired. Mechanical treatments would have little short-term effect on non-target plants, due to the specificity of the treatments on target vegetation. One exception would be damage to shallow-rooted species when using chaining or a Dixie harrow. Seeding methods that result in soil surface disturbance (drilling, chaining, and harrowing) could result in similar disturbance. However, seeding grasses and forbs using these methods would be conducted primarily where the understory is depleted; therefore, the negative impacts would be minimal.

Alternative A would treat the fewest acres (approximately 7 percent of Mid-elevation Shrub and Juniper; see Table 4-1) and, therefore, would have the least short-term impact. This alternative, however, would do little to control juniper encroachment and restore landscape-level structural diversity. Alternative C, in contrast, would treat approximately 70 percent of the total acreage over 10 years, or approximately 16,500 acres annually, with the goal of restoring natural fire rotation intervals at a landscape scale. Alternatives B and D/E propose to treat 25 percent and 33 percent of the area, respectively, and would have intermediate effects on Alternative A and Alternative C.

4.2.1.2.2 Long-term Effects

Treatments applied to Mid-elevation Shrub and areas of juniper encroachment within Juniper would have long-term positive effects due to increasing the diversification of vegetation structure and composition. Alternative C is the most aggressive of the alternatives and would do the most to reintroduce the natural fire rotation on a landscape scale. However, given any of the alternatives juniper is anticipated to increase. Alternative C is the only alternative that would move the mix of desirable successional states for Mid-elevation Shrub toward DFC (Table 4-3). All alternatives would keep uncharacteristic vegetation below 15 percent, with Alternative B meeting DFC. Due to natural succession, juniper encroachment in USFO would increase given any alternative.

TABLE 4-3. VEGETATION/AGE CLASS, DESIRED FUTURE CONDITION (DFC), CURRENT CONDITION, AND EFFECTS OF FIVE ALTERNATIVES FOR MID-ELEVATION SHRUB AND JUNIPER, UPPER SNAKE FIELD OFFICE (USFO)

Vegetation/Age Class[1]	DFC	Current	Alternatives Over 30 Years			
			A	B	C	D and E
Perennial Grass <15-year	23%	0%	3%	6%	20%	14%
Grass/Shrub 5-15-year	45%	7%	9%	18%	34%	16%
Shrub/Grass >15-year	23%	86%	73%	67%	35%	57%
Juniper	7%	2%	8%	7%	5%	6%
Invasive Annual Grass in Understory[2]	2%	5%	7%	2%	6%	7%

[1] Age Class is the number of years since last fire, which is used as an approximation of seral stage in this analysis.

[2] Although absence of cheatgrass is desirable, these percentages have been deemed acceptable, since complete eradication of cheatgrass is impossible.

All alternatives would treat Mid-elevation Shrub and Juniper with the intention of moving these cover types toward FRCC 1 (Figure 4-3). Alternative A, however, would maintain the current condition in FRCC 3 and would not increase fire frequency. Thus, Alternative A would permit the continued accumulation of fuels; the dominance of old, decadent shrubs; increased juniper densities; and/or increased encroachment of juniper into Mid-elevation Shrub. Increased juniper densities would increase wildland fire hazard by supporting larger, more intense and more large wildland fire.

Alternatives B, D, and E would move the current condition from FRCC 3 to FRCC 2. Fire frequency would be shortened in these cover types; however, none of the three alternatives proposes enough treatment, or decreases the vegetation/fuel departure enough, to achieve FRCC 1 in 30 years. Alternative C would move the current conditions to FRCC 1. Under Alternative C, fire frequency would approximate the natural fire rotation rate, and the mix of characteristic successional stages and vegetation and fuels structure and composition across the landscape would approach DFC.

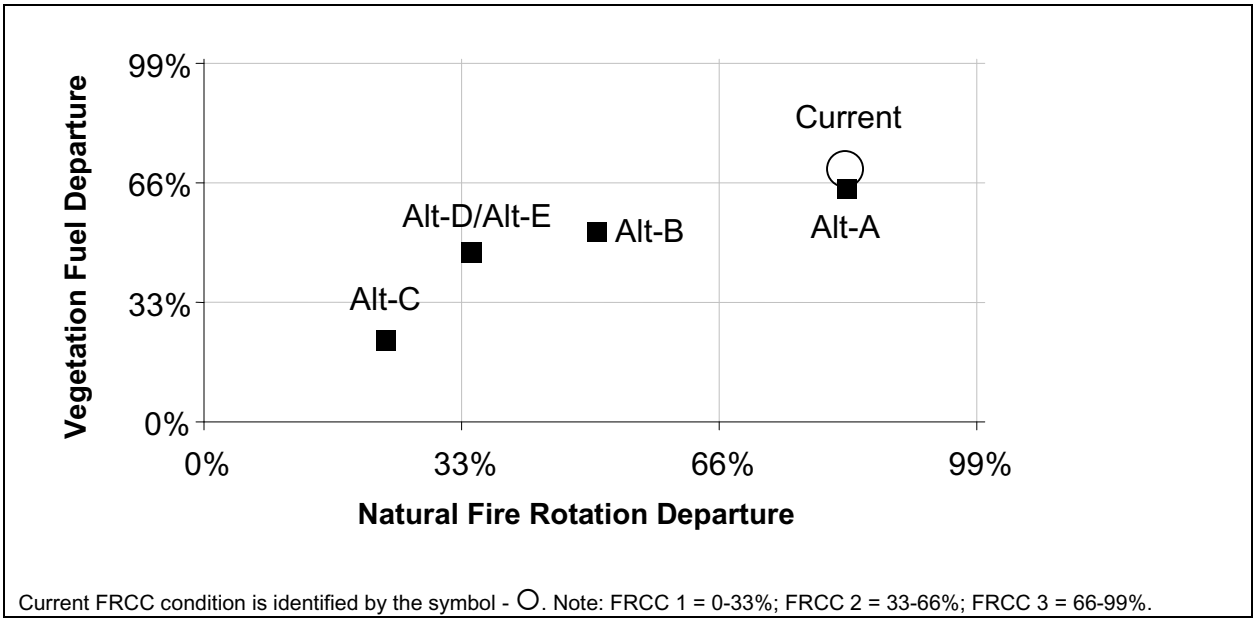


Figure 4-3. The effects of each alternative on Fire Regime Condition Class (FRCC) rating for Mid-elevation Shrub and Juniper in the Upper Snake Field Office (USFO).

4.2.1.3 Salt Desert Shrub

There are no planned treatments in the Salt Desert Shrub cover type in the USFO.

4.2.1.4 Aspen/Conifer and Dry Conifer

4.2.1.4.1 Short-term Effects

Alternative treatment levels for these cover types range from 0 acres (Alternative D) to approximately 11,050 acres (Alternative B) of Aspen/Conifer and Dry Conifer (see Table 4-1), with the goal of rejuvenating aspen stands and creating a diversity of forest successional stages and associated forest structure and species composition across the landscape.

Short-term effects of restoration treatments in the Aspen/Conifer and Dry Conifer cover types would reduce Aspen and Dry Conifer densities, decrease overstory canopy cover, and increase gaps in forest structure that allow solar radiation to reach understory vegetation and/or soil surface. A temporary reduction in understory shrub, grass, and forb cover would occur with RxFire and WFU. The vast majority of shrubs found in this vegetation resprout after fire and would provide structure and shade to the soil surface within a year or two following treatment. Perennial grasses and forbs would also resprout or recolonize the treatment areas. Increased soil temperatures, aspen root scarification, and/or a decrease in the number of older aspen trees would encourage aspen regeneration via resprouting or suckering.

Alternative D would not treat any forest type, including Aspen/Conifer and Dry Conifer cover types and, therefore, would produce no short-term effects. Alternatives A and C would treat small levels of this cover type (4 percent and 9 percent, respectively) and would produce

relatively few short-term effects. Alternative B would treat the most acres (36 percent of these types) and would produce substantial short-term effects.

4.2.1.4.2 Long-term Effects

Long-term effects of treatment across alternatives in the Aspen/Conifer and Dry Conifer types are positive and would result in a diversity of forest successional stages which is currently overabundant across the landscape. Pure aspen stands would become larger and more numerous. Vegetation species richness across the landscape would increase as the proportion of forest successional stages becomes more even. The number of stands at high risk to forest insect and disease outbreaks and subsequent uncharacteristically large wildland fire would decrease.

Treatments for the Aspen/Conifer and Dry Conifer cover types would be applied with the intent of moving toward a vegetation/fuels DFC consisting of a 40:40:20 mix of early successional, mid-successional, and late successional forest cover types (Table 4-4). None of the alternatives would achieve DFC in 30 years; however, Alternatives B, C, and E would achieve a more even distribution of successional forest cover types across the landscape and would make the most progress toward DFC. All three of these alternatives increase the percentage of early and mid-successional forest and decrease the percentage of late successional forest. Alternative A and Alternative D move away from DFC, slightly increasing the amount of early successional forest, decreasing the amount of mid-successional forest and increasing the amount of late successional forest from current proportions.

TABLE 4-4. VEGETATION/AGE CLASS, DESIRED FUTURE CONDITION (DFC), CURRENT CONDITION, AND EFFECTS OF FIVE ALTERNATIVES FOR ASPEN/CONIFER AND DRY CONIFER, UPPER SNAKE FIELD OFFICE (USFO)

Vegetation/Age Class[1]	DFC	Current	Alternatives Over 30 Years			
			A	B	C and E	D
Forb/grass with aspen trees/suckers, <25 years old	40%	3%	6%	13%	10%	5%
Aspen/Conifer/Shrub mix, 25-50 years old	40%	29%	24%	43%	34%	22%
Conifer-dominated, >50 years old	20%	68%	70%	44%	56%	73%

[1] Age Class is the number of years since last fire, which is used as an approximation of seral stage in this analysis.

All alternatives would treat Aspen/Conifer and Dry Conifer with the intention of moving these cover types toward FRCC 1 (Figure 4-4). Alternative A, however, would maintain (current) FRCC 2 and would permit accumulation of fuels, an increase in conifer tree densities, and higher rates of insect attacks and disease. Forests composed of Dry Conifer with a litter understory would pose a greater wildland fire hazard and would more likely burn with stand-replacement severity as opposed to Aspen/Conifer with a grass/forb/shrub understory. Wildland fire sizes and intensities would be greater in Dry Conifer-dominated areas, often leading to crown-fires. Under

Alternative A, the proportions of successional stages would be allowed for too many late successional stages, and over time, would increase the departure from DFC.

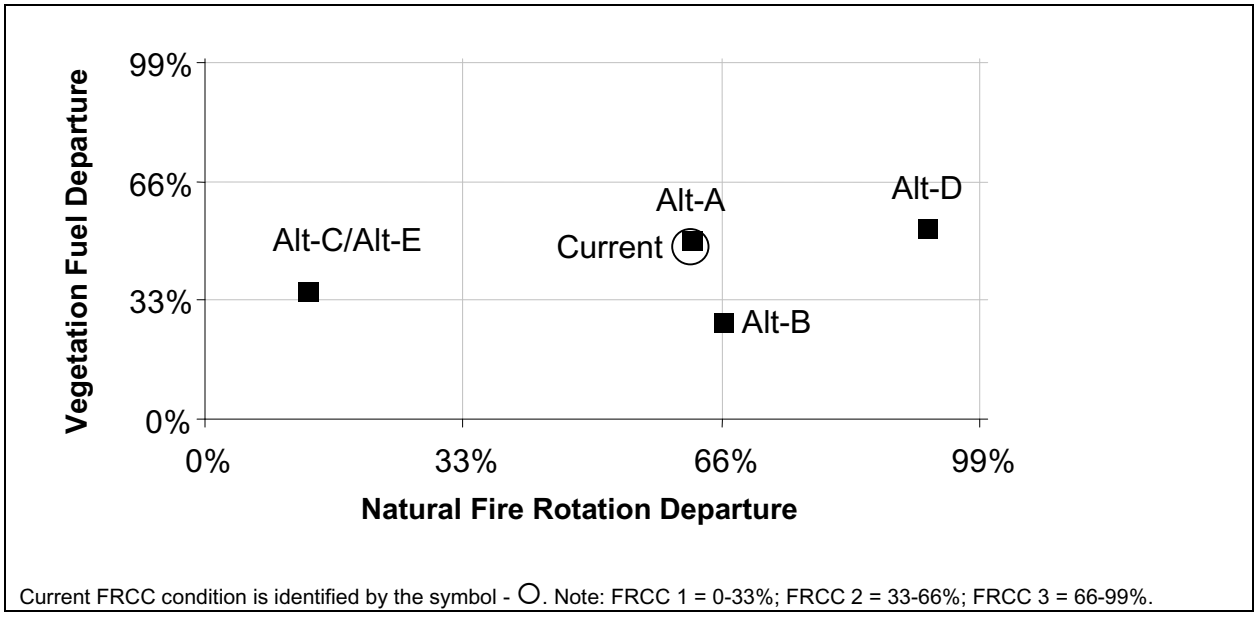


Figure 4-4. The effects of each alternative on Fire Regime Condition Class (FRCC) rating for Aspen/Conifer and Dry Conifer in the Upper Snake Field Office (USFO).

Alternative B would maintain FRCC 2 but would move vegetation and fuels structure and composition toward DFC and shorten the fire frequency. A shorter fire frequency would increase early and mid-successional stages and decrease late successional stages. In 30 years, Alternative B would decrease the departure of vegetation/fuels more than the other alternative; however, progress toward DFC would not be realized in the first decade.

Alternatives C and E would move these cover types close to FRCC 1 in 30 years. Fire frequency would approximate the natural fire rotation, creating the desired mix of successional forest cover types and vegetation and fuels structure and composition across the landscape. Alternative D would not treat these cover types and would permit a decline from FRCC 2 to FRCC 3 and an increase in hazardous conditions. Under Alternative D, fire frequency would remain at a rate less than historical, causing more acres to move toward late successional.

4.2.1.5 Mountain Shrub

4.2.1.5.1 Short-term Effects

Alternative treatment levels for this cover type in the USFO range from 200 acres (Alternative A) to approximately 9,700 acres (Alternatives D and E) of Mountain Shrub (see Table 4-1), with the goals of rejuvenating old, decadent shrubs; increasing cover and density of desirable herbaceous species (i.e., cheatgrass and noxious weeds); and creating a diversity of successional stages in a mosaic across the landscape.

Treatments primarily would be RxFire and WFU. Short-term effects of restoration treatments would include a temporary decrease in shrub, grass, and forb canopy cover. RxFire would kill some individual shrubs. This is particularly true for antelope bitterbrush at lower elevations and mountain mahogany. These changes would increase the amount of solar radiation reaching the soil surface. The vast majority of Mountain Shrub species resprout after low to moderate severity fire and would provide structure and shade to the soil surface within a year or two following treatment. Effects of fire on mountain mahogany, however, could persist for a number of years (and perhaps into the long term) due to a general lack of resprouting. Perennial grasses and forbs would resprout or recolonize the treatment areas. Shrub leader growth would be vigorous following treatment due to increased light and soil temperatures as well as a reduction in standing, dead, woody material.

Alternative A would treat the fewest acres (less than 2 percent of this cover type) and would have negligible short-term impacts. Alternatives D and E would treat the most acres (approximately 75 percent of this cover type) and would have substantial short-term impacts. Alternatives B and C propose intermediate amounts of treatment (39 percent and 12 percent of this cover type, respectively) and would result in an intermediate level of short-term effects.

4.2.1.5.2 Long-term Effects

Effects of treatment across alternatives in the Mountain Shrub cover type would be positive and would result in a diversity of shrub successional stages across the landscape. Stands of Mountain Shrub would become larger and more numerous. Across the landscape, species richness would increase as the proportion of shrub successional stages becomes more even. The number of shrub stands at risk of large wildland fire due to heavy fuel loading would decrease.

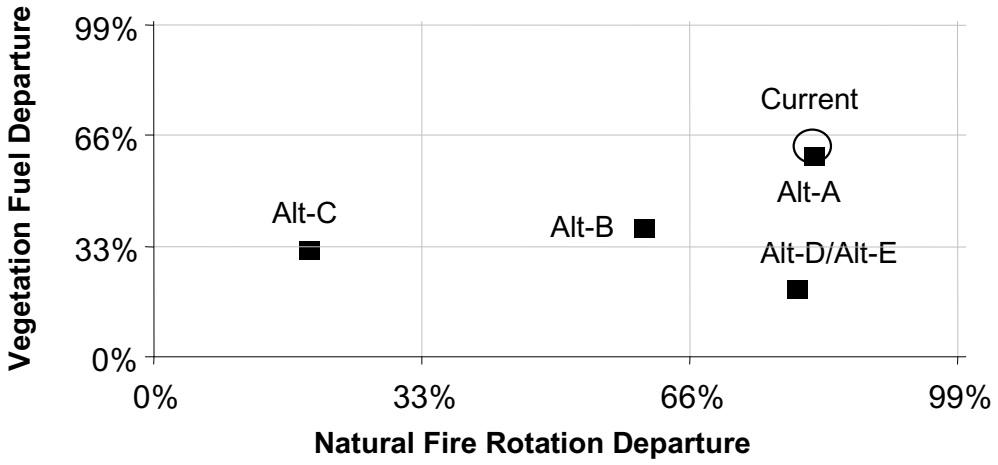
Treatments in Mountain Shrub would be applied with the intent of moving toward a vegetation/fuels DFC consisting of a 33:33:34 mix of early successional, mid-successional, and late successional shrub cover types (Table 4-5). None of the alternatives would achieve DFC in 30 years; however, three alternatives would achieve a more even distribution of successional stages across the landscape. Alternatives D and E would most closely approximate DFC followed by Alternative C. These three alternatives would increase the percentage of early and mid-successional shrub cover types and decrease the percentage of late successional shrub cover types. Alternative B would make limited progress toward DFC.

All alternatives would treat Mountain Shrub with the intention of moving toward FRCC 1 (Figure 4-5). Alternative A would maintain the current condition in FRCC 3, however, and permit the dominance of old, decadent shrubs; depletion of understory species; and woody fuel build-up. Increased fuel structure and composition would increase fire hazard by supporting larger, more intense and large wildland fires. Alternative B would improve the current condition to FRCC 2. Fire frequency would be shortened in this cover type; however, Alternative B would not treat enough vegetation or decrease the vegetation/fuel departure enough to achieve FRCC 1 in 30 years.

TABLE 4-5. VEGETATION/AGE CLASS, DESIRED FUTURE CONDITION (DFC), CURRENT CONDITION, AND EFFECTS OF FIVE ALTERNATIVES FOR MOUNTAIN SHRUB, UPPER SNAKE FIELD OFFICE (USFO)

Vegetation/Age Class[1]	DFC	Current	Alternatives Over 30 Years			
			A	B	C	D and E
Perennial Grass/Shrub, <10 years old	33%	0%	4%	9%	11%	13%
Shrub/Perennial Grass 10-20 years old	33%	3%	2%	18%	23%	32%
Shrub dominated, >20 years old	34%	97%	94%	73%	66%	55%

[1] Age Class is the number of years since last fire, which is used as an approximation of seral stage in this analysis.



Current FRCC condition is identified by the symbol - O. Note: FRCC 1 = 0-33%; FRCC 2 = 33-66%; FRCC 3 = 66-99%.

Figure 4-5. The effects of each alternative on Fire Regime Condition Class (FRCC) rating for Mountain Shrub in the Upper Snake Field Office (USFO).

Alternative C would achieve FRCC 1 in 30 years. Fire frequency would become shortened to approximate the natural fire rotation, and treatments would create a mix of successional stages and fuel loadings across the landscape that approach DFC. Alternatives D and E would maintain FRCC 3, due to an aggressive treatment regime, and would implement too much treatment over too short a period of time, making the disturbance rate shorter than the natural fire rotation and would move the proportion of successional stages across the landscape away from DFC.

4.2.1.6 Wet/Cold Conifer

4.2.1.6.1 Short-term Effects

Alternative treatment levels for this cover type in the USFO range from 0 acres (Alternatives B and D) to approximately 1,100 acres (Alternatives C and E) of Wet/Cold Conifer (Table 4-1), with the goals of reducing risk of insect infestation and disease as well as creating a diversity of forest successional stages and associated forest structure across the landscape. In areas where private landowners are intermingled with the forest, the goal of treatment would be to reduce threats to private land by reducing wildland fire intensity and spread.

Short-term effects of restoration treatments in Wet/Cold Conifer would reduce tree density, decrease overstory canopy cover, and increase the amount of solar radiation reaching the understory vegetation and/or soil surface. Where mechanical treatments are used, a reduction in mature and pole-sized lodgepole pine tree density would occur. Where WFU treatments are used, overstory trees would be replaced by understory shrubs, grasses, and forbs, while lodgepole pine would reproduce and grow above the understory vegetation within approximately 10 years following disturbance.

Alternatives B and D would not treat Wet/Cold Conifer and would have no short-term effects. Alternatives A, C, and E would treat few acres in this cover type (less than 0.5 percent) and would have negligible short-term effects.

4.2.1.6.2 Long-term Effects

Effects of treatment across alternatives in the Wet/Cold Conifer cover type would be positive and would result in more resilient forest stands and a diversity of forest successional stages across the landscape. Lodgepole pine stands would become more capable of withstanding insect and disease outbreaks. Vegetation species richness across the landscape would increase as the proportion of forest successional stages becomes more evenly distributed. In those areas where private land are intermingled with the forest and treatment is implemented as a measure of protection, fire intensity and spread would increase.

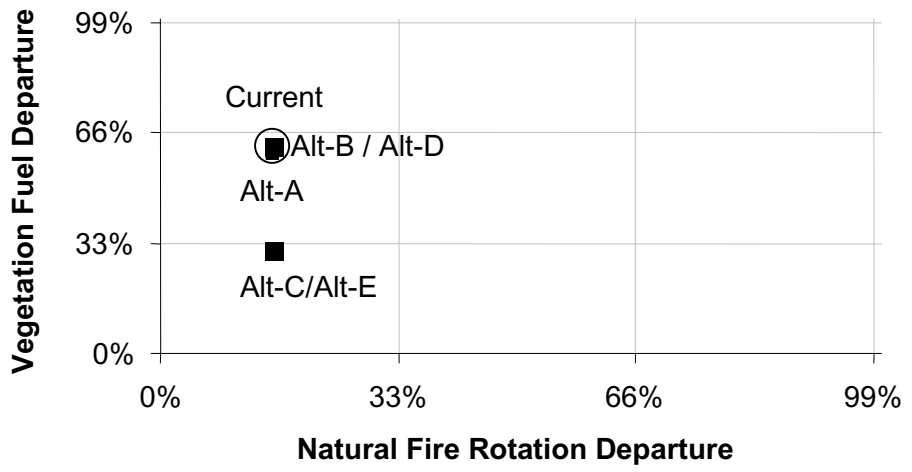
Treatments in Wet/Cold Conifer would move this cover type toward a vegetation/fuels DFC consisting of a 30:44:26 mix of early successional, mid-successional, and late successional forest cover types (Table 4-6). None of the alternatives would achieve DFC in 30 years. Alternatives C and E are the only alternatives that would achieve a more even distribution of successional forest cover types across the landscape. These alternatives would increase the percentage of early and mid-successional stages and decrease the percentage of late successional stages across the landscape. Furthermore, Alternatives C and E are the only alternatives that would substantially decrease the threats associated with wildland fire to private land in the WUI. Alternatives A, B, and D make very limited progress toward DFC (through limited treatment and/or wildland fire) by slightly increasing early successional stages and slightly decreasing late successional stages.

TABLE 4-6. VEGETATION/AGE CLASS, DESIRED FUTURE CONDITION (DFC), CURRENT CONDITION, AND EFFECTS OF FIVE ALTERNATIVES FOR WET/COLD CONIFER, UPPER SNAKE FIELD OFFICE (USFO)

Vegetation/Age Class[1]	DFC	Current	Alternatives Over 30 Years			
			A	B	C and E	D
Forb/grass with seedlings	30%	2%	5%	3%	26%	3%
Conifer Shrub mix	44%	10%	9%	9%	17%	9%
Conifer-dominated	26%	89%	86%	88%	57%	88%

[1] Age Class is the number of years since last fire, which is used as an approximation of seral stage in this analysis.

Alternatives A, C, and E would treat Wet/Cold Conifer with the intention of moving this cover type toward FRCC 1 (Figure 4-6). Alternative A, however, would treat very little of this cover type and maintain current FRCC 2. Alternatives B and D would not treat Wet/Cold Conifer. Because growth and succession rates are so slow in this cover type, lack of treatments would not exacerbate existing conditions. Forests in FRCC 2 would have moderate to high stocking densities, substantial ladder fuels (e.g., small trees and overlapping deadfall), and moderate to widespread insect and disease outbreaks.



Current FRCC condition is identified by the symbol - O. Notes: FRCC 1 = 0-33%; FRCC 2 = 33-66%; FRCC 3 = 66-99%.
Due to the lack of long-term fire history data for this cover type, the FRCC rating is based on vegetation/fuel departure. For clarity, departure from the natural fire rotation was positioned at the midpoint of FRCC 1.

Figure 4-6. The effects of each alternative on Fire Regime Condition Class (FRCC) rating for Wet/Cold Conifer in the Upper Snake Field Office (USFO).

Alternatives C and E would achieve FRCC 1 in Wet/Cold Conifer within 30 years (see Figure 4-6). Forests in FRCC 1 would have a mix of successional stages and vegetation and fuels structure and composition close to DFC across the landscape. Treatments in WUI areas would

have priority, and threats to private land would be reduced. Departure from the natural fire rotation was not calculated for Wet/Cold Conifer due to long fire return intervals and incomplete fire history data. The FRCC for the current situation and all alternatives is based entirnely on departure from the vegetation/fuels DFC. Alternatives A, B, and D would maintain the current condition in FRCC 2. Forests in this condition would have moderate to high stocking densities, substantial ladder fuels (e.g., small trees and overlapping deadfall), and moderate to widespread insect and disease outbreaks.

4.2.1.7 Vegetated Rock/Lava

4.2.1.7.1 Short-term Effects

Alternative treatment levels for the Vegetated Rock/Lava cover type range from 0 acres (Alternatives C, D, and E) to approximately 5,800 acres (Alternative B) (see Table 4-1). These treatments would consist of WFU and chemical treatments to control noxious weeds.

WFU would be allowed on Vegetated Rock/Lava in Alternative A and Alternative B, with a minimal amount in Alternative A (see Table 4-1). Because wildland fire starts on Vegetated Rock/Lava are infrequent, it is assumed that only a small fraction of the existing acreage would burn. This cover type is discontinuous and limited to areas with some soil development; therefore, wildland fires would have minimal spread. Wildland fire is primarily allowed due to suppression difficulties. However, because cheatgrass is not a substantial problem in this type, WFU allows for historical successional processes to occur. Noxious weed invasions, usually found near the edges of Vegetated Rock/Lava, would be chemically treated to prevent or reduce spread.

WFU would permit historical successional processes to occur. Where cheatgrass or noxious weed invasions are found near the edges of Vegetated Rock/Lava, treatment would be conducted to prevent or reduce spread and maintain current percentages across the landscape. Vegetation mortality due to wildland fire would be most noticeable for long-lived shrubs and trees, such as Wyoming big sagebrush *(Artemisia tridentata* subsp. *wyomingensis)* and junipers. Because vegetation is patchy, fire effects would also be discontinuous, creating openings in areas with dense concentrations of fuels.

4.2.1.7.2 Long-term Effects

All alternatives would tend to increase the proportion of early to mid-seral vegetation in this cover type, while decreasing late seral shrub/tree cover types dominated by sagebrush and juniper (Table 4-7). Current conditions are very close to the DFC; however, over time, all alternatives would move this cover type in the wrong direction due to the continuance of wildland fire. Alternatives C, D, and E move current conditions away from DFC equally, while Alternative B is only slightly better. Alternative A would move this cover type away from DFC the least; however, the percentage of cheatgrass-infested acreage would not decrease from current proportions. Alternative B is the only alternative that includes proactive chemical treatments, and would slightly decrease the percentage of cheatgrass-infested acreage within this type.

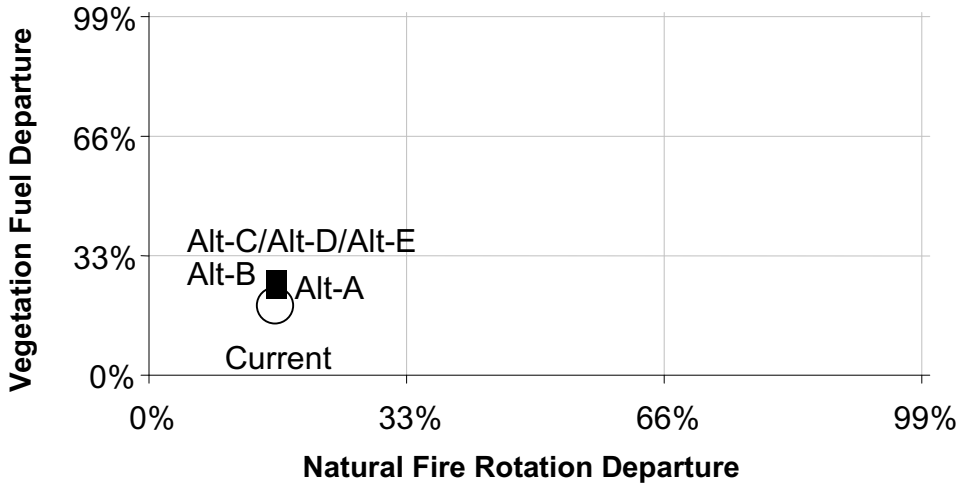
TABLE 4-7. VEGETATION/AGE CLASS, DESIRED FUTURE CONDITION (DFC), CURRENT CONDITION, AND EFFECTS OF FIVE ALTERNATIVES FOR VEGETATED ROCK/LAVA, UPPER SNAKE FIELD OFFICE (USFO)

Vegetation/Age Class[1]	DFC	Current	Alternatives Over 30 Years			
			A	B	C	D and E
Perennial herbaceous	6%	11%	16%	22%	17%	17%
Tree/shrub/herbaceous	80%	75%	68%	66%	67%	67%
Invasive Annual Grass in Understory[2]	14%	14%	16%	12%	16%	16%

[1] Age Class is the number of years since last fire, which is used as an approximation of seral stage in this analysis.

[2] Although absence of cheatgrass is desirable, these percentages have been deemed acceptable, since complete eradication of cheatgrass is impossible.

All alternatives would maintain the Vegetated Rock/Lava in FRCC 1. Alternative A would have the least departure from the vegetation/fuels DFC (Figure 4-7). Alternative B is the only alternative with proactive chemical treatments proposed for cheatgrass control and, therefore, decreases the percentage of cheatgrass-infested acres more than any other alternative. Alternative B would also be the most flexible and would allow for an Appropriate Management Response when suppressing fires in, or adjacent to, this cover type. Due to the lack of long-term fire history data, departure from the natural fire rotation was not calculated for Vegetated Rock/Lava. The FRCC rating for the current situation and all alternatives are based entirely on departure from the vegetation/fuels DFC. All alternatives would maintain the current condition in FRCC 1.



Current FRCC condition is identified by the symbol - O. Notes: FRCC 1 = 0-33%; FRCC 2 = 33-66%; FRCC 3 = 66-99%.

Due to the lack of long-term fire history data for this cover type, the FRCC rating is based on vegetation/fuel departure. For clarity, departure from the natural fire rotation was positioned at the midpoint of FRCC 1.

Figure 4-7. The effects of each alternative on Fire Regime Condition Class (FRCC) rating for Vegetated Rock/Lava in the Upper Snake Field Office (USFO).

4.2.2 ANALYSIS OF EFFECTS FOR THE POCATELLO FIELD OFFICE (PFO)

4.2.2.1 Low-elevation Shrub, Perennial Grass, and Invasive Annual Grass

4.2.2.1.1 Short-term Effects

Alternative treatment levels for these cover types of the PFO range from 0 acres (Alternative A) to approximately 69,000 acres (Alternatives D and E) (Table 4-8), with the goal of improving vegetation structure and composition, as well as increasing fire rotation and decreasing fire size.

Aerial seeding of sagebrush would have negligible impacts on native vegetation. Fire would have a short-term impact of removing dried biomass. However, grassland fires rarely burn at high intensity; therefore, the mortality of herbaceous plants and resprouting shrubs is unlikely, and recovery would likely occur the following growing season.

Some Low-elevation Shrub would undoubtedly burn and be treated through seeding sagebrush, grasses, and forbs to speed succession back to shrub-steppe. Areas where cheatgrass has become established would also be seeded with sagebrush, grasses, and forbs to restore a healthy herbaceous understory. Chemical treatments would be used to control cheatgrass and noxious weeds. Short-term effects of treatments would be mortality of non-target plants from herbicide use and seeding methods that cause soil surface disturbance.

TABLE 4-8. VEGETATION COVER TYPES AND THEIR ACREAGES IN THE POCATELLO FIELD OFFICE (PFO)

Cover Type	Total Acres in PFO	Alternatives (footprint-acres)[1]				
		A	B	C	D	E
Low-elevation Shrub	38,244	0	0	2,700	18,950	18,950
Perennial Grass	108,255	0	1,300	53,300	50,200	50,200
Invasive Annual Grass	33[2]	0	0	33	0	0
Mid-elevation Shrub	143,599	0	5,700	102,000	21,900	21,900
Juniper	26,102	0	3,500	18,000	10,650	10,650
Salt Desert Shrub	346	0	0	0	0	0
Aspen/Conifer	40,395	1,600	7,000	4,391	0	4,391
Dry Conifer	49,022	1,800	6,200	5,366	0	5,366
Mountain Shrub	186,869	0	16,600	15,000	16,500	16,500
Wet/Cold Conifer	679	0	0	66	0	66
Vegetated Rock/Lava	16,386	0	0	200	0	0
TOTAL	**609,930**	**3,400**	**40,300**	**201,056**	**118,200**	**128,023**

[1] Footprint-acres describe broad treatment levels over 10 years for rehabilitation and restoration.

[2] As mapped (100% coverage of Invasive Annual Grass)

While Alternatives A and B would treat the fewest acres (see Table 4-8) and have the smallest short-term impacts, Alternatives C, D, and E would treat large acreages and restore sagebrush to large areas of Perennial Grass; Alternative C would be slightly more aggressive than Alternatives D and E. All of these alternatives would also treat or rehabilitate existing sagebrush steppe; although, Alternatives D and E would treat more acreage than Alternative C. Alternative B would treat less than 2 percent of the acreages proposed in Alternatives C, D, or E. Alternative A would not propose any treatments within these cover types.

4.2.2.1.2 Long-term Effects

Long-term effects of treatments applied to poor condition Low-elevation Shrub would be positive, resulting in cover types with sagebrush canopy and a diverse, perennial understory. Alternatives C and D/E would treat approximately 7 percent and 50 percent of this cover type, respectively, much of which is lacking in a perennial understory and is at risk of encroachment by cheatgrass. Alternatives D and E would make the most progress toward creating a more resilient landscape. Alternative A and Alternative B would do nothing to improve or rehabilitate Low-elevation Shrub in the PFO.

Treatments applied to Perennial Grass would have long-term positive effects due to the reestablishment of a sagebrush component. Alternatives C and D/E treat large areas of this cover type: 49 percent and 46 percent, respectively (see Table 4-8). All of these alternatives would reestablish sagebrush on approximately half the existing Perennial Grass thereby moving those acres to a later seral state. Alternative A would do nothing to speed the reestablishment of sagebrush.

Treatments for Invasive Annual Grass, Perennial Grass, and Low-elevation Shrub would be applied with the intent of moving these types toward a DFC that consists of a mix of desirable seral states with minimal composition of uncharacteristic vegetation (Table 4-9). Alternatives C, D, and E would be most effective of minimizing cheatgrass but do not necessarily move desired vegetation toward DFC. However, it appears that all three alternatives would result in a relatively even mix of seral states across the landscape, in addition to minimizing uncharacteristic vegetation. Alternative A and Alternative B also result in a relatively even mix of desired seral states; however, these alternatives would not reduce cheatgrass, which would have 35 percent and 34 percent coverage, respectively.

All alternatives would maintain the current condition in FRCC 2 after 30 years (Figure 4-8). Alternatives A, B, and C would maintain the fire frequency within the range of historical variability, while Alternatives D and E would lengthen the fire frequency beyond the natural fire rotation (given the analysis assumption that for every acre treated, there is a 1 acre reduction in wildfire). Alternatives B, C, D, and E would create a more desirable mix of successional stages across the landscape by reducing vegetation and fuels departure from DFC. Lengthened fire frequencies under Alternatives D and E would permit the development of a desirable mix of successional stages to recreate sagebrush steppe habitats. Alternatives C, D, and E would most reduce cheatgrass. Alternative A and Alternative B would permit an increase in cheatgrass over current levels (see Table 4-9) as a consequence of relatively small treatment levels.

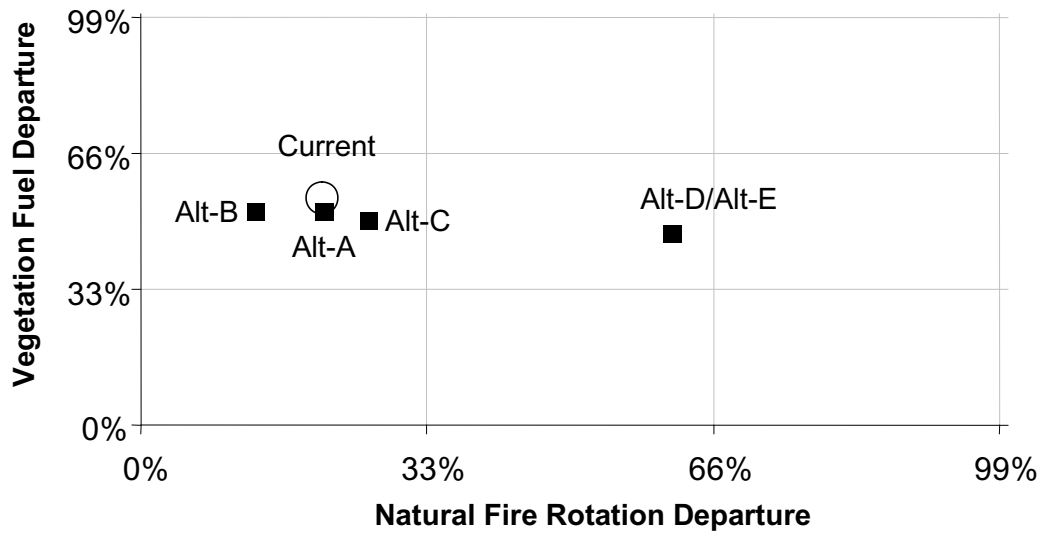
TABLE 4-9. VEGETATION/AGE CLASS, DESIRED FUTURE CONDITION (DFC), CURRENT CONDITION, AND EFFECTS OF FIVE ALTERNATIVES FOR LOW-ELEVATION SHRUB, PERENNIAL GRASS, AND INVASIVE ANNUAL GRASS, POCATELLO FIELD OFFICE (PFO)

Years Since Last Disturbance[1]	DFC	Current	Alternatives Over 30 Years			
			A	B	C	D and E
Perennial Grass <15-year	14%	32%	18%	18%	35%	25%
Grass/Shrub 15-30-year	14%	5%	17%	18%	31%	36%
Shrub/Grass >30-year	52%	24%	20%	20%	22%	25%
Crested Wheatgrass	N/A[3]	10%	10%	10%	10%	10%
Invasive Annual Grass in Understory[2]	<20%	29%	35%	34%	2%	4%

[1] Disturbance = Wildland fire, RxFire, mechanical, chemical, and seeding treatments.

[2] Although absence of cheatgrass is desirable, these percentages have been deemed acceptable, since complete eradication of cheatgrass is impossible.

[3] Not applicable; no DFC objective was set for Crested wheatgrass. Crested wheatgrass percentages remain constant across the landscape over time die o the success of overseeding shrub species and through succession these areas become shrub dominated while minimal acres areseeded with Crested wheatgrass.



Current FRCC condition is identified by the symbol - O. Note: FRCC 1 = 0-33%; FRCC 2 = 33-66%; FRCC 3 = 66-99%.

Figure 4-8. The effects of each alternative on Fire Regime Condition Class (FRCC) rating for Low-elevation Shrub, Perennial Grass, and Invasive Annual Grass in the Pocatello Field Office (PFO).

4.2.2.2 Mid-elevation Shrub and Juniper

4.2.2.2.1 Short-term Effects

Alternative treatment levels for these cover types of the PFO range from 0 acres (Alternative A) to approximately 120,000 acres (Alternative C) of Mid-elevation Shrub and Juniper, which includes areas of juniper encroachment (see Table 4-8) with the goal of improving vegetation structure and composition, as well as reintroducing fire in areas where juniper encroachment is a problem.

The Mid-elevation Shrub cover type has been affected by reduced fire frequencies. This has increased shrub and juniper densities, reduced the herbaceous understory, and reduced the area of high-quality sagebrush habitats. Treatments would focus on increasing disturbances to mimic historical wildland fire through RxFire and WFU, as well as mechanical methods to reduce shrub and juniper density. Areas with invasive or noxious weeds would receive chemical treatments to reduce or eliminate infestations. Chemical treatments would also be used for selective thinning of shrub cover or to eliminate immature encroaching junipers. Seeding could occur after fire and/or mechanical treatments in areas where the understory has been depleted.

Short-term effects of RxFire and WFUs would be the reductions of shrub and tree canopies, as well as temporary reductions in herbaceous cover. Wildland fire could result in greater mortality and more continuous removal of canopy due to higher heat intensities than RxFires. Because herbaceous cover, particularly among annual species, could increase within two growing seasons following a fire, chemicals or other forms of integrated weed control would be used to control these undesirable plants. Chemical treatments could result in the mortality of non-target species.

Mechanical treatments would be used in areas or situations where RxFire or WFU is not appropriate or effective, or where selective vegetation removal is desired. Mechanical treatments would have little short-term effect on non-target plants, due to the specificity of the treatments on target vegetation. One exception would be damage to shallow-rooted species when using chaining or a Dixie harrow. Seeding methods that result in soil surface disturbances (drilling, chaining, and harrowing) could result in similar disturbances. However, seeding grasses and forbs using these methods would be conducted primarily where the understory is depleted; therefore, the negative impacts would be minimal.

Alternative A would treat none of these cover types (see Table 4-8) and would have no short-term impacts. However, Alternative A would do nothing to control juniper encroachment in Juniper or to restore landscape-level structural diversity in Mid-elevation Shrub. Alternative B would only treat approximately 5 percent of these cover types and would result in little short-term impact. By contrast, Alternative C would treat approximately 71 percent of the total acreage, or approximately 120,000 acres annually, with the goal of restoring historical fire-return intervals at a landscape scale. Alternatives D and E would treat approximately 19 percent of the total acreage or approximately 3,300 acres annually, which would result in relatively minor short-term impacts on a landscape scale.

4.2.2.2.2 Long-term Effects

Treatments applied to Mid-elevation Shrub and areas of juniper encroachment within Juniper would have long-term positive effects due to increasing the diversification of cover type structure and composition. Alternatives C, D, and E would be equally effective in moving the mix of desirable successional states toward DFC; although, all of these alternatives would fall short of achieving that goal (Table 4-10). Similarly, these three alternatives would have approximately the same impacts on uncharacteristic vegetation—while not meeting DFC, both juniper invasion and cheatgrass landscape composition would be maintained at less than 10 percent.

TABLE 4-10. VEGETATION/AGE CLASS, DESIRED FUTURE CONDITION (DFC), CURRENT CONDITION, AND EFFECTS OF FIVE ALTERNATIVES FOR MID-ELEVATION SHRUB AND JUNIPER, POCATELLO FIELD OFFICE (PFO)

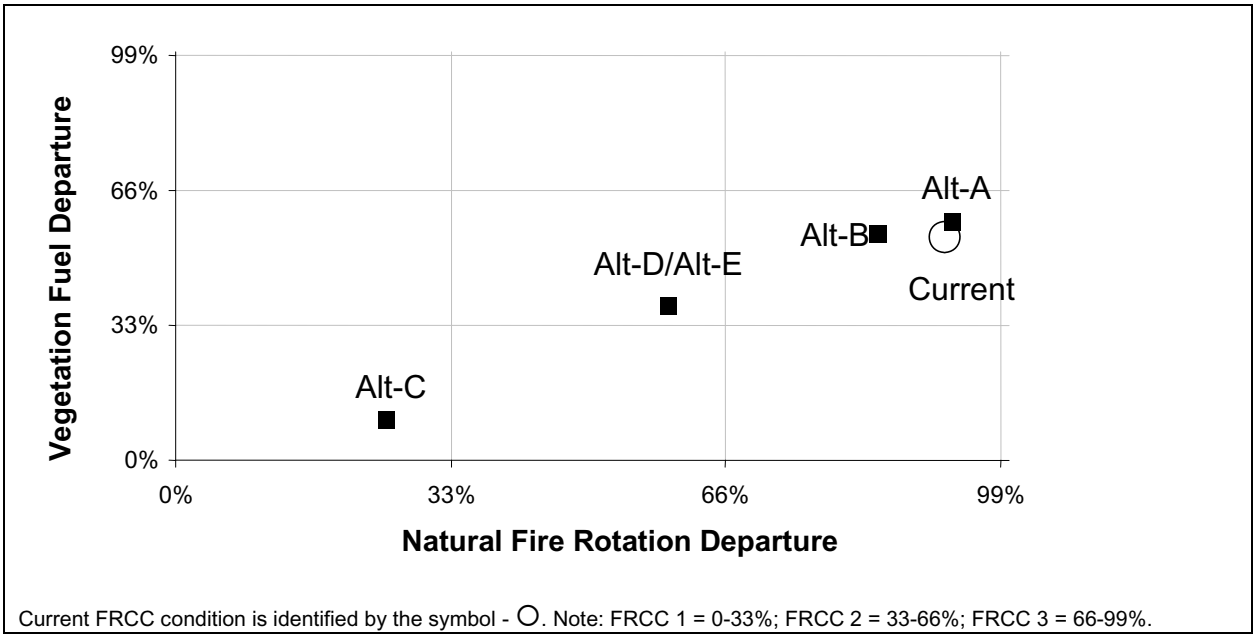
Vegetation/Age Class[1]	DFC	Current	Alternatives Over 30 Years			
			A	B	C	D and E
Perennial Grass <15-year	23%	16%	11%	11%	12%	12%
Grass/Shrub 5-15-year	45%	7%	7%	10%	26%	27%
Shrub/Grass >15-year	23%	61%	60%	58%	46%	46%
Juniper	7%	11%	15%	14%	10%	9%
Invasive Annual Grass in Understory[2]	2%	5%	7%	7%	6%	6%

[1] Age Class is the number of years since last fire, which is used as an approximation of seral stage in this analysis.

[2] Although absence of cheatgrass is desirable, these percentages have been deemed acceptable, since complete eradication of cheatgrass is impossible.

Neither Alternative A nor Alternative B would substantially move these cover types toward DFC. Both alternatives achieve little change toward the desired mix of age classes/seral states. Uncharacteristic vegetation would actually increase under these alternatives due to lack of treatment.

All alternatives would treat Mid-elevation Shrub and Juniper with the intention of moving these cover types to FRCC 1 (Figure 4-9). Alternative A and Alternative B would maintain FRCC 3 with fire frequencies less than the natural fire rotation, which would permit increases in fuel accumulation; dominance of old, decadent shrubs; increased juniper densities; and/or conversion of Mid-elevation Shrub to Juniper. Increased juniper densities would also increase fire hazard by supporting larger, more intense and large wildland fires.



Current FRCC condition is identified by the symbol - ○. Note: FRCC 1 = 0-33%; FRCC 2 = 33-66%; FRCC 3 = 66-99%.

Figure 4-9. The effects of each alternative on Fire Regime Condition Class (FRCC) rating for Mid-elevation Shrub and Juniper in the Pocatello Field Office (PFO).

Alternatives D and E would move the current condition to FRCC 2. Treatment levels for this alternative would more closely approximate the natural fire rotation compared to Alternative A and Alternative B. However, Alternatives D and E would not propose enough treatment to create the desired mix of successional stages across the landscape in 30 years. Alternative C would achieve FRCC 1 in 30 years. It would most closely approximate the natural fire rotation and would be the most effective alternative at creating a mix of successional stages across the landscape that approach DFC.

4.2.2.3 Salt Desert Shrub

There are no planned treatments in the Salt Desert Shrub type in the PFO.

4.2.2.4 Aspen/Conifer and Dry Conifer

4.2.2.4.1 Short-term Effects

Alternative treatment levels for these cover types range from 0 acres (Alternative D) to approximately 13,000 acres (Alternative B) of Aspen/Conifer and Dry Conifer (see Table 4-8), with the goal of rejuvenating aspen stands and creating a diversity of forest successional stages and associated forest structure and species composition across the landscape.

Short-term effects of restoration treatments in the Aspen/Conifer and Dry Conifer would result in a reduction of tree densities, decrease canopy cover, and increase in the amount of solar radiation reaching the understory vegetation and/or soil surface. Where RxFire or WFU would be applied, a temporary reduction in understory shrub, grass, and forb cover would occur. The vast majority of shrubs found in the understory of this cover type resprout after fire and would provide

structure and shade to the soil surface within a year or two following treatment. Perennial grasses and forbs would resprout or recolonize the area following treatment. Increased soil temperature, aspen root scarification, and/or a decrease in the number of older aspen trees would encourage aspen regeneration via resprouting or suckering.

Alternative D would not treat any forest type, including Aspen/Conifer and Dry Conifer types and would permit fuel accumulation in these cover types. Alternative A would treat the fewest acres (less than 4 percent of these cover types) and would produce relatively few short-term effects. Alternative B would treat the most acres (15 percent of these cover types) and would produce moderate short-term effects. Alternatives C and E would treat an intermediate amount of acres (11 percent of these cover types) and would result in a moderate level of short-term effects.

4.2.2.4.2 Long-term Effects

Long-term effects of treatment in Aspen/Conifer and Dry Conifer are positive and would result in a diversity of forest successional stages across the landscape. Pure aspen stands would become larger and more numerous. Vegetation species richness across the landscape would increase as the proportion of forest successional stages becomes more even. The number of stands at high risk to forest insect and disease outbreaks and subsequent large wildland fires would decrease.

Treatments would be used in Aspen/Conifer and Dry Conifer types with the intention of moving these cover types toward a DFC consisting of a 40:40:20 mix of early successional, mid-successional, and late successional forest cover types (Table 4-11). None of the alternatives would achieve DFC in 30 years; however, three of the alternatives would achieve a somewhat more even distribution of successional forest cover types across the landscape. Alternatives B, C, and E would make progress toward the DFC while Alternative A and Alternative D would move away from DFC. Alternative B would increase the percentage of early and mid-successional forest and would decrease the percentage of late successional forest. Alternatives C and E would slightly increase the early successional forest, slightly decrease late successional forest, and not increase mid-successional forest. Alternative D would decrease mid-successional forest and substantially increase late successional forest.

TABLE 4-11. VEGETATION/AGE CLASS, DESIRED FUTURE CONDITION (DFC), CURRENT CONDITION, AND EFFECTS OF FIVE ALTERNATIVES FOR ASPEN/CONIFER AND DRY CONIFER, POCATELLO FIELD OFFICE (PFO)

Vegetation/Age Class[1]	DFC	Current	Alternatives Over 30 Years			
			A	B	C and E	D
Forb/grass with aspen trees/suckers, <25 years old	40%	2%	3%	6%	4%	2%
Aspen/Conifer/Shrub mix, 25-50 years old	40%	29%	25%	31%	28%	22%
Conifer-dominated, >50 years old	20%	69%	72%	63%	68%	76%

[1] Age Class is the number of years since last fire, which is used as an approximation of seral stage in this analysis.

Alternative A and Alternative D would maintain FRCC 3 over 30 years while Alternatives B, C, and E would achieve FRCC 2 within 30 years (Figure 4-10). Alternative D would not treat any Aspen/Conifer and Dry Conifer and departures from desired future condition and natural fire rotation would increase beyond current conditions.

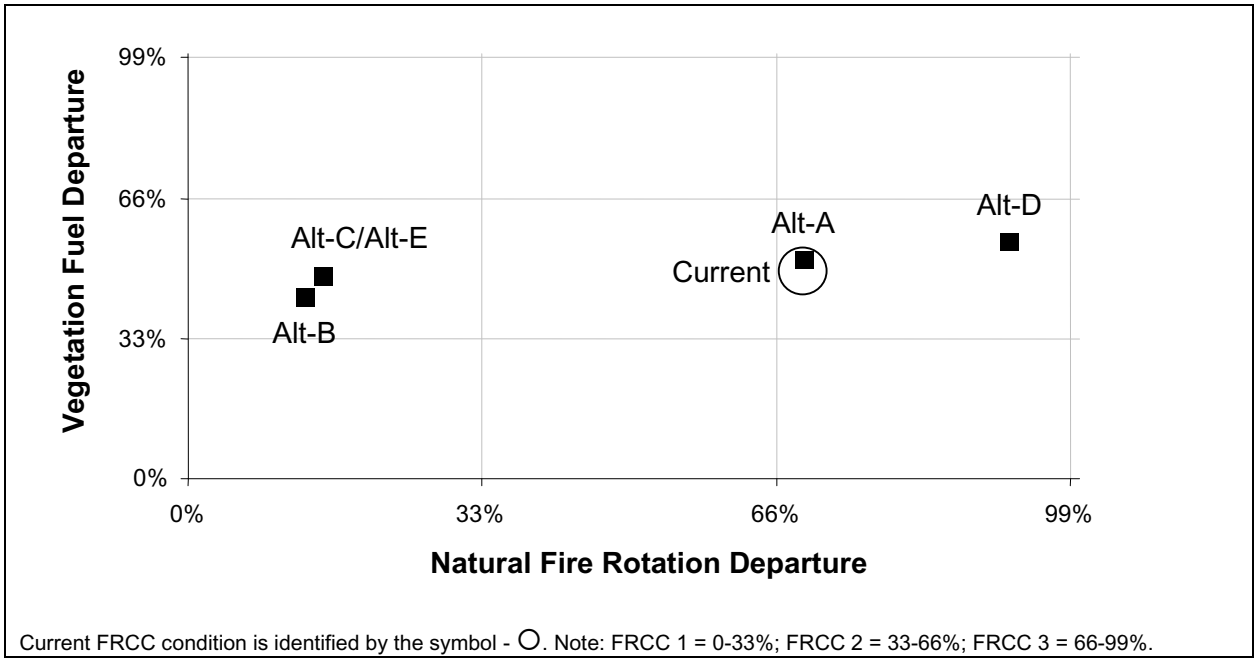


Figure 4-10. The effects of each alternative on Fire Regime Condition Class (FRCC) rating for Aspen/Conifer and Dry Conifer in the Pocatello Field Office (PFO).

Fire frequency under Alternative A and Alternative D would maintain rates less than the natural fire rotation, permitting fuel build-up. Continued suppression of fire in the Aspen/Conifer and Dry Conifer would permit an increase in the conifer component, an increase in tree densities, and forests with higher rates of insect attacks and disease. Forests composed of Dry Conifer with a litter understory would pose a greater fire hazard and burn with stand replacement severity unlike Aspen/Conifer with a grass/forb/shrub understory. After 30 years, Alternative A and Alternative D would increase late successional forest cover types (Dry Conifer) with little early successional stages and an intermediate proportion of mid-successional stages (Aspen/Conifer and Dry Conifer).

Alternatives B, C, and E would achieve FRCC 2 within 30 years. The level of treatment in these alternatives would be aggressive and would result in a disturbance rate shorter than the natural fire rotation. With a shortened disturbance rate, the proportions of forest successional stages across the landscape would become unbalanced over time with an overabundance of early and mid-successional forest cover types and less-than-abundant, late successional forest cover types. In 30 years, Alternative B would make substantial progress toward the vegetation/fuels DFC; however, if the disturbance rate were to remain at this high level beyond the first decade, movement away from DFC would occur. Alternatives C and E would also approximate natural

fire rotation and improve the mix of successional forest cover types and vegetation and fuels structure and composition across the landscape.

4.2.2.5 Mountain Shrub

4.2.2.5.1 Short-term Effects

Alternative treatment levels for this cover type of the PFO range from 0 acres (Alternative A) to approximately 16,500 acres (Alternatives B, D, and E) of Mountain Shrub (see Table 4-8), with the goals of rejuvenating old, decadent shrubs; increasing density and cover of desirable herbaceous species; reducing density and cover of uncharacteristic vegetation (i.e., cheatgrass and noxious weeds); and creating a diverse mosaic of successional stages across the landscape.

Treatments in Mountain Shrub are primarily RxFire and WFU. Short-term effects of restoration treatments would include a temporary decrease in shrub, grass, and forb canopy cover. Some individual shrubs could be killed (particularly true for antelope bitterbrush at lower elevations and mountain mahogany) in high severity fires. These changes would temporarily increase the amount of solar radiation reaching the soil surface, which would increase production by resprouting shrubs. The vast majority of Mountain Shrub species resprout after low to moderate-severity fire and they would provide structure and shade to the soil surface within a year or two following treatment. Effects of fire on mountain mahogany however, could persist for a number of years (and perhaps into the long term) due to a general lack of resprouting. Perennial grasses and forbs would resprout or recolonize the treatment areas. Shrub leader growth would be vigorous following treatment due to increased light and soil temperatures as well as a reduction in standing, dead, woody material.

Alternative A would not treat any acres in this cover type and would have no short-term impacts. Alternative B, D, and E would treat the most acres (9 percent of the cover type) and would have moderate short-term impacts. Alternative C would treat a similar number of acres (8 percent of the cover type) that would also result in a moderate level of short-term effects.

4.2.2.5.2 Long-term Effects

Effects of treatment across alternatives in the Mountain Shrub cover type would be positive and would increase shrub successional diversity. Across the landscape, Mountain Shrub stands would become larger and more numerous. Vegetation species richness would increase as the proportions of shrub successional stages become even. The number of shrub stands at risk of large wildland fire due to increased vegetation and fuels structure and composition would decrease.

Treatments in Mountain Shrub would be applied with the intention of moving this cover type toward a vegetation/fuels DFC consisting of a 33:33:34 mix of early successional, mid-successional, and late successional shrub cover types (Table 4-12). None of the alternatives would achieve DFC in 30 years; however, four of the five alternatives would achieve a more even distribution of shrub successional stages across the landscape. Alternative C would most closely approximate DFC, followed by Alternatives B, D, and E, with higher percentages of early and mid-successional shrub cover types and lower percentages of late successional shrub

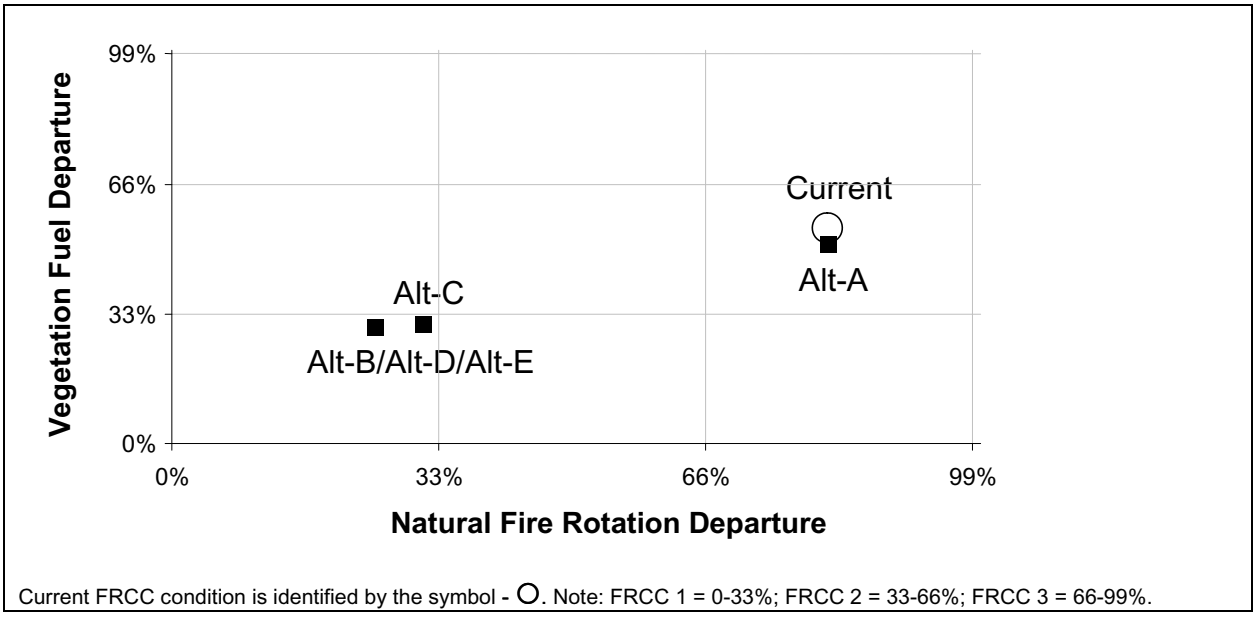
cover types from current proportions. Alternative A would make very limited progress toward DFC by increasing early successional stages and slightly decreasing late successional stages.

TABLE 4-12. VEGETATION/AGE CLASS, DESIRED FUTURE CONDITION (DFC), CURRENT CONDITION, AND EFFECTS OF FIVE ALTERNATIVES FOR MOUNTAIN SHRUB, POCATELLO FIELD OFFICE (PFO)

Vegetation/Age Class[1]	DFC	Current	Alternatives Over 30 Years			
			A	B	C	D and E
Perennial Grass/Shrub, <10 years old	33%	1%	10%	3%	15%	3%
Shrub/Perennial Grass 10-20 years old	33%	10%	5%	38%	20%	38%
Shrub dominated, >20 years old	34%	90%	85%	59%	65%	59%

[1] Age Class is the number of years since last fire, which is used as an approximation of seral stage in this analysis.

Alternatives B, C, D, and E would achieve FRCC 1 within 30 years (Figure 4-11). Alternative A would maintain the current condition in FRCC 3 with fire frequency less than historical rates, which would permit dominance of old, decadent shrubs; depletion of understory species; and woody fuel build-up. Increased fuel accumulation would increase fire hazard by supporting larger, more intense and large wildland fires. Under Alternatives B, C, D, and E fire frequency would approximate the historical rate and would create the desired mix of successional stages across the landscape (vegetation/fuels DFC) and would have a disturbance rate similar to the natural fire rotation.



Current FRCC condition is identified by the symbol - ○. Note: FRCC 1 = 0-33%; FRCC 2 = 33-66%; FRCC 3 = 66-99%.

Figure 4-11. The effects of each alternative on Fire Regime Condition Class (FRCC) rating for Mountain Shrub in the Pocatello Field Office (PFO).

4.2.2.6 Wet/Cold Conifer

4.2.2.6.1 Short-term Effects

Alternative treatment levels for this cover type of the PFO range from 0 acres (Alternatives A, B, and D) to approximately 66 acres (Alternatives C and E) of Wet/Cold Conifer with the goals of reducing risk of insect infestation and disease as well as creating a diversity of forest successional stages and associated forest structure across the landscape. In areas where private landowners are intermingled with the forest, the goal of treatment would be to reduce threats to private land by reducing wildland fire intensity and spread.

Short-term effects of restoration treatments in the Wet/Cold Conifer would reduce tree densities, decrease canopy cover, and increase the amount of solar radiation reaching the understory vegetation and/or soil surface. Where mechanical treatments are used, a reduction in mature and pole-sized lodgepole pine and/or spruce/fir tree densities would occur. Where WFU treatments are used, overstory trees would be replaced by understory shrubs, grasses, and forbs. Lodgepole pines would reproduce and grow above the understory within approximately 10 years following disturbance. Engelmann spruce *(Picea engelmannii)* and subalpine fir *(Abies lasiocarpa)* seedlings would begin to grow once the lodgepole pine canopy cover is established.

Alternatives A, B, and D would not treat any acres for Wet/Cold Conifer and would have no short-term effects. Alternatives C and E would treat approximately 10 percent of this cover type and have a low-level, short-term effect.

4.2.2.6.2 Long-term Effects

Effects of treatment across alternatives in the Wet/Cold Conifer cover type are positive and would result in more resilient forest stands and a diversity of forest successional stages across the landscape. Lodgepole pine and/or spruce/fir stands would become more capable of withstanding insect and disease outbreaks. Vegetation species richness across the landscape would increase as the proportion of forest successional stages becomes more even. In those areas where private land are intermingled with the forest and treatment is implemented as a measure of protection, fire intensity and spread would increase.

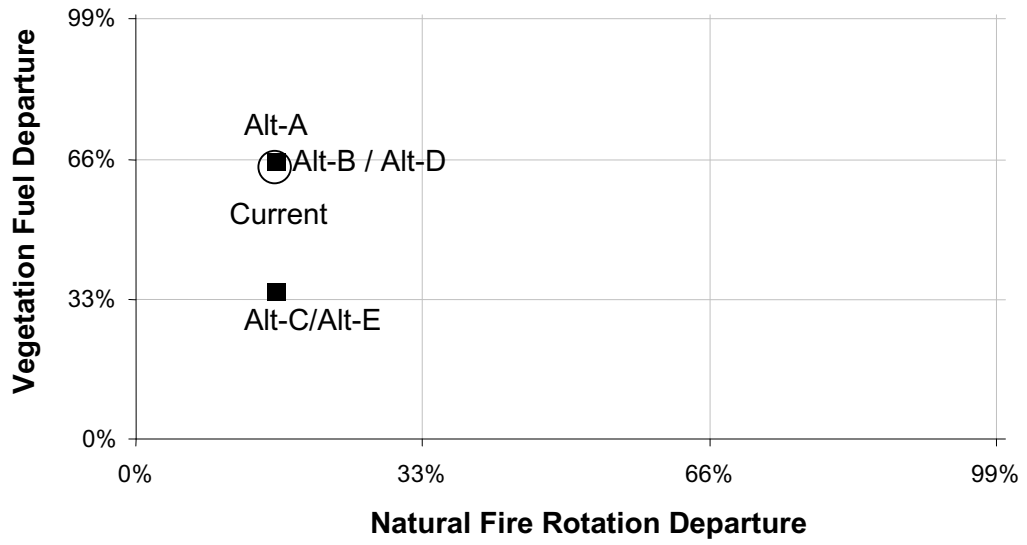
Treatments in Wet/Cold Conifer type would be applied to moving toward a vegetation/fuels DFC consisting of a 30:44:26 mix of early successional, mid-successional, and late successional forest cover types (Table 4-13). None of the alternatives would achieve DFC in 30 years. Alternatives C and E are the only alternatives that would achieve a more even distribution of successional forest cover types across the landscape. These alternatives would increase the percentage of early and mid-successional stages and decrease the percentage of late successional stages across the landscape. Alternatives A, B, and D would move the Wet/Cold Conifer type further from DFC than current conditions.

TABLE 4-13. VEGETATION/AGE CLASS, DESIRED FUTURE CONDITION (DFC), CURRENT CONDITION, AND EFFECTS OF FIVE ALTERNATIVES FOR WET/COLD CONIFER, POCATELLO FIELD OFFICE (PFO)

Vegetation/Age Class[1]	DFC	Current	Alternatives Over 30 Years			
			A	B	C and E	D
Forb/grass with seedlings	30%	0%	0%	0%	22%	0%
Conifer Shrub mix	44%	10%	8%	8%	17%	8%
Conifer-dominated	26%	90%	92%	92%	61%	92%

[1] Age Class is the number of years since last fire, which is used as an approximation of seral stage in this analysis.

None of the alternatives achieve FRCC 1 in Wet/Cold Conifer within 30 years (Figure 4-12). Alternatives A, B, and D would not treat this cover type; however, lack of treatments would not affect the current fire frequency or vegetation and fuels structure and composition within 30 years. Forests in this condition would have moderate to high stocking densities, substantial ladder fuels (e.g., small trees and overlapping deadfall), and moderate to widespread insect and disease outbreaks. Alternatives C and E would apply treatments in this cover type and change conditions that approach but not achieve FRCC 1. Forests in this condition would have the desired mix of successional stages and fuel loadings close to DFC across the landscape. In WUI areas, threats to private land would be more fully mitigated by Alternatives C and E than any of the other alternatives.



Current FRCC condition is identified by the symbol - O. Notes: FRCC 1 = 0-33%; FRCC 2 = 33-66%; FRCC 3 = 66-99%.

Due to the lack of long-term fire history data for this cover type, the FRCC rating is based on vegetation/fuel departure. For clarity, departure from the natural fire rotation was positioned at the midpoint of FRCC 1.

Figure 4-12. The effects of each alternative on Fire Regime Condition Class (FRCC) rating for Wet/Cold Conifer in the Pocatello Field Office (PFO).

4.2.2.7 Vegetated Rock/Lava

4.2.2.7.1 Short-term Effects

Alternative treatment levels for the Vegetated Rock/Lava cover type range from 0 acres (Alternatives A, B, D, and E) to approximately 200 acres (Alternative C). These treatments would consist of WFU and chemical treatments to control noxious weeds.

Wildland fire would be allowed on Vegetated Rock/Lava in Alternative C, with only a minimal amount this cover type treated (see Table 4-8). WFU would permit historical successional processes to occur. Cheatgrass or noxious weed invasions near the edges of Vegetated Rock/Lava would be treated to prevent or reduce spread and maintain current percentages.

Short-term effects would include the mortality of vegetation due to wildland fire. This would be most noticeable for long-lived shrubs and trees, such as Wyoming big sagebrush and junipers. Because vegetation is patchy, fire effects would also be discontinuous, creating openings in areas with dense concentrations of fuels.

4.2.2.7.2 Long-term Effects

With the exception of Alternative C, all alternatives would tend to slightly increase the proportion of early to mid-successional shrub/tree cover types while maintaining or slightly decreasing late successional shrub/tree cover types dominated by sagebrush and juniper (Table 4-14). Alternatives A, B, D, and E would move vegetation condition away from DFC while Alternative C would move it toward DFC by reducing the proportion of cheatgrass infested acreage.

TABLE 4-14. VEGETATION/AGE CLASS, DESIRED FUTURE CONDITION (DFC), CURRENT CONDITION, AND EFFECTS OF FIVE ALTERNATIVES FOR VEGETATED ROCK/LAVA, POCATELLO FIELD OFFICE (PFO)

Vegetation/Age Class[1]	DFC	Current	Alternatives Over 30 Years			
			A	B	C	D and E
Perennial herbaceous	6%	7%	12%	12%	13%	12%
Tree/shrub/herbaceous	80%	79%	73%	73%	80%	73%
Invasive Annual Grass in Understory[2]	14%	14%	15%	15%	7%	15%

[1] Age Class is the number of years since last fire, which is used as an approximation of seral stage in this analysis.

[2] Although absence of cheatgrass is desirable, these percentages have been deemed acceptable, since complete eradication of cheatgrass is impossible.

Alternative C would apply treatments in the Vegetated Rock/Lava cover type with the intent of moving toward the desired FRCC 1 (Figure 4-13); due to a lack of long-term fire history data, departure from the natural fire rotation was not calculated for this cover type. This FRCC rating is based entirely on vegetation/fuel departure, indicated along the y-axis in Figure 4-13. All alternatives would maintain the current condition in FRCC 1. Alternative C, however, would reduce the largest proportion of uncharacteristic vegetation (cheatgrass understory acreage).

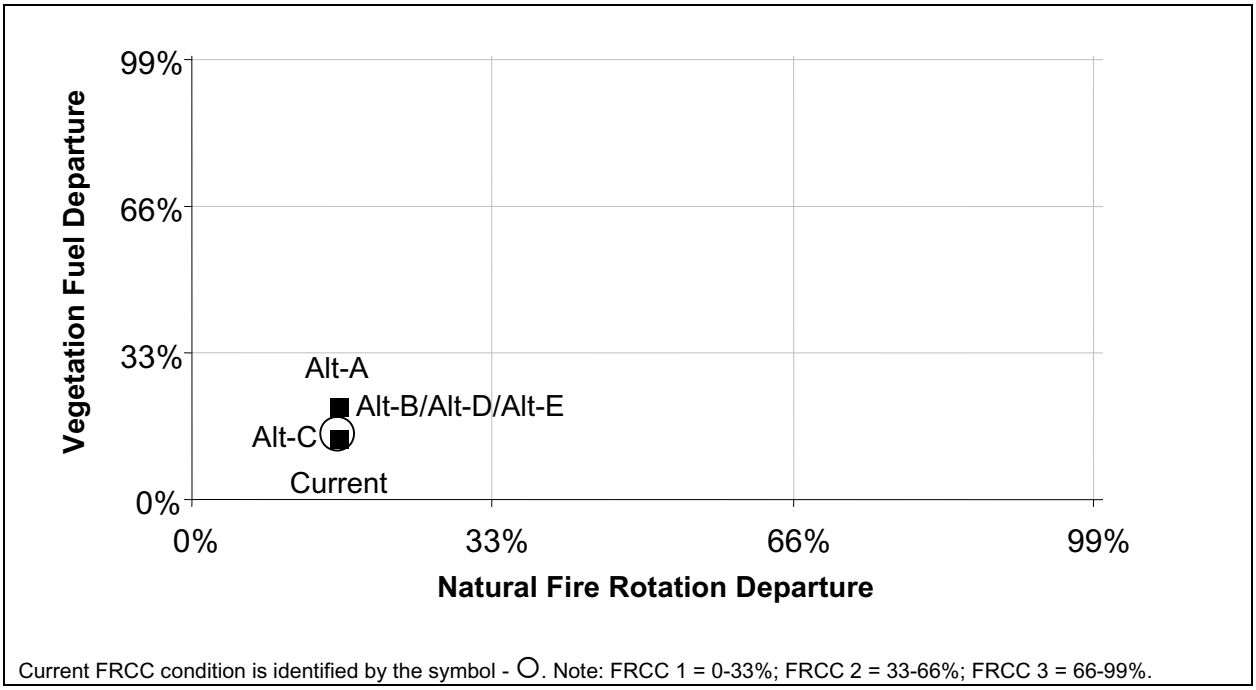


Figure 4-13. The effects of each alternative on Fire Regime Condition Class (FRCC) rating for Vegetated Rock/Lava in the Pocatello Field Office (PFO).

All alternatives would maintain this cover type in FRCC 1, but the proportion of early successional stages (perennial herbaceous) would increase from current conditions, moving away from DFC. Alternative C would result in the least departure from the vegetation/fuels DFC and the greatest reduction in cheatgrass.

4.2.3 ANALYSIS OF EFFECTS FOR THE BURLEY FIELD OFFICE (BFO)

4.2.3.1 Low-elevation Shrub, Perennial Grass, and Invasive Annual Grass

4.2.3.1.1 Short-term Effects

Alternative treatment levels for these cover types range from approximately 50,000 acres (Alternative B) to 185,000 acres (Alternatives A, C, D, and E) of potential or existing Low-elevation Shrub steppe (Table 4-15), with the goal of reducing fire frequency and decreasing fire size.

Some of the Low-elevation Shrub in the BFO area has been converted to Invasive Annual Grass by the degradation of sagebrush steppe, invasion of cheatgrass, and frequent fires. Short-term effects of restoration treatments would occur in Invasive Annual Grass where perennials would be topped killed, most seedlings would be killed, and early emerging forbs may also be killed. Additionally drill seeding methods would cause soil surface disturbance. These treatments would follow RxFire or WFUs to prevent the perpetuation of Invasive Annual Grass. Considering the ecologically altered condition of Invasive Annual Grass, the short-term negative impacts would be minimal, even when treatments occur at a large scale.

TABLE 4-15. VEGETATION COVER TYPES AND THEIR ACREAGES IN THE BURLEY FIELD OFFICE (BFO)

Cover type	Total Acres in BFO	Alternatives (footprint-acres)[1]				
		A	B	C	D	E
Low-elevation Shrub	164,756	25,175	15,750	26,300	29,300	29,300
Perennial Grass	309,128	57,625	9,600	109,600	107,300	107,300
Invasive Annual Grass	49,150[3]	15,925	24,850	49,069	48,850	48,850
Mid-elevation Shrub	162,524	7,575	14,200	106,063	72,500	72,500
Juniper	59,480	800	24,650	39,229	17,600	17,600
Salt Desert Shrub	10,037	975	0	0	0	0
Aspen/Conifer	1,177	0	500	147	0	147
Dry Conifer	373	0	0	46	0	46
Mountain Shrub	128,091	2,625	0	12,000	16,500	12,000
Wet/Cold Conifer	804	0	0	46	0	46
Vegetated Rock/Lava	94,090[2]	3,350	0	1,500	0	0
TOTAL	**979,610**	**114,050**	**89,550**	**344,000**	**292,050**	**287,789**

[1] Footprint-acres describe broad treatment levels over 10 years for rehabilitation and restoration.
[2] Due to changes in field office boundaries, this acreage is now located in the Shoshone Field Office.
[3] As mapped (100% coverage of Invasive Annual Grass).

Alternative B would treat the fewest acres (see Table 4-15) and have the smallest short-term effects. Alternative A treatments would have an intermediate effect. Alternatives C, D, and E would treat acreages large enough to stabilize landscape-level areas of degraded vegetation. All of these alternatives would treat nearly all of the mapped Invasive Annual Grass in the BFO. Treating these areas would protect adjacent, intact, sagebrush steppe over both the short and long term (see discussion below). Alternative B would treat approximately half the Invasive Annual Grass and have an intermediate effect, while Alternative A would treat the least Invasive Annual Grass for the smallest effect, and Alternatives C, D, and E would treat almost all of Invasive Annual Grass for the largest effect.

Large acreages of Low-elevation Shrub in the BFO have lost their shrub component and have been converted to Perennial Grass. Treating Perennial Grass types would involve seeding sagebrush following fire to speed succession back to sagebrush steppe cover types.

Treatment of Low-elevation Shrub could result in slightly greater short-term impacts to existing vegetation. However, because the acreages treated in the BFO area would consist primarily of degraded cover types with little native understory, these effects would be relatively minor. Acreages burned by wildland fires would be rehabilitated to stabilize sites against noxious weed and non-native Invasive Annual Grass invasion.

Short-term effects of treatments in Low-elevation Shrub would be similar to those for Invasive Annual Grass with mortality of non-target plants from herbicide use and seeding methods that cause soil surface disturbance. Areas containing stands of old, even aged sagebrush could be

mechanically treated to improve community structure. These treatments (e.g., thinning small areas using a Dixie harrow) would remove some older shrubs, as well as shallow-rooted plants. However, treatments would be done on small acreages and effects would occur in localized patches. All of the alternatives treat less than 20 percent of the Low-elevation Shrub and would have minimal short-term impacts. Alternative B would impact the least amount (approximately 10 percent) of Perennial Grass, while Alternative A would impact an intermediate level (19 percent) and Alternatives C, D, and E would impact the most Perennial Grass approximately 35 percent. Alternatives C, D, and E would impact more than 99 percent of Invasive Annual Grass, while Alternative B would impact approximately 50 percent, and Alternative A would impact approximately 32 percent of this undesirable cover type.

4.2.3.1.2 Long-term Effects

Effects of treatments in Low-elevation Shrub would be positive, resulting in cover types with sagebrush canopy and a diverse, perennial understory. Because little of the existing sagebrush steppe would be treated under any of the alternatives, effects on a landscape scale would be minimal. Alternatives D and E would make the most progress toward creating more resilient cover types. Alternative B would do little to improve or rehabilitate the degraded Low-elevation Shrub cover types in this area.

Treatments applied to Perennial Grass would have long-term positive effects due to the reestablishment of a sagebrush component. Alternatives C, D, and E would seed sagebrush on approximately 35 percent of existing Perennial Grass. Alternative A would treat an intermediate level (approximately 19 percent) of this cover type, while Alternative B would treat the least amount of this cover type (approximately 3 percent) and would do little to enhance the reestablishment of sagebrush on a landscape scale.

Long-term effects of treatment in Invasive Annual Grass are positive and result in replacing annual non-native plants with Perennial Grasses and forbs, and reestablishing a sagebrush overstory. Alternatives C, D, and E would all treat adequate acreages to move Invasive Annual Grass toward a Perennial Grass and shrub cover type, as well as protect existing sagebrush steppe with strategically placed treatments (see Table 4-15). Alternative A and Alternative B would treat approximately one-third and one-half of the existing Invasive Annual Grass, respectively. These alternatives would treat smaller areas of landscape, which would do less to enhance or protect the Low-elevation Shrub.

Treatments would be applied with the intention of moving these three cover types toward a DFC that consists of a mix of desirable seral states with minimal composition of uncharacteristic vegetation (Table 4-16). None of the alternatives would achieve DFC in 30 years; however, all alternatives achieve a more even distribution of characteristic seral states across the landscape. Alternatives C, D, and E would decrease cheatgrass cover types over the landscape and achieve DFC. None of the alternatives actually move the grass/shrub >30 years stage, due to a continued occurrence of wildland fire on the landscape.

None of the alternatives achieve FRCC 1 in Low-elevation Shrub, Perennial Grass, and Invasive Annual Grass within 30 years (Figure 4-14). Alternative A and Alternatives D/E would not make any appreciable improvement in fire frequency; although Alternatives D and E would slightly

improve vegetation and fuels structure and composition. Alternatives B and C would reduce the fire frequency departure. Alternative C would achieve zero departure from the natural fire rotation. Neither alternative, however, would substantially improve vegetation and fuels structure and composition over current condition.

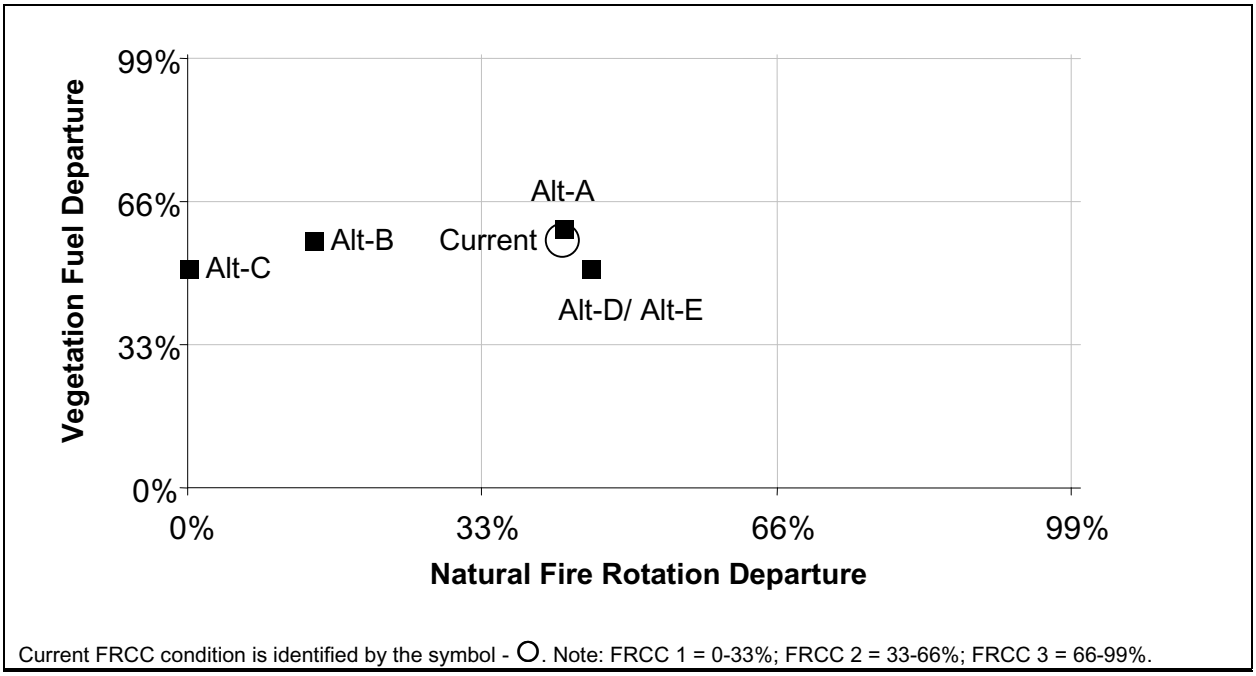
TABLE 4-16. VEGETATION/AGE CLASS, DESIRED FUTURE CONDITION (DFC) CURRENT CONDITION, AND EFFECTS OF FIVE ALTERNATIVES FOR LOW-ELEVATION SHRUB, PERENNIAL GRASS, AND INVASIVE ANNUAL GRASS, BURLEY FIELD OFFICE (BFO)

Years Since Last Disturbance[1]	DFC	Current	Alternatives Over 30 Years			
			A	B	C	D and E
Perennial Grass <15-year	14%	23%	26%	20%	27%	23%
Grass/Shrub 15-30-year	14%	7%	22%	17%	27%	31%
Shrub/Grass >30-year	52%	22%	12%	15%	21%	21%
Crested Wheatgrass	N/A[3]	15%	15%	15%	15%	15%
Invasive Annual Grass in Understory[2]	<20%	33%	25%	33%	10%	10%

[1] Disturbance = Wildland fire, RxFire, mechanical, chemical, and seeding treatments.

[2] Although absence of cheatgrass is desirable, these percentages have been deemed acceptable, since complete eradication of cheatgrass is impossible.

[3] Not applicable; no DFC objective was set for Crested wheatgrass. Crested wheatgrass percentages remain constant across the landscape over time due to the success of overseeding shrub species and through succession these areas become shrub dominated while minimal acres are seeded with Crested wheatgrass.



Current FRCC condition is identified by the symbol - ○. Note: FRCC 1 = 0-33%; FRCC 2 = 33-66%; FRCC 3 = 66-99%.

Figure 4-14. The effects of each alternative on Fire Regime Condition Class (FRCC) rating for Low-elevation Shrub, Perennial Grass, and Invasive Annual Grass in the Burley Field Office (BFO).

4.2.3.2 Mid-elevation Shrub and Juniper

4.2.3.2.1 Short-term Effects

Alternative treatment levels for these cover types of the BFO range from approximately 8,400 acres (Alternative A) to 145,000 acres (Alternative C) of Mid-elevation Shrub and Juniper (see Table 4-15), including areas of juniper encroachment. The goal is to improve vegetation structure and composition, as well as reintroduce fire in areas where juniper encroachment is a problem. In recognition of the unique value of Pinyon pine stands, there would be no treatment of Pinyon-juniper sites (fire-resistant) under any of the five alternatives.

The Mid-elevation Shrub in the BFO has been affected by reduced fire frequencies. This has increased shrub and juniper densities, reduced the diversity and cover of herbaceous understory, and resulted in the loss of high-quality sagebrush habitats. Treatments would focus on increasing disturbance to mimic historical fire. This would be accomplished through RxFire and WFU, as well as mechanical methods, to reduce shrub and juniper densities. Areas with invasive or noxious weeds would receive chemical treatments to reduce or eliminate infestations. Chemical treatments would also be used for selective thinning of shrub cover or to eliminate immature encroaching junipers. Seeding could occur after fire and/or mechanical treatments in areas where the understory has been depleted.

Short-term effects of RxFire and WFU would reduce shrub and tree canopies and temporarily reduce herbaceous canopy. Wildland fire could result in greater mortality and more continuous removal of canopy due to higher heat intensities than what occurs during RxFire. Herbaceous cover, particularly among annual species, should increase within two growing seasons following a fire. There could be an increase in invasive or noxious weeds on burned areas, requiring chemical or other forms of integrated weed control. Chemical treatments could result in the mortality of non-target species.

Mechanical treatments would be used in areas or situations where RxFire or WFU is not appropriate or effective, or where selective vegetation removal is desired. Mechanical treatments would have little short-term effect on non-target plants, due to the specificity of the treatments on target vegetation. One exception would be damage to shallow-rooted species when using chaining or a Dixie harrow. Seeding methods that result in soil surface disturbances (drilling, chaining, and harrowing) could result in similar disturbances. However, seeding grasses and forbs using these methods would be conducted primarily where the understory is depleted; therefore, the negative impacts would be minimal.

Alternative A would treat the fewest acres over a 10-year period (approximately 4 percent of the total Mid-elevation Shrub and Juniper) (see Table 4-15) and would have little short-term impact. But this alternative would do nothing to control juniper encroachment or to restore landscape-level structural diversity in Mid-elevation Shrub. Alternative B would treat approximately 18 percent of the total Mid-elevation Shrub and Juniper types, which would result in short-term impacts to approximately 3,900 acres annually. By contrast, Alternative C would treat approximately 65 percent of the total acreage over a 10-year period, or approximately 15,000 acres annually, with the goal of restoring historical fire-return intervals at a landscape scale. Alternatives D and E would treat approximately 41 percent of the total acreage, or approximately

9,000 acres annually, causing intermediate effects that would fall between Alternatives B and C. However, Alternatives D and E would allow treatment of landscape-level areas of vegetation.

4.2.3.2.2 Long-term Effects

Due to lack of recent fire, Mid-elevation Shrub in the BFO tends to be dominated by dense, even-aged sagebrush stands or areas of high juniper density. Treatments applied to Mid-elevation Shrub and areas of juniper encroachment within Juniper would have long-term positive effects due to diversification of cover type structure and composition.

Alternative C would be the most effective in moving the mix of desirable seral states toward DFC (Table 4-17) with Alternative D close behind. However, both alternatives would fall short of achieving DFC. Neither Alternative A nor B would make any substantial progress toward meeting DFC. None of the alternatives would effectively result in control of juniper invasion; although, Alternative C would be slightly better than the others. All of the alternatives would maintain cheatgrass composition over the landscape at less than 10 percent; although, the only alternatives that would meet DFC are Alternatives D and E. Alternative A would actually allow an increase of uncharacteristic vegetation due to low levels of treatment.

TABLE 4-17. VEGETATION/AGE CLASS, DESIRED FUTURE CONDITION (DFC), CURRENT CONDITION, AND EFFECTS OF FIVE ALTERNATIVES FOR MID-ELEVATION SHRUB AND JUNIPER, BURLEY FIELD OFFICE (BFO)

Vegetation/Age Class[1]	DFC	Current	Alternatives Over 30 Years			
			A	B	C	D and E
Perennial Grass <15-year	23%	1%	5%	7%	10%	10%
Grass/Shrub 5-15-year	45%	6%	5%	9%	24%	18%
Shrub/Grass >15-year	23%	63%	55%	56%	40%	48%
Juniper	7%	23%	27%	21%	19%	23%
Invasive Annual Grass in Understory[2]	2%	7%	8%	7%	7%	1%

[1] Age Class is the number of years since last fire, which is used as an approximation of seral stage in this analysis.

[2] Although absence of cheatgrass is desirable, these percentages have been deemed acceptable, since complete eradication of cheatgrass is impossible.

Alternative A would maintain the current condition of Mid-elevation Shrub in FRCC 3 over 30 years (Figure 4-15). Alternatives B, D, and E would achieve FRCC 2, while Alternative C would achieve FRCC 1 within 30 years. Alternative A and Alternative B would maintain fire frequency at less than historical rates, though Alternative B would shorten fire frequency better than Alternative A. Fire frequency greater than natural fire rotation would cause fuel accumulation; dominance of old, decadent shrubs; increased juniper densities; and/or conversion of Mid-elevation Shrub to Juniper. These would all contribute to an increased potential of larger, more intense, and more large wildland fires.

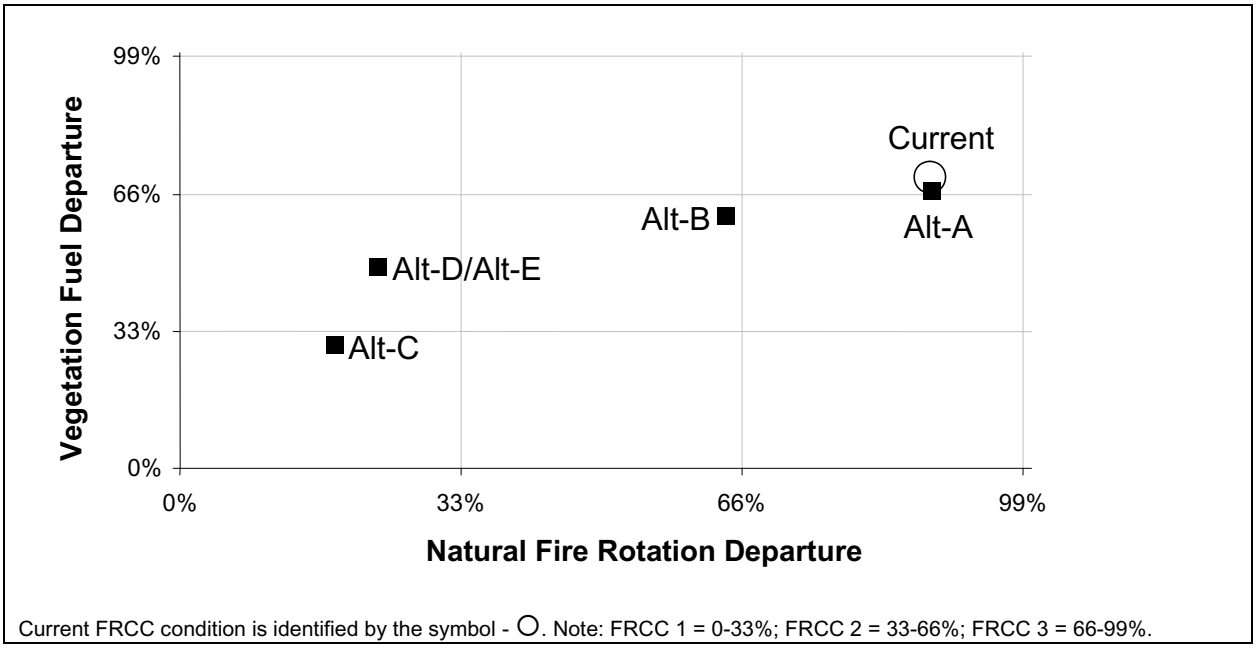


Figure 4-15. The effects of each alternative on Fire Regime Condition Class (FRCC) rating for Mid-elevation Shrub and Juniper encroachment in the Burley Field Office (BFO).

Alternatives D and E would move the current condition to FRCC 2 and approach FRCC 1. Treatments would lengthen the time between wildland fires and permit a more natural fire rotation. Treatments would also improve vegetation and fuels structure and composition over current conditions. There would not be sufficient treatments under Alternatives D and E to create the desired mix of successional stages across the landscape (vegetation/fuels DFC) in 30 years. Alternative C, however, would achieve FRCC 1 in 30 years. Treatment levels in this alternative would most closely approximate the natural fire rotation and would be the most effective at creating the desired mix of successional stages across the landscape (vegetation/fuels DFC).

4.2.3.3 Salt Desert Shrub

4.2.3.3.1 Short-term Effects

Alternative treatment levels for this cover type of the BFO range from 0 acres (Alternatives B, C, D, and E) to approximately 1,000 acres (Alternative A) of Salt Desert Shrub (see Table 4-15), with the goal of controlling Invasive Annual Grasses and noxious weeds to restore a perennial herbaceous understory.

Salt Desert Shrub in the BFO merges in places with the lowest precipitation areas of the Low-elevation Shrub. Soil chemistry, coupled with low precipitation (at or below an average of 8 inches annually) creates difficult conditions for rehabilitation and restoration. Salt Desert Shrub cover types would receive chemical treatments to reduce the cover of cheatgrass and invasive weeds (primarily halogeton), with some emergency stabilization and rehabilitation (ESR) following wildland fire. Chemical treatments could result in the mortality of non-target species, depending on the chemical and concentration used. Seeding treatments that result in soil surface

disturbance could result in the mortality of shallow-rooted species and the disturbance of biological soil crusts.

Only Alternative A would treat Salt Desert Shrub cover types in the BFO. These treatments would all be in the form of ESR treatments following wildland fires. Treatments for chemical suppression of weedy species and seeding would impact approximately 10 percent of the total Salt Desert Shrub. The other alternatives would not treat Salt Desert Shrub and would have no impacts.

4.2.3.3.2 Long-term Effects

The present mix of desirable seral states for Salt Desert Shrub is reasonably near DFC. All alternatives would move the current condition toward DFC by increasing Perennial Grass. Alternative A would reduce cheatgrass to slightly exceed DFC (Table 4-18). In this cover type, all alternatives are approximately equal in achieving later successional stages due to the slowness of ecological processes and plant growth. Only Alternative A would achieve DFC for composition of uncharacteristic vegetation. Treatments would decrease cheatgrass to less than 10 percent throughout the type.

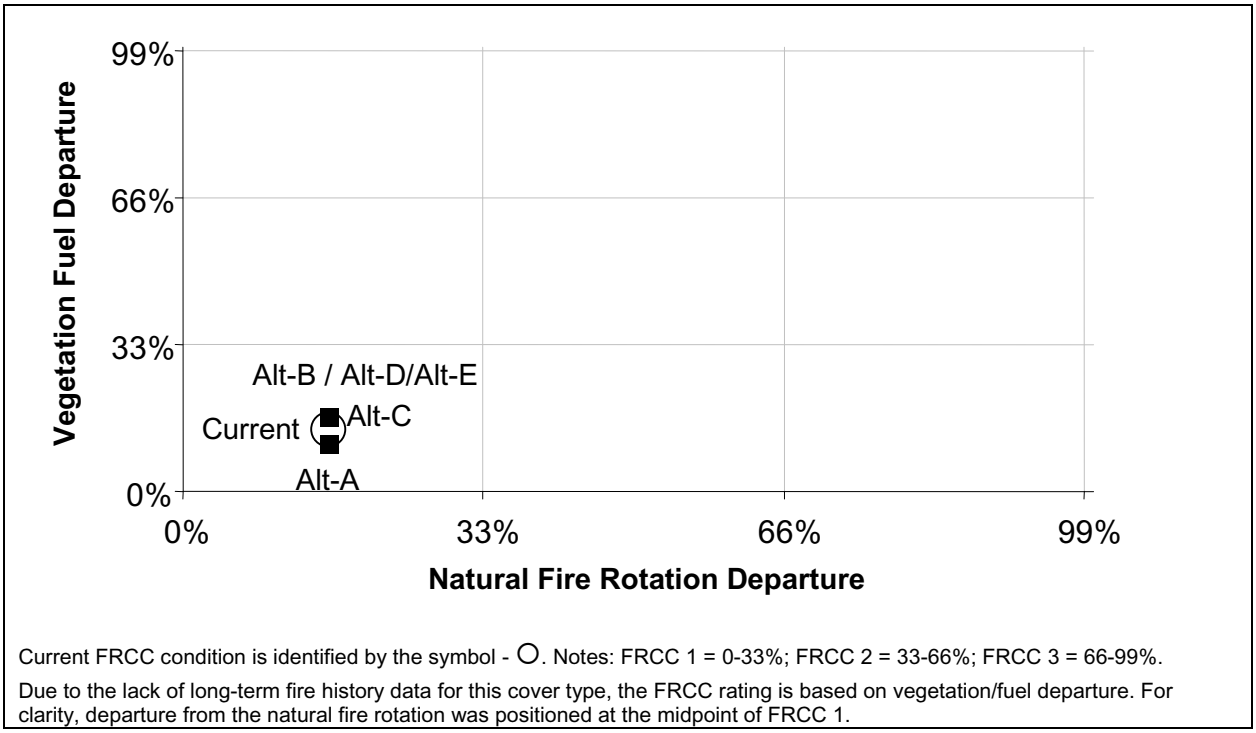
TABLE 4-18. VEGETATION/AGE CLASS, DESIRED FUTURE CONDITION (DFC), CURRENT CONDITION, AND EFFECTS OF FIVE ALTERNATIVES FOR SALT DESERT SHRUB, BURLEY FIELD OFFICE (BFO)

Vegetation/Age Class[1]	DFC	Current	Alternatives Over 30 Years			
			A	B	C	D and E
Perennial Grass and Forb	20%	11%	23%	13%	15%	14%
Shrub/Grass-Forb	76%	75%	69%	69%	68%	68%
Invasive Annual Grass in Understory[2]	4%	14%	8%	18%	17%	18%

[1] Age Class is the number of years since last fire, which is used as an approximation of seral stage in this analysis.

[2] Although absence of cheatgrass is desirable, these percentages have been deemed acceptable, since complete eradication of cheatgrass is impossible.

Essentially, all alternatives would maintain Salt Desert Shrub in FRCC 1, even though Alternative A is the only alternative that would propose treatments (Figure 4-16). Vegetation and fuels tend to be sparse in this cover type. Ignitions are relatively rare and wildland fires are infrequent. Little wildland fire is expected to occur in this cover type over 30 years. Alternative A would treat a small portion of this Salt Desert Shrub (less than 10 percent) (see Table 4-15). Alternative A would maintain fire frequency, reduce uncharacteristic cheatgrass, and improve the proportions of perennial shrubs and grasses.



Current FRCC condition is identified by the symbol - ○. Notes: FRCC 1 = 0-33%; FRCC 2 = 33-66%; FRCC 3 = 66-99%.
Due to the lack of long-term fire history data for this cover type, the FRCC rating is based on vegetation/fuel departure. For clarity, departure from the natural fire rotation was positioned at the midpoint of FRCC 1.

Figure 4-16. The effects of each alternative on Fire Regime Condition Class (FRCC) rating for Salt Desert Shrub in the Burley Field Office (BFO).

4.2.3.4 Aspen/Conifer and Dry Conifer

4.2.3.4.1 Short-term Effects

Alternative treatment levels for these cover types of the BFO range from 0 acres (Alternative A and Alternative D) to approximately 500 acres (Alternative B) of Aspen/Conifer and Dry Conifer (see Table 4-15) with the goal of rejuvenating aspen stands and creating a diversity of forest successional stages, associated forest structure, and species composition across the landscape.

Short-term effects of restoration treatments in Aspen/Conifer and Dry Conifer would reduce tree densities, decrease overstory canopy cover, and increase the amount of solar radiation reaching the understory vegetation and/or soil surface. Where RxFire or WFU treatments are applied, a temporary reduction in understory shrub, grass, and forb cover would occur. The vast majority of shrubs found in the understory of this cover type resprout after fire and would provide structure and shade to the soil surface within a year or two following treatment. Perennial grasses and forbs would also resprout or recolonize the area following treatment. Increased soil temperature, aspen root scarification, and/or a decrease in the number of older aspen trees would encourage aspen regeneration via resprouting or *suckering*.

The total acreage of Aspen/Conifer and Dry Conifer is minimal (approximately 1,550 acres) and occurs as scattered stands intermingled with Mountain Shrub. Because the proposed treatment-acreages are quite small, substantial short-term effects would not be anticipated. Alternative A and Alternative D would not propose treatments in this cover type and have no short-term

effects. Alternative B proposes the most treatments (32 percent of these cover types); however, due to the scattered nature of treatments, this alternative would also produce a low level of short-term effects. Alternatives C and E propose fewer treatments (13 percent of the cover type) and would produce few short-term effects.

4.2.3.4.2 Long-term Effects

Treatments in Aspen/Conifer and Dry Conifer would be positive and result in a greater diversity of forest successional stages across the landscape. This would improve the health of these cover types, including enhancing structural and species diversity and decreasing insect and disease outbreaks.

Treatments would move these cover types toward a DFC consisting of a 40:40:20 mix of early successional, mid-successional, and late successional stages (Table 4-19). None of the alternatives would achieve DFC within 30 years; however, treatments applied under Alternatives B, C, and E would be equally effective in moving the vegetation toward DFC, particularly with regards to the proportion of mid-successional stages. The lack of treatments under Alternative A and Alternative D would result in a complete lack of early seral stages, a decrease in mid-seral, and an increase in the landscape-level proportion of late seral.

TABLE 4-19. VEGETATION/AGE CLASS, DESIRED FUTURE CONDITION (DFC), CURRENT CONDITION, AND EFFECTS OF FIVE ALTERNATIVES FOR ASPEN/CONIFER AND DRY CONIFER, BURLEY FIELD OFFICE (BFO)

Vegetation/Age Class[1]	DFC	Current	Alternatives Over 30 Years			
			A	B	C and E	D
Forb/grass with aspen trees/suckers, <25 years old	40%	0%	0%	7%	7%	0%
Aspen/Conifer/Shrub mix, 25-50 years old	40%	30%	25%	43%	43%	22%
Conifer-dominated, >50 years old	20%	70%	75%	50%	50%	78%

[1] Age Class is the number of years since last fire, which is used as an approximation of seral stage in this analysis.

Only Alternatives B, C, and E would treat Aspen/Conifer and Dry Conifer; Alternative A and Alternative D would not propose any treatments in these cover types. Alternatives B, C, and E would improve conditions to FRCC 2 and FRCC 1, respectively, within 30 years (Figure 4-17).

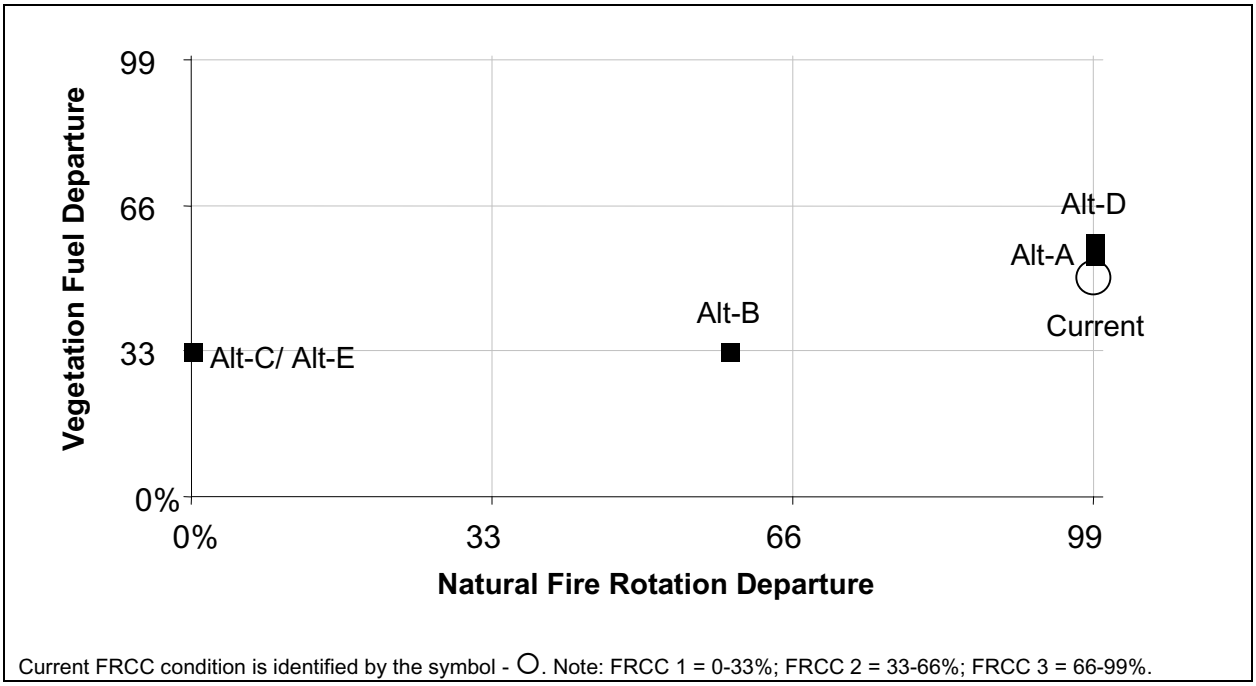


Figure 4-17. The effects of each alternative on Fire Regime Condition Class (FRCC) rating for Aspen/Conifer and Dry Conifer in the Burley Field Office (BFO).

The level of 10-year treatment would result in lower levels of vegetation fuel departure; however, some communities would move through successional stages and reach the mid and late-seral stages again within 30 years. Alternative A and Alternative D, on the other hand, would maintain current FRCC 3 over 30 years because no treatments are proposed.

Alternatives B, C, and E would reduce departures of fire frequency, vegetation and fuels structure, and composition and improve current conditions. Alternatives C and E would achieve a natural fire rotation for these cover types as well as a small increase in early seral stages, a substantial increase in mid-seral stages near to DFC, and a decrease in late seral stages that would improve current conditions. Alternative B would achieve an intermediate fire frequency, but would improve vegetation and fuels structure and composition as well as Alternatives C and E. Ten year treatment levels (see Table 4-15) would result in lower levels of vegetation fuel departure. Some successional stages would move through succession and reach the mid and late seral stages again within 30 years.

4.2.3.5 Mountain Shrub

4.2.3.5.1 Short-term Effects

Alternative treatment levels for Mountain Shrub in the BFO range from approximately 0 acres (Alternatives B) to 16,500 acres (Alternative D) (see Table 4-15), with the goals of rejuvenating old, decadent cover types or maintaining healthy cover types; increasing cover and density of desirable herbaceous species; reducing cover and density of uncharacteristic vegetation; and creating a mosaic of successional stages within cover types as well as the mosaic of Mountain Shrub with other cover types (e.g., Aspen/Conifer and Dry Conifer) across the landscape.

Treatments in this cover type would primarily be RxFire and WFU. Short-term effects of these treatments would be a temporary decrease in shrub, grass, and forb canopy cover. In the event of a high severity fire, individual shrubs could be killed (especially antelope bitterbrush, at lower elevations, and mountain mahogany). These changes would increase the amount of solar radiation reaching the soils surface and stimulate resprouting and regrowth. The majority of Mountain Shrubs resprout after low to moderate severity fire and would provide structure and shade to the soil surface within a year or two following treatment. Effects of fire on mountain mahogany however, could persist for a number of years (and perhaps into the long term) due to a general lack of resprouting. Perennial grasses and forbs would also resprout or recolonize the treatment areas. Shrub leader growth would increase due to increased light and soil temperatures, as well as a reduction in standing, dead, woody material.

Alternatives B, D, and E propose no treatment-acres in this cover type and, therefore, would have no short-term effects (see Table 4-15). Alternative A proposes the fewest treatment-acres (2 percent of this cover type) would have minimal impacts at the landscape scale. Alternative C would treat approximately 9 percent of the total Mountain Shrub acreage, or approximately 1,200 acres annually. This would result in more substantial impacts than the other alternatives, primarily in the form of temporary removal of vegetative cover.

4.2.3.5.2 Long-term Effects

Treatment in Mountain Shrub would result in a greater structural and compositional diversity in this cover type. Species richness would increase as the proportion of different successional stages becomes more diverse. Landscape-level fuel loading would decrease with a decrease in dense, woody vegetation.

Treatments would move Mountain Shrub toward an even distribution of successional stages (Table 4-20). None of the alternatives would achieve DFC in 30 years. All alternatives would increase the proportion of early successional stages and decrease the proportion of late successional stages. However, only Alternative C would substantially move all three successional states toward a more even distribution. Treatment levels in Alternative A would essentially have the same effect as no treatment.

TABLE 4-20. VEGETATION/AGE CLASS, DESIRED FUTURE CONDITION (DFC), CURRENT CONDITION, AND EFFECTS OF FIVE ALTERNATIVES FOR MOUNTAIN SHRUB, BURLEY FIELD OFFICE (BFO)

Vegetation/Age Class[1]	DFC	Current	Alternatives Over 30 Years			
			A	B	C	D and E
Perennial Grass/Shrub, <10 years old	33%	1%	9%	9%	13%	10%
Shrub/Perennial Grass 10-20 years old	33%	5%	4%	6%	22%	7%
Shrub dominated, >20 years old	34%	94%	87%	85%	65%	83%

[1] Age Class is the number of years since last fire, which is used as an approximation of seral stage in this analysis.

Alternative A and Alternative C would treat Mountain Shrub, while Alternatives B, D, and E would not treat this cover type. Alternative A would maintain current FRCC 1, while Alternatives B, D, and E would achieve FRCC 2, and Alternative C would achieve FRCC 1 within 30 years (Figure 4-18). Alternative A would maintain the current fire frequency in this cover type, but not do much to improve vegetation and fuels structure and composition. Alternatives B, D, and E would shorten the fire frequency in this cover type; departure from natural fire rotation would decrease to 40 percent for Alternative B, and to less than 10 percent for Alternatives D and E. However, departure of vegetation and fuels structure and composition under these two alternatives would not decrease substantially within 30 years. Alternative C would substantially increase fire frequency over current conditions and bring wildland fire regime within the historical range of variability. Of the five alternatives, Alternative C would create the best mix of successional stages across the landscape (vegetation/fuels DFC) and would have a disturbance rate most similar to the natural fire rotation.

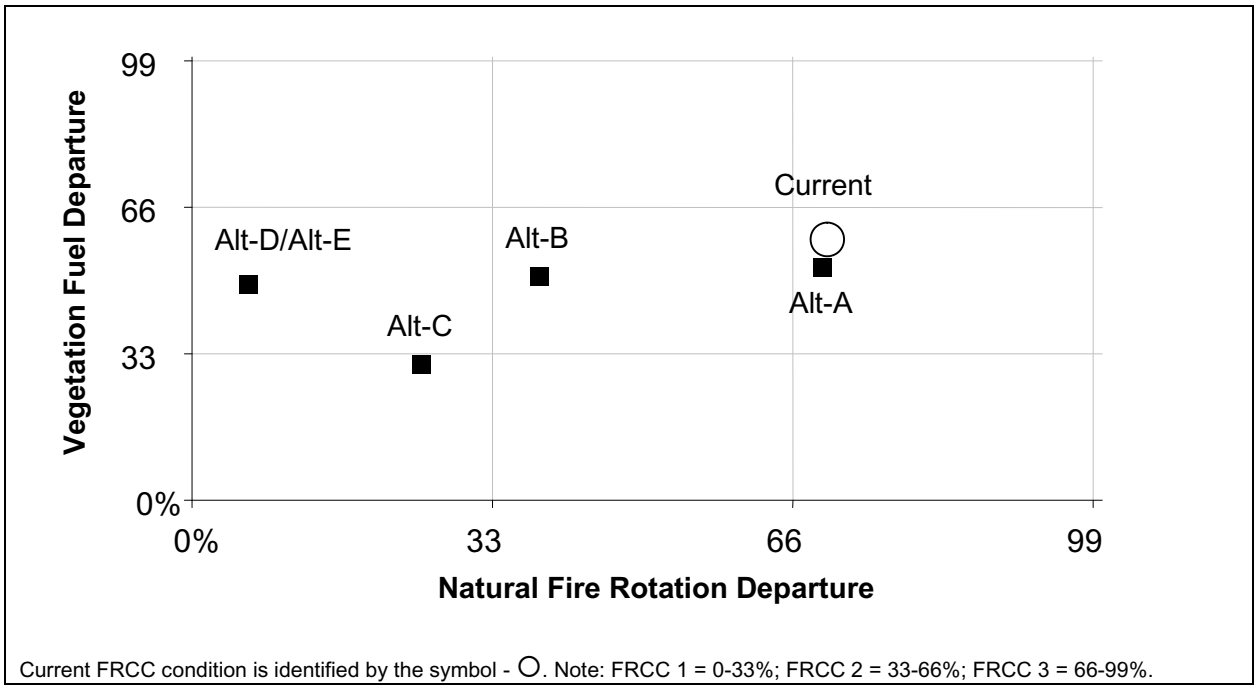


Figure 4-18. The effects of each alternative on Fire Regime Condition Class (FRCC) rating for Mountain Shrub in the Burley Field Office (BFO).

4.2.3.6 Wet/Cold Conifer

4.2.3.6.1 Short-term Effects

Alternative treatment levels for the Wet/Cold Conifer cover type range from 0 acres (Alternatives A, B, and D) to approximately 50 acres (Alternatives C and E) over a 10-year period (see Table 4-15). Treatment goals include reducing the risk of insect infestation and disease, creating a more diverse mosaic of successional stages across the landscape, and reducing wildland fire intensity and spread.

Short-term effects of restoration treatments in Wet/Cold Conifer would reduce tree densities, decrease canopy cover, and increase the amount of solar radiation reaching the understory vegetation and/or soil surface. Mechanical treatments would result in a reduction in mature and pole-sized tree density. WFU treatments would remove overstory trees and increase understory shrubs, grasses, and forbs. Trees would regenerate and grow above the understory vegetation within approximately 10 years.

Alternatives A, B, and D would not treat Wet/Cold Conifer and would have no short-term effects (see Table 4-15). Alternatives C and E would treat approximately 6 percent of this cover type. Short-term effects associated with Alternatives C and E would be minimal due to the small acreages proposed for treatment.

4.2.3.6.2 Long-term Effects

Effects of treatments across alternatives in the Wet/Cold Conifer cover type would be positive and result in greater structural and compositional diversity, as well as resistance and resilience to fire disturbance, within the areas treated.

Treatments would move this cover type toward a DFC consisting of a 30:44:26 mix of early successional, mid-successional, and late successional forest cover types (Table 4-21). Alternatives A, B, and D would not treat this cover type, would not move the vegetation toward DFC, and would have no impacts in this cover type. Only Alternatives C and E would treat this cover type; although, these alternatives would not meet DFC, but they would result in a more even distribution of successional stages across the landscape within 30 years.

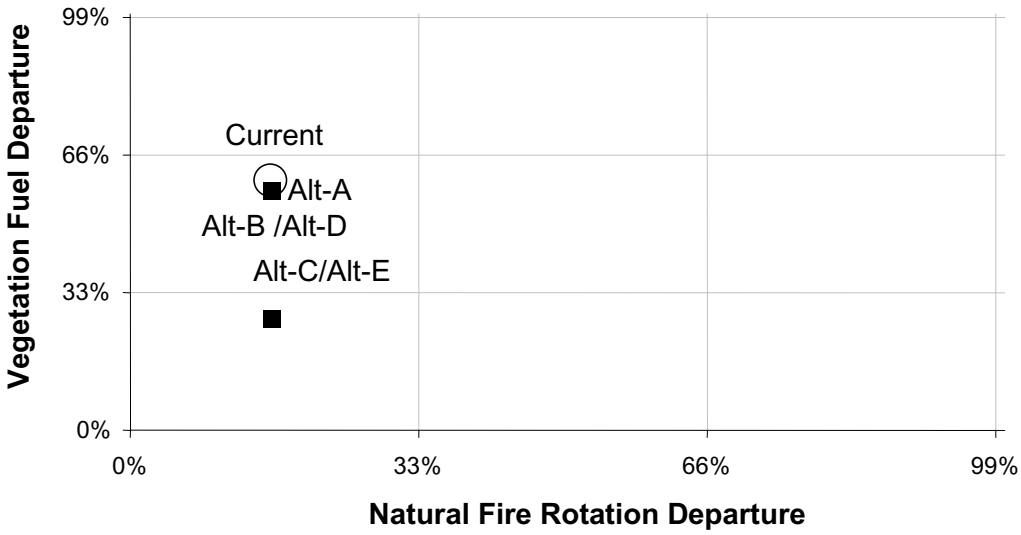
TABLE 4-21. VEGETATION/AGE CLASS, DESIRED FUTURE CONDITION (DFC), CURRENT CONDITION, AND EFFECTS OF FIVE ALTERNATIVES FOR WET/COLD CONIFER, BURLEY FIELD OFFICE (BFO)

Vegetation/Age Class[1]	DFC	Current	Alternatives Over 30 Years			
			A	B	C and E	D
Forb/grass with seedlings	30%	4%	7%	7%	30%	7%
Conifer Shrub mix	44%	10%	9%	9%	17%	9%
Conifer-dominated	26%	86%	84%	84%	53%	84%

[1] Age Class is the number of years since last fire, which is used as an approximation of seral stage in this analysis.

Alternatives A, B, and D would not treat this cover type; however, lack of treatments would not affect the current fire frequency or vegetation and fuels structure and composition within 30 years (Figure 4-19). Forests in this condition would have moderate to high stocking densities, substantial ladder fuels (e.g., small trees and overlapping deadfall), and moderate to widespread insect and disease outbreaks. Alternative C, on the other hand, would achieve FRCC 1 within 30 years. Even though only approximately 6 percent of this cover type would be treated under Alternatives C and E, treatment levels would be sufficient to increase fire frequency to natural fire rotation rates and improve vegetation and fuels structure and composition to closer approach DFC. Forests close to DFC would have the desired mix of successional stages and fuel loadings

across the landscape. In WUI areas, threats to life and property would be more fully mitigated by Alternatives C and E than any of the other three alternatives.



Current FRCC condition is identified by the symbol - ○. Notes: FRCC 1 = 0-33%; FRCC 2 = 33-66%; FRCC 3 = 66-99%.
Due to the lack of long-term fire history data for this cover type, the FRCC rating is based on vegetation/fuel departure. For clarity, departure from the natural fire rotation was positioned at the midpoint of FRCC 1.

Figure 4-19. The effects of each alternative on Fire Regime Condition Class (FRCC) rating for Wet/Cold Conifer in the Burley Field Office (BFO).

4.2.3.7 Vegetated Rock/Lava

4.2.3.7.1 Short-term Effects

Alternative treatment levels for the Vegetated Rock/Lava type range from 0 acres (Alternatives B, D, and E) to approximately 3,300 acres (Alternative A) (see Table 4-15). These treatments would consist of WFU and chemical treatments to control noxious weeds.

WFU would be allowed on Vegetated Rock/Lava primarily in Alternative A and Alternative C (see Table 4-15). Because starts on this cover type are infrequent, it is assumed that only a small fraction of the existing acreage would burn. WFU would permit historical successional processes to occur. Where cheatgrass or noxious weed invasions are found near the edges of Vegetated Rock/Lava, treatment would be conducted to prevent or reduce spread and maintain current percentages across the landscape. Short-term effects would include the mortality of vegetation due to wildland fire. This would be most noticeable for long-lived shrubs and trees, such as Wyoming big sagebrush and junipers. Because vegetation is patchy, fire effects would also be discontinuous, creating openings in areas with dense concentrations of fuels.

4.2.3.7.2 Long-term Effects

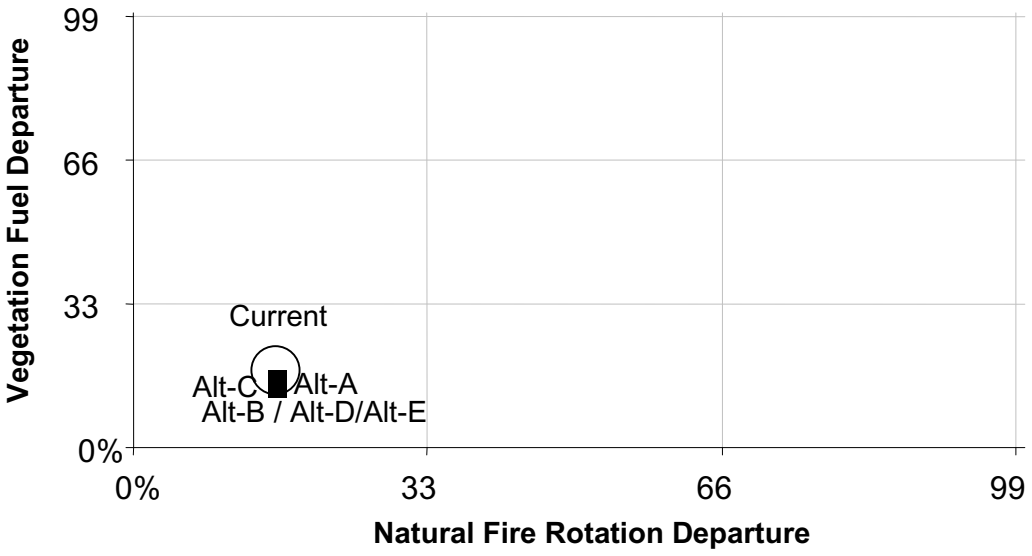
All alternatives would move Vegetated Rock/Lava toward DFC (Table 4-22), with Alternative C being slightly best. Greater number of acres burned under Alternative A would result in a slightly greater proportion of this cover type being dominated by herbaceous cover types, lacking sagebrush and juniper. All the alternatives would keep the composition of cheatgrass at or below 15 percent within this cover type; however, Alternative A and Alternative C would slightly decrease this proportion due to fire or chemical treatment.

TABLE 4-22. VEGETATION/AGE CLASS, DESIRED FUTURE CONDITION (DFC), CURRENT CONDITION, AND EFFECTS OF FIVE ALTERNATIVES FOR VEGETATED ROCK/LAVA, BURLEY FIELD OFFICE (BFO)

Vegetation/Age Class[1]	DFC	Current	Alternatives Over 30 Years			
			A	B	C	D and E
Perennial herbaceous	6%	2%	10%	7%	7%	7%
Tree/shrub/herbaceous	80%	84%	79%	78%	80%	78%
Invasive Annual Grass in Understory	14%	14%	11%	15%	13%	15%

[1] Age Class is the number of years since last fire, which is used as an approximation of seral stage in this analysis.

Alternative A and Alternative C would treat Vegetated Rock/Lava, while Alternatives B, D, and E would not treat this cover type. All alternatives would maintain FRCC 1, while they slightly reduce departures from the natural fire rotation and vegetation and fuels structure and composition (Figure 4-20). All alternatives would slightly improve fire frequency, as well as improve vegetation and fuels structure and composition similar to DFC. Alternative A and Alternative C would apply proactive restoration treatments and allow for flexibility in the Appropriate Management Response when suppressing fires in Vegetated Rock/Lava. Due to the small and fragmented nature of fire in this cover type, however, long-term changes in landscape composition and the resulting fuel and fire dynamics would be minimal.



Current FRCC condition is identified by the symbol - ○. Notes: FRCC 1 = 0-33%; FRCC 2 = 33-66%; FRCC 3 = 66-99%.
Due to the lack of long-term fire history data for this cover type, the FRCC rating is based on vegetation/fuel departure. For clarity, departure from the natural fire rotation was positioned at the midpoint of FRCC 1.

Figure 4-20. The effects of each alternative on Fire Regime Condition Class (FRCC) rating for Vegetated Rock/Lava in the Burley Field Office (BFO).

4.2.4 Analysis of Effects for the Shoshone Field Office (SFO)

4.2.4.1 Low-elevation Shrub, Perennial Grass, and Invasive Annual Grass

4.2.4.1.1 Short-term Effects

Alternative treatment levels for these cover types of the SFO range from approximately 109,000 acres (Alternative A) to 534,000 acres (Alternative C) of potential or existing Low-elevation Shrub (Table 4-23), with the goal of reducing fire frequency and decreasing fire size.

Large acreages of Low-elevation Shrub have been converted to Invasive Annual Grass by the invasion of cheatgrass and medusahead wildrye (*Taeniatherum caput-medusae*), frequent fires, and degradation of native cover types. Therefore, most treatments are in the Invasive Annual Grass cover type. Short-term effects of restoration treatments are mainly mortality of non-target plants from herbicide use and seeding methods that cause soil surface disturbance. These treatments would follow wildland fire and RxFire to prevent expansion of Invasive Annual Grass. Considering the overall poor ecological condition of areas that support Invasive Annual Grass, the short-term negative impacts are minimal, even when treatments occur at a large scale. While Alternative A treats the fewest acres (see Table 4-23) and would have the smallest short-term impacts, Alternatives C, D, and E would treat acreages large enough to stabilize landscape-level areas of degraded vegetation. Placed correctly, large projects would protect adjacent, intact, sagebrush steppe, on both the short and long term (see discussion below).

TABLE 4-23. VEGETATION COVER TYPES AND THEIR ACREAGES IN THE SHOSHONE FIELD OFFICE (SFO)

Cover type	Total Acres in SFO	Alternatives (footprint-acres)[1]				
		A	B	C	D	E
Low-elevation Shrub	415,308	5,525	84,000	62,831	112,230	112,230
Perennial Grass	548,807	96,505	70,500	193,619	113,500	113,500
Invasive Annual Grass	281,362[2]	6,700	102,500	281,362	281,600	281,600
Mid-elevation Shrub	311,194	850	17,550	200,000	58,000	58,000
Juniper	4	0	0	0	0	0
Salt Desert Shrub	0	0	0	0	0	0
Aspen/Conifer	4,441	0	750	479	0	479
Dry Conifer	19,241	0	5,150	2,043	0	2,043
Mountain Shrub	11,901	0	550	1,345	550	550
Wet/Cold Conifer	9,388	0	0	793	0	793
Vegetated Rock/Lava	166,787	370	0	2,300	0	0
TOTAL	**1,768,433**	**109,950**	**281,000**	**744,772**	**565,880**	**569,195**

[1] Footprint-acres describe broad treatment levels over 10 years for rehabilitation and restoration.
[2] As mapped (100% coverage of Invasive Annual Grass).

Treating Perennial Grass may involve seeding with sagebrush following fire to speed succession back to sagebrush steppe cover types; this cover type primarily consists of seedings established following past wildland fires and some native Perennial Grass areas that resulted from past fires in Low-elevation Shrub. There would be no negative short-term impacts from the former treatments because aerial seedings are performed following wildland fires.

Treating Low-elevation Shrub would result in moderate short-term impacts, but because the acres primarily would be cover types with little native understory, these effects would be relatively minor.

Wildland fire burn areas would be rehabilitated to stabilize them against noxious weed and non-native Invasive Annual Grass invasion. Short-term effects of treatments would be similar to those for Invasive Annual Grass: the mortality of non-target plants from herbicide use and seeding methods that cause soil surface disturbance. Areas containing stands of old, even-aged sagebrush could be mechanically treated to improve cover type structure. These treatments (e.g., thinning small areas using a Dixie harrow) would remove some older shrubs, as well as shallow-rooted plants. However, the treatments would be done on small acreages; therefore, effects would occur in localized patches.

4.2.4.1.2 Long-term Effects

Treatments in degraded Low-elevation Shrub would restore the sagebrush canopy and establish diverse, perennial understories. Alternatives C, B, and D/E would treat 15 percent, 20 percent, and 27 percent of this cover type, respectively, much of which is lacking a perennial understory and is either dominated by or at risk of dominance by cheatgrass and/or medusahead wildrye. Alternatives D and E would make the most progress toward creating a more resilient landscape. Alternative A would do little to improve or rehabilitate the degraded Low-elevation Shrub cover types in this area.

Treatments in Perennial Grass would have long-term, positive effects due to the reestablishment of sagebrush canopy. Alternative C would treat the most acres (approximately 35 percent) of this cover type; almost twice as many acres as Alternatives A (approximately 18 percent) and B (approximately 13 percent). Alternatives D and E would treat approximately 21 percent. Alternative C would result in reestablishing sagebrush on approximately 35 percent of existing Perennial Grass and moving the greatest number of acres toward a later seral state.

Long-term effects in Invasive Annual Grass are positive and would replace uncharacteristic, invasive annuals with Perennial Grasses, forbs, and a sagebrush overstory. Alternatives C, D, and E would treat large acres, approximately 28,000 acres annually, to restore functional Low-elevation Shrub where Invasive Annual Grass exists (see Table 4-23). Alternative B would treat approximately 10,000 acres annually, and Alternative A would treat less than 1,000 acres annually. Alternatives B, C, D, and E would convert large areas of Invasive Annual Grass to sagebrush steppe, as well as protect existing sagebrush steppe. Both Alternatives C and D would restore all acreages currently mapped as Invasive Annual Grass. Alternative A would do little to enhance or protect the sagebrush steppe.

Treatments in Invasive Annual Grass, Perennial Grass, and Low-elevation Shrub would move these cover types toward a DFC, which would consist of a mix of desirable seral states and minimal uncharacteristic vegetation (Table 4-24). While all alternatives somewhat modify the distribution of desirable early and mid-seral states toward DFC, only Alternatives C, D, and E would substantially decrease the dominance of cheatgrass; Alternatives D and E would be slightly more effective than Alternative C. None of the alternatives actually move the grass/shrub >30 years state toward DFC. This would be due to the continued occurrence of wildland fires across the landscape.

All alternatives would maintain FRCC 2 over 30 years; no alternative would achieve FRCC 1 in Low-elevation Shrub, Perennial Grass, and Invasive Annual Grass cover types (Figure 4-21); although, Alternatives B, C, D, and E would show improvement over current conditions. Alternative A would not treat enough of these cover types to change current conditions; although, it would maintain current fire frequency and vegetation and fuels structure and composition. Alternative B would reduce the departure from the natural fire rotation, but would not substantially improve vegetation and fuels structure and composition, even though it would slightly reduce uncharacteristic cheatgrass.

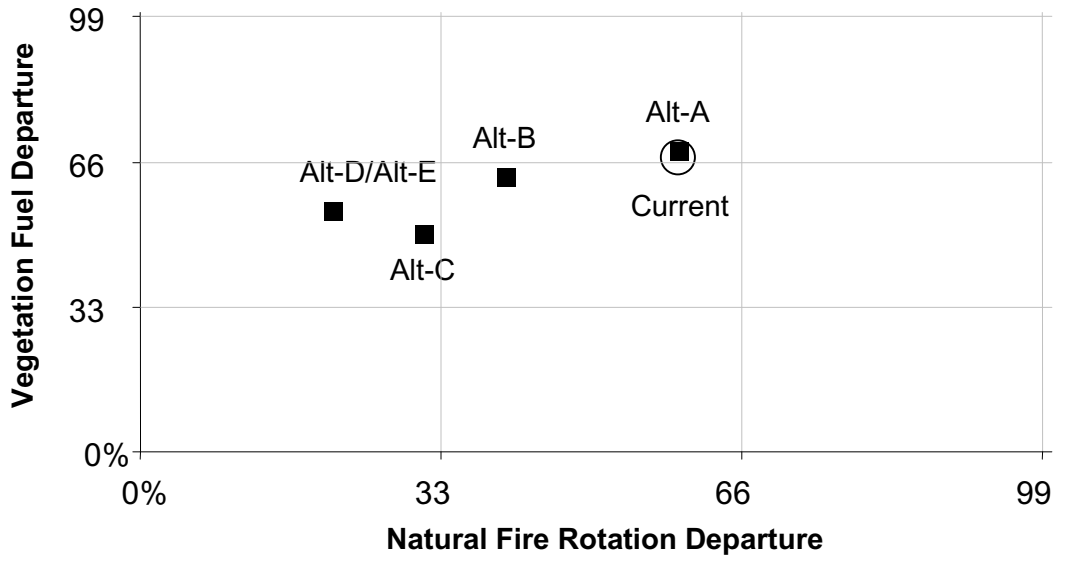
TABLE 4-24. VEGETATION/AGE CLASS, DESIRED FUTURE CONDITION (DFC), CURRENT CONDITION, AND EFFECTS OF FIVE ALTERNATIVES FOR LOW-ELEVATION SHRUB, PERENNIAL GRASS, AND INVASIVE ANNUAL GRASS, SHOSHONE FIELD OFFICE (SFO)

Years Since Last Disturbance[1]	DFC	Current	Alternatives Over 30 Years			
			A	B	C	D and E
Perennial Grass <15-year	14%	3%	18%	9%	17%	18%
Grass/Shrub 15-30-year	14%	2%	5%	15%	12%	21%
Shrub/Grass >30-year	52%	28%	12%	14%	24%	17%
Crested Wheatgrass	N/A[3]	25%	25%	25%	25%	25%
Invasive Annual Grass in Understory[2]	<20%	42%	40%	37%	22%	19%

[1] Disturbance = Wildland fire, RxFire, mechanical, chemical, and seeding treatments.

[2] Although absence of cheatgrass is desirable, these percentages have been deemed acceptable, since complete eradication of cheatgrass is impossible.

[3] Not applicable; no DFC objective was set for Crested wheatgrass. Crested wheatgrass percentages remain constant across the landscape over time die o the success of overseeding shrub species and through succession these areas become shrub dominated while minimal acres are seeded with Crested wheatgrass.



Current FRCC condition is identified by the symbol - O. Note: FRCC 1 = 0-33%; FRCC 2 = 33-66%; FRCC 3 = 66-99%.

Figure 4-21. The effects of each alternative on Fire Regime Condition Class (FRCC) rating for Low-elevation Shrub, Perennial Grass, and Invasive Annual Grass in the Shoshone Field Office (SFO).

Alternatives C, D, and E would reduce fire frequency sufficiently to approximate the natural fire rotation. However, none of the alternatives would reduce the vegetation/fuels departures sufficiently to achieve FRCC 1 in 30 years. Alternatives C, D, and E make similar progress in improving the vegetation and fuels structure and composition with a mix of successional stages, and substantially reduce the number of acres with uncharacteristic vegetation across the landscape. Alternative C would best improve the vegetation and fuels structure and composition by making large reductions in uncharacteristic cheatgrass (above) while increasing the proportion of early and mid-successional stages, though at the slight cost of reducing late successional stages.

4.2.4.2 Mid-elevation Shrub and Juniper

There are no planned treatments in the Juniper cover type in the SFO.

4.2.4.2.1 Short-term Effects

Alternative treatment levels for Mid-elevation Shrub range from 850 acres (Alternative A) to 200,000 acres (Alternative C) of (see Table 4-23), with the goal of improving vegetation structure and composition, as well as reintroducing fire at a more historical regime.

The Mid-elevation Shrub has been affected by reduced fire frequencies. This has increased shrub densities, reduced the diversity and cover of the herbaceous understory, and reduced the area of high-quality sagebrush habitats. Juniper only occurs as scattered trees in the SFO and does not present a threat to this cover type. Treatments would focus on increasing disturbance to mimic the effects of historical fire. Treatments would use RxFire and WFU, as well as mechanical methods, to reduce shrub densities. Areas with invasive or noxious weeds would receive chemical treatments to reduce or eliminate infestations. Chemical treatments would also be used for selective thinning of shrub cover. Seeding would occur after fire and/or mechanical treatments in areas where the understory has been depleted.

RxFire and WFU would reduce shrub and herbaceous canopy due to removing biomass. Wildland fire could result in greater mortality and more continuous removal of canopy due to higher heat intensities than in RxFire. Herbaceous cover, particularly annual species, would increase within two growing seasons following a fire. Chemical or other forms of integrated weed control would be used to minimize the expansion of invasive and noxious weeds. Chemical treatments could result in mortality of non-target species.

Mechanical treatments would be used where RxFire or WFU is not appropriate or effective, or where selective vegetation removal is desired. Mechanical treatments would have little short-term effect on non-target plants, due to the selectivity of the treatments on target vegetation. One exception would be damage to shallow-rooted species when using chaining or a Dixie harrow. Seeding methods that result in soil surface disturbances (drilling, chaining, and harrowing) could result in similar disturbances. However, seeding grasses and forbs using these methods would be performed where the understory is depleted; therefore, the negative impacts would be minimal. Much of this cover type would be aerially seeded with negligible impacts.

Alternative A would treat the fewest acres (less than 1 percent of this cover type) (see Table 4-23) and would have negligible short-term impacts. However, this alternative would do nothing

to restore landscape-level structural diversity in the Mid-elevation Shrub. In contrast, Alternative C would treatment approximately 64 percent of this cover type, or approximately 20,000 acres annually, with the goal of restoring historical fire-return intervals at a landscape scale. Primarily, this would be accomplished with RxFire or WFU. Alternatives B and D/E would treat 6 percent and 19 percent of this cover type, respectively, and would have intermediate effects compared to Alternative A and Alternative C.

4.2.4.2.2 Long-term Effects

Treatments in Mid-elevation Shrub would diversify the vegetation structure and composition, which would be a positive effect over the long term. Alternative C is the most aggressive of the alternatives and would move the current vegetation toward DFC (Table 4-25); none of the alternatives, however, would achieve DFC in 30 years. All alternatives would decrease the proportion of early seral stages from the current 40 percent to percentages below DFC, and increase the proportion of mid-seral toward DFC. Alternatives A, B, D, and E would not reduce the proportion of late seral stages to DFC. The proportion of late seral stages would be maintained under Alternative C. All alternatives would allow an increase in juniper, while they would have little effect on cheatgrass conditions.

TABLE 4-25. VEGETATION/AGE CLASS, DESIRED FUTURE CONDITION (DFC), CURRENT CONDITION, AND EFFECTS OF FIVE ALTERNATIVES FOR MID-ELEVATION SHRUB JUNIPER, SHOSHONE FIELD OFFICE (SFO)

Vegetation/Age Class[1]	DFC	Current	Alternatives Over 30 Years			
			A	B	C	D and E
Perennial Grass <15-year	23%	40%	10%	9%	12%	10%
Grass/Shrub 5-15-year	45%	2%	17%	18%	26%	21%
Shrub/Grass >15-year	23%	54%	63%	62%	53%	60%
Juniper[2]	7%	<1%	7%	7%	6%	6%
Invasive Annual Grass in Understory[3]	2%	3%	3%	4%	3%	3%

[1] Age Class is the number of years since last fire, which is used as an approximation of seral stage in this analysis.

[2] The SFO has only 4 acres of juniper invasion mapped in the area; the DFC listed is for the planning area as a whole.

[3] Although absence of cheatgrass is desirable, these percentages have been deemed acceptable, since complete eradication of cheatgrass is impossible.

Alternative A and Alternative B would maintain current FRCC 3. Alternatives D and E would achieve FRCC 2, but only Alternative C would achieve FRCC 1 in Mid-elevation Shrub within 30 years (Figure 4-22).[1] Alternative A would treat a small proportion (less than 3 percent) of this cover type and maintain the current fire frequency and vegetation and fuels structure and composition conditions. Alternative B would reduce the fire frequency departure, but not substantially change the current vegetation and fuels structure and composition. For both

[1] Only 4 acres of juniper are mapped in the SFO, so there were no treatments proposed in juniper by any of the five alternatives (see Table 4-23).

Alternative A and Alternative B, fire frequency would continue at rates less than the natural fire rotation, which would permit the accumulation of fuels; continued dominance of old, decadent shrubs; and a decline in desired herbaceous species. Neither alternative would make substantial progress toward achieving the desired mix of successional stages across the landscape (vegetation/fuels DFC).

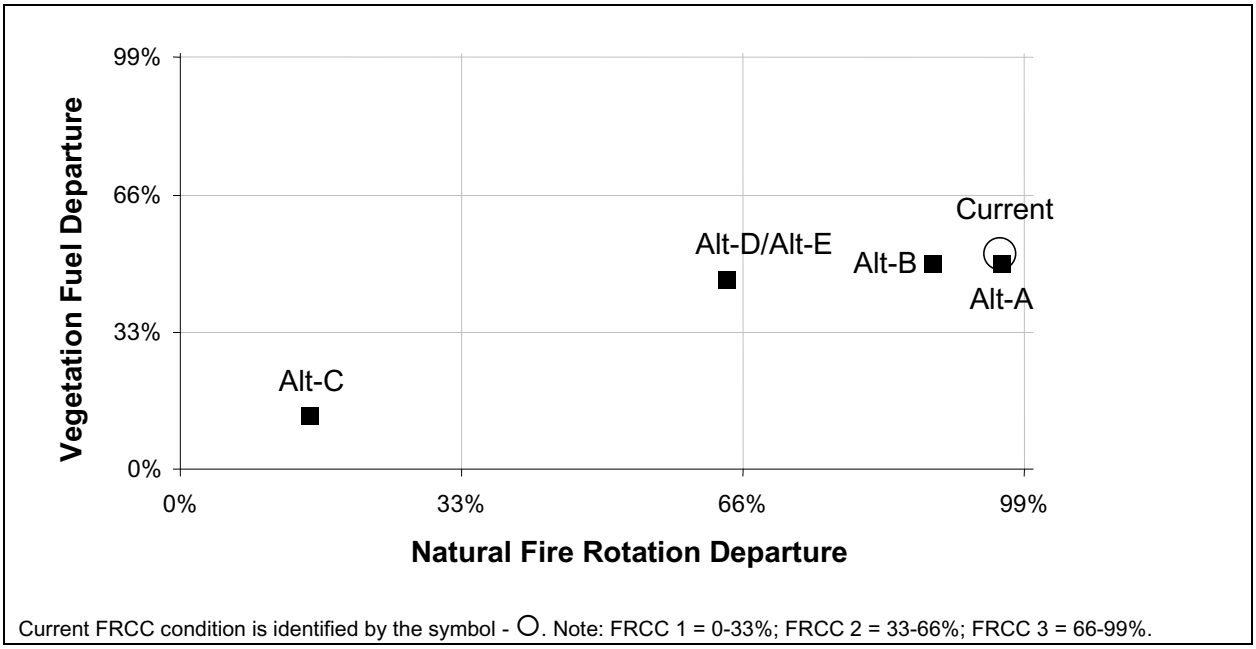


Figure 4-22. The effects of each alternative on Fire Regime Condition Class (FRCC) rating for Mid-elevation Shrub and Juniper encroachment in the Shoshone Field Office (SFO).

Alternatives D and E would reduce the departure of fire frequency, but not appreciably reduce the current departure from vegetation and fuels structure and composition. Treatments would reduce early successional stages, increase mid-successional stages, and do little to change the proportion of uncharacteristic vegetation; however, Alternatives D and E would also increase late successional stages, which could make these stands more prone to stand-replacing fires.

Alternative C would reduce departures of fire frequency, vegetation and fuels structure, and composition to levels that approach historical conditions and DFC. Treatments would reduce early successional stages, increase mid-successional stages, maintain late successional stages, and do little to change the proportion of uncharacteristic vegetation. Treatment levels in this alternative would most closely approximate the natural fire rotation and would be the most effective at creating the desired mix of successional stages across the landscape (vegetation/fuels DFC).

4.2.4.3 Salt Desert Shrub

There are no planned treatments in the Salt Desert Shrub cover type in the SFO.

4.2.4.4 Aspen/Conifer and Dry Conifer

4.2.4.4.1 Short-term Effects

Alternative treatment levels for these cover types of the SFO range from 0 acres (Alternatives A and D) to approximately 5,900 acres (Alternative B) (see Table 4-23). Treatment goals would include rejuvenating aspen stands and creating a diversity of forest successional stages and associated forest structure and species composition across the landscape.

Fire rotation goals for Aspen/Conifer and Dry Conifer include restoring fire rotation to its natural level (25 years to 100 years), allowing for aspen regeneration and the recolonization of Perennial Grasses and forbs. Short-term effects of proactive restoration treatments in Aspen/Conifer and Dry Conifer would reduce tree densities, decrease canopy cover, and increase the amount of solar radiation reaching the understory vegetation and/or soil surface. Where RxFire or WFU is applied, a temporary reduction in understory shrub, grass, and forb cover would occur. The vast majority of shrubs found in the understory of this cover type resprout after a fire and would provide structure and shade to the soil surface within a year or two following treatment. Perennial grasses and forbs would also resprout or recolonize the area following treatment. Increased soil temperature, aspen root scarification, and/or a decrease in the number of older aspen trees would encourage aspen regeneration via resprouting or *suckering*.

Alternatives A and D would not treat any Aspen/Conifer or Dry Conifer and would have no short-term effects (see Table 4-23). Alternatives C and E would treat the fewest acres (approximately 11 percent of this cover type or approximately 250 acres annually) and would produce few short-term effects due to small treatment-acreages. Alternative B proposes the highest treatment-acreage (approximately 25 percent of the cover type or approximately 600 acres annually). This would have a greater level of short-term treatment effects, particularly if all acres treated were in one area, but even these treatment levels are small in the SFO.

4.2.4.4.2 Long-term Effects

Alternatives B, C, and E would treat Aspen/Conifer and Dry Conifer, diversifying forest successional stages. Pure aspen stands would become larger and more numerous. Vegetation species richness would increase as the proportion of forest successional stages becomes more even. The number of stands at high risk to insect and disease outbreaks and subsequent large wildland fire would decrease.

Treatments in Aspen/Conifer and Dry Conifer would move these cover types toward DFC consisting of a 40:40:20 mix of early successional, mid-successional, and late successional forest cover types (Table 4-26). None of the alternatives would achieve DFC in 30 years. No treatments would be applied under Alternative A and Alternative D, and essentially, no progress would be made toward DFC. Treatments applied under Alternatives B, C, and E would result in some progress toward DFC, with increases in the proportion of early and mid-seral stages and decreases in late seral stages. Vegetation treated under Alternative B would progress more quickly toward DFC due to higher levels of treatment.

TABLE 4-26. VEGETATION/AGE CLASS, DESIRED FUTURE CONDITION (DFC), CURRENT CONDITION, AND EFFECTS OF FIVE ALTERNATIVES FOR ASPEN/CONIFER AND DRY CONIFER, SHOSHONE FIELD OFFICE (SFO)

Vegetation/Age Class[1]	DFC	Current	Alternatives Over 30 Years			
			A	B	C and E	D
Forb/grass with aspen trees/suckers, <25 years old	40%	2%	2%	8%	6%	2%
Aspen/Conifer/Shrub mix, 25-50 years old	40%	29%	30%	37%	34%	30%
Conifer-dominated, >50 years old	20%	69%	68%	55%	60%	68%

[1] Age Class is the number of years since last fire, which is used as an approximation of seral stage in this analysis.

Alternative A and Alternative D would not treat Aspen/Conifer and Dry Conifer cover types, while Alternatives B, C, and E would treat them. Alternative A and Alternative D would maintain vegetation in FRCC 3, and Alternatives B, C, and E would achieve FRCC 2 over 30 years (Figure 4-23). Under Alternative A and Alternative D, portions of forest successional stages would continue to be unbalanced in favor of the late seral stage, moving away from the vegetation/fuels DFC. Fire frequency would be maintained at a rate less frequent than the natural fire rotation, permitting fuel build-up. Excluding fire in Aspen/Conifer and Dry Conifer would permit an increase in conifer density (including conifers encroaching into aspen stands) and a greater incidence of insect infestations and disease. Late seral forests would pose a greater fire hazard than stands with mixed species and structural composition. Wildland fires in late seral, Dry Conifer stands would be larger and burn with higher intensities than mixed stands, often resulting in stand-replacing crown fires.

Alternative B would reduce departures of fire frequency and vegetation and fuels structure and composition. The levels of treatments would substantially improve fire frequency, but not achieve a natural fire rotation. However, the treatments would improve vegetation and fuels structure and composition to approach the historical range of DFC and increase the relative proportions of early and mid-seral stages across the landscape. The level of 10-year treatments would result in lower levels of vegetation fuels departure; however, some cover types would move through successional stages and reach the mid and late seral stages again within 30 years.

Alternatives C and E would reduce departure of fire frequency to within the historical range of variability (see Figure 4-23). Alternatives C and E, however, would have little effect on current departure of vegetation and fuels structure and composition. While there would be a slight increase in early and mid-seral vegetation over the current conditions, the proportion of late seral vegetation would maintain currently high proportions of these cover types. Alternatives C and E would have a disturbance rate that is closer to the natural fire rotation and would make slower progress toward the vegetation/fuels DFC than Alternative B.

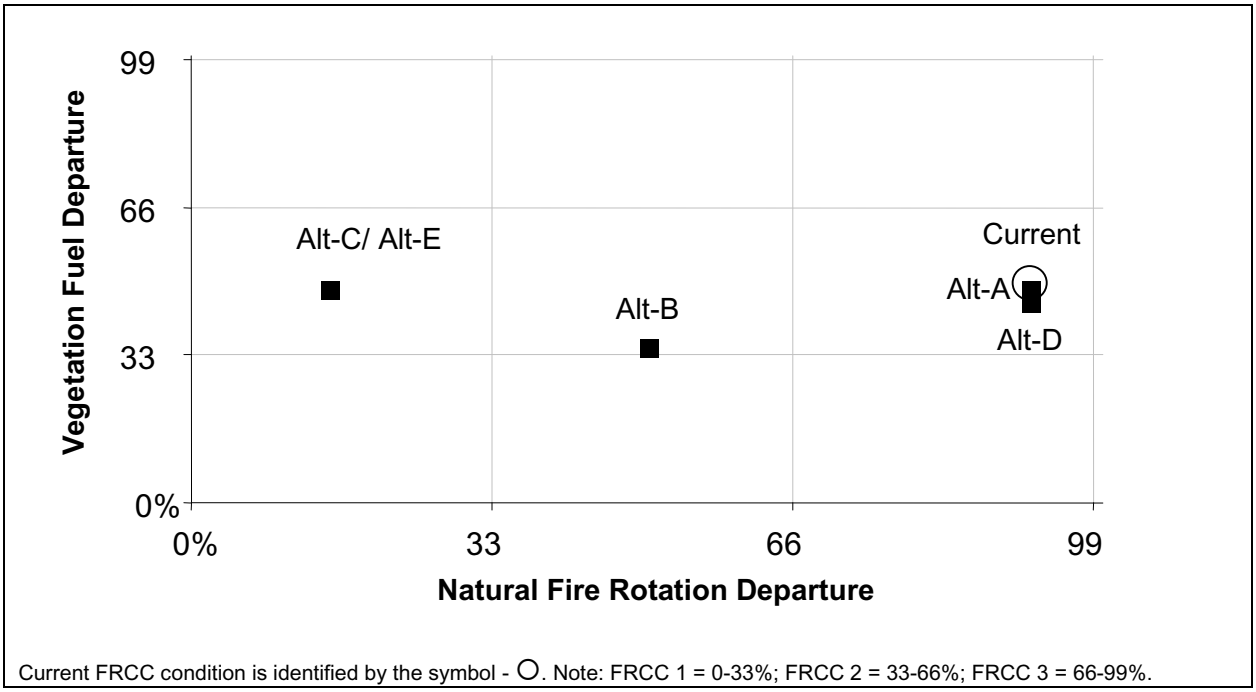


Figure 4-23. The effects of each alternative on Fire Regime Condition Class (FRCC) rating for Aspen/Conifer and Dry Conifer in the Shoshone Field Office (SFO).

4.2.4.5 Mountain Shrub

4.2.4.5.1 Short-term Effects

Fire rotation goals for Mountain Shrub include restoring fire rotation to natural levels (25 years to 100 years). Alternative treatment levels for this cover type in the SFO range from 0 acres (Alternative A) to approximately 1,300 acres (Alternative C) (see Table 4-23). Treatment goals include rejuvenating old, decadent cover types or maintaining healthy cover types; increasing cover and density of desirable herbaceous species; reducing cover and density of uncharacteristic vegetation; and creating a mosaic of successional stages within cover types, as well as a mosaic of Mountain Shrub with other cover types (e.g., Aspen/Conifer and Dry Conifer) across the landscape.

RxFire and WFU would be used to treat this vegetation. Short-term effects of these treatments would include a temporary decrease in shrub, grass, and forb canopy cover. Individual shrubs could be killed by high-severity fires, especially antelope bitterbrush at lower elevations. These changes would increase the amount of solar radiation reaching the soil surface, which would stimulate resprouting and regrowth of shrubs. The majority of Mountain Shrubs resprout after low to moderate severity fire and would provide structure and shade to the soil surface within a year or two following treatment. Perennial grasses and forbs would also resprout or recolonize the treatment areas. Shrub leader growth would increase following treatment due to increased light and soil temperatures, as well as a reduction in standing, dead, woody material.

Alternative A proposes no treatment-acres in Mountain Shrub and would have no short-term effects (see Table 4-23). Alternatives B, D, and E would treat the fewest acres, approximately 5 percent of this cover type. Impacts would be minimal at a landscape scale due to the small acreages treated over 10 years and on an annual basis. Alternative C would treat approximately 11 percent of this vegetation or approximately 130 acres annually. Effects from treatments proposed in Alternative C would be minimal; annual acreages would not be large. Most Mountain Shrub (e.g., buckbrush [*Ceanothus*], mountain snowberry [*Symphoricarpos oreophilus*], as well as herbaceous grasses and forbs) would provide good cover within one to two years.

4.2.4.5.2 Long-term Effects

The long-term effects of treatments in Mountain Shrub would be positive and increase structural and compositional diversity across the landscape. Vegetation species richness would increase as the proportion of different successional stages becomes more varied. Hazardous fuels would decrease across the landscape with a reduction in Mountain Shrub densities.

Treatments would move this cover type toward an even distribution of successional stages (Table 4-27). None of the alternatives would achieve DFC in 30 years. Alternatives A, B, D, and E would have little effect on early successional, mid-successional, and late successional stages in this cover type. Alternatives B, D, and E would do little to move the vegetation toward DFC. Only Alternative C would substantially move all three successional states toward a more even distribution and move this cover type toward DFC.

TABLE 4-27. VEGETATION/AGE CLASS, DESIRED FUTURE CONDITION (DFC), CURRENT CONDITION, AND EFFECTS OF FIVE ALTERNATIVES FOR MOUNTAIN SHRUB, SHOSHONE FIELD OFFICE (SFO)

Vegetation/Age Class[1]	DFC	Current	Alternatives Over 30 Years			
			A	B	C	D and E
Perennial Grass/Shrub, <10 years old	33%	2%	5%	5%	12%	5%
Shrub/Perennial Grass 10-20 years old	33%	2%	2%	4%	22%	4%
Shrub dominated, >20 years old	34%	96%	93%	91%	66%	91%

[1] Age Class is the number of years since last fire, which is used as an approximation of seral stage in this analysis.

Alternative A would not treat Mountain Shrub, while Alternatives B, C, D, and E would. Alternative A would maintain FRCC 3. Alternatives B, D, and E would achieve FRCC 2, and Alternative C would achieve FRCC 1 in 30 years (Figure 4-24). Under Alternative A, departures of fire frequency and vegetation and fuels structure and composition would be maintained over 30 years. Alternatives B, D, and E would reduce departures of fire frequency to approximately 60 percent though not so much as to achieve fire frequencies within the range of historical variability. Alternative C would reduce the departure of fire frequency to within the range of historical variability.

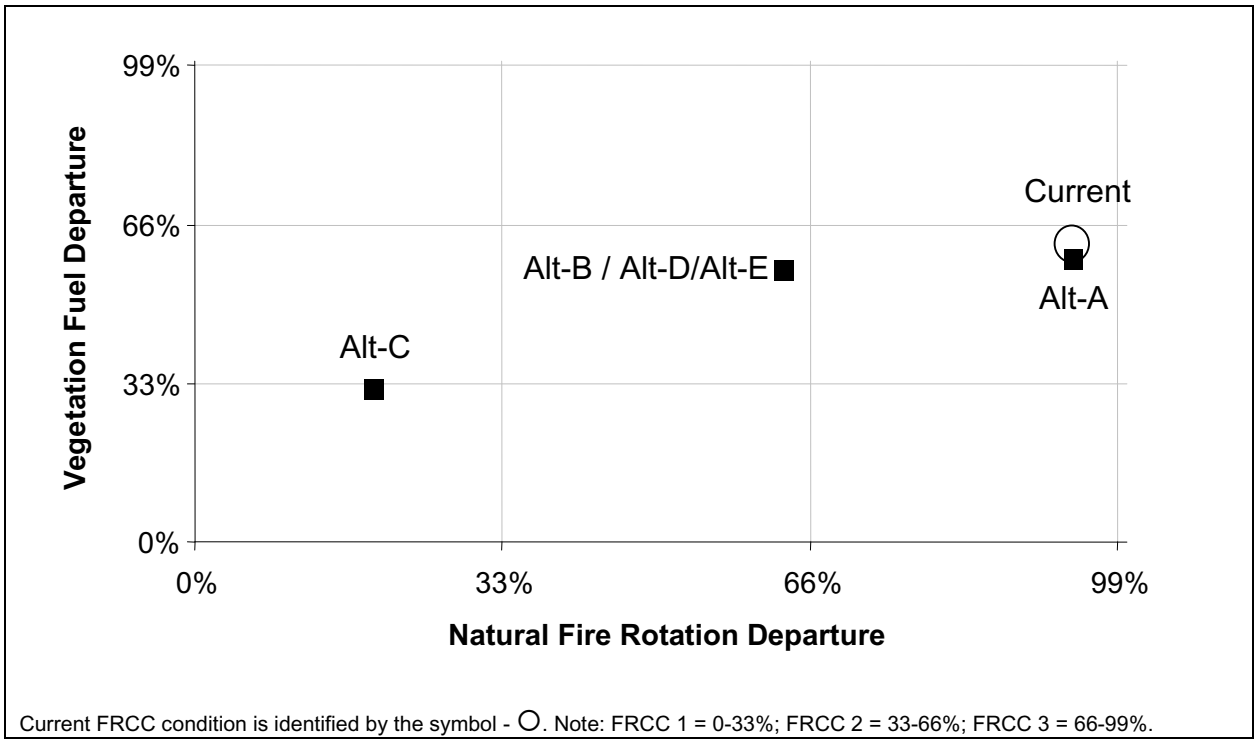


Figure 4-24. The effects of each alternative on Fire Regime Condition Class (FRCC) rating for Mountain Shrub in the Shoshone Field Office (SFO).

Alternatives B, D, and E would not appreciably reduce the departure of vegetation and fuels structure and composition from current conditions. Alternatives A, B, D, and E would maintain the dominance of late seral stages, depletion of understory herbaceous species, and build-up of woody fuel. Increased fuel accumulations would increase fire hazards by supporting larger, more intense and large wildland fires. Alternative C, however, would reduce the departure of vegetation and fuels structure and composition so as to approach DFC by increasing early and mid-successional stages, while substantially reducing late seral stages. This alternative would most closely create the desired mix of successional stages across the landscape (vegetation/fuels DFC) and would have a disturbance rate most similar to the natural fire rotation.

4.2.4.6 Wet/Cold Conifer

4.2.4.6.1 Short-term Effects

Alternative treatment levels for this cover type in the SFO range from 0 acres (Alternatives A, B, and D) to approximately 800 acres (Alternatives C and E) over a 10-year period (see Table 4-23). Treatment goals include reducing risk of insect infestation and disease, creating a more diverse mosaic of successional stages across the landscape, and reducing wildland fire intensity and spread.

Short-term effects of proactive restoration treatments in Wet/Cold Conifer would reduce tree densities, decrease canopy cover, and increase the amount of solar radiation reaching the understory vegetation and/or soil surface. Mechanical treatments would reduce mature and pole-

sized tree densities. WFU treatments would remove overstory trees and increase understory shrubs, grasses, and forbs. Trees would regenerate and grow above the understory vegetation within approximately 10 years.

Alternatives A, B, and D would not treat Wet/Cold Conifer and would produce no short-term effects (see Table 4-23). Alternatives C and E would treat approximately 9 percent of this cover type. Short-term effects would be minimal with Alternatives C and E due to the small acreages proposed for treatment.

4.2.4.6.2 Long-term Effects

Effects of treatment across alternatives in Wet/Cold Conifer would be positive and increase structural and compositional diversity, as well as increase resistance and resilience to wildland fires.

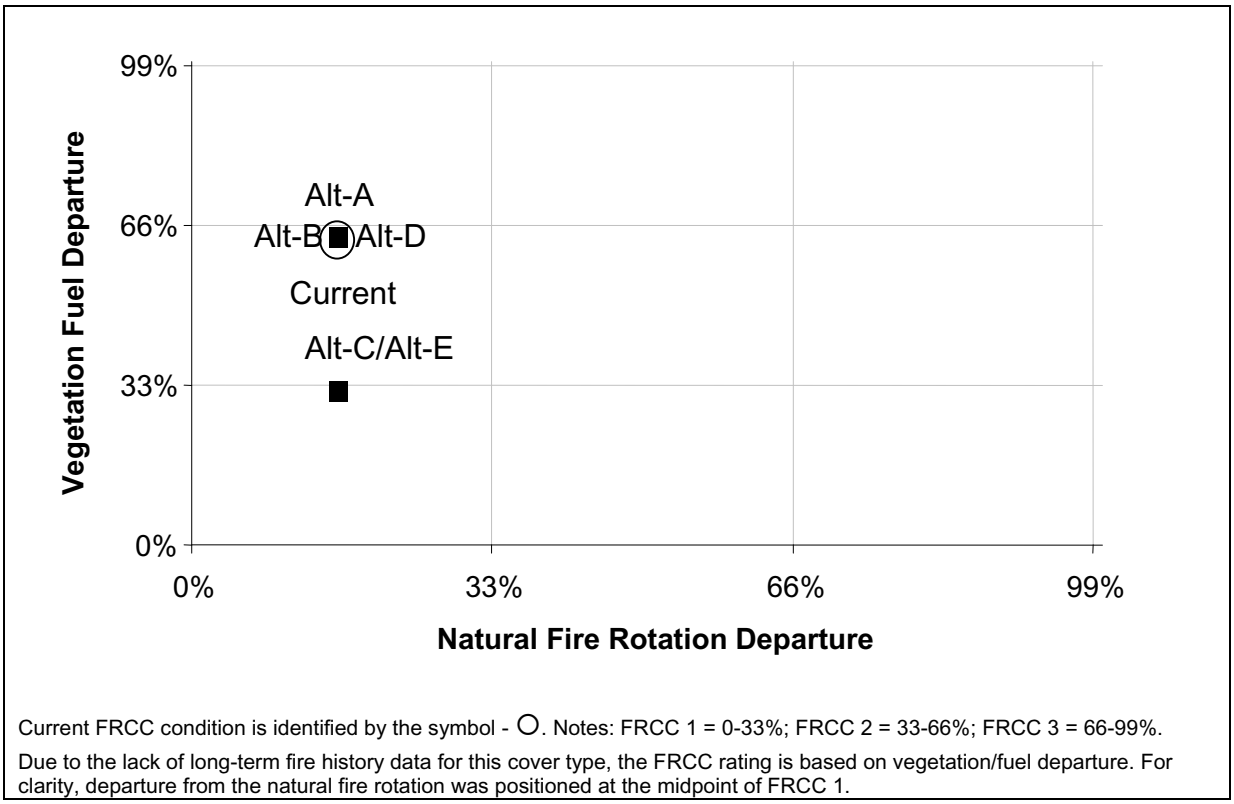
Only Alternatives C and E would treat this cover type. Treatments would be applied with the intention of moving the vegetation toward a DFC, which would consist of a 30:44:26 mix of early successional, mid-successional, and late successional forest cover types (Table 4-28). Alternatives A, B, and D do not propose treatments and would not move the vegetation toward DFC. While not achieving DFC, Alternatives C and E would result in a more even distribution of successional stages across the landscape within 30 years.

TABLE 4-28. VEGETATION/AGE CLASS, DESIRED FUTURE CONDITION (DFC), CURRENT CONDITION, AND EFFECTS OF FIVE ALTERNATIVES FOR WET/COLD CONIFER, SHOSHONE FIELD OFFICE (SFO)

Vegetation/Age Class[1]	DFC	Current	Alternatives Over 30 Years			
			A	B	C and E	D
Early, forb/grass with seedlings	30%	1%	2%	2%	25%	2%
Mid, conifer shrub mix	44%	10%	8%	8%	17%	8%
Late, conifer-dominated	26%	89%	90%	90%	58%	90%

[1] Age Class is the number of years since last fire, which is used as an approximation of seral stage in this analysis.

Alternatives A, B, and D would not treat Wet/Cold Conifer, while Alternatives C and E would treat this cover type. Alternatives A, B, and D would maintain FRCC 2, and Alternatives C and E would achieve FRCC 1 in this cover type within 30 years (Figure 4-25). Alternatives A, B, and D would maintain current fire frequency and vegetation and fuels structure and composition over 30 years. Alternatives C and E, on the other hand, would substantially reduce departure of fire frequency to within the range of historical variability. Furthermore, this alternative would substantially reduce departure of vegetation and fuels structure and composition to approach DFC. Treatments applied under this alternative would most closely create the desired mix of successional stages across the landscape (vegetation/fuels DFC).



Current FRCC condition is identified by the symbol - ○. Notes: FRCC 1 = 0-33%; FRCC 2 = 33-66%; FRCC 3 = 66-99%.
Due to the lack of long-term fire history data for this cover type, the FRCC rating is based on vegetation/fuel departure. For clarity, departure from the natural fire rotation was positioned at the midpoint of FRCC 1.

Figure 4-25. The effects of each alternative on Fire Regime Condition Class (FRCC) rating for Wet/Cold Conifer in the Shoshone Field Office (SFO).

4.2.4.7 Vegetated Rock/Lava

4.2.4.7.1 Short-term Effects

In the SFO area, alternative treatment levels for the Vegetated Rock/Lava cover type range from 0 acres (Alternatives B, D, and E) to approximately 2,300 acres (Alternative C) (see Table 4-23). These treatments consist of WFU and chemical treatments to control noxious weeds.

Wildland fire would be allowed on Vegetated Rock/Lava, primarily in Alternative A and Alternative C (see Table 4-23). It is assumed that only a small fraction of the existing acreage would burn because this vegetation is discontinuous and limited to areas with some soil development. Wildland fire would be allowed to burn, primarily due to suppression difficulties and safety concerns in this cover type. WFU would permit historical successional processes to occur. Where cheatgrass or noxious weed invasions are found near the edges of Vegetated Rock/Lava, treatment would be conducted to prevent or reduce spread and maintain current percentages across the landscape.

Short-term effects in this cover type would include the mortality of vegetation. This would most substaintially affect long-lived shrubs and trees, such as Wyoming big sagebrush, limber pine, and junipers. Because vegetation is patchy, fire effects would also be discontinuous, creating openings in areas with dense concentrations of fuels.

4.2.4.7.2 Long-term Effects

All alternatives would move the Vegetated Rock/Lava cover type toward DFC in the SFO (Table 4-29). (All the alternatives would maintain composition of cheatgrass at or below 15 percent within this type.

TABLE 4-29. VEGETATION/AGE CLASS, DESIRED FUTURE CONDITION (DFC), CURRENT CONDITION, AND EFFECTS OF FIVE ALTERNATIVES FOR VEGETATED ROCK/LAVA, SHOSHONE FIELD OFFICE (SFO)

Vegetation/Age Class[1]	DFC	Current	Alternatives Over 30 Years			
			A	B	C	D and E
Perennial herbaceous	6%	3%	7%	7%	8%	7%
Tree/shrub/herbaceous	80%	83%	78%	78%	78%	78%
Invasive Annual Grass in Understory[2]	14%	14%	15%	15%	14%	15%

[1] Age Class is the number of years since last fire, which is used as an approximation of seral stage in this analysis.

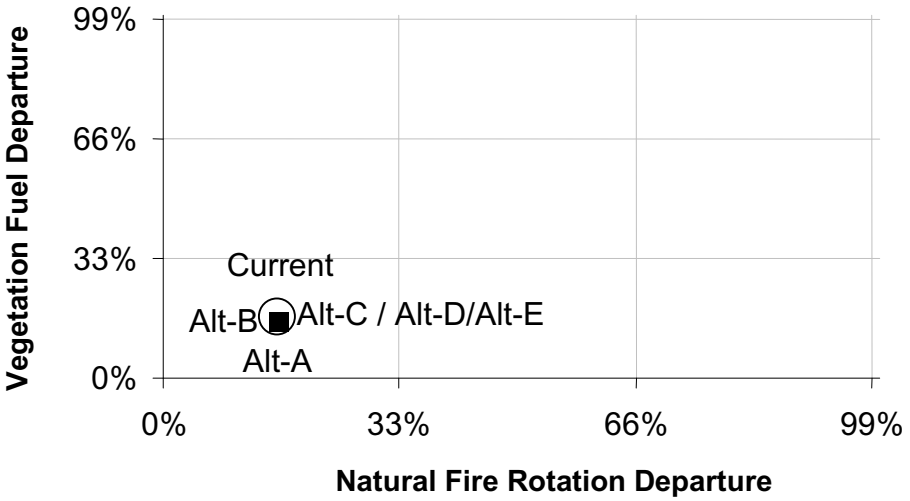
[2] Although absence of cheatgrass is desirable, these percentages have been deemed acceptable, since complete eradication of cheatgrass is impossible.

Alternative A and Alternative C would treat Vegetated Rock/Lava, while Alternatives B, D, and E would not treat this cover type. All alternatives, however, would maintain this cover type in FRCC 1 over 30 years. All alternatives would maintain current departures of fire frequency and vegetation and fuels structure and composition (Figure 4-26). Due to the small and fragmented nature of fire in this cover type, long-term changes in landscape composition and the resulting fuel and fire dynamics would be minimal.

4.2.5 T&E AND BLM-SENSITIVE PLANT SPECIES

T&E and BLM-Sensitive plants occur in nearly all the vegetation types within the planning area but are limited to a particular soil, aspect, drainage, or succesional stage in a particular vegetation type. Rarity is usually associated with an affinity for unique habitat conditions (soil or vegetation cover characteristics), narrow endemism, and/or impacts that result in a decline in population size or number. These impacts include habitat alteration resulting from changes in the natural fire cycle, with either too little fire (as is the current situation in the higher elevation vegetation types) or too much (e.g., low elevation shrub steppe).

Because the effects of treatments to T&E and BLM-Sensitive plants, in part, depend on the surrounding vegetation or the type of habitat or community that a plant occupies, this analysis of impacts is organized by vegetation types and would consider the types of treatments proposed for each alternative on a planning area level. Vegetation types are grouped as in Section 4.1. Impacts to T&E and BLM-Sensitive plants may be similar to and at least depend in part on the effects of treatment on the plant community as a whole.



Current FRCC condition is identified by the symbol - ○. Notes: FRCC 1 = 0-33%; FRCC 2 = 33-66%; FRCC 3 = 66-99%.
Due to the lack of long-term fire history data for this cover type, the FRCC rating is based on vegetation/fuel departure. For clarity, departure from the natural fire rotation was positioned at the midpoint of FRCC 1.

Figure 4-26. The effects of each alternative on Fire Regime Condition Class (FRCC) rating for Vegetated Rock/Lava in the Shoshone Field Office (SFO).

In all cases, BLM policy requires inventory and evaluation of project effects on T&E and BLM-Sensitive plants (BLM Manual 6840). Treatments that might result in potential negative effects on T&E and BLM-Sensitive plants would need to be evaluated in light of the status of the taxa, population health and integrity, ecology and response to disturbance, and habitat quality. In many cases, the ecology of T&E and BLM-Sensitive plants is not well understood, if studied at all. Therefore, careful observation of trends within populations and relative to habitat conditions would be necessary to anticipate short-term and long-term effects of vegetation treatments.

T&E and BLM-Sensitive plants in the planning area, their status, field offices of occurrence, and the vegetation types where they occur are listed in Appendix F. Proposed treatment acreages by vegetation type are listed for each of the five alternatives in Table 2-3 through Table 2-6.

4.2.5.1 Low-Elevation Shrub, Perennial Grassland, Invasive Annual Grass

4.2.5.1.1 Short-term Effects

T&E and BLM-Sensitive plants occurring in the Low-elevation Shrub are impacted by large-scale habitat conversions, primarily to non-native Invasive Annual Grasslands and non-native seedings following fire. Conversion from Low-elevation Shrub steppe to Invasive Annual Grass results in a change in vegetation structure as well as species composition. While some T&E and BLM-Sensitive taxa might be tolerant of this conversion (e.g., mourning milkvetch [*Astragalus atratus* var. *inseptus*]), habitat quality is marginal, and the status of plants, as well as other natives in the community, might be precarious due to competition and repeated fire. The effects of native and non-native seedings following fire are primarily due to the soil disturbance associated with the seeding process (usually drill-seeding or chaining). However, some

competition, as well as change in community structure, can occur with establishment of non-native seedings. Seedings that replicate as closely as possible the structure, species composition, and seral dynamics of the native community would improve T&E and BLM-Sensitive plant habitat over post-burn invasion of non-native Invasive Annual Grasses. The short-term effects of aerial seeding of sagebrush and other taxa would be negligible due to lack of soil disturbance.

In cases where an herbicide is needed to control Invasive Annual Grasses or noxious weeds, treatment of areas supporting T&E and BLM-Sensitive plants would need to be carefully planned or avoided in light of the following: (1) effects of the herbicide (e.g., broad vs. narrow spectrum), (2) phenology of the plant (active growing phases vs. dormancy), (3) the level of impact relative to the distribution of the taxon or taxa as a whole, and (4) quality of habitat with and without treatment. For example, T&E and BLM-Sensitive plants that are narrowly endemic with small, localized populations would be more impacted than taxa that are endemic but are relatively common within that range. Applying herbicide while a T&E and BLM-Sensitive plant is actively growing, flowering, or setting fruit could result in mortality, lack of seed production, and negative impacts to the population.

The effect of natural post-fire conversion to native grassland and/or RxFire and WFU treatments on a T&E and BLM-Sensitive plant would depend on the ecology of the taxon and whether it is (1) fire tolerant or (2) associated with a specific seral state of the native plant community. It could be assumed that sensitive plants occurring as an entity of a healthy native plant community would assume their natural role in succession, given a natural disturbance. This could mean that the plant might exist in undisturbed pockets of vegetation, or as part of the seed bank, until environmental conditions (e.g., light, competition) are appropriate. Some taxa (e.g., Picabo milkvetch [*Astragalus oniciformis*]) (Moseley & Popvich 1995) are poor competitors and need open light and vegetation conditions. Such taxa benefit somewhat from disturbances that recreate the openings of the early seral to mid-seral community. T&E and BLM-Sensitive plants tied to late seral communities would possibly be less tolerant of burning treatments due to shading or nutrient requirements. However, it is unlikely that late seral communities containing T&E and BLM-Sensitive plant habitat would be targeted for any treatment unless they were highly degraded and at risk for conversion to Invasive Annual Grassland or stand-replacement fire.

Alternatives D and E propose the greatest level of overall (footprint) treatment within the Low-elevation Shrub, Perennial Grass, and Invasive Annual Grass vegetation types, followed by Alternatives C, B, and A, respectively (Table 2-3 through Table 2-6). Alternatives C, D, and E include large 10-year treatment acreages (approximately 1.0 million acres and 1.2 million acres, respectively) with the primary focus on chemical control of invasive and noxious weed and seeding perennial vegetation and sagebrush, employing both mechanical and aerial methods. Alternatives A and B have similar emphasis but considerably less acreage (approximately 200,000 acres and 400,000 acres, respectively). RxFire would be used under all alternatives to prepare Invasive Annual Grass and Perennial Grass areas for subsequent chemical/seeding treatment and for creating mosaics in healthy but old, even-aged sagebrush stands. The amount of proposed RxFire is greatest in Alternatives D and E (about 500,000 acres) and about one-half of that in Alternatives B and C. Alternative A proposes very little use of RxFire (about 14,000 acres). Both of these alternatives include using wildland fire, with a nearly 10-fold increase in Alternative B (about 70,000 acres) vs. Alternative C (about 8,000 acres). Neither Alternative A, D, nor E would allow WFU.

4.2.5.1.2 Long-term Effects

Two important aspects of T&E and BLM-Sensitive plant conservation are (1) protecting existing habitat and (2) restoring degraded habitat. The proposed treatments in each of the alternatives speak to both aspects, at different levels of intensity, with a primary objective of reducing wildland fire frequency and size in the Low-elevation Shrub. Because project-level analysis provides for the protection of T&E and BLM-Sensitive plants due to treatment (including protection for populations), long-term effects of the alternatives relate to their effectiveness in protection and restoration of habitat. Alternatives C, D, and E propose to treat similar acreages of similar magnitudes, with Alternatives D and E being slightly more aggressive (Table 2-3 through Table 2-6). Alternatives C, D, and E focus on restoring nearly all Invasive Annual Grass acres within the planning area. Because Invasive Annual Grass provides little in the way of quality habitat for T&E and BLM-Sensitive plants, long-term effects of habitat restoration would be positive. This would provide for connectivity between pockets of existing sagebrush steppe habitat and possibly allow the expansion of T&E and BLM-Sensitive Species back into former habitats. Alternative B would treat approximately 38 percent of the total Invasive Annual Grass acreage and would provide only limited opportunity for expanding and connecting existing habitats, while Alternative A would treat only about 6 percent and would provide little to no opportunity.

Treatments in Low-elevation Shrub and Perennial Grass focus on controlling invasive and noxious weeds and diversifying the plant community both locally and on a landscape level though the use of fire, mechanical treatments, and seeding. T&E and BLM-Sensitive plants adapted to early successional or mid-successional stages of the Low-elevation Shrub vegetation type might decrease over time due to increases in shrub densities or competition resulting from successful seeding treatments; although, long-term goals for treatments aim toward creating a diverse mosaic of seral stages across the landscape. As discussed throughout Section 4.2, Alternatives A and B would do little to reduce uncharacteristic vegetation in these types and move the vegetation toward a desired composition and more natural, longer fire cycle. Alternatives C, D, and E would have similar effects, with Alternatives D and E being slightly more effective. Improved habitat quality, structural and species diversity, and reduced fire size and occurrence would, in the long-term, contribute to greater potential for T&E and BLM-Sensitive plant protection and conservation.

4.2.5.2 Mid-Elevation Shrub, Juniper, and Juniper-Encroachment

4.2.5.2.1 Short-term Effects

Communities in the Mid-elevation Shrub vegetation type have been altered by lengthened fire cycles (due to long-term suppression), resulting in less patterning of seral stages across the landscape and juniper encroachment. This has resulted in a need to reintroduce fire or other types of disturbance to this type, while controlling potential invasive or noxious weeds.

True juniper and pinyon-juniper, mountain mahogany, and black sagebrush communities tend to occur on relatively fire-resistant and/or rocky sites. T&E and BLM-Sensitive plants occurring on these types of sites would not be impacted due to a lack of need to treat this type of site. Treatments in Mid-elevation Shrub would be focused on areas where natural processes, and thus habitat quality, have been altered by lack of fire disturbance. Juniper encroachment results in a

decrease in herbaceous plant cover in the understory, which could have a negative effect on T&E and BLM-Sensitive plants that are part of the Mid-elevation Shrub vegetation type. As discussed in the previous section on Low-elevation Shrub, treatment effects would depend on the seral status of a T&E and BLM-Sensitive plant within a specific community and its tolerance of fire as well as competitive ability and shade tolerance. Species such as obscure phacelia (*Phacelia inconspicua*) occur in openings in this vegetation type (as well as Aspen and Mountain Shrub), indicating a need for disturbance (Murphy 2002). Treatments involving soil surface disturbance and/or chemical application would need to be evaluated relative to T&E and BLM-Sensitive plant populations (see the discussion for low elevation shrub steppe above).

Alternative C would treat approximately one-half the acreage of Mid-elevation Shrub and Juniper encroachment areas in the planning area over a 10-year period. Alternatives A, B, and D/E would treat approximately 3 percent, 15 percent, and 28 percent of the area, respectively (Table 2-3 through Table 2-6). Each alternative would employ RxFire to reintroduce disturbance into the system with Alternative C placing the greatest emphasis on RxFire and WFU. Alternatives D and E place a greater emphasis than the other alternatives on mechanical and chemical means to control unwanted vegetation and less emphasis than Alternative C on RxFire and WFU. Seeding treatments would be used in areas needing reestablishment of herbaceous or shrub by vegetation. Aerial seeding for the reestablishment of sagebrush in all alternatives would have essentially no short-term impact.

4.2.5.2.2 Long-term Effects

Treating this vegetation type would focus on restoring structural and species diversity, as well as reintroducing fire to maintain historical processes and patterns. T&E and BLM-Sensitive plants are protected by site-specific project evaluation projects could positively affect taxa by maintaining a seral community and/or expanding potential habitat on a landscape scale. Alternative C is the only alternative that proposes adequate acreage to move the current vegetation toward a desired seral composition, reduce undesirable vegetation, and return the fire cycle to more natural (historical) conditions within a 30-year period. Alternatives A and B would treat less acreage and therefore would have fewer direct, short-term impacts, but would possibly in the long-term have a greater negative effect on T&E and BLM-Sensitive plants due to lack of treatment and continued degradation of habitat. Alternatives D and E would be less effective than Alternative C, but still would provide for relatively aggressive treatment.

4.2.5.3 Salt Desert Shrub

Fire in the Salt Desert Shrub vegetation type is a rare occurrence in the planning area. Treatments are proposed for Alternative A only, as most of this vegetation type is currently in FRCC 1 (see Table 2-2). Treatments proposed under Alternative A are chemical, and seeding treatments that would occur in response to wildland fire and are proposed on less than 3 percent of the total acreage of Salt Desert Shrub over a 10-year period (Table 2-3). Due to the relatively small proportion of acreage proposed for treatment, it is highly unlikely that these treatments would impact any T&E and BLM-Sensitive plant populations. No treatments are proposed under Alternatives B, C, D, or E.

4.2.5.4 Aspen/Dry Conifer

4.2.5.4.1 Short-term Effects

Communities in the Aspen/Dry Conifer vegetation type have be altered by lengthened fire cycles (due to long-term suppression), resulting in less patterning of seral stages across the planning area. This has resulted in a need to reintroduce fire or other types of disturbance to this type, while controlling potential invasive or noxious weeds. Treatments in this vegetation type would be focused on areas where natural processes and patterns have been altered by lack of fire disturbance. As discussed in the previous section on Low-elevation Shrub, treatment effects would depend on the seral status of a T&E and BLM-Sensitive plant within a specific community and its tolerance of fire as well as competitive ability and shade tolerance. Species such as obscure phacelia (*Phacelia inconspicua*) occur in openings in the aspen vegetation type (as well as Mid-elevation Shrub and Mountain Shrub), indicating a need for low-levels of disturbance to maintain those openings (Murphy 2002). Unnatural buildup of fuels in this type would lead to higher intensity fires that could damage, rather than invigorate, the community and potentially T&E and BLM-Sensitive plant populations. Treatments involving soil surface disturbance and/or chemical application would need to be evaluated relative to T&E and BLM-Sensitive plant populations (see the discussion for Low-elevation Shrub).

Alternative B would treat about 21 percent of the Aspen/Dry Conifer type in the planning area over a 10-year period. Alternatives A, C, D/E would treat approximately 3 percent, 14 percent, and 0 percent of the area, respectively (Tables 2-3–2.6). Treatments would focus primarily on mechanical, RxFire, and WFU treatments to thin woody vegetation and stimulate aspen reproduction and understory diversity.

4.2.5.4.2 Long-term Effects

Treating this vegetation type would focus on restoring structural and species diversity, as well as reintroducing fire to maintain historical processes. T&E and BLM-Sensitive plants are protected by site-specific project evaluation; projects could positively affect taxa by maintaining a seral community and/or expanding potential habitat on a landscape scale. Alternatives B and C propose adequate acreage to move the current vegetation toward a desired seral composition and reduce undesirable vegetation; however, Alternative B would return the fire cycle to more natural (historical) conditions within a 30-year period. Alternatives A, D, and E would do nothing to ecological problems in this vegetation type. While these alternatives would treat little to no acreage and therefore would have no direct, short-term impacts, they would possibly in the long-term have a greater negative effect on T&E and BLM-Sensitive plants due to lack of treatment and continued degradation of habitat.

4.2.5.5 Mountain Shrub

4.2.5.5.1 Short-term Effects

Communities in the Mountain Shrub vegetation type have been altered by lengthened fire cycles (due to long-term suppression), resulting in less patterning of seral stages across the landscape and juniper encroachment. This has resulted in a need to reintroduce fire or other types of disturbance to this type, while controlling potential invasive or noxious weeds.

Several of the T&E and BLM-Sensitive plants in this vegetation type, including tufted (cryptantha *Cryptantha caespitosa*), Welsh's buckwheat (*Eriogonum capistratum* var. *welshii*), and tufted milkvetch (*Astragalus gilviflorus*) tend to occur on relatively fire-resistant, sparsely vegetated, and rocky sites. Plants occurring on these types of sites would not be impacted due to lack of need for treatment. Treatments in the Mountain Shrub vegetation type would be focused on areas where natural processes and patterns have been altered by lack of fire disturbance. Closing the shrub canopy can decrease herbaceous plant cover in the understory, which could have a negative effect on T&E and BLM-Sensitive plants that are part of Mountain Shrub vegetation cover type. As discussed in the previous section on Low-elevation Shrub, treatment effects would depend on the specific T&E and BLM-Sensitive plant within a specific community and its tolerance of fire as well as competitive ability and shade tolerance. Species such as obscure phacelia (*Phacelia inconspicua*) occur in openings in this vegetation type (as well as in the Aspen and Mountain Shrub vegetation types), indicating a need for disturbance (Murphy 2002). Treatments involving soil surface disturbance and/or chemical application would need to be evaluated relative to T&E and BLM-Sensitive plant populations (see the discussion for Low-elevation Shrub above).

Alternative C would treat approximately 42 percent the acreage of Mountain Shrub vegetation type in the planning area over a 10-year period. Alternatives A, B, D/E would treat <1 percent, 9 percent, and 13 percent of the area, respectively (Tables 2-3–2.6).

4.2.5.5.2 Long-term Effects

Treating this vegetation type would focus on restoring structural and species diversity, as well as reintroducing fire to maintain historical processes. T&E and BLM-Sensitive plants are protected by site-specific project evaluation; projects could positively affect taxa by maintaining a seral community and/or expanding potential habitat on a landscape scale. While Alternatives B, C, D, and E all make progress toward DFC, Alternative C is the only alternative that proposes adequate acreage to move the current vegetation toward a desired seral composition, reduce undesirable vegetation, and return the fire cycle to more natural (historical) conditions within a 30-year period (see discussion Section 4.1). Alternatives B, C, D, and E would treat less acreage and therefore would have fewer direct, short-term impacts, but would possibly, in the long-term, have a greater negative effect on T&E and BLM-Sensitive plants due to lack of treatment and continued degradation of habitat.

4.2.5.6 Wet/Cold Conifer

There are currently no T&E and BLM-Sensitive Species associated with the Wet/Cold Conifer vegetation type.

4.2.5.7 Riparian

Riparian areas in the planning area tend to occur primarily as small inclusions within other vegetation types, with the exception of the broader riparian zones adjacent to large water bodies such as the Main and South Fork Snake River. Therefore, fire frequency and the effects of fire on the riparian vegetation largely depends on the type of adjacent vegetation. T&E and BLM-Sensitive plants associated with the riparian vegetation type include alkali primrose (*Primula alcalina*), Marsh felwort (*Lomatogonium rotatum*), hoary willow (*Salix candida*), and the

planning area's only listed plant, Ute's-ladies tresses (*Spiranthes diluvialis*). These species occur in areas where the soil is saturated for much, if not all, of the growing season, and vegetation remains green until late in the year. These areas are usually broad with little to no gradient.

Riparian areas in the planning area would be treated under Alternatives A and C as part of the treatment of adjacent vegetation types. RxFire and seeding treatments proposed under Alternative A would comprise only about 1 percent of the total riparian acreage over a 10-year period. RxFire, WFU, mechanical, chemical, and seeding treatments proposed under Alternative C would comprise approximately 2 percent of the total riparian acreage over a 10-year period. No treatments are proposed under Alternatives B, D, and E, however, it is possible that some small riparian areas may unintentionally be treated in association with the treatment of adjacent areas. It is also possible that riparian areas may be impacted by wildland fires under all alternatives.

It is unlikely, due to the minute acreage proposed in Alternatives A and C, that treatments would have any short-term negative effect on T&E and BLM-Sensitive plants. It is not anticipated that areas supporting T&E and BLM-Sensitive plants would be treated, unless site-specific information indicates that small-scale RxFire use would be used to maintain a seral community and be beneficial to the taxa.

4.2.5.8 Vegetated Rock/Lava/Other

There are no current T&E and BLM-Sensitive plants that occur on Vegetated Rock/Lava. Taxa occurring in *Other* habitats include St. Anthony evening primrose (*Oenothera psammophila*), which occurs on sparsely vegetated sand dunes, and small-flowered ricegrass (*Piptatherum micranthum*), which occurs in cracks and on ledges of limestone cliffs. Such habitats would not receive treatments under any alternative and therefore would not be subject to treatment effects.

4.2.6 MITIGATION AND MONITORING

The management restrictions listed in Appendix Q, Management Restrictions, are incorporated into management practices common to all alternatives. These practices would be implemented to avoid adverse impacts to vegetation. Because of this, no further mitigation would be required to protect the vegetation resource.

Prior to any vegetation treatment, site-specific National Environmental Protection Act (NEPA) analysis would occur. The impacts analysis would include consideration for T&E and BLM-Sensitive plant species and habitats, including mitigation to prevent significant adverse impacts to these species.

4.2.7 UNAVOIDABLE ADVERSE IMPACTS

Short-term unavoidable adverse impacts to vegetation would include the same short-term vegetation treatment disturbances described above. Long-term unavoidable adverse impacts would persist in cover types remaining in FRCC 3 under all alternatives. In these FRCCs, vegetation of the planning area would continue to experience unnatural fire regimes and associated negative effects. Vegetation-related processes and T&E and BLM-Sensitive Species

would be adversely impacted, and noxious weed problems would continue. The lack of vegetation management would increase the risk of losing key ecosystem components, producing unavoidable adverse impacts.

4.2.8 IRRETRIEVABLE AND IRREVERSIBLE COMMITMENT OF RESOURCES

Irretrievable impacts to vegetation would include the short-term vegetation treatment disturbances described above. There would be no irreversible impacts, as these vegetation resources could be restored through the effective implementation of the ESR program.

4.2.9 CUMULATIVE EFFECTS

The spatial scale for cumulative impacts includes the planning area and immediately adjacent areas. For this analysis, past, present, and reasonably foreseeable future actions include fire management activities only.

In general, the action alternatives would positively contribute to the goals of other past, present, and reasonably foreseeable future plans in or adjacent to the planning area. The action alternatives would be consistent with the Interior Columbia Basin Ecosystem Management Project, designed to improve the health of the sagebrush steppe ecosystem, and the BLM's Memorandum of Understanding (MOU) of 2003, which aims to successfully implement this project.

The action alternatives, especially Alternatives D and E, would contribute positively to meeting the vegetative goals of the Idaho National Laboratory (INL) management plans by emphasizing the protection of sagebrush steppe habitat, including Low-elevation Shrub. Management plans for these areas would also need to concur with national-level fire management policy and direction, and as such, would be consistent with the objectives of this EIS. Negative cumulative impacts would not be anticipated.

A cumulatively positive effect would also occur when considering the action alternatives in conjunction with the Caribou-Targhee National Forest and Sawthooth National Forest fire management plans. Objectives to restore natural fire regimes and the associated vegetation composition and structure would positively extend to these adjacent federal lands. The action alternatives are also consistent with the *Idaho Statewide Implementation Strategy for the National Fire Plan* (2006) and would not result in cumulative adverse impacts to the vegetation resource. However, it should be noted that the scale of these fire management activities is very small in comparison with the action alternatives.

The NPS and the BLM have prepared a joint monument management plan for Craters of the Moon National Monument and Preserve, which is located entirely within the administrative boundary of the FMDA planning area. This management plan includes fire management decisions for the Monument and Preserve that, when considered in conjunction with the action alternatives, would result in cumulatively positive long-term impacts on vegetation resources.

It is not likely that the action alternatives, when considered in conjunction with past, present, or reasonably foreseeable future actions, would cause short-term or long-term cumulative

significant adverse impacts to the vegetation resource of the planning area. While short-term impacts to vegetation composition, structure, and productivity would occur with the above-mentioned projects, the difference in scale when comparing other plans to the planning area plan precludes the possibility for adverse cumulative impacts. Also, the long-term impacts of improving fire regimes across the planning area would positively affect other land management issues of the planning area and the immediately adjacent area.

4.3 ANALYSIS OF EFFECTS ON WILDLAND URBAN INTERFACE (WUI)

This section details the effects of treatment levels on WUI areas and communities-at-risk across the alternatives.

4.3.1 ANALYSIS ASSUMPTIONS AND METHODS

This section examines the impacts of each alternative to assess how to best meet select objectives of the National Fire Plan and Cohesive Strategy within the planning area. This primarily involves reducing the potential for wildland fire in and around WUI using tools such as creating anchored fuel breaks, reducing tree densities in juniper woodlands and conifer forests, and replacing continuous patches of Invasive Annual Grasses/non-native weeds with Perennial Grasses and shrubs in Low- and Mid-elevation Shrub, so that WUI areas have acceptable fuel loads and are defensible from wildland fires.

Management actions associated with this objective include:

- Using an Appropriate Management Response to safely manage and suppress fires.
- Using mechanical, chemical, and seeding treatments, as well as small-scale fire operations (e.g., pile burning), to change vegetation and/or reduce fuel loading and facilitate the use of RxFire treatments where applicable in the future.
- Developing mitigation plans and implementing plan actions, including fuels reduction work, rural fire department assistance, and public education in cooperation with state, county, and local governments and fire departments.

Table 4-30 through Table 4-33 compare alternatives by field office; although, the discussion below summarizes projected outcomes based on the alternatives. Communities presented in the first column of each table are grouped together based on proximity to each other (referred to as WUI Areas of Concern), and were analyzed together as a group. Appendix I lists communities in the vicinity of public lands at risk from wildland fire in Idaho as published in the Federal Register (Volume 66, August 17, 2001). Appendix J lists communities considered by BLM personnel to be at the highest risk from unwanted wildland fire.

The columns in the tables labeled "Proposed Treatment-acres" used the 10-year treatment footprint-acres as the basis to compare among alternatives, which could include any combination of any mechanical, chemical, seeding, and RxFire treatments depending on management objectives for a given area.

The columns in the tables labeled "Relative Potential Risk to Public and Fire-fighter Health and Safety" establish a risk factor/category that one would expect to see after 10 years or longer, as a product of specific management goals for a given alternative. Impacts were analyzed based on the projected number of unwanted high intensity wildland fire acres. Ideally, impacts to public and firefighter health and safety would be analyzed using intensity level of unwanted wildland fire in conjunction with number of acres burned. Unfortunately, historical fire intensity data does not exist. Because number of acres burned historically was used for this analysis without additional information on fire intensity levels, some of the risk ratings for WUI Areas of Concern are too low and do not adequately represent the real risk associated with high intensity wildland fire (e.g., American Falls, Chubbuck, Fort Hall, Inkom, Pocatello, Arimo, Downey, Lava Hot Springs, McCammon, Virginia).

Using the projected number of wildland fire acres and proposed treatment acres, inference was made as to what the relative potential risk to public and fire-fighter health and safety would be from wildland fire based on best professional judgment and past experience. An assumption was made that an acre of treatment occurring within or around a WUI area would reduce fire intensity to an acceptable risk level on that acre for a minimum of 10 years. Note that risk categories do not take into account topographical considerations, population density, fuel types, and other similar considerations that could influence fire behavior in and around WUI areas. A more comprehensive statewide assessment of relative risk to communities and ecosystems in Idaho was completed in 2003 by an interagency group that included the BLM, U.S. Forest Service (USFS), and Idaho Department of Lands (IDL). The data generated by this group would be used by the Idaho State Fire Plan Working Group to assist with prioritizing National Fire Plan related projects across ownerships and jurisdictions, at a subwatershed or county level, throughout the state. More information on this project can be found at http://www.fs.fed.us/r4/id_fire_assessment/id_haz_risk.html.

For the purposes of this analysis, risk categories include:

- Low Risk - projected high intensity fire acres of less than or equal to 1,000 acres
- Moderate Risk - projected high intensity fire acres between 1,001 acres and 30,000 acres
- High Risk - projected high intensity fire acres of greater than 30,000 acres

Assumptions for these analyses include the following: (1) all proposed WUI treatments occur on BLM-administered land near communities-at-risk so that treatments have a direct and immediate impact to communities-at-risk, and (2) counties and communities-at-risk continue to create defensible space as well as wildland fire compatible fire-wise homes and communities so that damage from public land fires, and risks from wildland fires escaping from private land to BLM-administered lands are diminished.

4.3.2 DIRECT AND INDIRECT IMPACTS

In general, the consequences of implementing the National Fire Plan and Cohesive Strategy would benefit WUI areas because one of the main objectives of this plan is to reduce fire risks within WUI areas. To accomplish this, the BLM must reduce woody and/or herbaceous fuel loads and maintain low-risk fire conditions within the cover types that are within and adjacent to WUI areas. Site-specific management plans would propose using various chemical, mechanical,

and seeding techniques, and to a lesser degree, RxFire to reduce fuel loads and maintain low-risk condition within WUI areas. In general, the more treatments a WUI area receives, the lower the long-term risk of that community experiencing a large fire. When RxFire is used, there would be some increased risk to public and fire-fighter health and safety, which is inherent to using any kind of fire treatment. These risks are short term and much lower than the risks associated with unwanted wildland fire. Mitigation measures and contingency plans would be in place to minimize the risk of an escaped RxFire.

Some WUI Areas of Concern have low relative potential risk projected for them under Alternative A (see Table 4-30 through Table 4-33), due to a low level of wildland fire historically. In those WUI Areas of Concern, where there have been high levels of wildland fire historically, without treatment, fuel loads and associated fire behavior would not diminish. Full-scale suppression would continue to be the primary tool in reacting to wildland fires, wildland fire damage to property would continue, financial and labor costs would increase, and the risk to public and fire-fighter health and safety would be ever increasing as more public land managers and property owners are faced with wildland fires.

Alternatives B, C, D, and E have low to high relative potential risks to WUI Areas of Concern, depending on historical levels of wildland fire and the amount of treatment proposed. Where treatment involves using RxFire, there would be a small increase in risk to public and fighter health and safety due to the unlikely possibility of an escaped fire. The small increase in risk due to using RxFire is overshadowed, however, by the benefits associated with treatment (i.e., substantially reduced risk to public and firefighter health and safety over the long run) Treatments over time would reduce the incidence of large wildland fire by reducing woody and/or herbaceous fuel loading, reducing fire intensity levels, increasing defensible space, and restoring native vegetation where feasible.

Of the five alternatives, the least amount of WUI acreage would be treated under Alternative A. Overall, the number of acres treated under Alternative A would be a minimum of 2.6 times less than that proposed under the other alternatives. Thus, potential consequences under Alternative A include worsening fuel conditions (e.g., increased fuel loads) for those communities that border areas with little or no vegetation treatments. It is expected that larger fires would be seen in these areas, increasing risk to public and fire-fighter health and safety.

TABLE 4-30. UPPER SNAKE FIELD OFFICE (USFO) WILDLAND URBAN INTERFACE (WUI) ALTERNATIVES										
	Alternative A		Alternative B		Alternative C		Alternative D		Alternative E	
WUI Area Of Concern	Proposed Treatment-acres[1] (10-Yr Footprint-acres)	Relative Potential Risk to Public and Fire-fighter Health and Safety[2]	Proposed Treatment-acres[1] (10-Yr Footprint-acres)	Relative Potential Risk to Public and Fire-fighter Health and Safety[2]	Proposed Treatment-acres[1] (10-Yr Footprint-acres)	Relative Potential Risk to Public and Fire-fighter Health and Safety[2]	Proposed Treatment-acres[1] (10-Yr Footprint-acres)	Relative Potential Risk to Public and Fire-fighter Health and Safety[2]	Proposed Treatment-acres[1] (10-Yr Footprint-acres)	Relative Potential Risk to Public and Fire-fighter Health and Safety[2]
Butte City, Howe	0	Moderate	6,000	Low	15,650	Low	42,000	Low	42,000	Low
Chester, Dubois, Garfield, Hamer, Lewisville, Parker, Rigby, Roberts, St. Anthony, Ucon	10,720	Moderate	60,000	Moderate	83,669	Moderate	47,200	Moderate	83,669	Moderate
Aberdeen, Atomic City, Pingree, Rockford, Springfield, Sterling	1,850	High	70,000	Moderate	108,840	Moderate	270,800	Low	270,800	Low
Arco, Darlington, Lost River, Moore	0	Moderate	5,000	Low	29,680	Low	32,000	Low	32,000	Low
Blackfoot, Firth, Moreland, Riverside, Shelley	0	Low	1,000	Low	60	Low	290	Low	290	Low
Monteview, Mud Lake, Terreton	0	Moderate	10,000	Low	17,515	Low	48,000	Low	48,000	Low

TABLE 4-30. UPPER SNAKE FIELD OFFICE (USFO) WILDLAND URBAN INTERFACE (WUI) ALTERNATIVES

	Alternative A		Alternative B		Alternative C		Alternative D		Alternative E	
WUI Area Of Concern	**Proposed Treatment-acres[1] (10-Yr Footprint-acres)**	**Relative Potential Risk to Public and Fire-fighter Health and Safety[2]**	**Proposed Treatment-acres[1] (10-Yr Footprint-acres)**	**Relative Potential Risk to Public and Fire-fighter Health and Safety[2]**	**Proposed Treatment-acres[1] (10-Yr Footprint-acres)**	**Relative Potential Risk to Public and Fire-fighter Health and Safety[2]**	**Proposed Treatment-acres[1] (10-Yr Footprint-acres)**	**Relative Potential Risk to Public and Fire-fighter Health and Safety[2]**	**Proposed Treatment-acres[1] (10-Yr Footprint-acres)**	**Relative Potential Risk to Public and Fire-fighter Health and Safety[2]**
Ashton, Island Park, Kilgore, Macks Inn, Marysville, Spencer, Warm River	4,770	Low	7,000	Low	14,960	Low	3,500	Low	14,960	Low
Heise, Irwin, Lorenzo, Ririe, Swan Valley, Thornton	0	Low	2,000	Low	830	Low	3,000	Low	3,000	Low
Bone, Idaho Falls, Iona, Lincoln	0	Low	1,000	Low	1,100	Low	3,000	Low	3,000	Low
Driggs, Drummond, Felt, Newdale, Rexburg, Sugar City, Teton, Tetonia, Victor	0	Low	2,200	Low	550	Low	1,150	Low	1,150	Low
TOTAL	**17,340**		**164,200**		**272,854**		**456,940**		**498,869**	

[1] Includes chemical, mechanical, seeding, and RxFire treatments.

[2] Includes the risks associated with unwanted wildland fire over 10 years.

TABLE 4-31. POCATELLO FIELD OFFICE (PFO) WILDLAND URBAN INTERFACE (WUI) ALTERNATIVES										
	Alternative A		Alternative B		Alternative C		Alternative D		Alternative E	
WUI Area Of Concern	Proposed Treatment-acres[1] (10-Yr Footprint-acres)	Relative Potential Risk to Public and Fire-fighter Health and Safety[2]	Proposed Treatment-acres[1] (10-Yr Footprint-acres)	Relative Potential Risk to Public and Fire-fighter Health and Safety[2]	Proposed Treatment-acres[1] (10-Yr Footprint-acres)	Relative Potential Risk to Public and Fire-fighter Health and Safety[2]	Proposed Treatment-acres[1] (10-Yr Footprint-acres)	Relative Potential Risk to Public and Fire-fighter Health and Safety[2]	Proposed Treatment-acres[1] (10-Yr Footprint-acres)	Relative Potential Risk to Public and Fire-fighter Health and Safety[2]
Basalt, Wayan	750	Low	500	Low	11,425	Low	13,850	Low	13,850	Low
American Falls, Chubbuck, Fort Hall, Inkom, Pocatello,	250	Moderate	8,500	Low	13,169	Low	7,000	Low	13,169	Low
Bennington, Bern, Bloomington, Dingle, Fish Haven, Georgetown, Montpelier, Ovid, Paris, St. Charles	0	Low	600	Low	2,166	Low	300	Low	2,166	Low
Geneva	0	Low	0	Low	19,600	Low	17,750	Low	19,600	Low
Bancroft, Conda, Soda Springs	200	Low	3,900	Low	5,400	Low	4,200	Low	5,400	Low
Arimo, Downey, Lava Hot Springs, McCammon, Virginia	175	Low	2,350	Low	6,054	Low	2,150	Low	6,054	Low
Banida, Grace, Mink Creek, Oxford, Samaria, Swanlake, Thatcher	100	Low	3,000	Low	6,025	Low	2,500	Low	6,025	Low

TABLE 4-31. POCATELLO FIELD OFFICE (PFO) WILDLAND URBAN INTERFACE (WUI) ALTERNATIVES

	Alternative A		Alternative B		Alternative C		Alternative D		Alternative E	
WUI Area Of Concern	**Proposed Treatment-acres[1] (10-Yr Footprint-acres)**	**Relative Potential Risk to Public and Fire-fighter Health and Safety[2]**	**Proposed Treatment-acres[1] (10-Yr Footprint-acres)**	**Relative Potential Risk to Public and Fire-fighter Health and Safety[2]**	**Proposed Treatment-acres[1] (10-Yr Footprint-acres)**	**Relative Potential Risk to Public and Fire-fighter Health and Safety[2]**	**Proposed Treatment-acres[1] (10-Yr Footprint-acres)**	**Relative Potential Risk to Public and Fire-fighter Health and Safety[2]**	**Proposed Treatment-acres[1] (10-Yr Footprint-acres)**	**Relative Potential Risk to Public and Fire-fighter Health and Safety[2]**
Clifton, Dayton, Franklin, Malad City, Preston, Weston	0	Low	300	Low	1,000	Low	300	Low	1,000	Low
Arbon, Pauline	500	Moderate	9,800	Low	48,371	Low	9,000	Low	48,371	Low
Holbrook, Stone	0	Low	6,000	Low	68,010	Low	42,000	Low	68,010	Low
Rockland	0	Moderate	600	Low	2,000	Low	600	Low	2,000	Low
TOTAL	**1,975**		**35,550**		**183,220**		**99,650**		**185,645**	

[1] Includes chemical, mechanical, seeding, and RxFire treatments.

[2] Includes the risks associated with unwanted wildland fire over 10 years.

TABLE 4-32. BURLEY FIELD OFFICE (BFO) WILDLAND URBAN INTERFACE (WUI) ALTERNATIVES

	Alternative A		Alternative B		Alternative C		Alternative D		Alternative E	
WUI Area Of Concern	**Proposed Treatment-acres[1] (10-Yr Footprint-acres)**	**Relative Potential Risk to Public and Fire-fighter Health and Safety[2]**	**Proposed Treatment-acres[1] (10-Yr Footprint-acres)**	**Relative Potential Risk to Public and Fire-fighter Health and Safety[2]**	**Proposed Treatment-acres[1] (10-Yr Footprint-acres)**	**Relative Potential Risk to Public and Fire-fighter Health and Safety[2]**	**Proposed Treatment-acres[1] (10-Yr Footprint-acres)**	**Relative Potential Risk to Public and Fire-fighter Health and Safety[2]**	**Proposed Treatment-acres[1] (10-Yr Footprint-acres)**	**Relative Potential Risk to Public and Fire-fighter Health and Safety[2]**
Buhl, Castleford, Hollister, Rogerson	3,200	Moderate	4,500	Moderate	15,763	Low	16,350	Low	16,350	Low
Acequia, Albion, Burley, Declo, Filer, Hansen, Heyburn, Kimberly, Minidoka, Murtaugh, Norland, Oakley, Paul, Rock, Creek, Rupert, Twin Falls	250	Moderate	1,850	Low	9,450	Low	6,550	Low	9,450	Low
Conner, Elba, Malta	4,875	Moderate	12,550	Moderate	24,583	Low	8,500	Moderate	24,583	Low
Almo	825	Moderate	3,000	Low	7,900	Low	3,200	Low	7,900	Low
TOTAL	**9,150**		**21,900**		**57,696**		**34,600**		**58,283**	

[1] Includes chemical, mechanical, seeding, and RxFire treatments.
[2] Includes the risks associated with unwanted wildland fire over 10 years.

TABLE 4-33. SHOSHONE FIELD OFFICE (SFO) WILDLAND URBAN INTERFACE (WUI) ALTERNATIVES

	Alternative A		Alternative B		Alternative C		Alternative D		Alternative E	
WUI Area Of Concern	**Proposed Treatment-acres[1] (10-Yr Footprint-acres)**	**Relative Potential Risk to Public and Fire-fighter Health and Safety[2]**	**Proposed Treatment-acres[1] (10-Yr Footprint-acres)**	**Relative Potential Risk to Public and Fire-fighter Health and Safety[2]**	**Proposed Treatment-acres[1] (10-Yr Footprint-acres)**	**Relative Potential Risk to Public and Fire-fighter Health and Safety[2]**	**Proposed Treatment-acres[1] (10-Yr Footprint-acres)**	**Relative Potential Risk to Public and Fire-fighter Health and Safety[2]**	**Proposed Treatment-acres[1] (10-Yr Footprint-acres)**	**Relative Potential Risk to Public and Fire-fighter Health and Safety[2]**
Fairfield	8,725	Moderate	4,000	Moderate	27,100	Moderate	23,500	Moderate	27,100	Moderate
Bellevue, Hailey, Ketchum, Sun Valley	400	Low	3,000	Low	18,200	Low	5,950	Low	18,200	Low
Gannett, Picabo	0	Low	8,000	Low	38,117	Low	7,400	Low	38,117	Low
Dietrich	6,125	High	86,000	Moderate	166,526	Moderate	188,000	Moderate	188,000	Moderate
Richfield, Shoshone	780	High	27,000	Low	57,870	Low	48,730	Low	57,870	Low
Carey	37,995	High	6,000	High	68,608	Moderate	31,000	High	68,608	Moderate
Eden, Hagerman, Hazelton, Jerome, Wendell	0	Moderate	20,000	Low	30,822	Low	33,000	Low	33,000	Low
Corral, Hill City	0	Moderate	5,000	Low	85,493	Low	10,800	Low	85,493	Low
Bliss, Gooding, King Hill	0	Moderate	34,000	Low	56,326	Low	47,000	Low	56,326	Low
TOTAL	**54,025**		**193,000**		**549,062**		**395,380**		**572,714**	

[1] Includes chemical, mechanical, seeding, and RxFire treatments.
[2] Includes the risks associated with unwanted wildland fire over 10 years.

Alternatives C, D, and E propose the highest amount of treatment acres and therefore, would decrease risks to communities the most. Alternative D, however, focuses only on Low-elevation and Mid-elevation Shrub, Mountain Shrub, Perennial Grass, and Invasive Annual Grass vegetation cover types. For those WUI Areas of Concern that border forested BLM land, there would be no improvement and a likely worsening of existing conditions. Long-term impacts may be similar to Alternative A for those communities bordering forested BLM land. Alternative B proposed a moderate amount of treatment-acreage (in between Alternative A and Alternatives C/D). Those WUI Areas of Concern that are of highest priority (see Appendix J) would have a reduced risk to public and firefighter health and safety over the long term. Alternative E is the combination of Alternatives C and D in that it proposes the highest amount of treatment in Low-elevation and Mid-elevation Shrub, Mountain Shrub, Perennial Grass Invasive Annual Grass, Dry Conifer, Aspen, and Wet/Cold Conifer. Accordingly, it would make the most progress toward creating fire safe communities of all of the alternatives.

4.3.3 Mitigation and Monitoring

The management restrictions listed in Appendix Q, Management Restrictions, are incorporated into management practices common to all alternatives. These practices would be implemented to avoid adverse impacts to WUI. Because of this, no further mitigation would be required to protect the WUI.

4.3.4 Unavoidable Adverse Impacts

None of the action alternatives would have unavoidable adverse impacts on WUI in the planning area.

4.3.5 Irretrievable and Irreversible Commitment of Resources

None of the action alternatives would result in irretrievable or irreversible impacts on WUI.

4.3.6 Cumulative Effects

The most beneficial impact to WUI is the completion and implementation of the community-at-risk assessment by the counties and BLM. Also, the fire planning work undertaken in similar plans include the Sawtooth, Caribou, and Targhee National Forests management plans, and the Idaho Statewide Implementation Strategy for the National Fire Plan (2006) would help reduce the intensity and duration of fires in the planning area.

Additionally, the IDL, in conjunction with the BLM and other federal agencies, signed the Idaho Statewide Implementation Strategy for the National Fire Plan. The implementation plan focuses on fire preventions and suppression, hazardous fuels reduction, restoration of fire-adapted ecosystems, and the promotion of community assistance in fire management (IDL 2002). During 2002, IDL, in cooperation with federal agencies, disbursed $1.9 million to WUI projects and for the development of defensible space. Additional money was used for hazardous fuels reduction programs for several communities, including Island Park, Idaho (IDL 2002b). The development of risk assessments and mitigation plans would allow counties and communities within the planning area to determine their current fire hazard risk and to develop effective mitigation to

minimize urban-wildland risks to persons and property. Additionally, implementing community-based fuels reduction programs provides opportunities for private landowners to work with public land management agencies to manage the WUI. The projects that result from the Idaho Statewide Implementation Strategy for the National Fire Plan would likely contribute cumulatively to the decrease in fire risks to people and property at the WUI. Also, the community-based fuel reduction programs would help decrease the risk of large, intense fires, with associated lessened cumulative impacts to air quality, water quality, wildlife habitat, and soils.

4.4 ANALYSIS OF EFFECTS ON THE SAGEBRUSH STEPPE ECOSYSTEM (ISSUE 2)

This section details the effects of treatment levels on habitats for the Sagebrush Guild species across the alternatives. In doing so, this section addresses Issue 2 as described in Section 1.4.1, Issues Driving Development of Alternatives.

4.4.1 GENERAL ANALYSIS OF EFFECTS BY VEGETATION COVER TYPE

Short-term impacts to Sagebrush Guild habitats depend on which cover types are considered, as well as the kinds of treatments applied. Treatments of cheatgrass-dominated Invasive Annual Grass result in different effects than treatments in Perennial Grass, Low-elevation and Mid-elevation Shrub, and areas of juniper encroachment within Juniper. For purposes of analyzing the impacts on the Sagebrush Guild, Invasive Annual Grass (e.g., cheatgrass) is generally considered to be low-quality habitat. Treating Invasive Annual Grass results in few negative impacts on the Sagebrush Guild because this habitat provides little value to these species, and this trade-off benefits the habitat for the guild in the long-term. Treatments in Perennial Grass would rapidly recover and result in relatively light impact to the Sagebrush Guild. Treatments in Low-elevation and Mid-elevation Shrub and areas of juniper encroachment within Juniper would result in decreased habitat quality over the short-term due to reduced canopy cover and structural diversity. This would be a negative impact to Sagebrush Guild species. However, these treatments would occur in small areas within larger areas of sagebrush cover, and the impact to the Sagebrush Guild would be expected to be minimal. Generally, the Mid-elevation Shrub cover types would receive lesser levels of treatment. Treating juniper would improve and enhance habitat values for the Sagebrush Guild by replacing juniper with sagebrush steppe habitat.

4.4.2 ANALYSIS OF EFFECTS FOR THE UPPER SNAKE FIELD OFFICE (USFO)

4.4.2.1 Low-elevation Shrub, Perennial Grass, and Invasive Annual Grass

4.4.2.1.1 Short-term Effects

Alternative treatment levels in these cover types range between approximately 4,250 acres (Alternative A) and 474,000 acres (Alternatives D and E) of sagebrush steppe, which is generally considered potential Sagebrush Guild habitat (Table 4-34).

Most of the Low-elevation Shrub, Perennial, and Invasive Annual Grass cover types in the USFO have been affected by increased fire frequencies. Among the five alternatives (see Table

4-34), Alternative A would have the least effect on these cover types. Alternative A would not restore cheatgrass and/or perennial-dominated areas to sagebrush, nor would it reconnect areas of relatively intact sagebrush canopy (Low-elevation Shrub). Alternatives D and E would improve and enhance more sagebrush steppe than the other alternatives. Alternatives B and C would improve intermediate levels of unsatisfactory sagebrush habitat.

TABLE 4-34. SAGEBRUSH STEPPE COVER TYPES AND THEIR ACREAGES IN THE UPPER SNAKE RIVER FIELD OFFICE (USFO)

Cover type	Total Acres in USFO	Alternatives (footprint-acres)[1]			
		A	B	C	D and E
Low-elevation Shrub	913,183	2,500	101,500	55,200	216,790
Perennial Grass	470,003	1,750	52,600	172,000	257,000
Invasive Annual Grass	36[3]	0	0	36	0
Mid-elevation Shrub	231,518	16,500	56,990	161,700	78,220
Juniper	5,380	0	2,200	3,300	900
Source Habitat[2]	776,333	0%	6.9%	7.7%	9.9%

[1] Footprint-acres describe broad treatment levels over 10 years for rehabilitation and restoration.

[2] Total acres of sage grouse Source Habitat and percentage of the area disturbed.

[3] As mapped (100% coverage of Invasive Annual Grass)

Other Notes: Fire and non-fire treatments over 10 years are also presented. Apparent precision of the acreages is a product of spreadsheet analysis.

Invasion of the sagebrush steppe by Invasive Annual Grass has been relatively minor in the Sands region (20 percent invasion) compared to Big Butte and Big Desert areas (more than 80 percent invasion). Perennial grass habitat in the USFO is predominately native grassland and provides essential habitat for Grassland Guild species. Alternatives D and E would treat approximately 257,000 acres of Perennial Grass (see Table 4-34) by seeding sagebrush to speed up the conversion to sagebrush steppe habitat, improving conditions for the Sagebrush Guild, and would have minimal short-term impact. The proposed treatments in Perennial Grass would have no short-term impact on the Grassland Guild.

4.4.2.1.2 Long-term Effects

Historically, Low-elevation Shrub had a relatively long fire frequency (approximately 60 years to 110 years); therefore, a fairly large percentage of the cover type should be mature grass and shrub that is greater than 30 years old (see Table 4-2), which provides quality habitat for the Sagebrush Guild. The <15-year and 15-year to 30-year age classes represent transitional (seral) states that are part of the historical ecology of sagebrush steppe. The percentage of uncharacteristic cheatgrass reflects the currently disturbed state of this vegetation type. Even though up to 20 percent of these conditions would be allowed, reducing them to a smaller percentage is desirable. The DFC cover type, which represents a historical sagebrush steppe cover type, would best benefit Sagebrush Guild species.

The current condition of the sagebrush steppe reflects the high degree of disturbance that has occurred in the past 30 years (see Table 4-2). Altered fire regimes have resulted in a significant decline in the quality of Sagebrush Guild habitat due to invasion by Invasive Annual Grass and noxious weeds, a scarcity of mid-seral vegetation, and fragmentation of the remaining late-seral sagebrush steppe habitat (e.g., the south and west portions of the Great Rift region). Invasive annual grasses and noxious weeds have altered this cover type's historical fire regime and successional framework. Some >30-year-old canopy structure remains, but much lacks a quality understory. The abundance of Perennial Grass (<15-year-old cover types-Table 4-2) illustrates recent, dramatic increases in wildland fire occurrences that have expanded this age class. The scarcity of the 15-year-old cover type also reflects the impact of repeated burns in the Perennial Grass which keeps this cover type in the early seral stage and prevents the development of an intermediate age class.

The current abundance of early seral stages, the absence of mid-seral stages, the loss of understory in late seral stages, the invasion by non-native vegetation and its accompanying altered fire regimes has placed the Sagebrush Guild at risk due to overall loss of habitat (see Table 4-2). Because of changes in fire ecology and succession, these cover types would not be expected to recover sufficiently to produce quality habitat for the Sagebrush Guild without implementing treatments.

The five alternatives would improve and enhance the quality of habitats for the Sagebrush Guild species to varying degrees. While all alternatives would significantly reduce cheatgrass, Alternatives D and E would be most effective. Alternatives D and E would also be best in keeping a relatively large proportion of mature, >30-year-old grass/shrub cover types while substantially improving the proportion of the 15-year-old to 30-year-old age class. These changes would provide a better distribution of age-classes (seral stages) of improved habitats for the Sagebrush Guild and improved herbaceous understory diversity; Alternatives D and E achieve this slightly better than the other alternatives.

For Sagebrush Guild species, the total acreage of mature, >30-year-old grass/shrub Low-elevation Shrub and loss of the intermediate, 15-year-old to 30-year grass/shrub are the major limiting factors in the sagebrush steppe. Current conditions emphasize the importance of the remaining >30-year-old age class, even though part of the understory is less than satisfactory. Alternatives D and E would provide the largest proportion of this mature habitat for the Sagebrush Guild.

Most of the improvement accomplished by all alternatives is the replacement of uncharacteristic cheatgrass-dominated cover types to native/native-like cover types and the movement of early seral stages into more mature cover types with a shrub overstory.

4.4.2.2 Mid-elevation Shrub and Juniper

4.4.2.2.1 Short-term Effects

Alternative treatment levels in these cover types range between approximately 16,500 acres (Alternative A) and 165,000 acres (Alternative C) of sagebrush steppe, which is generally considered potential Sagebrush Guild habitat (see Table 4-34).

Mid-elevation Shrub and Juniper have been affected by reduced fire frequencies and contain practically no cheatgrass-dominated areas. This, however, has aided the expansion of juniper into Mid-elevation Shrub and the loss of sagebrush steppe habitat. Mid-elevation Shrub would have high treatment levels under Alternative C and lesser levels under the other three alternatives (see Table 4-1). In recognition of the importance of the sagebrush cover that remains today, Alternatives D and E would treat less areas of juniper encroachment within Juniper and would disturb less intact sagebrush canopy in the Mid-elevation Shrub than Alternative C.

The greatest proportion of Source Habitat (approximately 10 percent) would be affected by Alternatives D and E (see Table 4-1). The rationale for treatment levels within Source Habitats in Alternatives D and E is to improve and enhance sagebrush steppe habitat. Alternatives D and E recognize the value of the Source Habitats that exist today to the Sagebrush Guild.

4.4.2.2.2 Long-term Effects

Historically, Mid-elevation Shrub had a short fire frequency (approximately 10 years to 25 years); therefore, a smaller percentage of the cover type would be greater than 15 years old. The <5-year-old and 5-years-old to 15-years-old age classes represent transitional (seral) states that are part of the historical ecology of Mid-elevation Shrub (see Table 4-3), with the mid-seral stage making up the greatest proportion of this cover type.

Current percentages of uncharacteristic juniper and cheatgrass (see Table 4-3) reflect the disturbed state of this cover type. Even though up to 9 percent of these uncharacteristic conditions would be allowed, reducing them to a smaller percentage is desirable. Because DFC without non-native species represents a historical sagebrush steppe cover type, this would be the most beneficial situation for the Sagebrush Guild of wildlife species by providing the necessary vegetation composition and structure for this habitat.

The current condition of Mid-elevation Shrub reflects the low degree of fire disturbance that has occurred in the past 30 years (see Table 4-3). This low degree of disturbance has resulted in a high proportion of late seral stages with dense, closed canopies and a lack of quality understory in portions of this cover type. This has affected its historical fire regime and successional framework. Mid-elevation Shrub is particularly crucial to Sagebrush Guild species because a relatively large portion of Low-elevation Shrub habitat has been adversely impacted by cheatgrass and frequent wildland fires. The Mid-elevation Shrub needs to be carefully managed. The proposed treatment areas (see Table 4-34) were designed to improve and enhance the quality of the understory without significantly reducing shrub cover, to replace the uncharacteristic cheatgrass-dominated cover types with native/native-like cover types, and to move early seral stages into more mature cover types with a shrub overstory. The low proportions of <5-years-old and 5-years-old to 15-years-old cover types demonstrate the recent decrease in wildland fire occurrences, which has resulted in the presence of virtually no early seral habitats.

The absence of early seral stages, the presence of few mid-seral stages, and the abundance of late seral stages has placed Sagebrush Guild species at risk due to overall loss of habitat quality (see Table 4-3). Under the current altered fire ecology, Mid-elevation Shrub would not recover to a satisfactory habitat quality for the Sagebrush Guild without implementing treatments.

The five alternatives would improve habitat quality for the Sagebrush Guild species to varying degrees. Alternative A provides for the least improvement, while Alternatives B, C, D, and E all provide for greater improvement. Alternatives D and E retains a large proportion of mid to late seral sagebrush (grass/shrub) habitat in Mid-elevation Shrub for the Sagebrush Guild, which would help offset the loss in Low-elevation Shrub cover types and help meet the short-term needs of these wildlife species. However, it would also place the vegetation type at highest risk of uncharacteristic large fire. Even though Alternative C more closely mimics the historical fire regime, it is not sensitive to the short-term needs of the Sagebrush Guild.

For the Sagebrush Guild, the total acreage of the 5-year-old to 15-year-old and >15-years-old age classes of Mid-elevation Shrub cover type is crucial. The lack of early seral stages does not adversely affect the sagebrush steppe in and of itself, yet the lack of replacement by younger-aged shrub cover types enables more cover types to reach a late seral stage, which would be more vulnerable to excessive wildland fire activity that could result in a loss of these stands.

4.4.3 Analysis of Effects for the Pocatello Field Office (PFO)

4.4.3.1 Low-elevation Shrub, Perennial Grass, and Invasive Annual Grass

4.4.3.1.1 Short-term Effects

Alternative treatment levels in these cover types range between 0 acres (Alternative A) to approximately 69,000 acres (Alternatives D and E) of sagebrush steppe, which is generally considered potential Sagebrush Guild habitat (Table 4-35).

Table 4-35. Sagebrush Steppe Cover Types and Their Acreages in the Pocatello Field Office (PFO)

Cover type	Total Acres in PFO	Alternatives (footprint-acres)[1]			
		A	B	C	D and E
Low-elevation Shrub	38,244	0	0	2,700	18,950
Perennial Grass	108,255	0	1,300	53,300	50,200
Invasive Annual Grass	33[3]	0	0	33	0
Mid-elevation Shrub	143,599	0	5,700	102,000	21,900
Juniper	26,102	0	3,500	18,000	10,650
Source Habitat[2]	182,263	0%	0%	24%	26%

[1] Footprint-acres describe broad treatment levels over 10 years for rehabilitation and restoration.

[2] Total acres of sage grouse Source Habitat and percentage of the area disturbed.

[3] As mapped (100% coverage of Invasive Annual Grass).

Other Notes: Fire and non-fire treatments over 10 years are also presented. Apparent precision of the acreages is a product of spreadsheet analysis.

Compared to the planning area's other field offices, Low-elevation Shrub, Perennial, and Invasive Annual Grass cover types in the PFO have been least affected by recently increased wildland fire frequencies as very little Low-elevation Shrub or Perennial Grass have been

converted to Invasive Annual Grass (see Table 4-8). Among the five alternatives (see Table 4-35), Alternative A would have the least effect on sagebrush steppe. Alternative A would not restore any potential sagebrush steppe, while Alternative B would restore a very small proportion of sagebrush steppe. The higher treatment levels proposed in Alternatives D and E would improve habitat quality for the benefit of the Sagebrush Guild; whereas, the high treatment levels in Alternative C would restore historical fire regimes. Alternatives D and E would improve more low-quality sagebrush steppe habitat than the other three alternatives. The proposal to treat approximately 50,000 acres of Perennial Grass under Alternatives D and E is to re-establish sagebrush. This would result in an improvement of habitat for the Sagebrush Guild and would have minimal short-term impact on these wildlife species.

4.4.3.1.2 Long-term Effects

Historically, Low-elevation Shrub had a relatively long fire frequency (approximately 60 years to 110 years); therefore, a fairly large percentage of the cover type should be mature grass and shrub that is greater than 30 years old (see Table 4-9), which provides quality habitat for the Sagebrush Guild. The <15-year and 15- to 30-year age classes represent Perennial Grass and grass/shrub seral stages, respectively, that are part of the historical ecology of sagebrush steppe. The percentage of uncharacteristic cheatgrass reflects the currently disturbed state of this vegetation type. Even though up to 20 percent of these uncharacteristic conditions would be allowed, reducing them to a smaller percentage is desirable. Because DFC without non-native species represents a historical sagebrush steppe cover type, this would be the most beneficial situation for the Sagebrush Guild by providing the necessary vegetation composition and structure for this habitat.

The current condition of Low-elevation Shrub reflects the high degree of disturbance that has occurred in the past 30 years (see Table 4-9). This disturbance has resulted in the scarcity of intermediate (15-year to 30-year) and mature (>30-year) grass/shrub cover types, an overabundance of uncharacteristic cheatgrass-dominated stands, fragmentation of the sagebrush steppe habitat, increased wildland fire frequencies, and a significant decline in the quality of the habitat for the Sagebrush Guild. This currently altered fire regime has affected the historical successional framework and the ability of the sagebrush steppe ecosystem to be maintained. The >30-year old habitat lacks a quality understory. The current predominance (32 percent) of the early seral, <15-year old cover types demonstrate the current altered fire regime (see Table 4-9). The scarcity of mid-seral, 15-year to 30-year old cover types (5 percent) also reflects the occurrence of frequent wildland fires that prevent early seral stages from developing into mid-seral stages (grass/shrub).

The currently altered habitat with an abundance of early seral stages, limited mid-seral stages, and degraded late seral stages has placed Sagebrush Guild species at risk. Because of changes in fire ecology and succession, these cover types would not be expected to recover quality habitat for the Sagebrush Guild without implementing proactive treatments.

The five alternatives would improve the quality of habitats for the Sagebrush Guild to varying degrees (see Table 4-9). Alternative A and Alternative B would provide the least improvement. Alternatives C, D, and E would both provide the best improvement (i.e., mid-seral and late seral, grass/shrub) for the Sagebrush Guild, while D and E are slightly better (sum of mid-seral and late

seral grass/shrub = 53 percent and 61 percent, respectively) and would produce the largest proportion of this mature habitat for the Sagebrush Guild.

For the Sagebrush Guild, the reduced proportions of the >30-year and 15-year to 30-year cover types provide the most adverse impact to the sagebrush steppe. Even though parts of their understories are less than satisfactory, the total combination of acreages in these age classes is the most important habitat for the Sagebrush Guild in the PFO.

Most of the improvement provided by Alternatives C, D, and E would occur through replacing the uncharacteristic cheatgrass-dominated cover types with native/native-like cover types and moving early seral stages into more mature cover types with a shrub overstory.

4.4.3.2 Mid-elevation Shrub and Juniper

4.4.3.2.1 Short-term Effects

Alternative treatment levels in these cover types range between 0 acres (Alternative A) to approximately 120,000 acres (Alternative C) of sagebrush steppe, which is generally considered potential Sagebrush Guild habitat (see Table 4-35). Mid-elevation Shrub and Juniper have been affected by reduced wildland fire frequencies. The reduced frequencies have provided the means for juniper to expand into Mid-elevation Shrub with the loss of sagebrush steppe habitat. Alternative C would treat more of these cover types than the other alternatives (see Table 4-35). Alternatives D and E, in recognition of the importance of remaining sagebrush cover, would treat less areas of juniper encroachment within Juniper. They would disturb less intact sagebrush canopy in the Mid-elevation Shrub than Alternative C, but would treat more sagebrush steppe than Alternative A and Alternative B.

The greatest proportion of Source Habitat (approximately 24 percent) would be affected by Alternative C, while the more desirable treatment level (approximately 16 percent) would be found under Alternatives D and E (see Table 4-35). Treatments within Source Habitats would improve sagebrush steppe habitat, benefiting the Sagebrush Guild by not reducing shrub canopy.

4.4.3.2.2 Long-term Effects

Historically, Mid-elevation Shrub had a short fire frequency (approximately 10 years to 25 years); therefore, under DFC, a small percentage of the cover type would be greater than 15 years old ((see Table 4-10). The <5-year and 5-year to 15-year age classes represent transitional seral states that are part of the historical ecology of Mid-elevation Shrub with the mid-seral stage making up the greatest proportion of this cover type.

The percentages of uncharacteristic juniper and cheatgrass reflect the current disturbed state of this cover type. Even though up to 9 percent of these uncharacteristic conditions would be allowed, reducing them to a smaller percentage is desirable. Because DFC represents a historical sagebrush steppe cover type, this would be the most beneficial situation for the Sagebrush Guild by providing the necessary vegetation composition and structure for this habitat.

The current condition of Mid-elevation Shrub reflects the low degree of fire disturbance that has occurred in the past 30 years (see Table 4-10). This low degree of disturbance has resulted in a

higher (61 percent) than desirable (23 percent) percentage of late seral stages. Due to the loss of Low-elevation Shrub through recent wildland fires, however, this Mid-elevation Shrub is crucial to the Sagebrush Guild; and, therefore, needs to be carefully managed. The proposed treatments would improve the quality of the understory without significantly reducing shrub cover and would replace uncharacteristic cheatgrass-dominated cover types with native/native-like cover types, reducing juniper encroachment and moving early seral stages into more mature cover types with a shrub overstory. The current percentages of <5-year old cover types (16 percent) and 5-year to 15-year old cover types (7 percent) illustrate the lack of wildland fire in these age classes and reflect little to no succession from early seral to higher successional states in the past 30 years.

The amount of early seral stages, the presence of few mid-seral stages, and the abundance of late seral stages in this cover type has placed the Sagebrush Guild at risk due to an overall loss of habitat quality and an increased potential for large wildland fire. All alternatives would have practically the same effect on Perennial Grasses and their related wildlife species. Alternative A and Alternative B would permit small increases in juniper, but this would exacerbate juniper encroachment in the PFO. Alternative A and Alternative B would do little to change current conditions, leaving habitat quality to decline with juniper encroachment. Alternatives C, D, and E would significantly increase the 5-year to 15-year grass/shrub cover type and retain more than half of the >15-year grass/shrub cover type. These three alternatives would increase the combined percentages of the grass/shrub components (72 percent and 73 percent, respectively), which would benefit Sagebrush Guild species. For the Sagebrush Guild, the total percentages of the 5-year to 15-year and >15-year age classes within Mid-elevation Shrub are crucial. The lack of early seral stages does not adversely affect the sagebrush steppe in and of itself, yet the lack of replacement by younger-aged shrub cover types enables more cover types to reach a late seral stage, which would be more vulnerable to excessive wildland fire activity that could result in a loss of these stands.

In returning wildland fire to a more historical role in the ecosystem, a greater proportion of Alternative C treatments would occur outside of Sagebrush Guild habitats; those treatments within guild habitats would maintain less shrub cover than Alternatives D and E. Alternative C is not designed to be sensitive to the needs of the Sagebrush Guild. On the other hand, Alternatives D and E would enhance and restore the current shortage of sagebrush steppe, recognizing that remaining habitats are crucial to the maintenance of remaining Sagebrush Guild populations. Treatment-acres in Alternatives D and E would be located on the landscape to have the maximum benefit in restoring Sagebrush Guild habitats.

4.4.4 Analysis of Effects for the Burley Field Office (BFO)

4.4.4.1 Low-elevation Shrub, Perennial Grass, and Invasive Annual Grass

4.4.4.1.1 Short-term Effects

Alternative treatment levels in these cover types range between approximately 50,000 acres (Alternative B) and 185,000 acres (Alternative C, D, and E) of sagebrush steppe (Table 4-36), which is generally considered potential Sagebrush Guild habitat.

Most of the Low-elevation Shrub, Perennial, and Invasive Annual Grass cover types in the BFO have been affected by increased wildland fire frequencies. Among the five alternatives, Alternative A would do the least to restore cheatgrass and would restore a moderate level of Perennial Grass and Low-elevation Shrub (see Table 4-36). Alternative B would do less to fix the deficiencies in the Low-elevation Shrub and Perennial Grass with a moderate increase of treatments in Invasive Annual Grass. The magnitude of treatments in Alternatives C, D, and E would be similar in the Low-elevation Shrub, Perennial, and Invasive Annual Grass cover types.

TABLE 4-36. SAGEBRUSH STEPPE COVER TYPES AND PROPOSED TREATMENTS BY ALTERNATIVE IN THE BURLEY FIELD OFFICE (BFO)

Cover Type	Total Acres in BFO	Alternatives (footprint-acres)[1]			
		A	B	C	D and E
Low-elevation Shrub	164,756	25,175	15,750	26,300	29,300
Perennial Grass	309,128	57,625	9,600	109,600	107,300
Invasive Annual Grass	49,150[3]	15,925	24,850	49,069	48,850
Mid-elevation Shrub	162,524	7,575	14,200	106,063	72,500
Juniper	59,480	800	24,650	39,229	17,600
Source Habitat[2]	172,396	0%	36%	14%	12%

[1] Footprint-acres describe broad treatment levels over 10 years for rehabilitation and restoration.

[2] Total acres of sage grouse Source Habitat and percentage of the area disturbed.

[3] As mapped (100% coverage of Invasive Annual Grass).

Note: Apparent precision of the acreages is a product of spreadsheet analysis.

Converting the sagebrush steppe to annual and Perennial Grass cover types has had a major impact on the sagebrush ecosystem. Invasive annual grass provides minimal habitat values for the Sagebrush Guild. Perennial grass is a mixture of non-native and native grasses, which provides essential habitat for the Grassland Guild species, but not the Sagebrush Guild species. Some of the older, non-native perennial seedings have been extensively re-established by sagebrush and are beginning to provide suitable habitat values for the Sagebrush Guild. The proposal to treat more than 100,000 acres of Perennial Grass (see Table 4-36) under Alternatives C, D, and E would facilitate the restoration of sagebrush steppe habitat and would have minimal short-term impacts. The proposed treatments in Perennial Grass would have no significant short-term impact on the Grassland Guild.

4.4.4.1.2 Long-term Effects

Historically, Low-elevation Shrub had a relatively long fire frequency (approximately 60 years to 110 years); therefore, a fairly large percentage of the cover type should be mature grass and shrub that is greater than 30 years old (see 4.16), which provides quality habitat for the Sagebrush Guild. The <15-year and 15-year to 30-year age classes represent transitional (seral) states that are part of the historical ecology of Low-elevation Shrub. The percentage of uncharacteristic cheatgrass reflects the currently disturbed state of this vegetation type. Even though up to 20 percent of these uncharacteristic conditions would be allowed, reducing them to a smaller percentage is desirable. Because DFC without non-native species represents a historical

sagebrush steppe cover type, this would be the most beneficial situation for the Sagebrush Guild by providing the necessary vegetation composition and structure for this habitat.

The current condition of this cover type reflects the high degree of disturbance that has occurred in the past 30 years (see Table 4-16). This disturbance has resulted in the scarcity of intermediate (15 years to 30 years) and mature (> 30-years) grass/shrub cover types, an overabundance of uncharacteristic cheatgrass-dominated stands (e.g., the desert north of Minidoka), fragmentation of the sagebrush steppe habitat, increased wildland fire frequencies, and a significant decline in the quality of the habitat for the Sagebrush Guild. This currently altered fire regime has affected the historical successional framework and the ability of the sagebrush steppe ecosystem to be maintained. These impacts have affected its historical fire regime and successional framework. The >30-year-old habitat lacks quality understory. The scarcity of intermediate, 15-year to 30-year grass/shrub cover types and the abundance of <15-year old cover types reflect the recent dramatic increase in wildland fire occurrences, which have resulted in cheatgrass-dominated areas, and little successional transition into the mid-seral, 15-year-old to 30-year-old age class.

An abundance of early seral stages, a near absence of mid-seral stages, and the degradation of late seral stages have placed the Sagebrush Guild at risk from an overall loss of habitat. Adversely affected by changes in fire regime and succession, Low-elevation Shrub would not be expected to recover sufficiently to produce quality habitat for the Sagebrush Guild without implementing treatments.

The five alternatives would improve habitat quality for the Sagebrush Guild to varying degrees. Alternative A and Alternative B would have little to no effect on the present conditions of Low-elevation Shrub, Perennial, and Invasive Annual Grass (see Table 4-16) in the BFO. Alternatives C, D, and E would both improve habitat quality. Alternatives D and E, however, would provide slightly more acres in mid-seral stages than Alternative C. Alternatives C, D, and E would equally maintain the current >30-year, mature grass/shrub cover types and provide the greatest reductions in cheatgrass from 33 percent to 10 percent composition. Alternatives D and E would make the largest increase in the mid-seral (15 to 30 years) cover types. Restoring these acres to sagebrush steppe would significantly increase habitat quality for Sagebrush Guild species.

For the Sagebrush Guild, total acreage of mature, late seral Low-elevation Shrub is the most limiting factor in this habitat. Even though part of the understory is less than satisfactory, the total acreage of late and mid-seral grass/shrub mixture stages (>30-year and 15-year to 30-year age classes) is the most important habitat factor. Alternatives D and E would result in the greatest increase in acres of these two age classes.

Most of the improvement from the current situation provided by the alternatives would occur in replacing the uncharacteristic cheatgrass-dominated cover types to native/native-like cover types and moving early seral stages into more mature cover types with a shrub overstory.

4.4.4.2 Mid-elevation Shrub and Juniper

4.4.4.2.1 Short-term Effects

Alternative treatment levels in these cover types range between approximately 8,400 acres (Alternative A) and 145,000 acres (Alternative C) of sagebrush steppe (see Table 4-36), which is generally considered potential Sagebrush Guild habitat.

Mid-elevation Shrub and Juniper in the BFO have been affected by reduced wildland fire frequencies and areas of juniper encroachment within Juniper (e.g., portions of the Upper Raft River Valley), resulting in the loss of sagebrush steppe habitat. Alternative A would do the least to restore Mid-elevation Shrub and areas of juniper encroachment within Juniper. Alternative B would provide a moderate increase of treatments in Mid-elevation Shrub, yet permit a significant increase in juniper encroachment.

Similar to Low-elevation Shrub (above), treatment levels in Alternative C would be higher than in the other alternatives. Nevertheless, Alternatives D and E would treat large areas of potential sagebrush steppe (approximately 18,000 acres of juniper encroachment), but it would treat less juniper encroachment within Juniper and disturb less intact sagebrush canopy than Alternative C. Compared to Alternative C, Alternatives D and E would have less effect on Mid-elevation Shrub and Juniper.

In returning fire to a more historical role in the ecosystem, a greater proportion of treatments in Alternative C would occur outside of Sagebrush Guild habitats; those treatments within guild habitats would maintain less shrub cover than Alternatives D and E. Alternative C would not be sensitive to the needs of the Sagebrush Guild. Under Alternative D, treatments would enhance sagebrush steppe habitat and would attempt to address its current shortage, recognizing that remaining habitats are crucial to the maintenance of remaining Sagebrush Guild populations. Treatment-acres in Alternatives D and E would be located on the landscape for maximum benefit in restoring Sagebrush Guild habitats.

Approximately 12 percent of sage grouse Source Habitats would be affected by Alternatives D and E (see Table 4-36). The rationale for treatment levels within Source Habitats in Alternatives D and E is to improve and enhance sagebrush steppe habitat. These alternatives recognize the value of the Source Habitats that exist today to the Sagebrush Guild.

4.4.4.2.2 Long-term Effects

Historically, Mid-elevation Shrub had a short fire frequency (approximately 10 years to 25 years); therefore, a relatively small percentage of the cover type should be greater than 15 years old (see Table 4-17). The <5-year and 5-year to 15-year age classes represent early and mid-seral seral stages that are part of the historical ecology of the Mid-elevation Shrub, with the mid-seral stage making up the greatest proportion of this cover type. The percentages for juniper and cheatgrass in Table 4-17 reflect the current disturbed state of this cover type. Even though up to 9 percent of these uncharacteristic conditions would be allowed, reducing them to a smaller percentage is desirable. Because DFC without non-native species represents a historical sagebrush steppe cover type, this would be the most beneficial situation for the Sagebrush Guild.

The current condition of this cover type reflects both large areas that have experienced too much wildland fire and smaller areas that have not experienced enough wildland fire in the past 30 years (see Table 4-17); both situations exist in the South Hills. This has produced fragmentation of the sagebrush steppe and a decline in habitat quality that is further aggravated, in part, by juniper encroachment within Juniper and the invasion of Invasive Annual Grass and noxious weeds (see Table 4-17). These altered cover types have affected the Mid-elevation Shrub's historical fire regime and successional framework. The limiting factor in the >15-year old habitat is primarily the loss of sagebrush from juniper encroachment. The current low percentage of <5-year cover types (1 percent) and 5-year to 15-year old cover types (6 percent) reflects the lack of wildland fire in these age classes and the little to no succession from early seral to higher successional states in the past 30 years.

The current lack of early seral stages, the presence of few mid-seral stages, and the abundance of mature, late seral stages has placed the Sagebrush Guild at risk by loss of habitat from large wildland fires. Furthermore, encroachment by juniper and the invasion of non-native species have affected this cover type's historical fire regime and successional framework.

The five alternatives would improve habitat quality for Sagebrush Guild species to varying degrees. Alternative A would provide the least improvement; Alternative B would do only slightly better than Alternative A (see Table 4-17). Alternatives D and E would provide for the greatest improvement in habitat quality. Alternatives D and E would create the largest portions of mid-seral and late seral sagebrush habitats for the Sagebrush Guild. For improving the Mid-elevation Shrub cover type, Alternative C would reduce most of the >15-year age class from 63 percent to 40 percent, while Alternatives D and E would reduce it to 48 percent. Most of the improvement under Alternatives C, D, and E would be in the increase of the <5-year and 5-year to 15-year age classes, the reduction of the >15-year age class, and the replacement of the uncharacteristic juniper and cheatgrass-dominated cover types with native/native-like cover types, which would facilitate the movement of early seral stages into more mature cover types with a shrub overstory.

In returning fire to a more historical role in the ecosystem, a greater proportion of Alternative C treatments would occur outside of Sagebrush Guild habitats; those treatments within guild habitats, however, would maintain less shrub cover than under Alternatives D and E. Alternative C would not be sensitive to the needs of the Sagebrush Guild. Under Alternatives D and E, treatments would enhance sagebrush steppe habitat and would attempt to address its current shortage, recognizing that remaining habitats are crucial to the maintenance of remaining Sagebrush Guild populations. Treatment-acres in Alternatives D and E would be located on the landscape for maximum benefit in restoring Sagebrush Guild habitats.

4.4.5 ANALYSIS OF EFFECTS FOR THE SHOSHONE FIELD OFFICE (SFO)

4.4.5.1 Low-elevation Shrub, Perennial Grass, and Invasive Annual Grass

4.4.5.1.1 Short-term Effects

Alternative treatment levels in these cover types range between approximately 109,000 acres (Alternative A) and 534,000 acres (Alternative C) of sagebrush steppe, which is generally considered potential Sagebrush Guild habitat (Table 4-3).

Most of the Low-elevation Shrub, Perennial, and Invasive Annual Grass cover types in the SFO have been affected by increased wildland fire frequencies. Among the five alternatives (see Table 4-37), Alternative A would have the least effect on sagebrush steppe, would do little to restore cheatgrass-dominated areas and Perennial Grass, and would do little to reconnect areas of relatively intact sagebrush canopy (Low-elevation Shrub). Treatment levels in Alternative B would be intermediate. The higher treatment levels proposed in Alternatives C, D, and E would correct existing, altered ecological conditions. Because large acreages are now of low quality, Alternatives C, D, and E would improve more sagebrush steppe than the other alternatives, but Alternatives D and E would affect less intact shrub canopy than Alternative C.

TABLE 4-37. SAGEBRUSH STEPPE COVER TYPES AND THEIR ACREAGES IN THE SHOSHONE FIELD OFFICE (SFO)

Cover type	Total Acres in SFO	Alternatives (footprint-acres)[1]			
		A	B	C	D and E
Low-elevation Shrub	415,308	5,525	84,000	62,831	112,230
Perennial Grass	548,807	96,505	70,500	193,619	113,500
Invasive annual grass	281,362[3]	6,700	102,500	281,362	281,600
Mid-elevation Shrub	311,194	850	17,550	200,000	58,000
Juniper	4	0	0	0	0
Source Habitat[2]	332,187	0%	0%	2%	9%

[1] Footprint-acres describe broad treatment levels over 10 years for rehabilitation and restoration.

[2] Total acres of sage grouse Source Habitat and percentage of the area disturbed.

[3] As mapped (100% coverage of Invasive Annual Grass).

Other Notes: Fire and non-fire treatments over 10 years are also presented. Apparent precision of the acreages is a product of spreadsheet analysis.

In returning fire to a more historical role in the ecosystem, a greater proportion of Alternative C treatments would occur outside of Sagebrush Guild habitats; treatments within guild habitats would maintain less shrub cover than under Alternatives D and E. Alternative C would not be sensitive to the needs of the Sagebrush Guild. Under Alternatives D and E, treatments would enhance sagebrush steppe habitat and would attempt to address its current shortage, recognizing that remaining habitats are crucial to the maintenance of remaining Sagebrush Guild populations. Treatment-acres in Alternatives D and E would be located on the landscape for maximum benefit in restoring Sagebrush Guild habitats.

In the SFO, conversion of sagebrush steppe to Invasive Annual Grass has been significantly greater than in the other field offices. At lower elevations, Perennial Grass is predominately seeded grassland and provides habitat for Grassland Guild species. Alternatives D and E would treat approximately 114,000 acres of sagebrush steppe habitat to enhance the conversion of Perennial Grass to sagebrush steppe habitat and would have minimal short-term impact. The proposed treatments in Perennial Grass would have no significant short-term impact on the Grassland Guild.

4.4.5.1.2 Long-term Effects

Historically, Low-elevation Shrub had a relatively long fire frequency (approximately 60 years to 110 years); therefore, a fairly large percentage of the cover type should be mature grass and shrub that is greater than 30 years old (see Table 4-24). This mature vegetation provides quality habitat for the Sagebrush Guild. The <15-year and 15-year to 30-year age classes represent early and mid-seral stages that are part of the historical ecology of Low-elevation Shrub. The percentage of uncharacteristic cheatgrass reflects the currently disturbed state of this vegetation type. Even though up to 20 percent of these uncharacteristic conditions would be allowed, reducing them to a smaller percentage is desirable. Because DFC without non-native species represents a historical sagebrush steppe cover type, this would be the most beneficial situation for the Sagebrush Guild by providing the necessary vegetation composition and structure for this habitat.

The current condition of Low-elevation Shrub reflects the high degree of disturbance that has occurred in the past 30 years (see Table 4-24) and the current scarcity of mature grass/shrub cover types in the SFO. Disturbance has resulted in fragmentation of the sagebrush steppe habitat and a significant decline in habitat quality due to the loss of the mature shrub canopy and the invasion of Invasive Annual Grass and noxious weeds. These species have affected this cover type's historical fire regime and successional framework. The limiting factors in the >30-year old habitat is primarily the scarcity of sagebrush cover across the landscape and the lack of quality understory. The near absences of early <15-year old and intermediate 15-year to 30-year-old cover types also illustrate the recent dramatic increases in wildland fires in Low-elevation Shrub, which have resulted in an abundance of cheatgrass-dominated vegetation and an altered fire ecology in which sagebrush is limited in its ability to replace itself.

The current abundance of uncharacteristic cheatgrass communities, which accounts for 42 percent (see Table 4-24) and near absence of early-seral and mid-seral communities, about 5 percent (Table 4-24) have placed the Sagebrush Guild species at risk due to overall loss of habitat. Because of changes in fire ecology and succession, Low-elevation Shrub would not be expected to recover sufficiently to produce quality habitat for the Sagebrush Guild without implementing proactive treatments.

The five alternatives would improve habitat quality for Sagebrush Guild species to varying degrees. Alternative C would be best at maintaining the current proportion of mature grass/Shrub cover types for the Sagebrush Guild, while the other alternatives would permit some losses of this habitat. Alternatives D and E, on the other hand, would be slightly better in restoring early and mid-seral stages and reducing the abundance of cheatgrass. For the Sagebrush Guild, the total acreage of the mature, >30-year grass/shrub cover type is the most limiting factor in the

sagebrush steppe. Even though part of the >30-year age class understory is less than satisfactory, the total acreage of >30-year age classes is the most important habitat factor. Alternative A and Alternative B would have the greatest negative impact on the Sagebrush Guild due to permitting large reductions in the mature habitat, >30-year age classes, from 28 percent to 12 and 14 percent, respectively. Alternatives D and E would have an intermediate impact on mature habitat, while Alternative C would more or less maintain the existing mature sagebrush cover >30 years old.

Most of the improvement under all alternatives would be to replace the uncharacteristic cheatgrass-dominated cover types with native/native-like cover types and to move early seral stages into more mature cover types with a shrub overstory.

4.4.5.2 Mid-elevation Shrub and Juniper

4.4.5.2.1 Short-term Effects

In the SFO, alternative treatment levels in these cover types range between 850 acres (Alternative A) and 200,000 acres (Alternative C) of sagebrush steppe, which is generally considered potential Sagebrush Guild habitat (see Table 4-37).

Mid-elevation Shrub and Juniper have been affected by increased wildland fire frequencies. This has caused the loss of sagebrush steppe habitat. Alternative C would treat more acres than the other alternatives (see Table 4-25). Alternatives D and E, in recognition of the importance of remaining sagebrush cover, would disturb less intact sagebrush canopy in the Mid-elevation Shrub than Alternative C.

The greatest proportion of sage grouse Source Habitat (approximately 9 percent) would be affected by Alternatives D and E (see Table 4-37). The rationale for treatment levels within Source Habitats (e.g., Laidlaw Park) in Alternatives D and E is to improve and enhance sagebrush steppe habitat. These alternatives recognize the value of the Source Habitats that exist today to the Sagebrush Guild.

4.4.5.2.2 Long-term Effects

Historically, Mid-elevation Shrub had a short fire frequency (approximately 10 years to 25 years); therefore, a smaller percentage of the cover type would be greater than 15 years old (see Table 4-25). The <5-year and 5-year to 15-year age classes represent early to mid-seral stages that are part of the historical ecology of Mid-elevation Shrub, with the mid-seral stage making up the greatest proportion of this cover type.

The percentages of uncharacteristic juniper and cheatgrass reflect the current disturbed state of the Mid-elevation Shrub (see Table 4-25). Even though up to 9 percent of these uncharacteristic conditions would be allowed, reducing them to a smaller percentage is desirable. Because DFC without non-native species represents a historical sagebrush steppe cover type, this would be the most beneficial situation for the Sagebrush Guild by providing the necessary vegetation composition and structure for this habitat.

The current condition of Mid-elevation Shrub reflects the moderate degree of wildland fire disturbance that has occurred in the past 30 years. This moderate degree of disturbance has resulted in a higher (40 percent) than desirable (23 percent) percentage of early seral stages. Because of the loss of Low-elevation Shrub through recent wildland fires, this existing Mid-elevation Shrub is crucial to maintaining the Sagebrush Guild; it therefore needs to be carefully managed. The proposed level of treatments under Alternatives C, D, and E (see Table 4-37) would improve and enhance the quality of the understory without significantly reducing shrub cover, while replacing the uncharacteristic cheatgrass-dominated cover types with native/native-like cover types and moving early seral stages into more mature cover types with a shrub overstory. The current low percentage of 5-year-old to 15-year-old cover types illustrates the combination of recent wildland fire occurrences and the lack of succession from early seral in the past 30 years.

The abundance of early seral stages (40 percent), the presence of few mid-seral stages (2 percent), and the abundance of decadent, late seral stages (54 percent) have placed the Sagebrush Guild at risk from overall loss of habitat quality. All five alternatives would cause similar long-term impacts to the Sagebrush Guild; although, Alternatives D and E would provide the highest percentage of grass/shrub cover type restoration, which would benefit the Sagebrush Guild by providing the necessary vegetation composition and structure for this habitat. All alternatives would result in an increase in the 5-year to 15-year grass/shrub age class through treatments in <5-year Perennial Grass. This conversion would have a positive effect on habitat for the Sagebrush Guild by providing the necessary vegetation composition and structure for this habitat.

4.4.6 Mitigation and Monitoring

The management restrictions listed in Appendix Q, Management Restrictions, are incorporated into management practices common to all alternatives. These practices would be implemented to avoid adverse impacts to vegetation. Because of this, no further mitigation would be required to protect the vegetation resource.

Prior to any vegetation treatment, preparation of site-specific NEPA analysis would occur. The impacts analysis would include consideration for T&E and BLM-Sensitive plant species and habitats, including mitigation to prevent significant adverse impacts to these species. Management restrictions for T&E and BLM-Sensitive Species are found in Appendix Q, Management Restrictions.

4.4.7 Unavoidable Adverse Impacts

The action alternatives would result in unavoidable short-term impacts to sagebrush steppe wildlife habitat during vegetation treatments as described above. However, these unavoidable impacts mimic a natural disturbance and succession pattern that would have long-term benefits on this resource.