

CHAPTER 2 – ALTERNATIVES INCLUDING THE PROPOSED ACTION

This chapter describes and compares the alternatives considered by the Forest Service for the Kenney Flats Fuels Reduction and Ponderosa Pine Restoration Project. It includes a discussion of how alternatives were developed, a description and map of each alternative considered in detail, and a comparison of these alternatives focusing on the issues developed during the scoping process, and an overview of mitigation measures, monitoring and other features common to all alternatives. Chapter 2 is intended to present the alternatives in comparative form, sharply defining the issues and providing a clear basis for choice among options by the decision maker and the public (40 CFR 1502.14).

Some of the information used to compare alternatives at the end of Chapter 2 is summarized from Chapter 3, Affected Environment and Environmental Consequences. Chapter 3 contains the detailed scientific basis for establishing baselines and measuring the potential environmental consequences of each of the alternatives. For a full understanding of the effects of the alternatives, readers will need to consult Chapter 3.

Alternative Process

Development of Alternatives

The IDT (interdisciplinary team) used issues and concerns generated from internal and public comments, (see Chapter 1), in conjunction with the field related resource information, to formulate different alternatives. Each action alternative is designed to meet the stated purpose and need for the Kenney Flats Project, and to move the landscape from the current state to the desired future condition, and represents a site-specific proposal developed through intensive interdisciplinary evaluation.

Based on the three major areas of significant issues (Chapter I), the IDT created six action alternatives. On closer examination of the feasibility and projected effectiveness of meeting the stated purpose and need, and of achieving the desired future condition, three action alternatives and the no action alternative were selected for in-depth analysis. The three alternatives not analyzed in detail are described in the following section, followed by the four remaining alternatives.

Alternatives Considered but Eliminated from Detailed Study

Several alternatives were considered during the planning process, but have not been included in the EA for detailed study. These are described briefly below, along with the reasons for not considering them further.

Burn and Mow Only - A burn and mow only alternative was considered during the initial project design. This would also have included pruning. It was eliminated from detailed evaluation because using these two vegetation management tools would not result in a substantial reduction in the amount of existing fuels or associated risk from high intensity wildfire, or substantially change forest structure. Much of the forested material in the area is too large to be treated via mowing and prescribed burning in very dense stands will not substantially change forest stand structure because the fire intensity that must be used in dense stands is low. If dense stands were burned at higher intensities there is a risk of having unacceptable amounts of tree mortality and elevated risk of an escape fire event. Likewise, only pruning standing ponderosa pine trees would not lower the extreme competition for nutrients, water and sunlight the existing trees are experiencing, nor would it change stand structure. This alternative would

not meet the goals and objectives of the Kenney Flats Fuels Reduction and Ponderosa Pine Restoration project.

Fuels Reduction with No Restoration – An alternative was considered that would have concentrated only on fuels reduction, with no attempt made at ponderosa pine forest restoration. Fuels reduction would have been achieved through tree spacing only, regardless of tree age or size. Trees would be spaced so that crowns would not touch, and be a sufficient distance apart so that the spread of crown fires would be reduced. This would have resulted in a very uniform forest structure across the analysis area since no effort would have been made at retaining clumps or increasing openings as would be done under restoration treatments. Previously authorized prescribed burning would take place, but this burning is done at a low intensity that does not effectively change stand structures. This alternative was eliminated from detailed consideration because it did not fully meet the purpose and need of the project, which is to change forest structure so that it more closely resembles that found under historic conditions. Under historic conditions, pine stands were uneven-aged, with even aged clumps. The purposes of improving size and age class diversity in pine stands, increasing vigor of large trees, increasing openness and the amount of herbaceous cover and maintaining large Gambel oak also cannot be fully realized under an alternative only concerned with fuels reduction.

Treat All Accessible Acres Within Analysis Area - An alternative was developed that would have mechanically treated all accessible acres within the analysis area. This alternative included units 6,7,8, 9 (which do not appear on Alternatives 2-4 maps) and 559 acres of unit 20. This alternative was dropped from detailed consideration because of the recognition that historically, stand structures were diverse, even under the historic fire regime of frequent, low intensity fire. Fires did not burn every acre of the landscape on a set interval. Some pine stands may not have burned for several decades, while other burned numerous times per decade. This would have created a variety of stand conditions across the Kenney Flats Analysis Area. Stands that may have experienced fewer fires, or fires of lower intensity include areas on wetter, north facing slopes or stands on the leeward sides of meadows or other non-forested areas. Stands on the leeward sides of meadows may be expected to be denser with more closed canopy conditions because fire coming out of meadows was probably less intense. Stands on north facing slopes were cooler and wetter, so fires probably burned less frequently and thus had less impact on stand conditions than in pine stands where fire was more frequent. By not treating these areas we are responding to the concern raised that aggressively treating the whole area could reduce diversity. Other units eliminated from detailed evaluation are 13 and 14, where currently there is no established access. Small portions of other treatment units were eliminated due to slope and operability with standard mechanized equipment.

Alternatives Considered in Detail

Four alternatives were analyzed in detail. Alternative 1 is the no-action alternative, under which the project area would continue to have ongoing activities (previously planned, analyzed and approved) take place. The other action alternatives represent different means of satisfying the purpose and need by responding with different emphases to the significant issues discussed in Chapter 1. Maps and tables with comparative information regarding specific activities for each action alternative are presented. Table 1 provides a comparative description of activities and quantities for Alternatives 2, 3 and 4.

Alternative 1 – No Action

The Council on Environmental Quality (CEQ) regulations (40 CFR 1502.14d) requires that a "no action" alternative be analyzed in every EA. The framework for the no-action alternative is to set the base against which other alternatives can be measured. It is a snapshot of existing conditions, and the on going activities taking place in the Analysis Area.

No restoration activities, other than previously planned prescribed burning, would occur under this scenario. Current activities in the landscape area would continue. These include implementation of the Pagosa Ranger District prescribed burning plan, grazing activities, dispersed recreation, camping, hunting and firewood gathering. Refer to *Figure 3, Alternative 1 Map*.

The goals set forth in the National Fire Plan, Archuleta County Community Fire Action Plan and the San Juan National Forest Land and Resource Management Plan would not be met in this alternative.

RATIONALE: Required by law to set a baseline to compare action alternatives.

Elements Common to All Action Alternatives

All action alternatives involve the mechanical treatment of 3,826 acres. Variations between alternatives are whether treated material is left on site, or removed from the site and the timing of the treatments. Please refer to *Figure 4, Alternative 2 Map; Figure 5, Alternative 3 Map; and Figure 6, Alternative 4 Map*.

Alternatives 2, 3 and 4 would include approximately 438 acres of mowing of fuels adjacent to private property, as noted on the maps. This activity is conducted primarily for hazardous fuel reduction.

Each action alternative would mechanically thin 208 acres (units 15, 16 and 17) of material that would be left on site due to a lack of access through an inventoried roadless area. These units would be prescribed burned following thinning.

Each of the action alternatives would have a prescribed fire program associated with woody fuels reduction. Combined with mechanical thinning treatments, these activities will move the treated stands from Condition Class 2 or 3 to Condition Class 1.

In response to concerns that treatments might target older, larger ponderosa pines, including old growth stands, pre-settlement trees will not be removed under any of the action alternatives, except for safety regulations mandated through the Occupational Safety and Health Administration (OSHA). Pre-settlement trees are those that established prior to 1880 and can be recognized by the relatively smooth, orange bark with large plates. The crowns of pre-settlement trees are often irregular and flat topped. Landings and roads will be located to avoid pre-settlement trees.

Desired Stand Structure Attributes:

For Alternatives 2, 3 and 4, following thinning and prescribed burning, treated units will be highly variable, based on the current characteristics of the stand. However, treated stands will generally appear more open and park-like, having an understory of grasses and herbaceous vegetation. No pre-settlement trees will be removed, so older and larger diameter ponderosa pine will appear more visually prominent following treatment.

Interspersed amongst these open stands will be existing clumps of denser ponderosa pine having a range of size and age classes. These pine clumps will generally range in size from 1/20 to 3/4 acre having 2 to 40 trees. The spatial arrangement and amount of area in clumps will be variable and dependent on the existing clumpiness of individual stands.

Openings will be created and will be dispersed across approximately 7% (270 acres total) of the treated acreage. Groups will range in size from 1/4 up to 2 acres.

Existing clumps of larger size oak (6 inches + diameter at root collar) will be maintained over the landscape and where feasible, protected during prescribed burning and thinning.

Gully Restoration:

The goal is to stabilize the gullies and headcuts and stop or minimize future erosion from these sites. The gullies will be stabilized by constructing check dams or sediment retention basins within the gullies themselves. These structures establish a rigid base level, which prevents the gully from continuing to downcut. The structures would be constructed wherever physically feasible. Disturbed areas of the sediment retention basins would be reseeded with appropriate grass species when construction is completed.



Image 1 Photo of Exposed Soils in Gully Area

Small headcuts will be stabilized by either sloping back or cleaning up the face of the headcut, laying filter fabric over the bare soil, and placing rock or logs over the filter fabric. This hardens the headcut and reduces the chance that the headcut will continue to erode.

Areas where the gullying has not been well developed could also benefit from rehabilitation efforts. All stabilization efforts will be monitored to determine effectiveness. Please refer to the alternative maps showing the location of active gullies inventoried for this environmental analysis.

Alternative 2 - Incremental Fuels Reduction – Fuels Treated on Site

Alternative 2 would involve the mechanical treatment of 3,826 acres, 438 mowed and 3417 thinned. Each thinning unit would be entered four times, once every five years over a 20-year period until desired stand densities, desired Condition Class and desired stand structures are reached. Prescribed burning would follow each thinning. The majority of thinned material would be left on site. Only incidental amounts of firewood and posts/poles would be removed via personal use permits. Since thinned material would be treated on-site, this alternative would not involve any road reconditioning, reconstruction or temporary road construction activities.

Depending on site densities, thinnings would remove from 11 to 499 trees per acre, leaving a range of 16 to 63 trees per acre. This generally equates to removing 7 to 128 basal area, leaving residual stands ranging from 58 to 95 basal area.

RATIONALE: This alternative addresses the suggestion to evaluate an approach that does not include the use of commercial operations to remove the small material produced from thinning. This also reflects the concerns that no additional roads be built and that no heavy equipment be used for fuel removal. Because of the heavy fuel loading, the units need repeated entries to thin and burn safely.

Alternative 3 – Periodic Fuels Reduction – Fuels Taken off Site

Alternative 3 would mow and thin the same 3,826 acres as Alternative 2. However, under this alternative the units to be thinned would be divided into four smaller areas. Every five years one of the smaller areas would be thinned, then a prescribed burn would be conducted as follow-up. Areas closer to private land would have a higher priority for treatment. The entire treatment area would be accomplished by year 20. Treated material making up various forest products (post & poles, firewood and small diameter sawtimber) would be removed and sold via a number of personal use permits, stewardship contracts, and commercial sales of varying sizes.

Unlike Alternative 2, this alternative would allow for the removal of usable thinned material such as post and poles and small diameter saw timber through available contracting or permitting procedures via current accepted means such as timber permits, timber sale contracts, stewardship or service contracts. In particular, usable woody fuels, such as post and poles and small diameter saw timber would be removed from the site. Areas to be thinned would be entered one time, as the removal of material would allow for prescribed burning to be conducted safely.

This alternative would involve various road reconditioning, reconstruction and temporary road construction activities in order to provide removal of wood products while meeting Forest Plan standards and guidelines for water and soil resource protection. No new permanent roads would be constructed. The majority of roadwork would be accomplished during the first five-year treatment period. Please refer to the alternative maps on the next 4 pages.

Thinned material will remain on site until prescribed burned for units 15, 16 and 17 totaling 208 acres. No road reconditioning, reconstruction or temporary road construction activities will take place within these units.

Depending on site densities, thinnings would remove from 11 to 499 trees per acre, leaving a range of 16 to 63 trees per acre. This generally equates to removing 7 to 128 basal area, leaving residual stands ranging from 58 to 95 basal area.

RATIONALE: Provides for restoration and fuels reduction treatments in a systematic approach across the landscape in 20 years. Requires only one entry per acre to accomplish. Sensitive to limits of equipment available, yearly treated acres, operational feasibility, and recovery of some activity costs.

Alternative 4 – Prompt Fuels Reduction – Fuels Taken off Site

Alternative 4 is designed to achieve the project objectives in the most expeditious timeframe and thins and mows the same area (3,826 acres) as the other action alternatives. As in Alternative 3, this allows for the removal of usable thinned material. This alternative would mechanically treat all acreage by the end of 5 years, with follow-up prescribed burning as soon as feasible.

Alternative 4 would result in a high level of activity in years 1 through 5, where thinning activities would occur, in conjunction with prescribed fire. Prescribed fire would be used following removal of usable woody fuel to maintain a restored stand condition. Usable treated material making up various forest products (post & poles, firewood and small diameter saw timber) would

be removed and sold via a number of personal use permits, stewardship contracts, and commercial sales of varying sizes.

This alternative would involve various road reconditioning, reconstruction and temporary road construction activities in order to provide safe removal of wood products while meeting Forest Plan standards and guidelines for water and soil resource protection. No new permanent roads would be constructed. Please refer to the alternative maps on the next 4 pages.

Depending on site densities, thinnings would remove from 11 to 499 trees per acre, leaving a range of 16 to 63 trees per acre. This generally equates to removing 7 to 128 basal area, leaving residual stands ranging from 58 to 95 basal area.

RATIONALE: This alternative represents the most expeditious means to accomplish fuels reduction and restoration objectives. Periods of mechanical disturbance are limited. Provides the quickest change in Condition Classes over the largest area and recovers some activity costs.

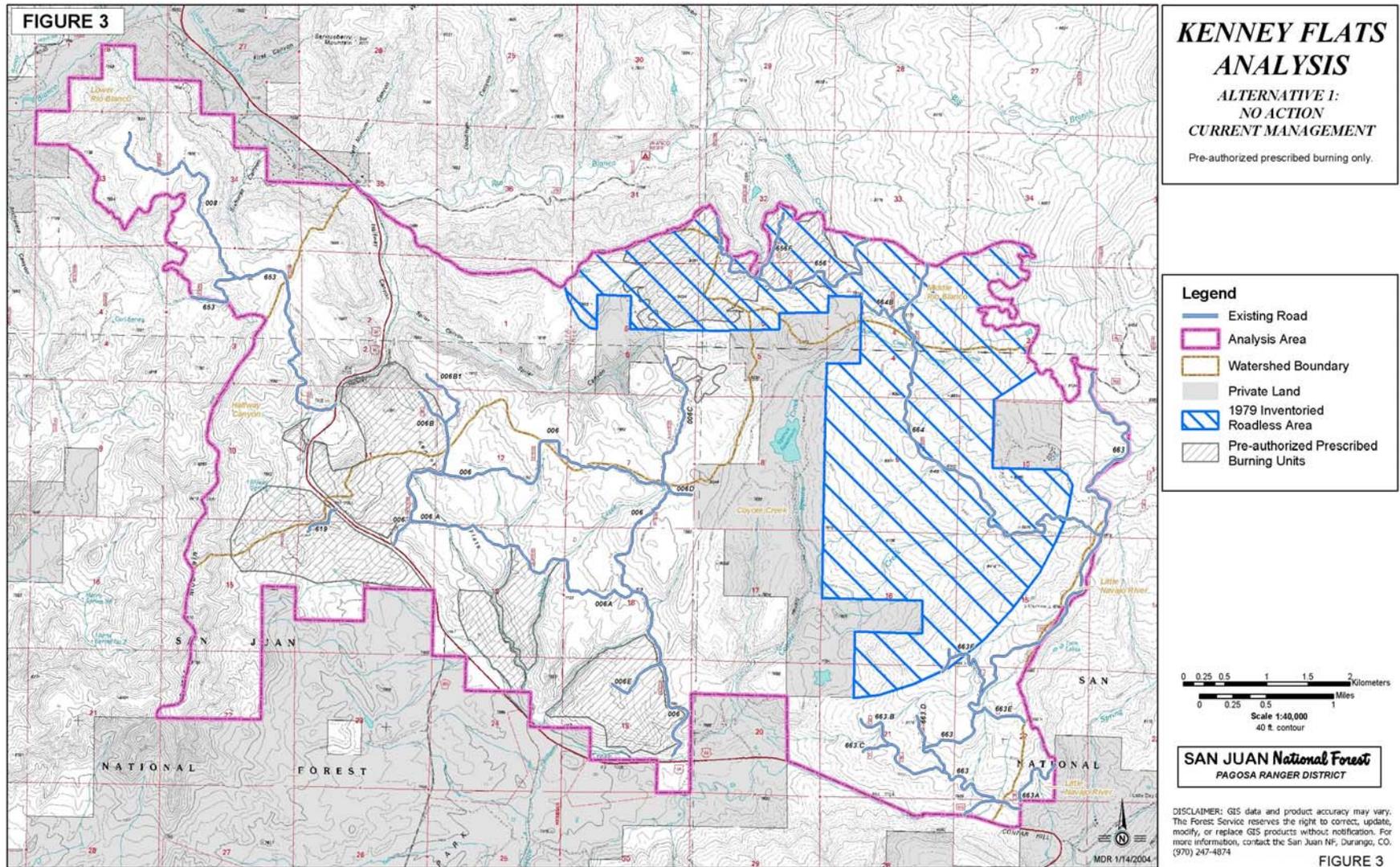


FIGURE 3

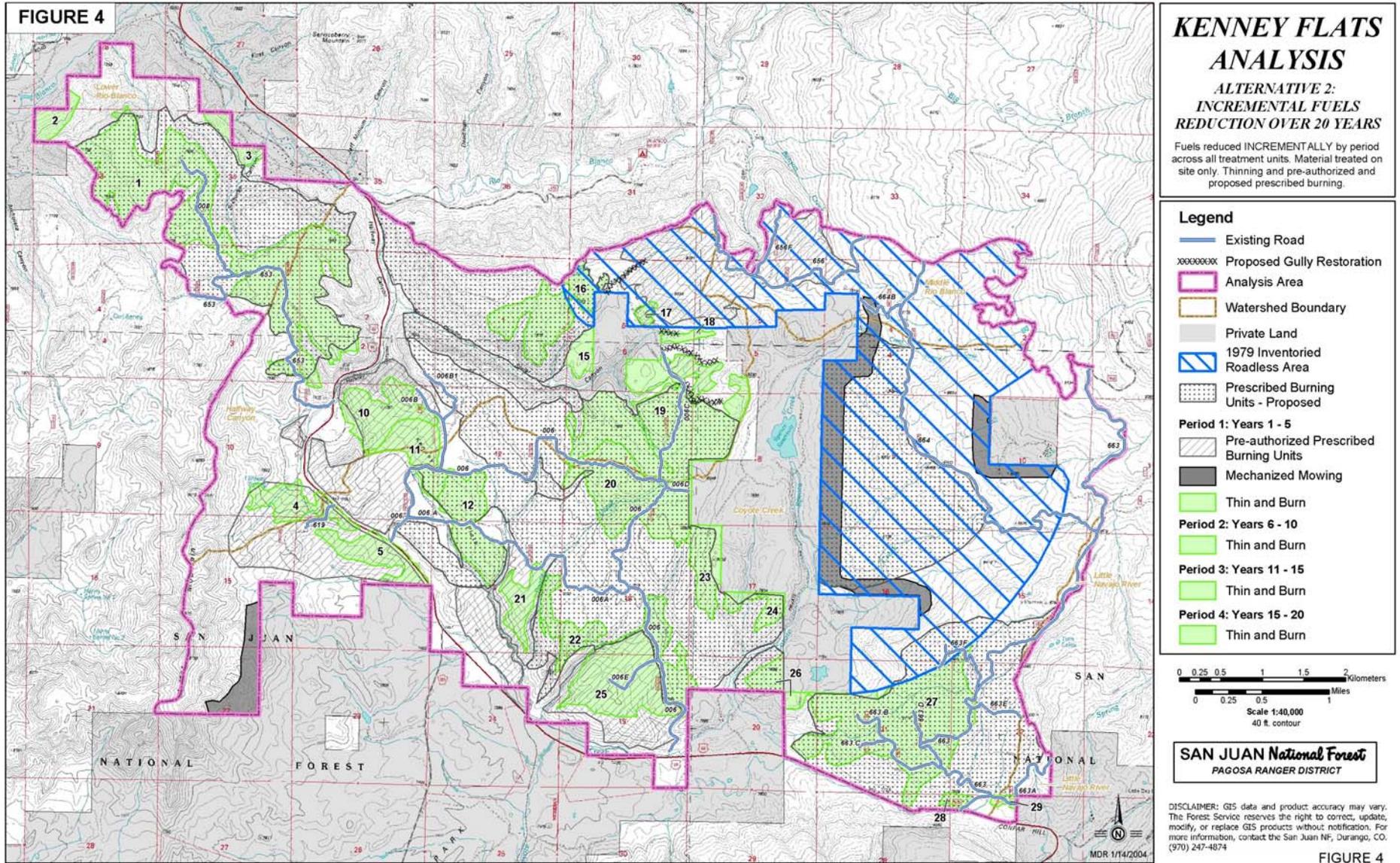


FIGURE 4

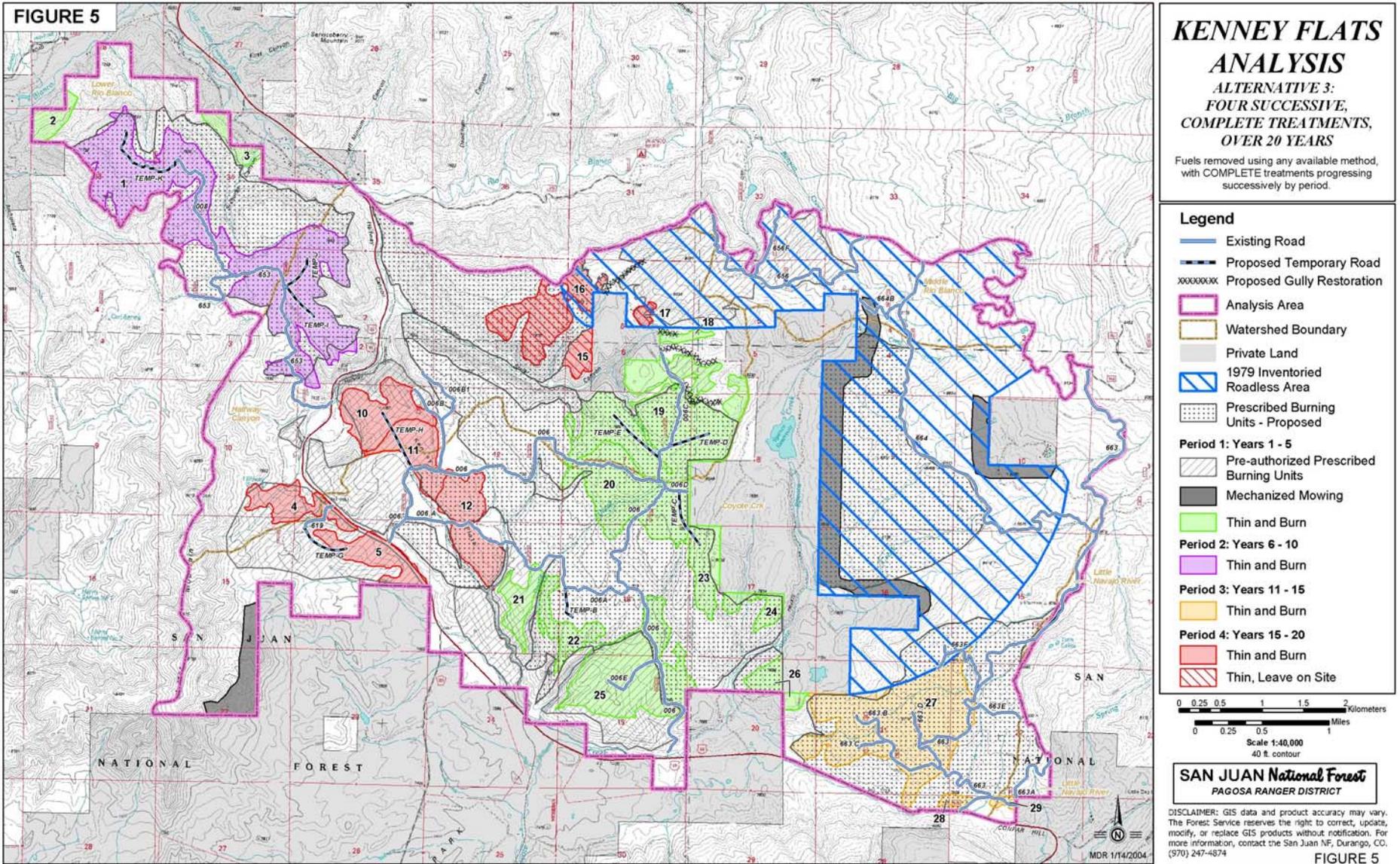


FIGURE 5

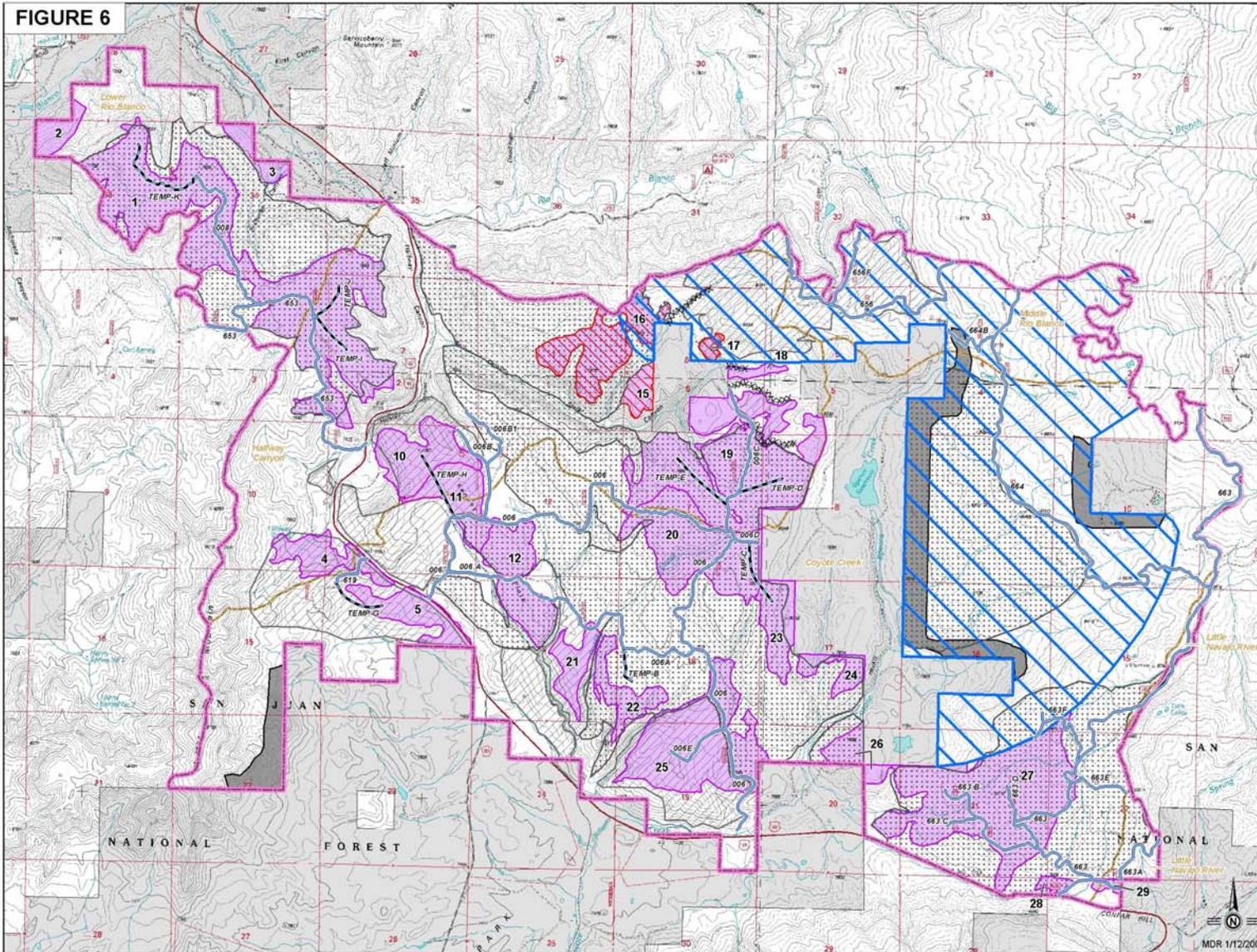


FIGURE 6

KENNEY FLATS ANALYSIS

ALTERNATIVE 4: ALL TREATMENTS IN ONE PERIOD

Fuels removed using any available method.
Mechanical treatments completed in period 1.

Legend

- Existing Road
- Proposed Temporary Road
- Proposed Gully Restoration
- Analysis Area
- Watershed Boundary
- Private Land
- 1979 Inventoried Roadless Area
- Prescribed Burning Units - Proposed
- Period 1: Years 1 - 5
Pre-authorized Prescribed Burning Units
- Mechanized Mowing
- Thin and Burn
- Thin, Leave on Site

0 0.25 0.5 1 1.5 2 Kilometers
0 0.25 0.5 1 Miles
Scale 1:40,000
40 ft. contour

SAN JUAN National Forest
PAGOSA RANGER DISTRICT

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FIGURE 6

Comparison of Alternatives

This section compares the activities, outputs, and effects of Alternatives 2, 3 and 4 in terms of the significant issues for the Kenney Flats Fuels Reduction and Ponderosa Pine Restoration Project. The discussions of effects are summarized from Chapter 3, which should be consulted for a full understanding of these and other environmental consequences.

The table below provides an overview comparison of activities from the alternative descriptions and Chapter 3 relevant to the issues. This information will be used in the discussions that follow. The table does not include Alternative 1, No-Action.

Table 1 Action Alternatives Comparisons

Activity	Alternative 2 Incremental Fuels Reduction <i>Fuels Treated on Site</i>	Alternative 3 Periodic Fuels Reduction <i>Fuels Taken off Site</i>	Alternative 4 Prompt Fuels Reduction <i>Fuels Taken off Site</i>
Total Acres Thinned	3,388	3,388	3,388
Total Acres Mowed	438	438	438
Total Acres Treated	3,826	3,826	3,826
Acres thinned year 1-5	3,388	1,423	3,180 removed (208 left on-site)
Acres thinned year 6-10	3,388	730	0
Acres thinned year 11-15	3,388	489	0
Acres thinned year 16-20	3,388	538 removed (208 left on-site)	0
Volume treated year 1-5	7,116 CCF 3,193 MBF 21.8 M Tons	13,505 CCF 5,771 MBF 41.5 M Tons	41,578 CCF 12,517 MBF 127.7 M Tons
Volume treated year 6-10	7,116 CCF 3,273 MBF 21.8 M Tons	5,271 CCF 2,334 MBF 16.2 M Tons	0
Volume treated year 11-15	9,061 CCF 4,204 MBF 27.8 M Tons	6,384 CCF 3,053 MBF 19.5 M Tons	0
Volume treated year 16-20	9,973 CCF 4,896 MBF 30.6 M Tons	5,129 CCF 2,404 MBF 15.7 M Tons	0
Total volume thinned material treated on-site	33,894 CCF 15,566 MBF 104.0 M Tons	3,867 CCF 1,530 MBF 11.9 M Tons	3,867 CCF 1,530 MBF 11.9 M Tons
Types of products removed from site	Incidental personal use firewood and post/poles	Firewood, post/poles, saw timber	Firewood, post/poles, saw timber
Total volume thinned material removed off-site	600 cords 67 CCF posts & poles	600 cords 29,795 CCF 13,562 MBF 457 CCF poles	600 cords 27,488 CCF 12,517 MBF 463 CCF poles
Miles temporary road construction	0	3.5	3.5
Miles road reconstruction	0	2.4	2.4
Miles road reconditioning	0	8.9	8.9

CCF = one hundred cubic feet 5 inches diameter and up, MBF = one thousand board feet 8 inches diameter and up.; M Tons = one thousand tons.

Tables 2, 3, 4, and 5 display the pertinent stand characteristics at year 0, current conditions and how each would change by alternative. Each of the action alternatives accomplishes the restoration goals of reducing trees per acre, reducing canopy cover, reducing basal area, increasing the residual tree diameter and favoring larger trees in the landscape. Each action alternative will also change areas in Condition Class 2 or 3 to Condition Class 1.

Table 2 Trees Per Acre Remaining by Alternative

Unit No.	TPA 2003	Alternative 1	Alternative 2				Alternative 3				Alternative 4
			Yr 0	Yr 20	Yr 1-5	Yr 6-10	Yr 11-15	Yr 16-20	Yr 1-5	Yr 6-10	
1	106	100	88	64	48	37	105	40	39	39	44
2	561	517	344	108	70	46	62	62	61	61	61
3	371	325	134	67	54	45	54	54	53	53	53
4	103	92	90	65	48	38	101	98	95	43	44
5*	90	87	74	56	43	32	90	89	88	35	37
10	67	65	60	42	33	26	66	66	65	29	31
11	86	84	78	54	41	33	86	86	85	36	38
12*	109	105	87	62	45	32	107	106	105	35	36
15	96	93	72	54	40	29	95	94	94	32	34
16	227	198	133	83	53	30	220	213	206	33	34
17	146	141	96	64	45	31	145	143	141	34	36
18	242	220	156	105	69	40	48	47	47	47	47
19	222	203	146	94	64	43	50	49	49	49	49
20	92	88	78	58	47	35	48	48	47	47	47
21	115	112	98	69	53	41	48	47	47	47	47
22	182	170	115	73	50	33	37	36	35	35	35
23	141	126	118	83	63	46	57	56	54	54	54
24	102	92	92	64	49	37	47	45	44	44	43
25	98	92	87	66	52	40	45	45	44	44	45
26	73	61	65	54	45	36	40	38	36	36	36
27	102	94	88	72	55	42	100	98	45	45	47
28	32	31	28	22	18	14	32	32	16	16	16
29	32	31	28	22	18	14	32	32	16	16	16

* indicates a skip in unit number due to elimination from detailed study in the alternatives development process

Table 3 Basal Area Square Feet Per Acre Remaining by Alternative

Unit No.	BA 2003	Alternative 1	Alternative 2				Alternative 3				Alternative 4
	Yr 0	Yr 20	Yr 1-5	Yr 6-10	Yr 11-15	Yr 16-20	Yr 1-5	Yr 6-10	Yr 11-15	Yr 16-20	Yr 1-5
1	101	114	94	86	77	68	104	68	71	72	76
2	129	164	124	107	93	78	79	84	89	94	95
3	68	93	67	61	55	50	49	53	57	60	60
4	98	109	93	85	75	67	101	104	107	67	75
5*	114	127	105	94	84	72	117	120	123	70	79
10	75	88	72	66	61	56	78	81	84	54	62
11	100	114	96	87	79	71	104	107	110	71	80
12*	144	155	129	111	94	77	146	149	152	77	85
15	110	127	101	87	74	61	114	118	122	61	69
16	201	208	172	141	110	77	203	205	207	78	89
17	116	132	106	91	76	61	120	124	128	61	71
18	202	213	174	143	111	78	78	83	87	91	92
19	168	179	149	127	105	83	82	86	89	93	93
20	84	98	81	77	72	67	65	68	71	74	74
21	121	134	112	100	89	77	77	80	83	86	86
22	154	166	137	117	96	76	76	79	81	83	83
23	104	113	97	87	79	69	69	71	74	77	76
24	73	86	71	65	60	56	53	56	59	61	61
25	100	108	94	86	77	70	69	72	73	74	75
26	95	93	88	82	75	68	69	69	69	70	68
27	103	115	93	79	66	51	106	109	51	55	60
28	89	100	85	76	69	62	91	93	62	64	69
29	89	101	85	77	69	62	92	95	62	65	70

* indicates a skip in unit number due to elimination from detailed study in the alternatives development process

Table 4 Quadratic Mean Diameter Inches by Alternative

Unit No.	QMD 2003	Alternative 1	Alternative 2				Alternative 3				Alternative 4
	Yr 0	Yr 20	Yr 1-5	Yr 6-10	Yr 11-15	Yr 16-20	Yr 1-5	Yr 6-10	Yr 11-15	Yr 16-20	Yr 1-5
1	13.2	14.4	13.9	15.7	17.1	18.5	13.5	17.7	18.2	18.5	17.9
2	6.5	7.6	8.1	13.5	15.6	17.6	15.3	15.8	16.4	16.8	16.9
3	5.8	7.3	9.6	12.9	13.8	14.2	12.9	13.4	14.0	14.5	14.4
4	13.2	14.7	13.8	15.5	16.8	17.9	13.5	13.9	14.3	16.9	17.6
5*	15.2	16.3	16.1	17.6	18.9	20.2	15.5	15.7	15.9	19.2	19.7
10	14.3	15.7	14.9	16.9	18.3	19.9	14.7	15.0	15.2	18.5	19.2
11	14.6	15.8	15.0	17.2	18.7	19.9	14.9	15.2	15.4	19.0	19.5
12*	15.6	16.5	16.5	18.2	19.6	20.8	15.8	16.0	16.3	20.1	20.6
15	14.5	15.8	16.0	17.1	18.4	19.7	14.9	15.2	15.5	19.3	19.4
16	12.7	13.9	15.4	17.6	19.5	21.7	13.0	13.3	13.6	20.8	21.9
17	12.1	13.1	14.2	16.1	17.6	19.0	12.3	12.6	12.9	18.1	19.0
18	12.4	13.3	14.3	15.8	17.2	18.9	17.3	18.0	18.4	18.8	18.9
19	11.8	12.7	13.7	15.7	17.3	18.8	17.4	17.9	18.3	18.7	18.7
20	13.0	14.3	13.8	15.7	16.8	18.8	15.7	16.1	16.7	17.0	17.0
21	13.9	14.8	14.5	16.3	17.5	18.6	17.1	17.6	18.0	18.3	18.3
22	12.5	13.4	14.8	17.1	18.8	20.5	19.4	20.1	20.3	20.9	20.9
23	11.6	12.9	12.3	13.9	15.1	16.6	14.9	15.3	15.7	16.1	16.0
24	11.5	13.1	11.9	13.6	15.0	16.6	14.5	15.0	15.6	16.1	16.1
25	13.7	14.7	14.0	15.4	16.6	17.8	16.8	17.1	17.5	17.9	17.5
26	15.4	16.7	15.8	16.7	17.5	18.6	17.8	18.2	18.5	18.8	18.6
27	13.6	15.0	13.9	14.9	14.8	15.1	13.9	14.0	14.2	14.7	15.2
28	22.6	24.3	23.6	25.2	26.5	28.5	22.8	23.0	26.7	27.1	28.1
29	22.6	24.4	23.6	25.3	26.5	28.5	23.0	23.2	26.7	27.3	28.3

* Indicates a skip in unit number due to elimination from detailed study in the alternatives development process

Table 5 Canopy Cover Percent by Alternative

Unit No.	CANCOV 2003	Alternative 1	Alternative 2				Alternative 3				Alternative 4
			Yr 0	Yr 20	Yr 1-5	Yr 6-10	Yr 11-15	Yr 16-20	Yr 1-5	Yr 6-10	
1	53	57	51	47	43	38	55	39	40	41	42
2	74	82	71	60	53	45	47	49	51	52	52
3	44	54	42	38	34	31	31	33	34	36	36
4	53	56	50	46	42	38	54	55	56	38	42
5*	55	59	52	49	44	39	56	57	58	39	43
10	40	44	39	36	34	31	41	42	44	31	34
11	52	57	51	47	43	39	54	55	56	39	42
12*	65	68	61	55	49	41	66	66	66	41	44
15	58	62	53	47	41	34	59	61	62	35	38
16	80	80	73	65	55	41	80	80	80	42	46
17	60	64	56	49	42	35	61	62	63	35	39
18	79	81	74	65	55	42	43	45	46	47	48
19	70	72	66	60	52	43	44	45	46	47	47
20	46	50	45	43	40	37	37	38	39	41	41
21	60	63	57	52	47	42	43	44	45	46	46
22	71	73	65	57	50	41	41	42	43	43	43
23	56	58	53	48	45	40	41	42	42	43	43
24	45	50	44	41	37	34	34	35	36	37	37
25	54	57	52	48	44	40	40	41	41	42	42
26	51	49	48	45	42	39	39	39	39	40	38
27	53	57	50	45	39	32	54	54	32	34	36
28	45	48	43	39	36	33	46	46	33	34	36
29	45	48	43	39	36	33	46	46	33	34	36

* indicates a skip in unit number due to elimination from detailed study in the alternatives development process

Table 6 Significant Issue Comparisons

Significant Issues and Indicators <i>(from Chapter 1)</i>	Alternative 1 No Action	Alternative 2 Incremental Fuels Reduction <i>Fuels Treated on Site</i>	Alternative 3 Periodic Fuels Reduction <i>Fuels Taken off Site</i>	Alternative 4 Prompt Fuels Reduction <i>Fuels Taken off Site</i>
Wildfire Hazard: Predicted change in fire behavior	Potential for stand replacing wildfires in Condition Class 3 areas continues	Potential for stand replacing wildfires still present in first 5 to 10 years. Decreasing as treatment progresses over the 20 year period. Narrow window for Rx fire because of high fuel loading.	Potential for stand replacing wildfires similar to Alt. 1 until areas are treated. After treatment, risk of stand replacing wildfire much less. Risk reduction is incremental, reducing risk closest to private land first, but taking 20 years to reduce risk across entire area.	Risk of stand replacing wildfire reduced in first decade. Lowest risk of stand replacement fire in the long term. Fuel loads increase across entire analysis area in first 5 year period, as compared to Alt. 3 because entire area mechanically treated in first 5 years.
Risk to firefighter safety	Potential for stand replacing wildfires in Condition Class 3 areas cause increased risk to firefighters compared to Alt 3 and 4	Highest risk to firefighter safety due to trees and slash left on site. This could cause high intensity fire behavior and a physical barrier for firefighters.	Potential for stand replacing wildfires similar to Alt. 1 until areas are treated. After treatment, risk to firefighters much less. Risk reduction to firefighters is incremental, taking 20 years to reduce risk across entire area.	Risk to firefighters is reduced most quickly under this alternative, since the entire area is treated in 5 years. Risk in first 5 year period is slightly elevated due to slash presence across entire area.
Suppression options	Wide range of suppression options available in most situations. If stand replacement fires occur, suppression options limited to indirect attack, aerial attack, structure protection.	Has potential for fewest suppression options because of highest fuel loading of any alternative and highest risk of stand replacing fire. Indirect attack safest option, using aerial attack, structure protection.	Suppression options similar to Alt 1 until areas treated. After treatment, more suppression options available.	Offers most suppression options in the shortest period of time as compared to other alternatives due to expected changes in stand conditions and fire behavior. Direct attack could be used in most situations.
Effectiveness of Fuels Treatments: Comparative costs: treatments*	Based on recent fires within Colorado, wildfire suppression costs can range from \$500 to 1,500 per acre. Based on extreme fire conditions modeling scenario suppression costs would range from \$2,767,500 to \$8,302,500.	\$ - 236,697.16 Net annual equivalent	\$ - 117,097.17 Net annual equivalent	\$ - 187,887.80 Net annual equivalent
Effect on crown base height (CBH)	CBH raised slightly after prescribed burning, but less so than under action alternatives	CBH raised 3' to 9' incrementally over entire area 20 years total	CBH raised 3' to 9' progressive areas 20 years total	CBH raised 3' to 9' all at once 5 years total
Effect on crown bulk density	Crown bulk density gradually increasing over time	Periodic, incremental reduction over 20 years	Reduction over ¼ of the area every 5 years.	Reduction over entire area in 5 years
Change in Condition Class (CC)	Pre-authorized prescribed burning is not changing stand structure, so no change in CC. Some areas in CC 1 or 2 may become CC 3 in the long term as the stands continue to grow and become denser.	No significant change in CC in 10 years; but gradual changes in CC over 10+ years	In areas receiving mechanical treatment and burning, CC changes two classes. In areas with only mowing, CC changes one class. Change in CC is incremental, changing CC closest to private land first, but taking 20 years to change CC across project area	In areas receiving mechanical treatment and burning, CC changes by two classes. In areas with only mowing, CC changes one class. Change in at least one class of CC occurs in the first 5 years across entire project area.
Timeframes to meet fuels reduction objectives	Not possible to meet fuels reduction objectives under pre-approved	Fuels reduction objectives met in 20 years	Fuels reduction objectives met in 20 years	Fuels reduction objectives met when follow-up burning is completed.

Significant Issues and Indicators <i>(from Chapter 1)</i>	Alternative 1 No Action	Alternative 2 Incremental Fuels Reduction <i>Fuels Treated on Site</i>	Alternative 3 Periodic Fuels Reduction <i>Fuels Taken off Site</i>	Alternative 4 Prompt Fuels Reduction <i>Fuels Taken off Site</i>
Ecosystem Restoration: Resilience to disturbances such as wildfire and insect and disease outbreaks	Potential for stand replacing wildfires in Condition Class 3 areas will continue. Vigor of trees lower than under action alternatives, so not able to survive insect and disease outbreaks as well.	Resilience to disturbance low during first 5 or 10 years of treatment since heavy fuels left on site could intensify ground fires and provide large amounts of brood trees for beetle infestations. Resiliency improves after burning.	Resilience to disturbance similar to Alt. 1 until areas are treated. After treatment, resilience to disturbance increases. Stands that have been treated will be less likely to experience stand replacing fires, and trees will become more vigorous, thus able to survive insect and disease outbreaks better.	Resilience to disturbance increases in shortest period of time. Treated stands less likely to experience stand replacing fires, and trees will become more vigorous, thus able to survive insect and disease outbreaks better.
Change in canopy closure (Cc), diameter growth and stems/acre	Cc gradually increasing, diameter growth slower, with more stems/acre than under action alternatives	Incremental reduction of Cc over all treated acres every 5 years, with 30-50% decrease in Cc over a 20-year period. Diameter growth increasing, with fewer stems/acre than Alt 1	Cc similar to Alt 1 until areas are treated. After treatment, Cc reduced 30-50%. Reduction in Cc is incremental. Diameter growth increasing, with trees becoming large orange barks quicker in treated areas than under Alts 1 or 2. Fewer stems/acre in treated stands than under Alt 1.	Quickest reduction in Cc, with a 30-50% reduction occurring in 5 years. Diameter growth increases most quickly across the treated acres under this alternative since its all treated in 5 years, with fewer stems/acre than Alt 1.
Erosion potential	No erosion potential due to ground disturbing activities. Gullies will not be stabilized and will continue to erode	Erosion potential minimal unless high intensity fire occurs due to heavy fuel loading. Gullies will be stabilized.	Potential for localized short-term erosion due to ground disturbing activities. Gullies will be stabilized.	Potential for localized short-term erosion due to ground disturbing activities. Gullies will be stabilized..
Structural diversity at the stand level, including changes to openness, clumpiness, and size classes	Stands will continue to be mostly even-aged, losing openness and clumpiness as density increases. Few opportunities for pine to regenerate. Once existing yellow pine dies, there will be no replacements as trees in existing dense stands will be stagnated.	Stands will be less uniform, having more openings and clumps. Pine regeneration may be suppressed due to heavy fuels loads until burning occurs. Trees will grow into larger size classes more quickly than Alt 1. Changes in structural diversity at the stand level will happen gradually over a 20-year period.	Similar to Alt 1 until treatment occurs. After treatment, stands will be less uniform, having more openings and clumps. There will be more opportunity for pine regeneration to occur, and trees will grow into larger size classes more quickly than under Alts 1 or 2, so large old trees will be replaced when they die. Changes will be incremental, happening over a 20-year period.	Stands will be less uniform, having more openings and clumps. There will be more opportunity for pine regeneration to occur, and trees will grow into larger size classes more quickly than Alts 1 or 2, so large old trees will be replaced when they die. Changes in structural diversity at the stand level will happen over a 5-year period.
Structural diversity at the landscape level, including changes in size class distribution and changes in habitat structural stages (HSS)	Slow change in size class distribution and HSS. Even aged character maintained across the landscape; little opportunity for large tree yellow bark recruitment. Continued increase in acreage of mature, dense, 70-100% canopy closure pine (HSS 4C)	Gradual change in structural diversity across the landscape. Decrease in acreage of 4C (structural stage) pine, slowest development of mature, 40-70% pine (HSS 4B)	Incremental change in structural diversity across the landscape. More size classes will be present on treated acres, than under Alt 1 and 2. Decrease in acreage of 4C pine, more rapid development of mature, 40-70% pine (HSS 4B)	Quickest change in structural diversity across the landscape. More size classes will be present on treated acres, than under Alts 1 and 2. Decrease in acreage of 4C pine, most rapid development of mature, 40-70% pine (HSS 4B)

*1 Data from Quick Silver economic analysis; Appendix G

Mitigation

Mitigation measures are requirements that address site-specific conditions and are designed to reduce specific environmental effects. These mitigation measures have been selected to provide additional detail and guidance for those implementing this project. They are based on over three decades of experience and field evaluation of their practicality and effectiveness. They have been evaluated by hydrologists, wildlife biologists, soil scientists, engineers, and other resource specialists, and found to be both practical and effective.

In addition, the interdisciplinary team used the following criteria in identifying and designing mitigation measures. Mitigation measures should:

- Reduce impacts to an insignificant level;
- Demonstrate effectiveness (in past usage);
- Lack controversy about their effectiveness;
- Be specific;
- Be measurable, and
- Be enforceable.

Project-specific Mitigation

The analysis documented in this EA discloses the possible beneficial and adverse impacts that may occur from implementing the actions proposed under each alternative. Where feasible, measures have been formulated to mitigate or reduce these impacts. These measures include guidance from the Forest Plan (described in Chapter 1).

Resource specialists include their concerns in describing the consequences of alternatives (Chapter 3) and describe how the concerns can be mitigated (if not completely avoided) in the design of each treatment unit. Major mitigation measures are summarized in the following section.

Applicable Forest Plan standards and guidelines, the *Watershed Conservation Practices Handbook* practices used to meet the requirements of the Clean Water Act, and project-specific mitigation measures are identified in Section 2.9.

Wildlife

Snags and replacements: Forest Plan standards and guidelines require the protection and/or provision of 20 snags per 10 acres in all forested types in management areas 6B and 7E. Management areas 4B and 5B have the same snag protection/provision requirement, but call for 25 to 30 snags per 10 acres in all forest types.

No snags will be cut irregardless of size except for meeting OSHA safety reasons. Snags will be protected to the extent possible during mechanical and prescribed burning treatments. The contractor will be required to pull slash away from snags to help protect them from prescribed burns. Where burning will occur, snags will be protected by Forest Service personnel before burning where feasible. Protection may involve one or a combination of the following: scraping hand line around the snag and/or spraying them with water.

Replacement trees will be provided by retaining all pre-settlement trees, and mature sized trees that are not harvested. In addition, green trees containing cavities, spiked tops, broken tops, lightning scars or “wooly” trees will be maintained as snag replacements.

Large Gambel oak retention: Clumps of large Gambel oak will be protected during mowing and prescribed-burn operations to serve as valuable food sources for species such as black bear, Merriam’s turkey and other wildlife, and to provide habitat for nesting birds. The amount protected will be determined on a site-specific basis.

Roads: Temporary roads will be closed upon completion of harvest and prescribed-burning operations via installation of gates, barricades, or other effective methods to minimize human disturbance to wildlife.

Northern goshawk: Personnel involved in project preparation, layout, and administration will be trained in goshawk species and nest identification. There is a known goshawk territory containing five nests that are adjacent to a Forest Developed Road in the analysis area. All nests are located within 400 feet of the road. A ¼ mile minimal disturbance activity zone will be established around active goshawk nests from March 1 to August 15 to protect nesting birds. A wildlife biologist will confirm whether the nesting area is being actively used. Given that nest locations are adjacent to an existing open road, goshawks have likely become habituated to vehicular activity. Vehicular activity associated with project activities will be monitored to determine any need for restrictions.

As recommended by Reynolds et al. (1992) nest areas may be treated via thinning unwanted understory trees or shrubs with non-uniform spacing using prescribed fire or hand tools. These activities should be applied outside the March 1 to August 15 seasonal restriction. Treatment should be applied in a manner that does not reduce basal areas below 110 square feet, or reduce canopy closure less than 50%. High canopy closures (50-70% +), large overstories, basal area between 90-110, and open understories are desired structural attributes for nest areas (Shuster 1994).

Place landings and skid-trails outside the nest area as far away as possible, to prevent creating large openings near the nest stand and potential access points for human disturbances.

Wildlife Monitoring

Monitoring will occur to evaluate the effectiveness of mitigation described above, and Forest Plan standards and guidelines.

Project level inventories for Abert’s squirrel, mountain bluebird, and hairy woodpecker were conducted in 2004 to gather pre-treatment information on species presence or absence, distribution, and habitat associations. Post-project level monitoring for these species will continue to help determine their response from management actions.

Watershed

The following standards and design criteria listed in the R2 Watershed Conservation Practices Handbook will be followed: 11.1, 11.2, 12.1 (a,b,c,d,l,m), 12.2, 12.4, 13.1, 13.2, 13.3, 13.4, 14.1, and 14.2.

Locate skid trails perpendicular to slope angles (along the contour) as much as possible. Avoid creating a dendritic runoff pattern.

Rip or scarify and seed landings and temporary roads subject to compaction.

Require “no equipment buffer zones” around streams and wetlands that will be defined as follows unless otherwise determined by the district hydrologist:

Ephemeral streams – 50 feet each side;

Intermittent streams – 75 feet each side;

Perennial streams – 100 feet each side;

Wetlands – two times the maximum diameter of a wetland up to a maximum of 100 feet.

Proper drainage will be constructed on roads that will be used as a part of Alternatives 3 or 4. Road crossings through wet areas will be hardened and existing multiple tracks around wet areas will be rehabilitated.

All drainage structures on roads will be inspected at the completion of the project to make sure they are in good condition and functioning properly.

Vegetation

Stand-alone clumps of existing, healthy and established regeneration approximately ¼-acre or larger will be protected and maintained to foster multi-cohort, clumpy stand structure. Protection and maintenance can be in the form of:

Directing mechanized equipment from operating in these regeneration groups except to affect thinning within the groups;

Directing burning operations to avoid loss of trees within groups.

Gambel oak over 6 inches diameter at root collar, or clumps of large oak will be retained in mowing units and no more than 75% of oak will be mowed. Large Gambel oak will be avoided, where feasible, during burning operations.

Forest Service will treat known noxious weed infestations prior to the 1st year of treatment, and will monitor and treat annually thereafter. Noxious weed inventory will be conducted in the Kenney Flats Project Area to map new infestations.

The Forest Service shall receive at least 3 business days notice prior to moving each piece of off-road equipment on to the project area. Notification will include identifying the location of the equipment's most recent operations. Prior to commencement of operations, all off-road equipment will be cleaned and free of soil, seeds, vegetative matter, or other debris that could contain or hold noxious weed seeds.

Off-road equipment must be cleaned prior to moving between different project areas.

New infestations of noxious weeds identified by either the Forest Service or operators shall be promptly reported to the Forest Service noxious weed coordinator to insure that treatment can occur.

Soils

During periods when soils are too wet, heavy equipment will not be allowed on land other than graveled roads. Soils are too wet when the soil moisture content exceeds the plastic limit. If soils within three inches of the surface can be rolled into threads that are three millimeters in diameter without breaking or crumbling, they are too wet. This condition should exist over the majority of the project area and not in isolated depressions.

Heritage Resources

Sites 5AA553, 5AA556, 5AA825, 5AA2406 and 5AA2415 in their entirety are to be avoided during all project activities. These sites should be protected from all project activities by flagging the site boundaries, as delineated by an archaeologist, prior to implementation of project activities. If necessary, these sites should be protected from burning by constructing a fireline (hand or wet line) around the site boundary as flagged by an archaeologist prior to line construction.

The Pagosa District Archaeologist is responsible for ensuring that these sites are monitored during and after project activities to ensure that they are avoided. The results of monitoring will be reported in writing to the Pagosa District Archaeologist, noting the site number(s), the date of monitoring, and the condition of the sites.

Undisturbed fire-sensitive portions of 5AA550.3 are to be avoided from all burning activities. Also, undisturbed portions of the railroad segment are to be avoided by mechanized equipment during proposed thinning treatment activities. Broadcast burning, maintenance burning and thinning treatment activities are allowed over the disturbed portion of the railroad grade.

Sites 5AA521, 5AA772, 5AA1725 and 5AA1894, in their entirety, are to be avoided during proposed prescribed burning treatment activities. These sites should be protected from burning by constructing a fireline (hand or wet line) around the site boundary as flagged by an archaeologist prior to line construction. The project manager or Pagosa District Archaeologist is responsible for ensuring that these sites are monitored during the course of the burn to ensure that they are avoided by burning. The results of monitoring will be reported in writing to the Pagosa District Archaeologist, noting the site number(s), the date of monitoring, and the condition of the sites.

Because of the lack of surface architecture or features at these sites, the stable geomorphologic setting, and expected short duration and low intensity of the prescribed fire based upon fuels in and around the sites, prescribed burning is permitted through sites 5AA426, 5AA555, 5AA826, 5AA1132, 5AA1136, 5AA1137, 5AA1731, and 5AA2407 with the stipulation that there be no piling and burning of slash or operation of heavy equipment within heritage site boundaries. The project manager or Pagosa District Archaeologist is responsible for ensuring that these sites are monitored during and after project activities. The results of monitoring will be reported in writing to the Pagosa District Archaeologist, noting the site number(s), the date of monitoring, and the condition of the sites.

The project manager is responsible for ensuring that personnel involved in conducting the prescribed burn are made aware of the potential for encountering undiscovered cultural resources and the responsibilities and procedure for avoidance and reporting.

Should any additional prehistoric or historic archaeological sites be encountered during the implementation of the proposed project, they are to be avoided and reported to the Pagosa District Archaeologist. Should fire lines be needed, a complete survey of the proposed lines will be necessary prior to their construction.

When maintenance burning is proposed in the future, the Pagosa District Archaeologist will be notified with adequate lead time to determine site avoidance and protection measures for eligible and need data sites.

Transportation

Warning signs alerting the public to truck traffic will be posted at strategic locations.

Range

Any structural range improvements, fences or water developments will be protected. If any are disturbed or destroyed by treatment activities, they will be reconstructed or returned to their pre-treatment condition.

Cattle guards along access roads shall be periodically inspected and cleaned as needed to maintain their function.

Where temporary roads bisect range fences, gates will be installed.

Compliance with Forest Plan Standards and Guidelines

All action alternatives including the proposed action are consistent with the *Amended Land and Resource Management Plan for the San Juan National Forest* (Forest Plan). All applicable forest-wide and land use designation standards and guidelines have been incorporated. The Forest Service uses many mitigation and preventive measures in the planning and implementation of land management activities. The application of these measures begins during the planning and design phases of a project. Additional direction comes from the applicable Forest Service manuals and handbooks.

The following items are listed to highlight some of the key direction from the Forest Plan; primarily from Chapter 3, Forestwide Standards and Guidelines. The "*Watershed Conservation Practices Handbook*" was also used to develop mitigation measures for each alternative.

Heritage Resources

Areas considered as having a high probability of containing heritage resources (cultural sites) have been intensively surveyed by cultural resource specialists. All proposed actions have received clearance and concurrence from the Colorado State Historic Preservation Officer. Site-specific heritage resource mitigation is contained in Section 2.6.4

Scenery

Areas within the viewshed of a priority travel route or use area as identified in the Forest Plan, if retained in the timber-suitable land base, have been allocated to either scenic viewshed or modified landscape land use designations in the Forest Plan. Units within these areas have been designed to meet the visual quality objectives of the applicable designation.

Soils, Water Quality and Wetlands

Mechanical treatment units will not exceed sustained slopes of 35 percent. Some prescribed burning units will exceed 35 percent. With the exception of stream crossings, wetland and riparian areas will be avoided during mechanical operations. Temporary road locations avoid slopes greater than 20 percent, unstable areas, and areas in the vicinity of deep gullying where natural processes have created deeply eroded areas over the past decades.

Limit conventional logging equipment to slopes less than 30% on Nunn loam (soil unit 36D) and to slopes less than 25% on Carracas loam (4E), Corta silt loams (11D, 11E), Dunton loam (12D), Heflin loam (19D), Hunchback clay loam (22D), and Mayoworth silt loam (30E) unless more site specific soils information indicates that this restriction is not necessary.

Threatened, Endangered, and Sensitive Species

A biological assessment has been completed for any threatened or endangered species potentially inhabiting the project area. Standards and guidelines have been applied as needed

to ensure that any listed species or its habitat will not be adversely affected. Please refer to *Appendix C, Biological Assessment*.

Biological evaluations for all sensitive species potentially inhabiting the project area have been completed. Where feasible, mitigation measures for potentially affected species have been incorporated into the project. Please refer to *Appendix D, Biological Evaluation*.

Implementation and Effectiveness Monitoring

Routine implementation monitoring assesses whether the project was implemented as designed and whether or not it complies with the Forest Plan. Planning for routine implementation monitoring began with the preliminary design of the Kenney Flats project.

Routine implementation monitoring is part of the administration of all project contracts. Performance is monitored relative to contract requirements. Input by resource staff specialists, such as foresters, biologists, soil scientists, hydrologists and engineers, are regularly requested during this implementation monitoring process. These specialists provide technical advice when questions arise during project implementation.

San Juan National Forest staff annually monitors application of Forest Plan standards and guidelines for implementation effectiveness. The results of this and other monitoring are summarized in a National Forest Annual Monitoring and Evaluation Report. This report provides information about how well the management direction of the Forest is being carried out, and measures the accomplishment of anticipated outputs, activities and effects.

Effectiveness monitoring is designed to determine how well specific design features or mitigation measures work in protecting natural resources and their beneficial uses. The restoration of healthy forest conditions at Kenney Flats will be monitored by observing application of mitigation measures, the improvement in the vigor of the residual trees, the behavior of natural fires, and the trends in insect and disease populations in the area. Individual resource staff specialists and/or interdisciplinary monitoring teams will assess resource protection measures as well as progress toward reaching project goals.

The project manager or contract administrator is the person primarily responsible for monitoring and documenting the implementation and effectiveness of the site-specific mitigation measures identified in this document. That individual will modify requirements or impose additional ones to remedy observed inadequacies, with the assistance of the appropriate resource staff. The contract administrator will also work with specific specialists as needed in the application and effectiveness monitoring of the various mitigation measures. The ID Team will monitor implementation of selected measures by visiting the sale during the active sale contract period and post-sale time, determining where and whether mitigation was appropriately applied and assessing mitigation effectiveness.

Findings and Disclosures

Several laws and executive orders require project-specific findings or other disclosures which apply to all alternatives considered in detail in this EA.

National Forest Management Act

All project alternatives fully comply with the Forest Plan. This project incorporates all applicable Forest Plan forest-wide standards and guidelines and management area prescriptions as they apply to the project area, and complies with Forest Plan goals and objectives. This includes additional direction contained in all amendments. All required interagency review and

coordination has been accomplished; new or revised measures resulting from this review have been incorporated.

The Forest Plan complies with all resource integration and management requirements of 36 CFR 219 (219.14 through 219.27). Application of Forest Plan direction for the Kenney Flats project ensures compliance at the project level.

Endangered Species Act

None of the alternatives is anticipated to have a direct, indirect or cumulative effect on any threatened or endangered species in or outside the project area. A complete biological assessment is included in the planning record and *Appendix C, Biological Assessment*.

National Historic Preservation Act

Cultural resource surveys of varying intensities have been conducted, following inventory protocols approved by the State Historic Preservation Officer. Native American communities have been contacted and comment encouraged. The consultation and concurrence process with the State Historic Preservation Officer has been concluded. Potentially adverse effects to identified, historically significant heritage resources have been mitigated in consultation with the State Historic Preservation Officer (SHPO) and approved by SHPO.

Clean Water Act

The design of project activities and roads is in accordance with Forest Plan standards and guidelines, the Regional Guide, Watershed Conservation Practices Handbook practices, and applicable Forest Service manual and handbook direction. Monitoring and evaluation of the implementation and effectiveness of Forest Plan standards and guidelines and Watershed Conservation Practices Handbook practices will occur. Project activities will meet all applicable State water quality standards.

All roads will be designed and constructed in accordance with the applicable best management practices listed at 33 CFR 323.4(a). No permits under Section 404 of the Clean Water Act will be required.

Clean Air Act

Emissions anticipated from the implementation of any project alternative will be of short duration and are not expected to exceed State of Colorado ambient air quality standards (18 AAC 50). Short-term, air borne particulate matter related to log truck traffic is an effect of several of the action alternatives. Smoke from prescribed fires is also an impact of the burning plan. Applicable burning permits will be received from the State prior to the initiation of prescribed burns.

All of the impacts to air quality are of short duration and will not have long-term negative air quality impacts.

Executive Order 12898, Environmental Justice Act

Implementation of any project alternative is not anticipated to cause disproportionate adverse human health or environmental effects to minority or low-income populations