Appendix A
Empire Project Maps

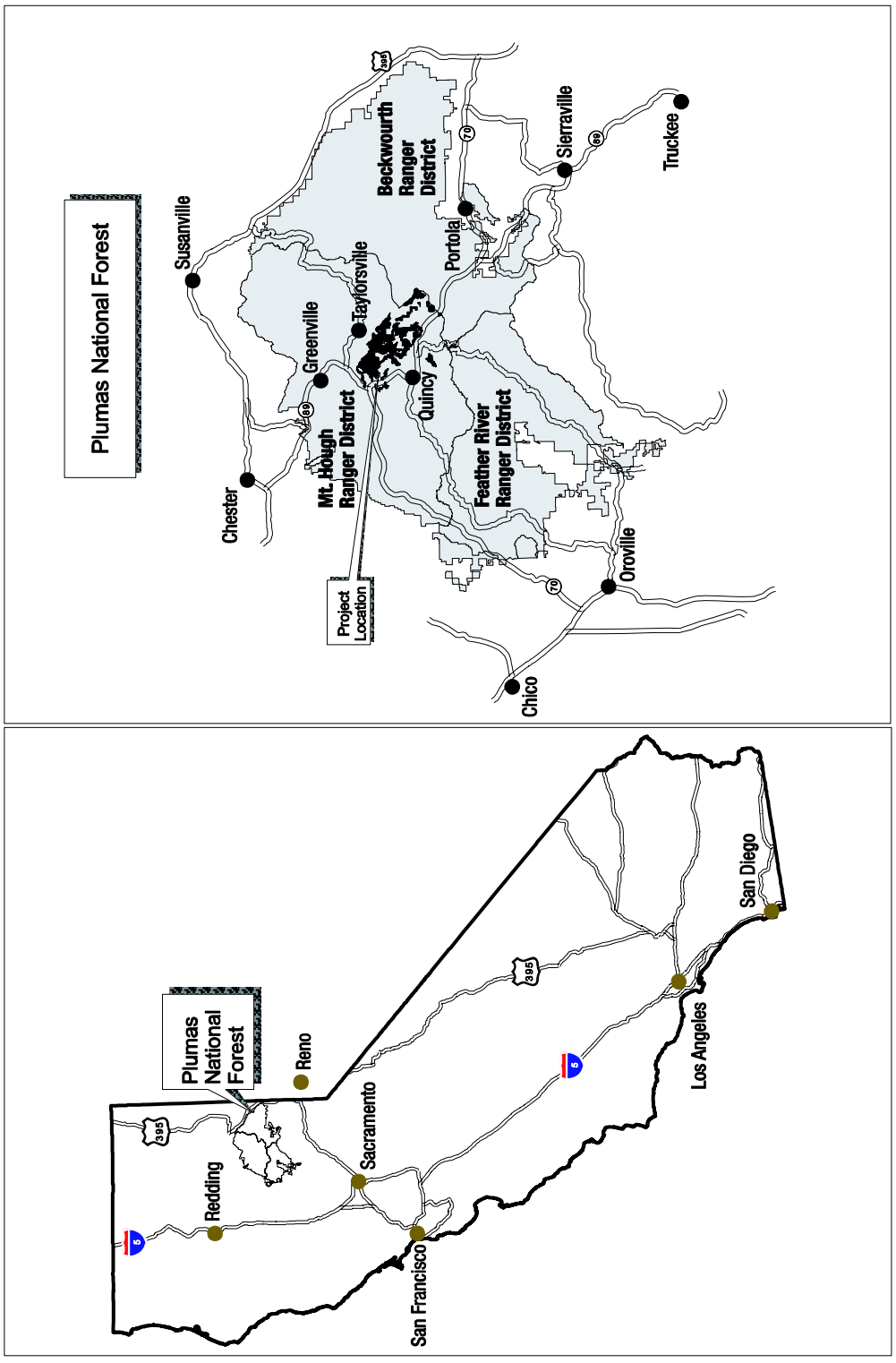


Figure A-1. Empire Vegetation Management Project vicinity map.

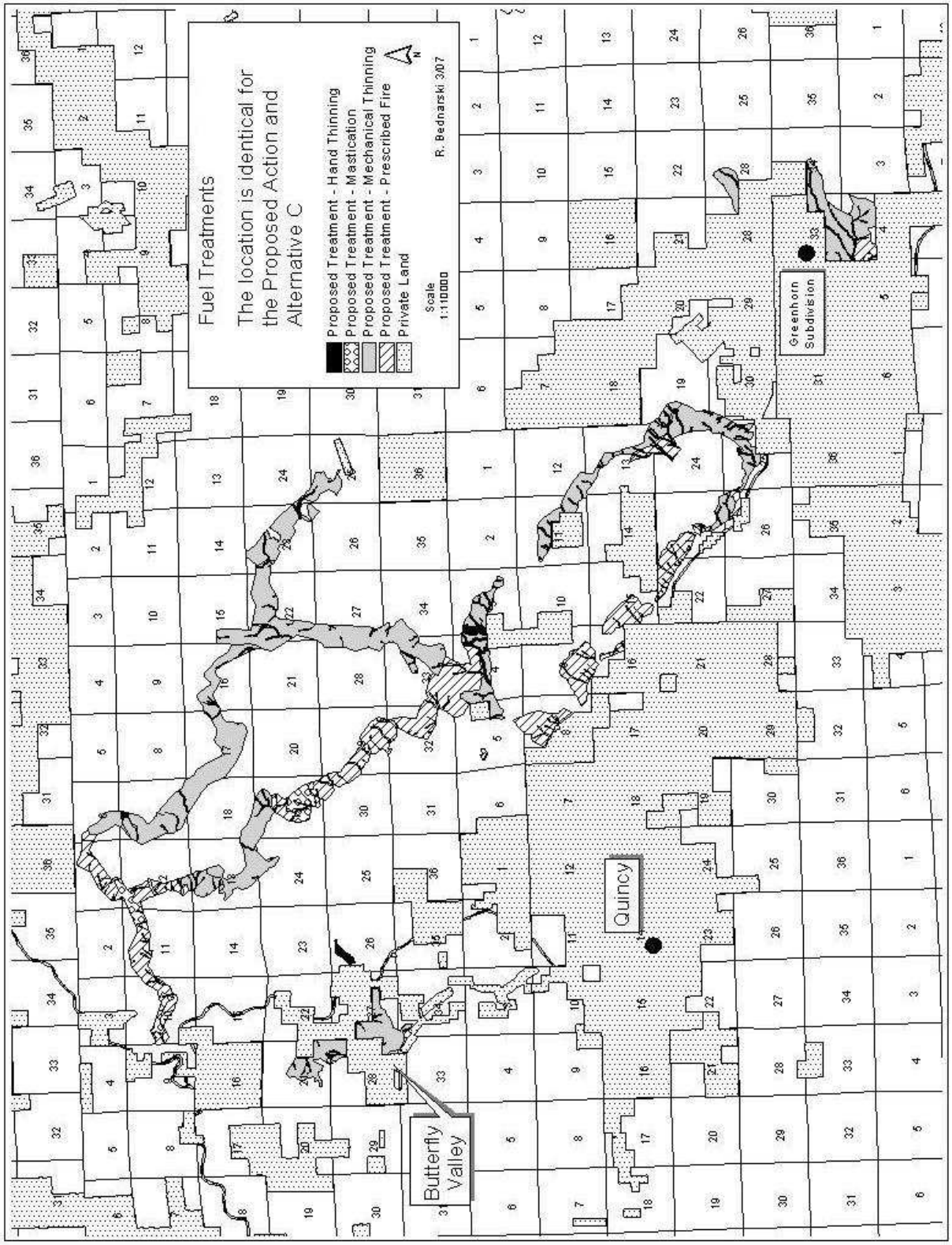


Figure A-2. Proposed fuels treatments, alternative C.

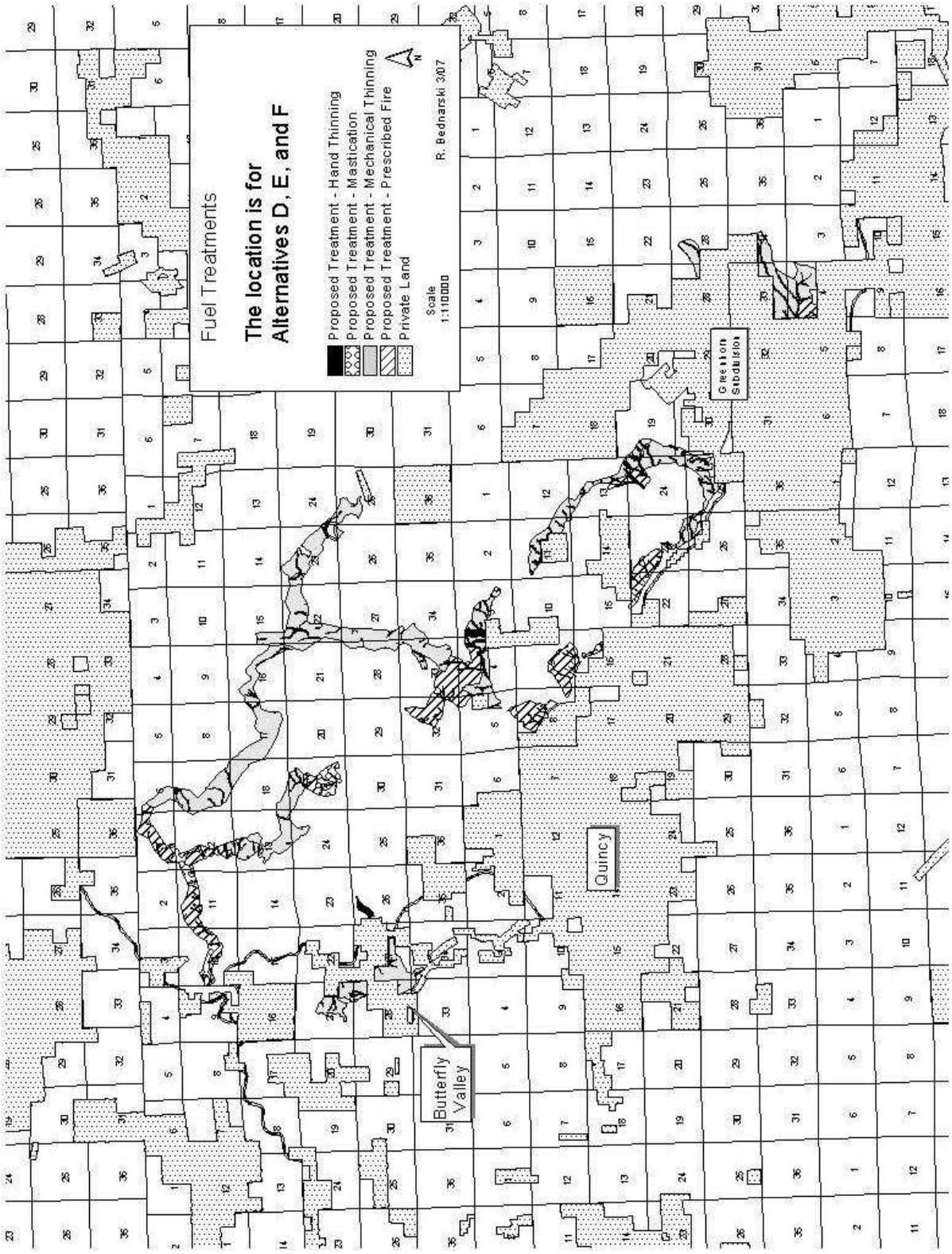


Figure -2a. Proposed fuels treatments, alternative D, E &

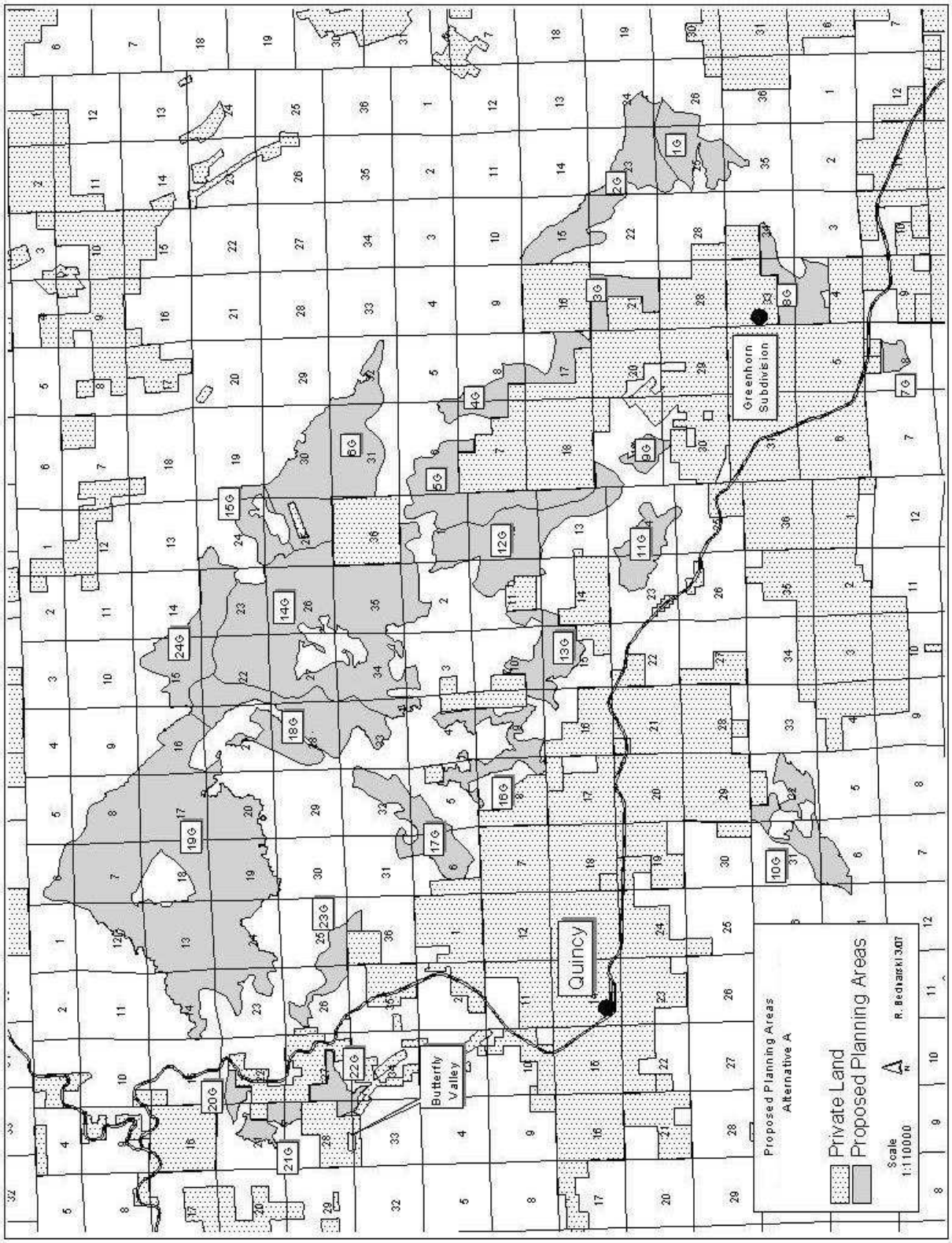


Figure A-3. Proposed Defensible Fuel Zones, alternative A

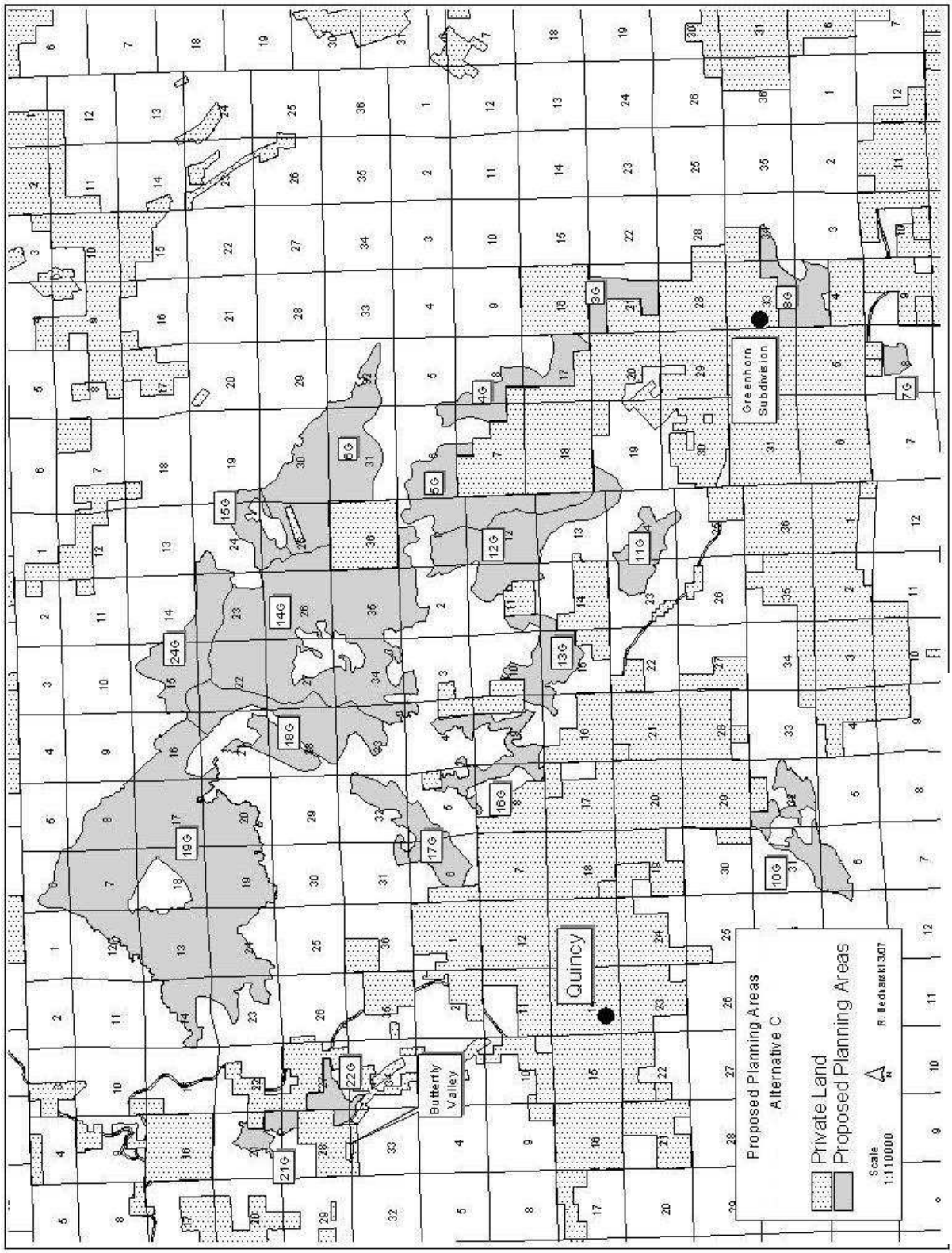


Figure A-4. Proposed planning areas, alternative C.

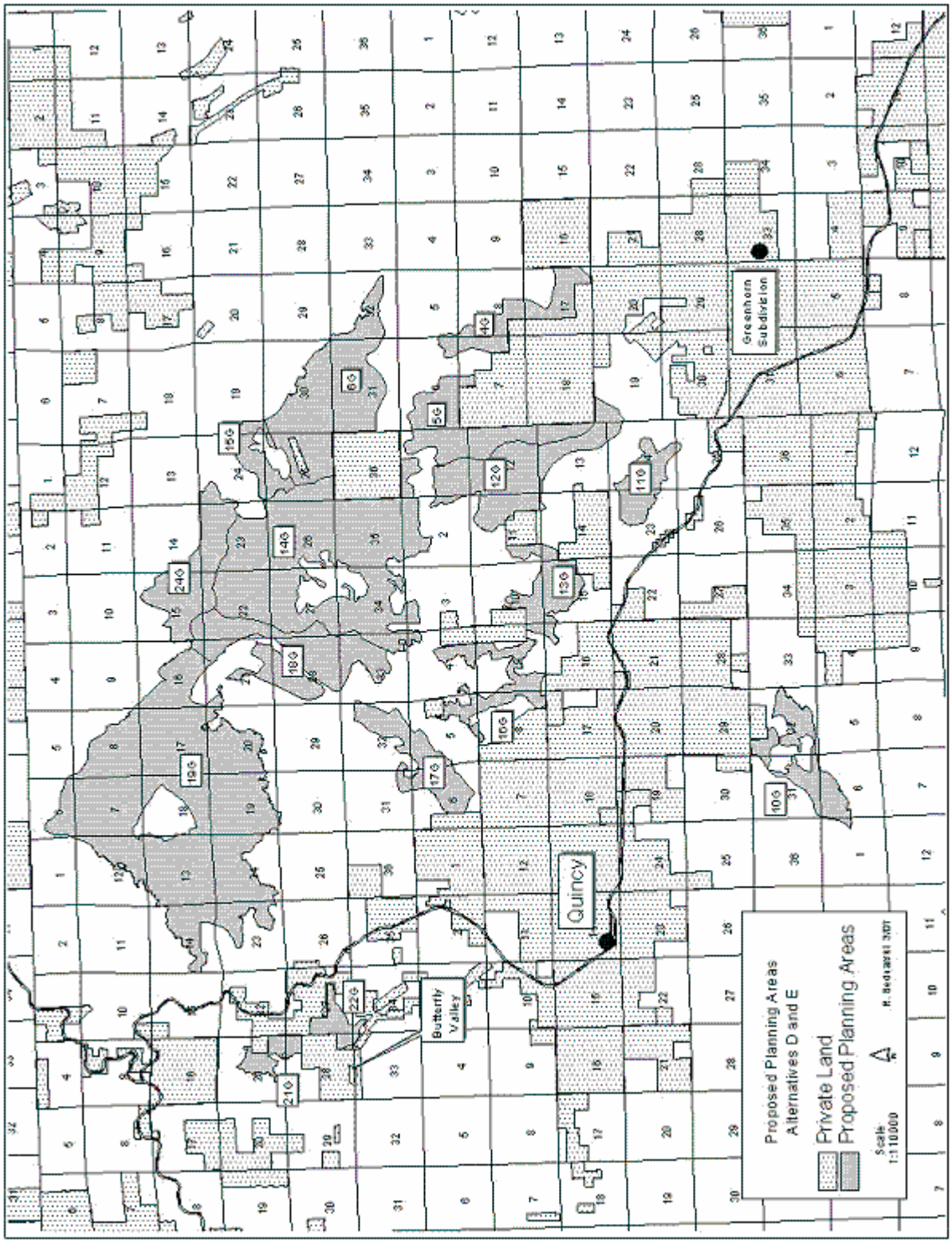
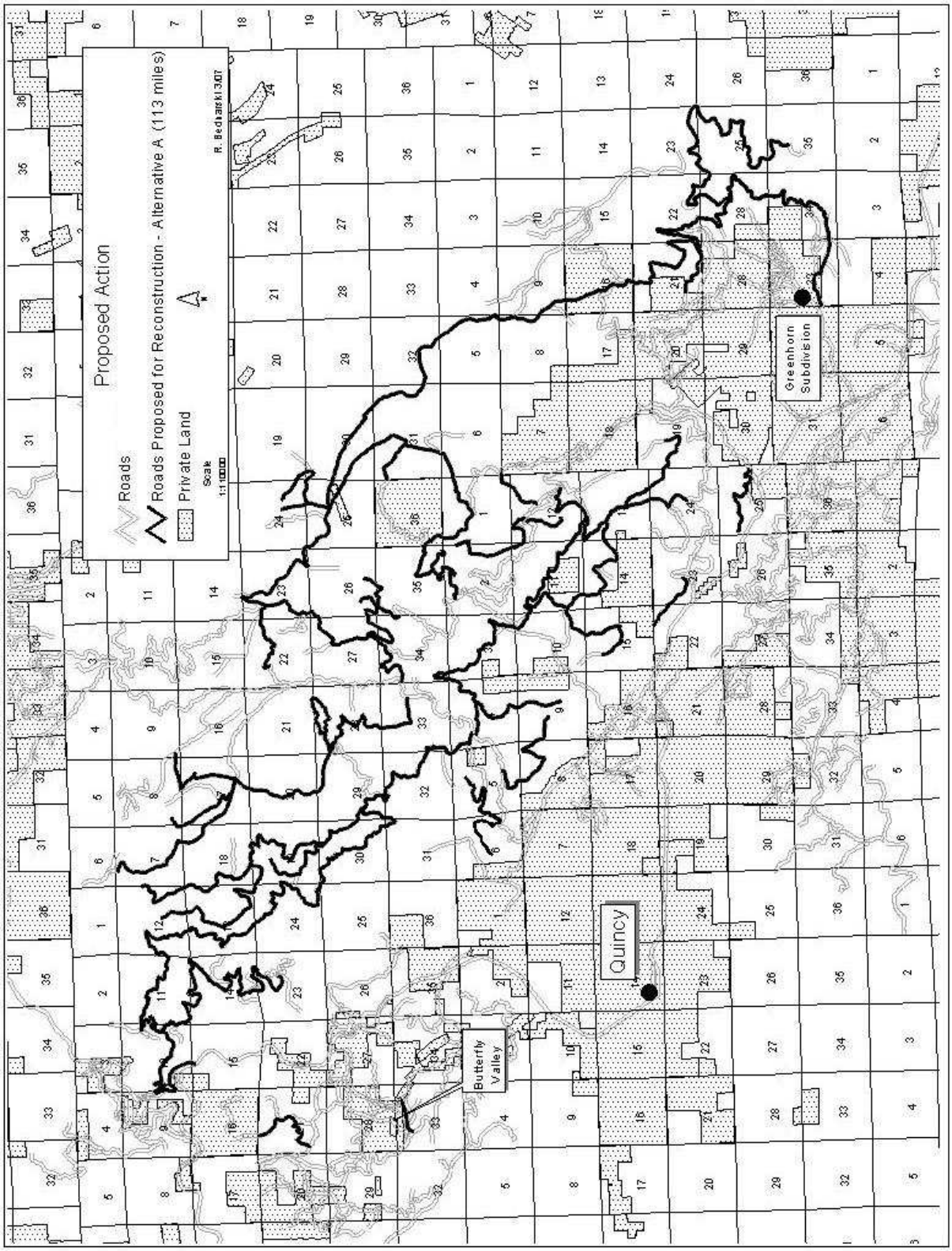


Figure A-5. Proposed planning areas, alternatives D and E.


Proposed Action
Roads
Roads Proposed for Reconstruction - Alternative A (113 miles)
Private Land
Scale
1:110000
R. Bednarski 3/07
Greenhorn Subdivision
Quincy
Butterfly Valley

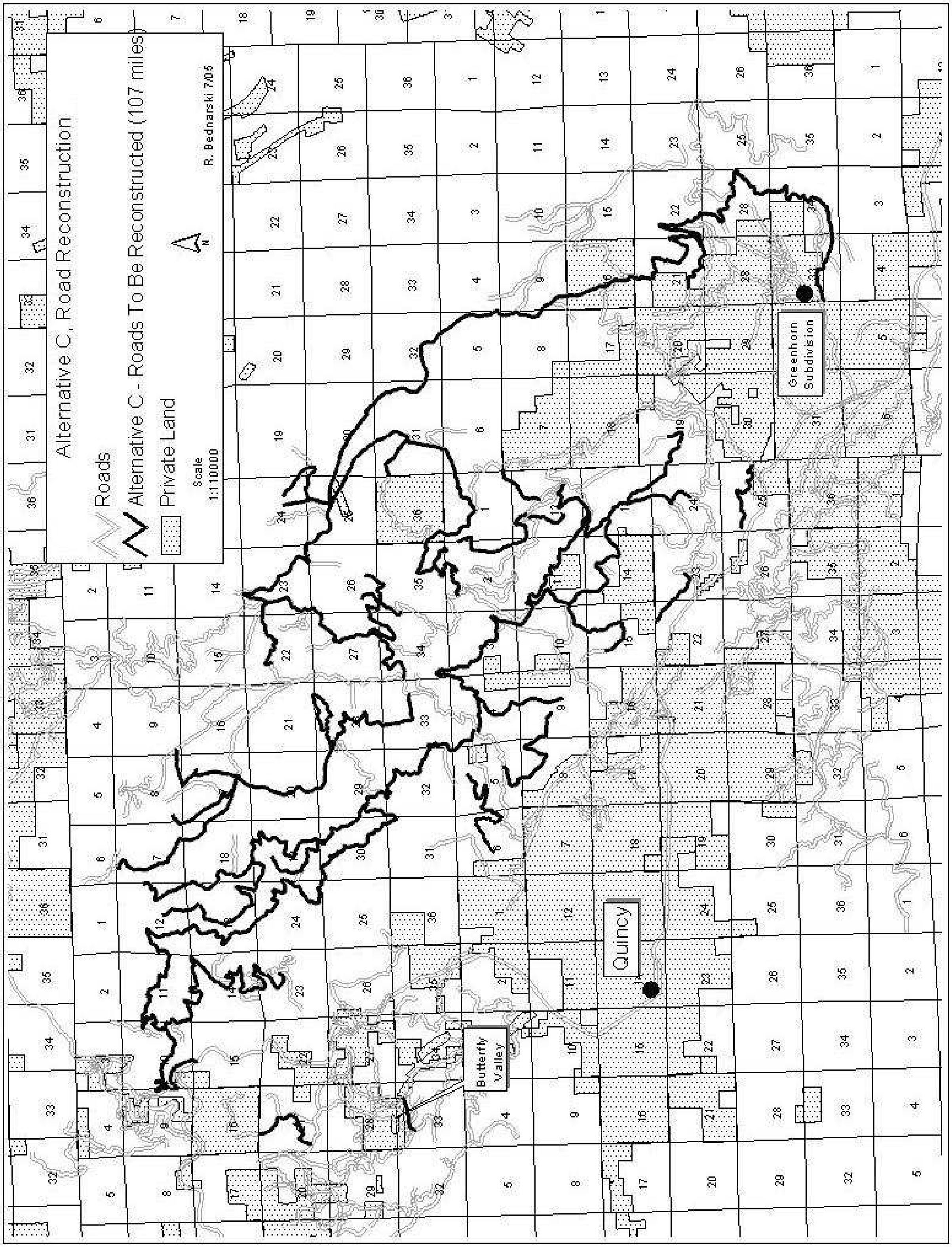


Figure A-7. Alternative C — road reconstruction.

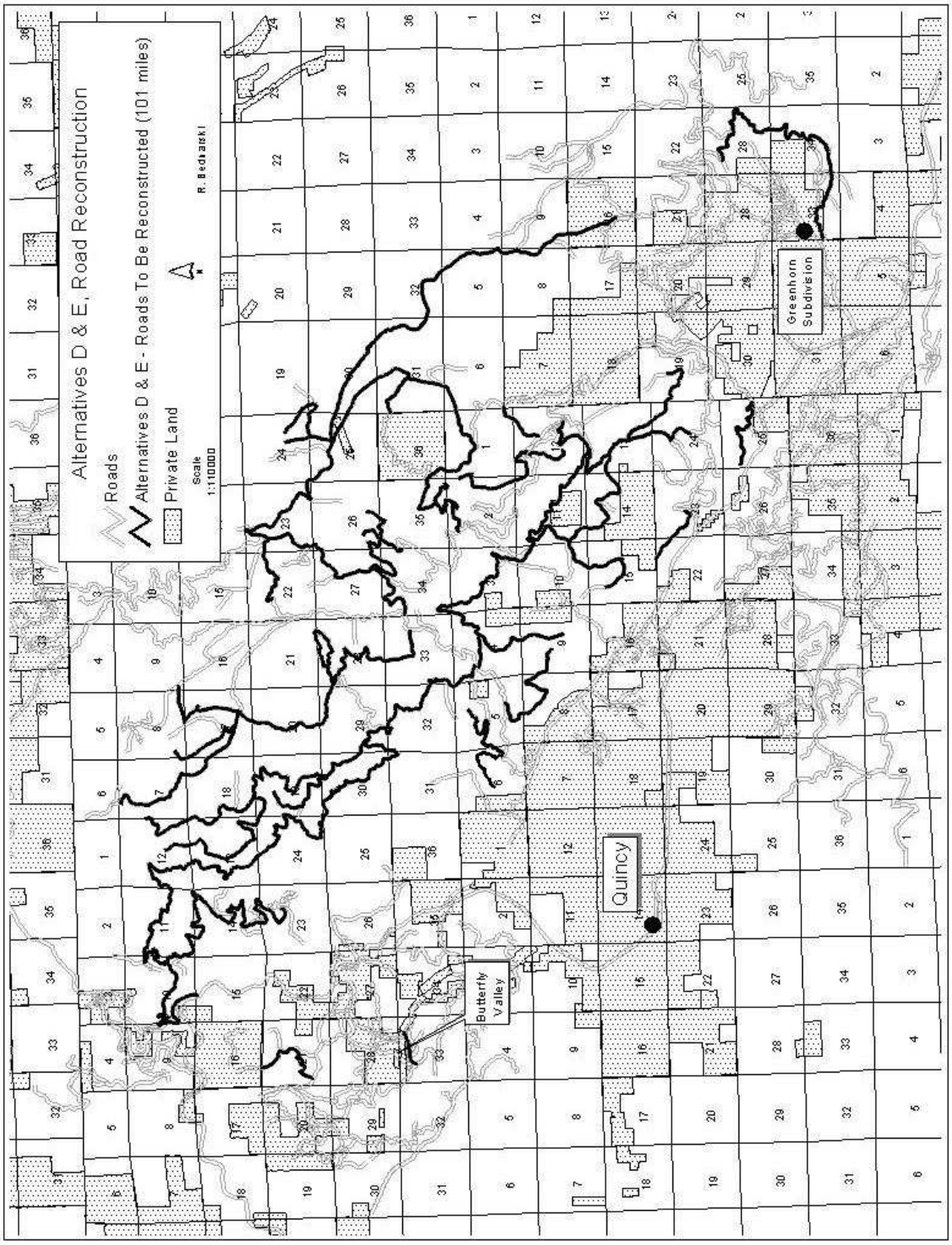


Figure A-8. Alternatives D and E — road reconstruction.

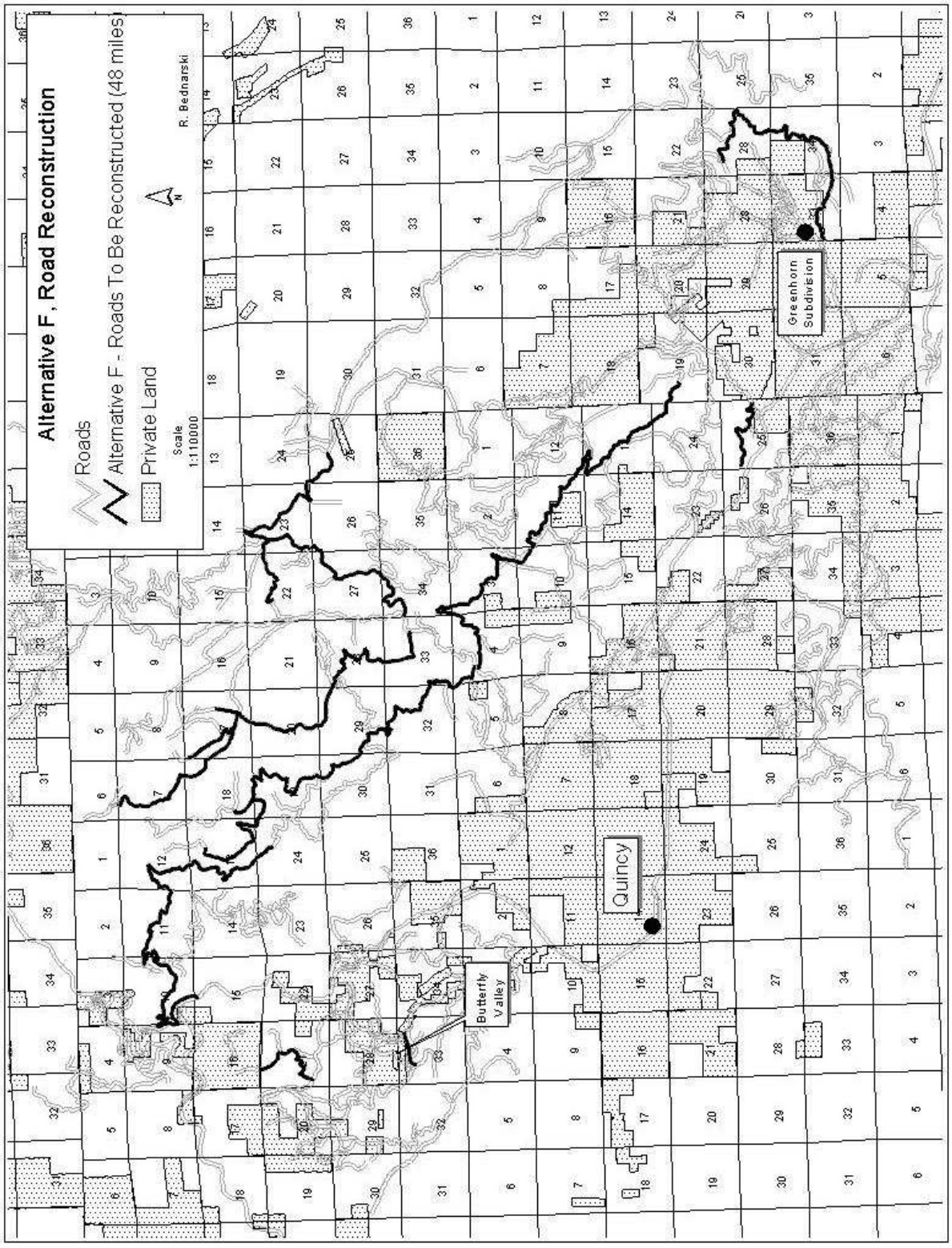


Figure A-9. Alternative F — road reconstruction.

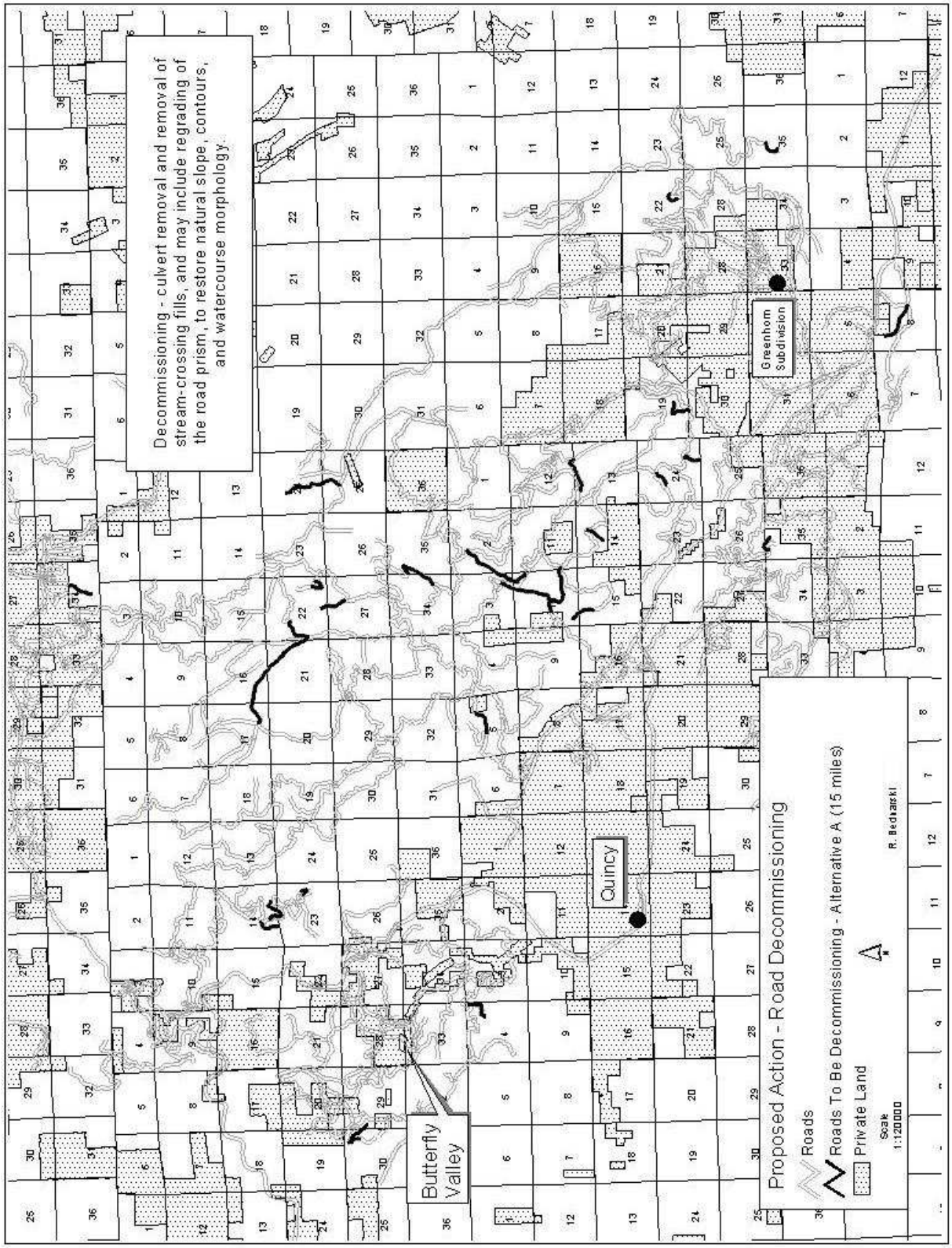


Figure A-10. Proposed action — road decommissioning, alternative A

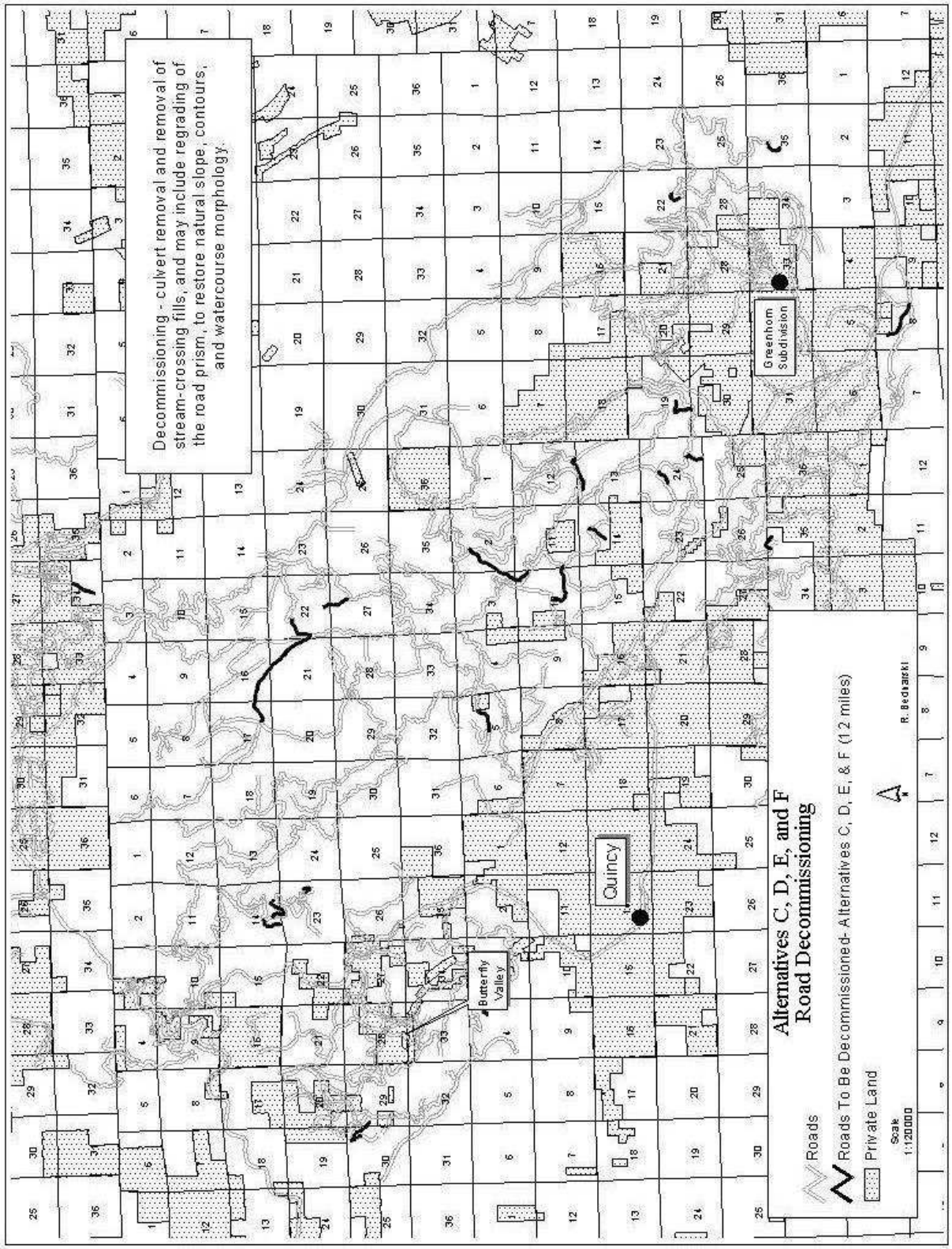


Figure A-11. Alternatives C, D, E, and F — road decommissioning.

Figure A-12. Proposed action — road closure.

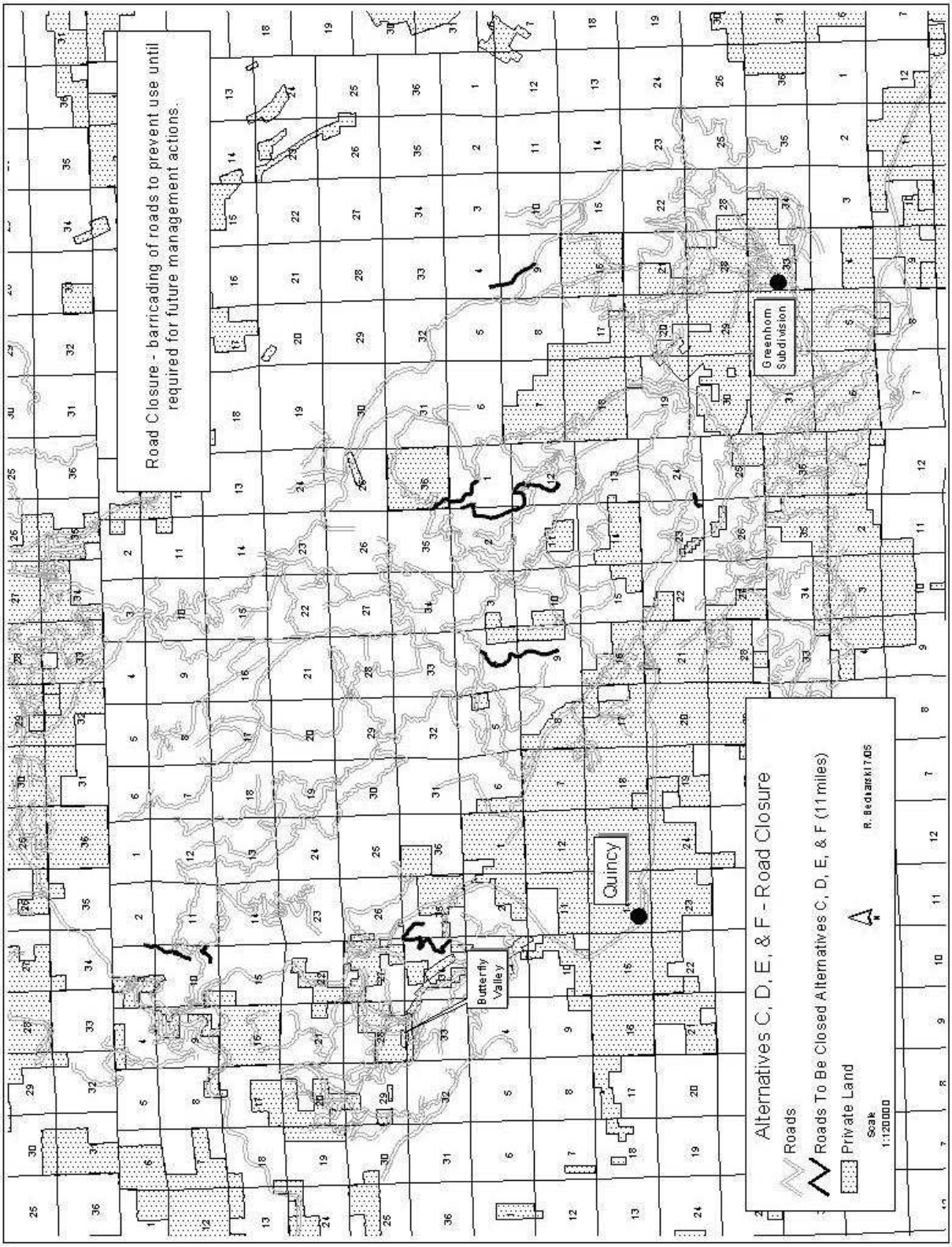


Figure A-13. Alternatives C, D, E, and F — road closure.

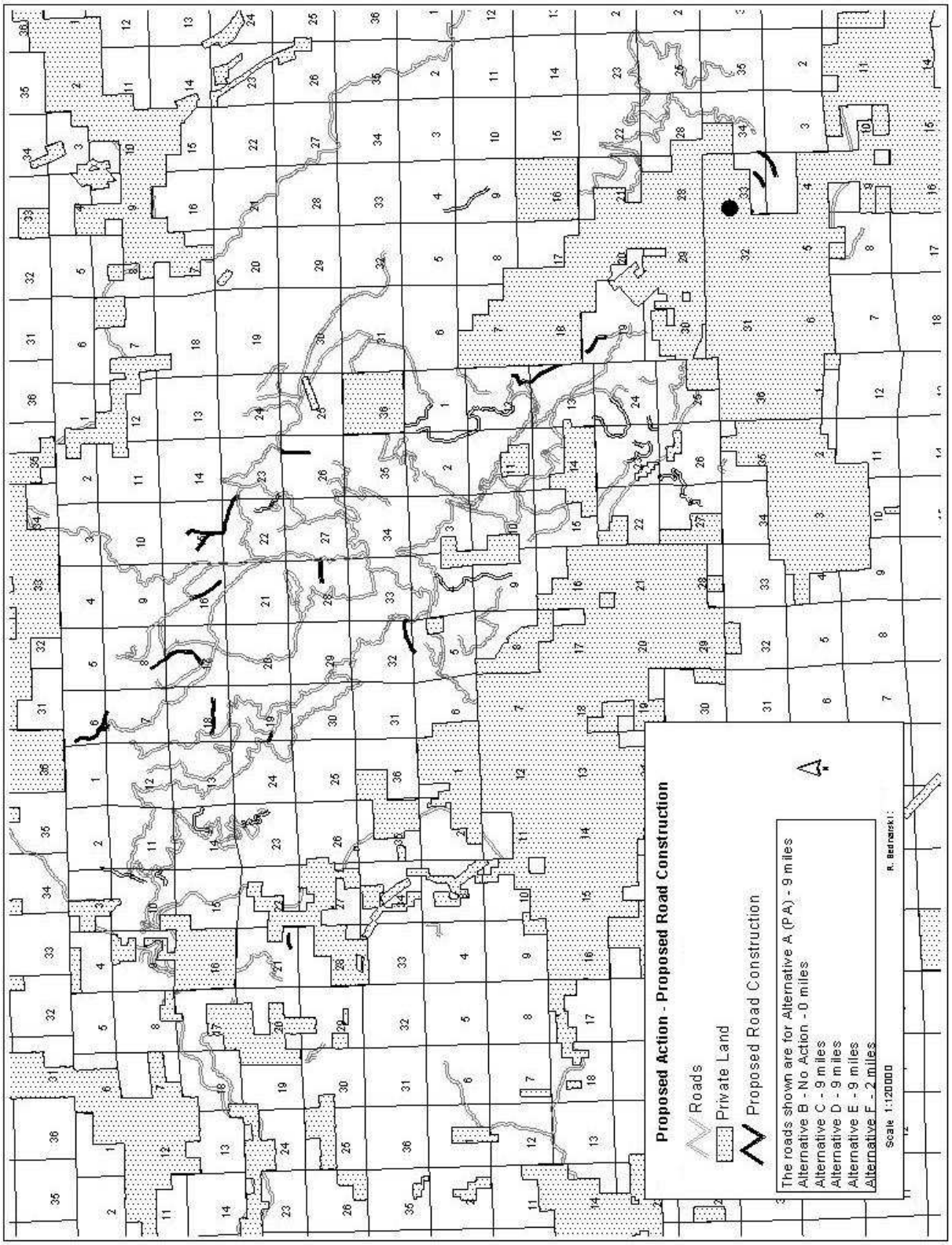


Figure A-14. Proposed action — road construction.

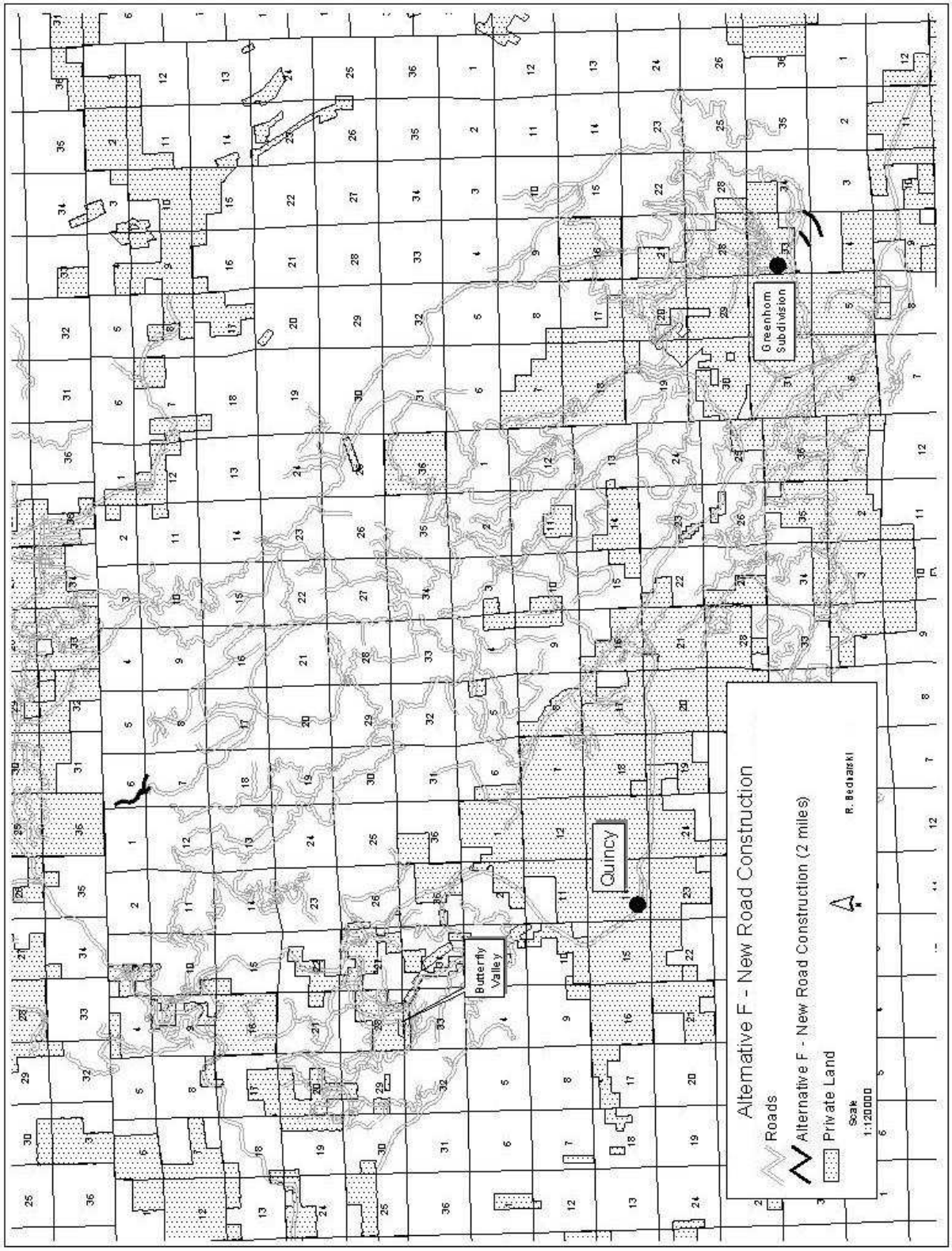


Figure A-15. Alternative F — road construction.

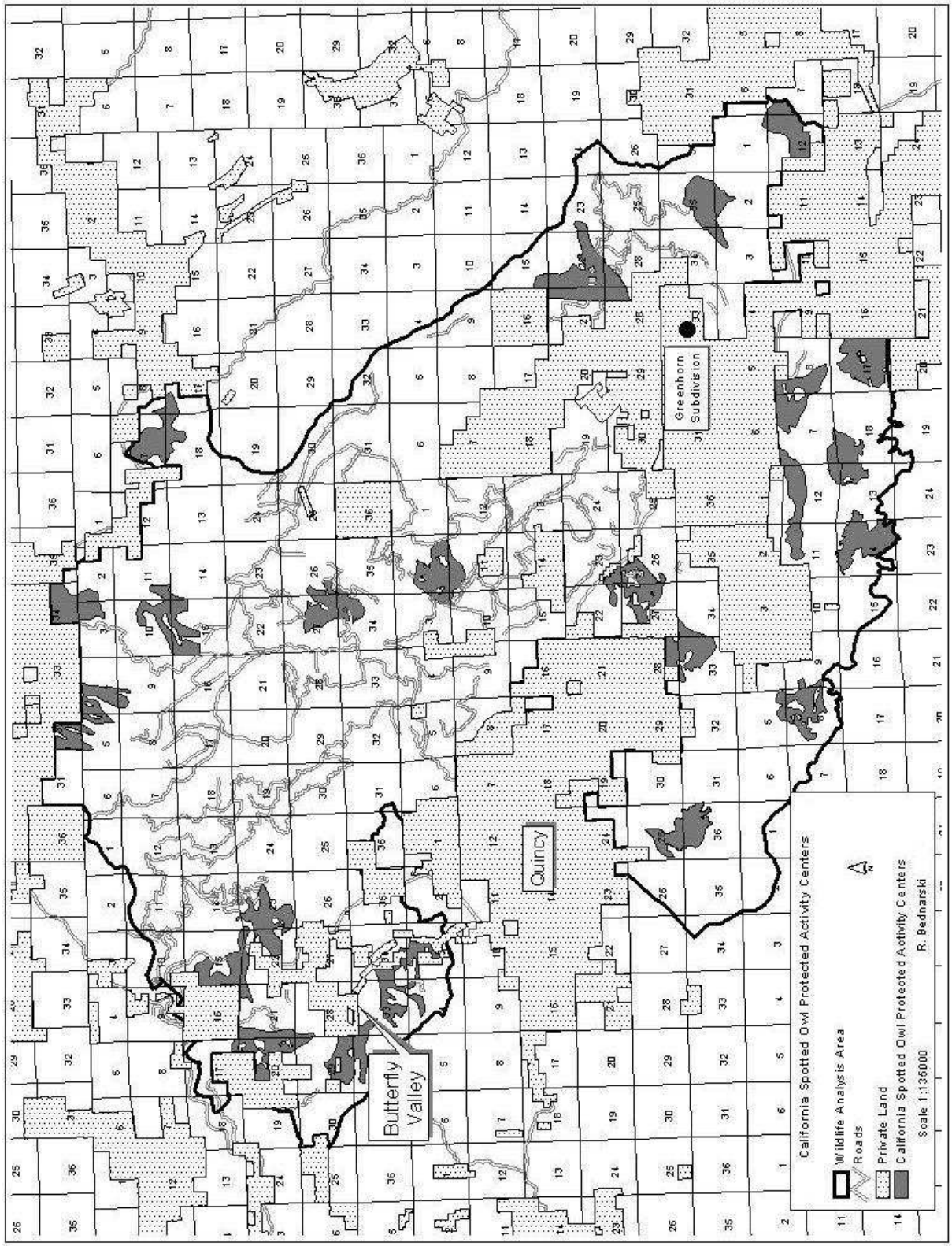


Figure A-16. California Spotted Owl Protected Activity Centers.

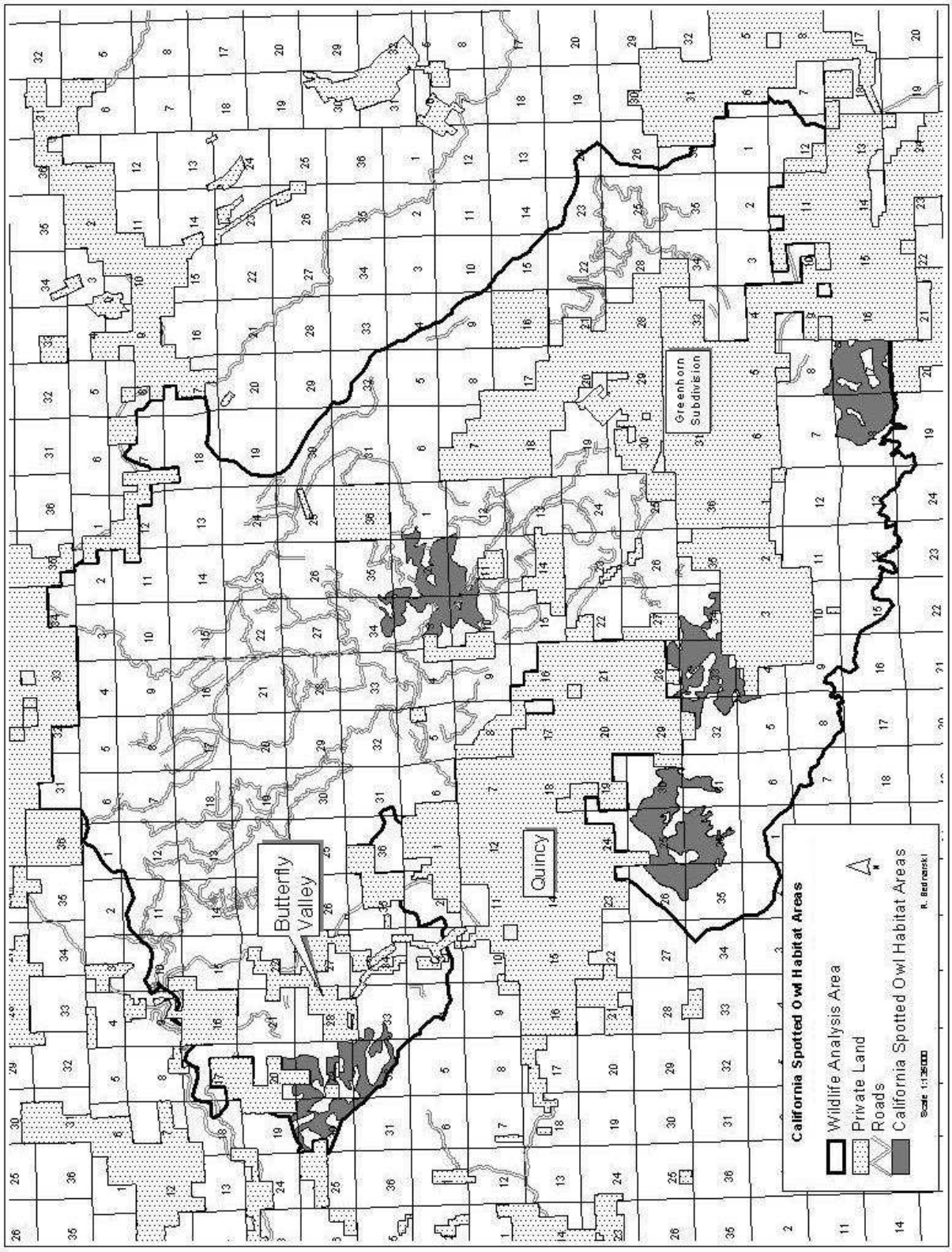


Figure A-17. California Spotted Owl Habitat Areas.

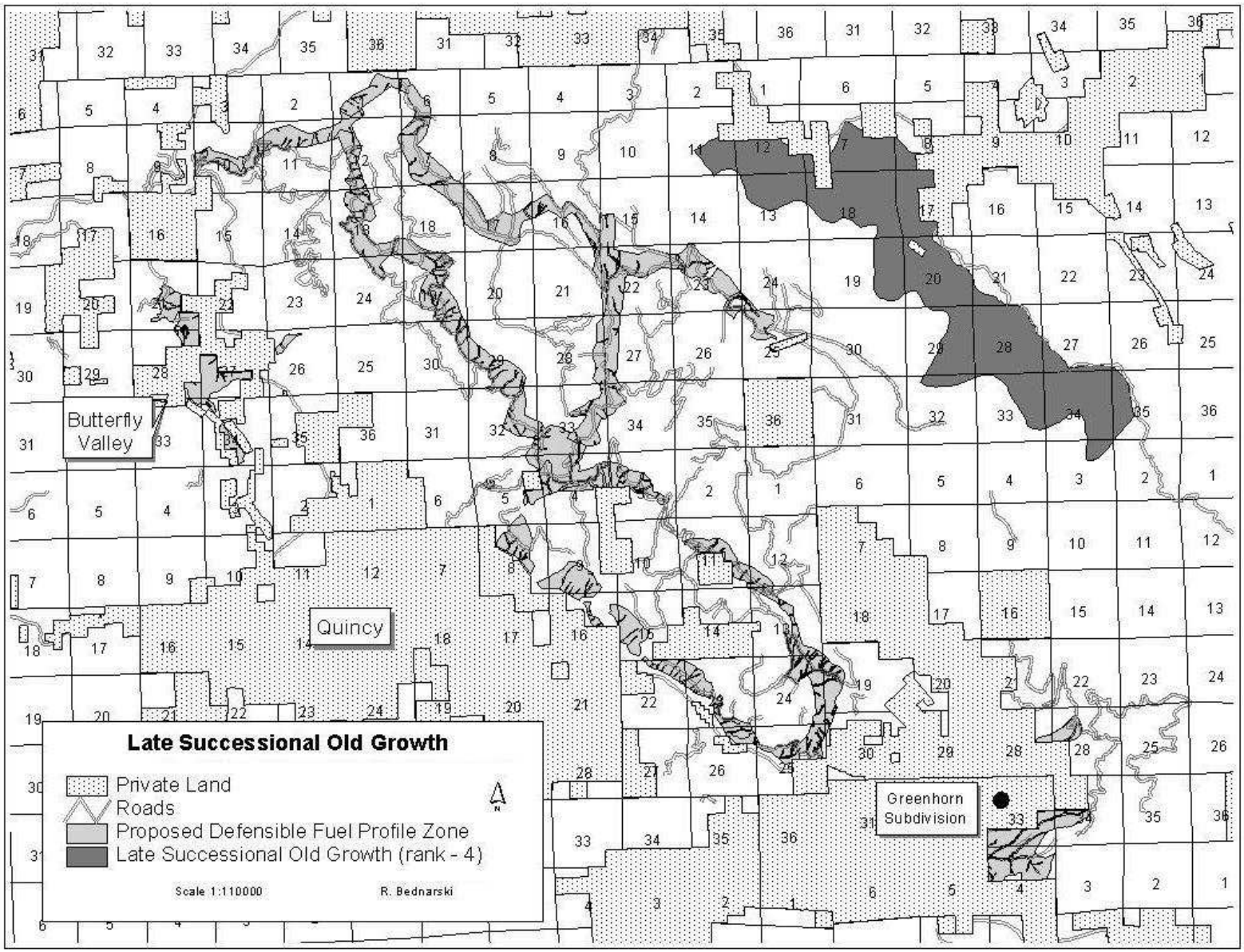


Figure A-18. Late-successional old-growth stands.

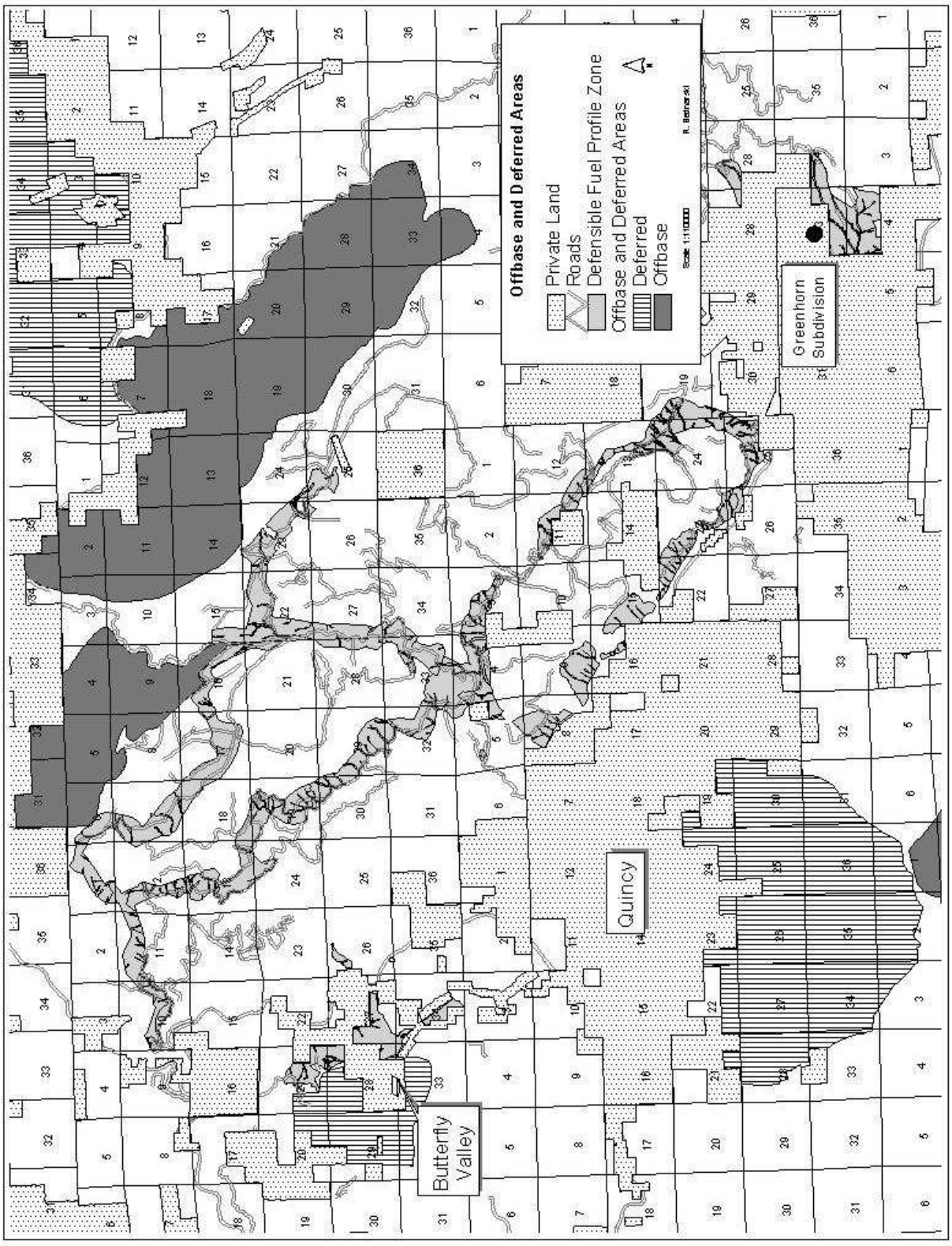


Figure A-19. Off Base and Deferred Lands.

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Appendix B

Fuel Reduction — Existing Condition and Proposed Treatment by Treatment Unit

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Table B.1. Fuel reduction — existing condition and proposed treatment by treatment unit.

Unit / Acres	Watershed	Physical Characteristics	Existing Condition		Treatment, Logging System, and Access Needs[c]	Remarks[d]
			Fuels[a]	CWHR Vegetation Type[b]		
1 / 315	Sockum and Big Blackhawk	Gravelly loam to clay loam soils Moderate erosion hazard Elev: 4,200–4,600 feet Slope: 0–35% Aspect: predominantly SW	111 ac. Model 5 51 ac. Model 9 153 ac. Model 10 162 ac. FCC1 153 ac. FCC2 and 3	187ac Sierran mixed conifer 68ac. montane hardwood 53ac ponderosa pine 7ac montane chaparral	Mechanical harvest 50% of unit by ground-based equipment; prescribed fire Brush mastication and prescribed fire on portions of remaining 50%	Northwest portion of unit burned in wildfire in 1970 Taylor Creek present Irrigation Ditch present 14 ac in 5M and 5D classes Western third of unit in WUI
2 / 746	Big Blackhawk and Sockum	Very gravelly silt loam to clay loam soils Moderate to high erosion hazard Elev: 4,200–5,200 feet Slope: 0–55% Aspect: predominantly SW	376 ac. Model 5 264 ac. Model 9 106 ac. Model 10 640 ac. FCC1 106 ac. FCC2 and 3	140 ac Sierran mixed conifer 98 ac ponderosa pine 488 ac montane hardwood 20 ac montane chaparral	Prescribed fire Brush mastication on portions	Portions of unit burned by wildfire in 1931, 1943, 1970, 1972, 1977
3 / 323	Sockum and Estray	Gravelly loam to clay loam soils Moderate to high erosion hazard Elev: 4,400–5,300 feet Slope: 6–45% Aspect: predominantly SW	13 ac. Model 5 4 ac. Model 9 306 ac. Model 10 17 ac. FCC1 306 ac. FCC2 and 3	316 ac Sierran mixed conifer 6 ac ponderosa pine 1ac montane chaparral	Mechanical harvest with ground-based equipment; prescribed fire	Between Mt. Hough Rd and Squirrel Ck 14 ac in 5M and 5D classes
4 / 320	Sockum and Estray	Gravelly loam to clay loam soils Moderate to high erosion hazard Elev: 3,900–4,800 feet Slope: 0–5% Aspect: S	15 ac. Model 5 305 ac. Model 10 15 ac. FCC1 305 ac. FCC2 and 3	309 ac Sierran mixed conifer 11 ac ponderosa pine	Mechanical harvest 50% of unit by ground-based equipment; prescribed fire. Hand thin, pile and burn portions of remaining 50%	North of Williams Loop Dissected with drainages, steep and narrow WUI

Table B.1. Fuel reduction — existing condition and proposed treatment by treatment unit (continued).

Unit / Acres	Watershed	Physical Characteristics	Existing Condition		Treatment, Logging System, and Access Needs[c]	Remarks[d]
			Fuels[a]	CWHR Vegetation Type[b]		
5 / 28	Sockum	Gravelly loam to clay loam soils Moderate to high erosion hazard Elev: 3,900–4,200 feet Slope: 6–45% Aspect: predominantly S	6 ac. Model 5 22 ac. Model 10 6 ac. FCC1 22 ac. FCC2 and 3	23 ac Sierra mixed conifer 5 ac ponderosa pine	Prescribed fire	Small, steep, open unit, adjacent to RR tracks and Hwy 70; uphill from tracks WUI
6 / 77	Sockum	Gravelly loam to clay loam soils Moderate to high erosion hazard Elev: 3,800–4,300 feet Slope: 6–45% Aspect: predominantly W	8 ac. Model 5 69 ac. Model 10 8 ac. FCC1 69 ac. FCC2 and 3	77 ac Sierran mixed conifer	Mechanical harvest less than 30% of unit Hand thin, pile and burn portions of remaining unit	Power line Limited mechanical ground Access on small ridgetops WUI
7 / 156	Sockum	Gravelly loam to clay loam soils Moderate to high erosion hazard Elev: 3,800–4,000 feet Slope: 0–45% Aspect: predominantly SW	40 ac. Model 5 17 ac. Model 9 99 ac. Model 10 57 ac. FCC1 99 ac. FCC2 and 3	99 ac Sierran mixed conifer 36 ac ponderosa pine 17 ac montane hardwood 4 ac montane chaparral	Prescribed fire	Along RR tracks Steep, just east of Massack WUI
8 / 20	Sockum	Gravelly loam to clay loam soils Moderate erosion hazard Elev: 3,700–3,900 feet Slope: 6–25% Aspect: predominantly SW	12 ac. Model 5 6 ac. Model 9 2 ac. Model 10 18 ac. FCC1 2 ac. FCC2 and 3	2 ac Sierran mixed conifer 12 ac ponderosa pine 6 ac montane hardwood	Prescribed fire	Along Chandler Rd, above RR tracks WUI

Table B.1. Fuel reduction — existing condition and proposed treatment by treatment unit (continued).

Unit / Acres	Watershed	Physical Characteristics	Existing Condition		Treatment, Logging System, and Access Needs[c]	Remarks[d]
			Fuels[a]	CWHR Vegetation Type[b]		
9 / 182	Sockum	Gravelly loam to clay loam soils Moderate to high erosion hazard Elev: 3,700–4,300 feet Slope: 6–35% Aspect: predominantly SW	96 ac. Model 5 12 ac. Model 9 74 ac. Model 10 108 ac. FCC1 74 ac. FCC2 and 3	74 ac Sierran mixed conifer 19 ac montane hardwood 89 ac montane chaparral	Prescribed fire	Along Chandler Rd Johnson Hill WUI Steep portions
10 / 147	Sockum	Gravelly loam to clay loam soil Moderate to high erosion hazard Elev: 3,600–4,300 feet Slope: 6-45% Aspect: predominantly SW	79 ac. Model 5 55 ac. Model 9 13 ac. Model 10 134 ac. FCC1 13 ac. FCC2 and 3	75 ac Sierran mixed conifer 11 ac ponderosa pine 55 ac montane hardwood 6 ac montane chaparral	Prescribed fire	Along Chandler Rd WUI Steep below road
11 / 76	Estray	Gravelly loam to clay loam soils High to very high erosion hazard Elev: 5,000–5,400 Slope: 6–35% Aspect: predominantly S	6 ac. Model 5 67 ac. Model 10 6 ac. FCC1 67 ac. FCC2 and 3	60 ac Sierran mixed conifer 13 ac white fir 4 ac rock	Mechanical harvest portions along ridgetop and bottom near road; prescribed fire. Hand thin, pile and burn portions of remaining unit	3 acres of unit is nonflammable fuels Rock outcrops Near Greenhorn Ranch development WUI
12 / 152	Big Blackhawk	Gravelly loam to clay loam soils Moderate erosion hazard Elev: 4,900–5,300 feet Slope: 0–35% Aspect: predominantly S	43 ac. Model 5 1 ac. Model 9 107 ac. Model 10 44 ac. FCC1 107 ac. FCC2 and 3	150 ac Sierran mixed conifer 1 ac montane hardwood 1 ac montane chaparral	Prescribed fire and mastication on 40% of area	Portions of unit burned by wildfire in 1931 and 1943 Mid-slope 3 ac in 5M and 5D classes

Table B.1. Fuel reduction — existing condition and proposed treatment by treatment unit (continued).

Unit / Acres	Watershed	Physical Characteristics	Existing Condition		Treatment, Logging System, and Access Needs[c]	Remarks[d]
			Fuels[a]	CWHR Vegetation Type[b]		
13 / 322	Big Blackhawk	Very gravelly silt loam to clay loam soils Moderate to high erosion hazard Elev: 4,600–5,500 feet Slope 0–45% Aspect: predominantly SW	9 ac. Model 5 3 ac. Model 9 310 ac. Model 10 12 ac. FCC1 310 ac. FCC2 and 3	317 ac Sierran mixed conifer 5 ac ponderosa pine	Mechanical harvest by ground-based equipment; prescribed fire Hand thin, pile and burn steep portions of unit	Mid-slope, some steep ground in middle of unit Tributaries to Cashman Ck 204 ac in 5M and 5D classes
14 / 98	Big Blackhawk	Gravelly loam to clay loam soils Moderate to high erosion hazard Elev: 4,700–5,300 feet Slope: 16–45% Aspect: predominantly W	1 ac. Model 9 97 ac. Model 10 1 ac. FCC1 97 ac. FCC2 and 3	98 ac Sierran mixed conifer	Mechanical harvest all Ground-based yarding on 25%; Aerial yarding on portions of remaining to evaluate effectiveness of biomass removal on steep slopes Prescribed fire on portions	Steep Possible thin along w/GS and ITS 31 ac in 5M and 5D classes
15 / 585	Big Blackhawk and Indian Falls	Very gravelly silt loam to clay loam soils Low to high erosion hazard Elev: 3,500–6,500 feet Slope: 6–55% Aspect: predominantly SW	201 ac. Model 5 200 ac. Model 9 180 ac. Model 10 401 ac. FCC1 180 ac. FCC2 and 3	156 ac Sierran mixed conifer 60 ac ponderosa pine 65 ac white fir 218 ac montane hardwood 83 ac montane chaparral 3 ac rock	Prescribed fire Brush mastication on portions	Large portion of unit burned by wildfire in 1946. 4 ac of unit is nonflammable fuels Goat Hill 5 ac in 5M and 5D classes Western third in WUI
16 / 29	Big Blackhawk	Very cobbly loam to clay loam soils Moderate to high erosion hazard Elev; 5,600–6,100 feet Slope: 16–55% Aspect: predominantly West	1 ac. Model 5 28 ac. Model 10 1 ac. FCC1 28 ac. FCC2 and 3	28 ac white fir 1 ac montane chaparral	Aerial yarding system to evaluate effectiveness of biomass removal on steep slopes Prescribed fire on portions	Steep 16 ac in 5M and 5D classes Clear Creek

Table B.1. Fuel reduction — existing condition and proposed treatment by treatment unit (continued).

Unit / Acres	Watershed	Physical Characteristics	Existing Condition		Treatment, Logging System, and Access Needs[c]	Remarks[d]
			Fuels[a]	CWHR Vegetation Type[b]		
17 / 733	Big Blackhawk and Indian Falls	Very cobbly loam to clay loam soils Moderate to high erosion hazard Elev: 5,500–6,600 feet Slope: 0–55% Aspect: predominantly SW	9 ac. Model 5 703 ac. Model 10 19 ac. Model 12 9 ac. FCC1 722 ac. FCC2 and 3	156 ac Sierran mixed conifer 572 ac white fir 3 ac montane chaparral 2 ac rock	Mechanical harvest with ground-based equipment; prescribed fire	2 ac. of unit is nonflammable fuels SW of Mt. Hough LO Broken topography Tollgate Creek 382 ac in 5M and 5D classes
18 / 871	Sockum, Big Blackhawk, and Indian Falls	Very gravelly clay loam to clay loam soils Moderate to high erosion hazard Elev: 4,800–6,000 feet Slope: 0–35% Aspect: predominantly S	21 ac. Model 5 1 ac. Model 9 848 ac. Model 10 1 ac. Model 12 22 ac. FCC1 849 ac. FCC2 and 3	494 ac Sierran mixed conifer 39 ac ponderosa pine 338 ac white fir	Mechanical harvest with ground-based equipment; prescribed fire	Near Rhinehart Mdw. Steep near bottom of unit 311 ac in 5M and 5D classes
19 / 293	Sockum and Indian Falls	Very cobbly loam to very cobbly clay loam soils Low to moderate soil erosion hazard Elev: 5,800–7,000 feet Slope: 0–45% Aspect: predominantly W	23 ac. Model 5 265 ac. Model 10 5 ac. Model 12 23 ac. FCC1 270 ac. FCC2 and 3	95 ac Sierran mixed conifer 198 ac white fir	Mechanical harvest with ground-based equipment; prescribed fire	N of Soloman Saddle Includes large plantations 37 ac in 5M and 5D classes
20 / 137	Sockum	Gravelly loam to clay loam soils Moderate to high erosion hazard Elev: 3,800–4,500 feet Slope: 0–55% Aspect: predominantly SW	107 ac. Model 5 27 ac. Model 9 3 ac. Model 10 134 ac. FCC1 3 ac. FCC2 and 3	3 ac Sierran mixed conifer 28 ac montane hardwood 106 ac montane chaparral	Prescribed fire	Unit burned by wildfire in past, not in last 35 years Behind Chandler Rd Steep brushfield S. of Johnson Hill WUI

Table B.1. Fuel reduction — existing condition and proposed treatment by treatment unit (continued).

Unit / Acres	Watershed	Physical Characteristics	Existing Condition		Treatment, Logging System, and Access Needs[c]	Remarks[d]
			Fuels[a]	CWHR Vegetation Type[b]		
21 / 198	Big Blackhawk	Very gravelly silt loam to clay loam soils Moderate soil erosion hazard Elev: 3,400–3,900 feet Slope: 0–45% Aspect: predominantly N	1 ac. Model 5 9 ac. Model 9 188 ac. Model 10 10 ac. FCC1 188 ac. FCC2 and 3	189 ac Sierran mixed conifer 9 ac ponderosa pine	Mechanical harvest 50% of unit by ground-based equipment; prescribed fire Aerial yarding systems on remaining portions of unit Right-of-way needed	8 ac in 5M and 5D classes WUI
22 / 7	Big Blackhawk	Very gravelly silt loam to clay loam soils Moderate to high soil erosion hazard Elev: 4,100–4,300 feet Slope: 0–35% Aspect: predominantly W	5 ac. Model 5 2 ac. Model 10 5 ac. FCC1 2 ac. FCC2 and 3	3 ac Sierran mixed conifer 4 ac montane chaparral	Prescribed fire	Unit burned by wildfire in 1970 WUI
23 / 434	Estray	Very gravelly loam to clay loam soils Moderate to high erosion hazard Elev: 4,400–4,900 feet Slope: 0–25% Aspect: predominantly W	434 ac. Model 10 0 ac. FCC1 434 ac. FCC2 and 3	399 ac Sierran mixed conifer 35 ac white fir	Mechanical harvest with ground-based equipment; prescribed fire Temporary road construction; decommissioned after use	Near Greenhorn Ranch development WUI
24 / 24	Big Blackhawk	Very gravelly silt loam to sandy loam soils Moderate to high erosion hazard Elev: 3,200–3,500 feet Slope: 6–45% Aspect: predominantly NW	1 ac. Model 5 23 ac. Model 10 1 ac. FCC1 23 ac. FCC2 and 3	24 ac Sierran mixed conifer	hand thin, pile, and burn	Cascades Trailhead Near Keddie, adjacent to development on PVT 5 ac in 5M and 5D classes WUI

Table B.1. Fuel reduction — existing condition and proposed treatment by treatment unit (continued).

Unit / Acres	Watershed	Physical Characteristics	Existing Condition		Treatment, Logging System, and Access Needs[c]	Remarks[d]
			Fuels[a]	CWHR Vegetation Type[b]		
25 / 181	Big Blackhawk	Very gravelly silt loam to loam soils Moderate to high erosion hazard Elev: 3,400–4,100 feet Slope: 0–45% Aspect: predominantly S	57 ac. Model 5 124 ac. Model 10 57 ac. FCC1 124 ac. FCC2 and 3	181 ac Sierran mixed conifer	Mechanical harvest with ground-based equipment; prescribed fire Temporary road construction; decommissioned after use	N of Butterfly Valley 6 ac in 5M and 5D classes WUI
26 / 87	Sockum	Gravelly loam to clay loam soils Moderate to high erosion hazard Elev: 4,500–4,800 feet Slope: 0–35% Aspect: predominantly SW	40 ac. Model 5 47 ac. Model 10 40 ac. FCC1 47 ac. FCC2 and 3	87 ac Sierran mixed conifer	Prescribed fire	Above Empire Ravine, east of Massack. WUI
27 / 67	Estray	Gravelly loam to loam soils Moderate to high erosion hazard Elev: 4,400–4,800 feet Slope: 0–45% Aspect: predominantly N	67 ac. Model 10 0 ac. FCC1 67 ac. FCC2 and 3	67 ac Sierran mixed conifer	Prescribed fire	Steep WUI
28 / 41	Big Blackhawk	Gravelly loam to loam soils Moderate to high erosion hazard Elev: 3,500–3,800 feet Slope: 10–40% Aspect: predominantly SW	25 ac. Model 9 16 ac. Model 10 41 ac. FCC2 and 3	15 ac. Sierran mixed conifer 26 ac. ponderosa pine	Hand thin, pile and burn portions of remaining unit	Within the WUI

a. Fire behavior fuel models from Anderson 1982:

Fuel Model 5 – low, green shrubs with light surface litter, includes short montane chaparral
Fuel Model 9 – long-needle pine and oak hardwood stands with light surface litter
Fuel Model – Sierran mixed conifer with understory, moderate to heavy down and dead surface fuels
Fuel Model – moderate slash with heavy surface fuels in the in the 0–3 inch diameter size class

Table B.1. Fuel reduction — existing condition and proposed treatment by treatment unit (continued).

FCC1 = Fire Condition Class 1. Fire regimes are within historical range. Risk of losing key ecosystem components to wildfire is low. Species composition and structure are functioning within historical range. Potential wildfire intensities and severity are low to moderate. Desired condition.

FCC2 = Fire Condition Class 2. Fire regimes are slightly altered from historical range. Risk of losing key ecosystem components to wildfire is moderate. This results in moderate changes in one or more of the following: fire size, fire intensity, and fire severity. In forestland, there is moderate encroachment of shade tolerant tree species. Potential wildfire intensities and severity are moderate to high. Not desired condition.

FCC3 = Fire Condition Class 3. Fire regimes are significantly altered from historical range. Risk of losing key ecosystem components to wildfire is high. This results in dramatic changes to one or more of the following: fire size, fire intensity, and fire severity. In forestland, there is high encroachment and establishment of shade tolerant tree species. Potential wildfire intensities and severity are moderate to extreme. Not desired condition.

b. These large treatment units include several tree size and density classes of each CWHR type listed. This additional detail is not shown to keep the table from being too large, but the information is available at the Mt. Hough Ranger District office.

c. RHCAs are found throughout the fuel treatment units - refer to “Action 1 – Fuel Treatments” for design elements pertaining to treatments in RHCAs. For each unit, the desired post-treatment conditions are:

Surface fuels less than 3 inches in diameter would be less than or equal to 5 tons per acre.

Healthy and vigorous stands would not have interlocking tree crowns for the next ten years.

Conifers with suppressed and intermediate crown classes containing ladder fuels would be absent.

Live crown base height would be 15 to 25 feet.

Surface fuels would include 10 to 15 tons per acre of the largest down logs.

Snag levels would be as follows: 2 of the largest snags per acre in DFPZ units in WUIs, 4 of the largest snags per acre in mixed conifer stands, and 6 of the largest snags per acre in red fir stands.

d. 5M and 5D and 6 are CWHR classifications. These classes are subject to specific canopy-cover retention guidelines – refer to “Action 1 – Fuel Treatments.”

Appendix C

Group Selection and Individual Tree Selection by Planning Area

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Table C.1. Group selection and individual tree selection by planning area.

Plan Area / Plan Area Acres	Group selection Acres[a]	ITS Acres[b]	Water-shed	Physical Characteristics	Existing Condition[c]	Logging System and Access Needs[d]	Remarks
1G / 545	26	80	Estray	Very gravelly sandy loam soils Moderate to high erosion hazard Elev: 5,400–7,000 feet Slope: 6–55% Aspect: predominantly W	144 ac Sierra mixed conifer 324 ac white fir 63 ac montane chaparral 3 ac montane riparian 11 ac rock	65% ground-based equipment 35% aerial yarding	Rock outcrops
2G / 1,010	36	55	Estray	Very cobbly loam to gravelly sandy loam soils Moderate to high erosion hazard Elev: 5,700–7,300 feet Slope: 0–55% Aspect: predominantly SW	168 ac Sierra mixed conifer 775 ac white fir 6 ac red fir 33 ac montane chaparral 28 ac rock	15% ground-based equipment 85% aerial yarding	Rock outcrops; carnivore network
3G / 314	16	90	Estray	Very cobbly loam to very gravelly loam soils Low to moderate erosion hazard Elev: 5,200–6,600 feet Slope: 6–55% Aspect: predominantly SW	179 ac Sierra mixed conifer 135 ac white fir	85% ground-based equipment 15% aerial yarding	Rock outcrops
4G / 562	51	20	Estray	Very cobbly loam to gravelly loam soils Moderate to high erosion hazard Elev: 5,300–7,100 feet Slope: 16–55% Aspect: predominantly SW	126 ac Sierra mixed conifer 433 ac white fir 3 ac rock	10% ground-based equipment 90% aerial yarding	Rock outcrops
5G / 881	50	240	Estray	Very cobbly loam to clay loam soils Low to high erosion hazard Elev: 4,800–6,400 feet Slope: 0–55% Aspect: predominantly S	664 ac Sierra mixed conifer 3 ac ponderosa pine 11 ac lodgepole pine 203 ac white fir	95% ground-based equipment 5% aerial yarding New system road construction Temporary road construction, decommissioned after use	Carnivore network

Table C.1. Group selection and individual tree selection by planning area (continued).

Plan Area / Plan Area Acres	Group selection Acres[a]	ITS Acres[b]	Water-shed	Physical Characteristics	Existing Condition[c]	Logging System and Access Needs[d]	Remarks
6G / 1,626	85	300	Estray	Very cobbly loam to very gravelly loam soils Low to very high erosion hazard Elev: 6,200–7,600 feet Slope: 0–65% Aspect: predominantly SW	55 ac Sierra mixed conifer 1293 ac white fir 253 ac red fir 23 ac montane chaparral 2 ac rock	100% ground-based equipment	Some rock outcrops and erosive peridotite soils
7G / 99	12	54	Estray	Gravelly loam to gravelly sandy loam soils Moderate to high erosion hazard Elev: 4,400–4,600 feet Slope: 0–25% Aspect: predominantly N	99 ac Sierra mixed conifer	100% ground-based equipment	
8G / 502	26	0	Estray	Very gravelly sand loam to clay loam soils Moderate to high erosion hazard Elev: 4,400–4,900 feet Slope: 0–45% Aspect: predominantly W	467 ac Sierra mixed conifer 35 ac white fir	100% ground-based equipment Temporary road construction; decommissioned after use	Rock outcrops
9G / 135	8	32	Estray	Gravelly loam to clay loam soils Moderate to high erosion hazard Elev: 4,300–5,000 feet Slope: 6–55% Aspect: predominantly E	134 ac Sierra mixed conifer 1 ac ponderosa pine	50% ground-based equipment 50% aerial yarding Temporary road construction; decommissioned after use	
10G / 561	43	100	Sockum	Very gravelly sand loam to sandy loam soils Moderate to high erosion hazard Elev: 4,600–6,400 feet Slope: 0–45% Aspect: predominantly NE	99 ac Sierra mixed conifer 5 ac ponderosa pine 651 ac white fir 2 ac montane hardwood 4 ac montane chaparral	100% ground-based equipment	

Table C.1. Group selection and individual tree selection by planning area (continued).

Plan Area / Plan Area Acres	Group selection Acres[a]	ITS Acres[b]	Water-shed	Physical Characteristics	Existing Condition[c]	Logging System and Access Needs[d]	Remarks
11G / 391	22	100	Sockum	Gravelly loam to clay loam soils Moderate to high soil erosion hazard Elev: 4,000–6,400 feet Slope: 0–35% Aspect: predominantly W	377 ac Sierra mixed conifer 10 ac ponderosa pine 4 ac montane chaparral	100% ground-based equipment	
12G / 1,178	42	348	Sockum	Very cobbly loam to clay loam soils Low to high erosion hazard Elev: 4,600–6,100 feet Slope: 0–45% Aspect: predominantly SW	1133 ac Sierra mixed conifer 6 ac ponderosa pine 29 ac white fir 10 ac montane chaparral	100% ground-based equipment New system road construction Temporary road construction; decommissioned after use	
13G / 509	40	140	Sockum	Gravelly loam to clay loam soils Moderate to high soil erosion hazard Elev: 3,900–4,700 feet Slope: 0–55% Aspect: predominantly W	699 ac Sierra mixed conifer 4 ac montane hardwood 3 ac montane chaparral 3 ac rock	100% ground-based equipment	
14G / 3,277	254	873 and 100ac bio-mass	Sockum	Very cobbly loam to clay soils Low to very high erosion hazard Elev: 4,400–7,200 feet Slope: 0–65% Aspect: predominantly W	1306 ac Sierra mixed conifer 29 ac ponderosa pine 1867 ac white fir 13 ac montane hardwood 35 ac montane chaparral 13 ac montane riparian 14 ac rock	75% ground-based equipment 25% aerial yarding New system road construction Temporary road construction, decommissioned after use	Rock outcrops and erosive peridotite soils
15G / 309	22	80	Sockum	Very cobbly loam to very gravelly loam soils Low to moderate erosion hazard Elev: 6,600–7,600 feet Slope: 0–55% Aspect: predominantly SW	11 ac Sierra mixed conifer 261 ac white fir 37 ac red fir	100% ground-based equipment	Carnivore network

Table C.1. Group selection and individual tree selection by planning area (continued).

Plan Area / Plan Area Acres	Group selection Acres[a]	ITS Acres[b]	Water-shed	Physical Characteristics	Existing Condition[c]	Logging System and Access Needs[d]	Remarks
16G / 503	30	159	Sockum	Gravelly loam to clay loam soils Moderate to high soil erosion hazard Elev: 3,500–4,500 feet Slope: 0–45% Aspect: predominantly E	495 ac Sierra mixed conifer 1 ac ponderosa pine 7 ac montane chaparral	100% ground-based equipment	
17G / 659	27	23	Big Black-hawk	Very gravelly silt loam to clay loam soils Moderate to high erosion hazard Elev: 3,500–5,100 feet Slope: 0–55% Aspect: predominantly W	538 ac Sierra mixed conifer 53 ac ponderosa pine 58 ac montane hardwood 10 ac montane chaparral	40% ground-based equipment 60% aerial yarding New system road construction	
18G / 1,246	94	308 and 100ac bio-mass	Big Black-hawk	Very cobbly loam to clay loam soils Moderate erosion hazard Elev: 4,800–6,300 feet Slope: 0–55% Aspect: predominantly S	968 ac Sierra mixed conifer 15 ac ponderosa pine 342 ac white fir 3 ac montane hardwood 17 ac montane chaparral 1 ac montane riparian	75% ground-based equipment 25% aerial yarding New system road construction	
19G / 5,162	324	801 and 100ac bio-mass	Big Black-hawk	Very cobbly loam to clay loam soils Moderate to high erosion hazard Elev: 3,700–7,200 feet Slope: 0–65% Aspect: predominantly SW	2852 ac Sierra mixed conifer 71 ac ponderosa pine 2316 ac white fir 71 ac red fir 56 ac montane hardwood 75 ac montane chaparral 19 ac montane riparian 2 ac rock	95% ground-based equipment 5% aerial yarding	Some rock outcrop and rubble lands
20G / 92	10	0	Big Black-hawk	Gravelly loam to loam soils Moderate to high erosion hazard Elev: 3,300–4,100 feet Slope: 16–45% Aspect: predominantly SE	92 ac Sierra mixed conifer	100% aerial yarding	

Table C.1. Group selection and individual tree selection by planning area (continued).

Plan Area / Plan Area Acres	Group selection Acres[a]	ITS Acres[b]	Water-shed	Physical Characteristics	Existing Condition[c]	Logging System and Access Needs[d]	Remarks
21G / 193	10	0	Big Black-hawk	Gravelly loam to loam soils Moderate to high erosion hazard Elev: 3,400–4,100 feet Slope: 0–45% Aspect: predominantly SE	193 ac Sierra mixed conifer	100% ground-based equipment Temporary road construction, decommissioned after use	
22G / 198	14	0	Big Black-hawk	Gravelly loam to loam soils Moderate to high erosion hazard Elev: 3,400–3,900 feet Slope: 0–45% Aspect: predominantly N	189 ac Sierra mixed conifer 9 ac ponderosa pine	100% ground-based equipment Right-of-way needed	
23G / 302	15	77	Big Black-hawk	Gravelly loam to loam soils Moderate to high erosion hazard Elev: 3,200–4,100 feet Slope: 6–65% Aspect: predominantly NE	276 ac Sierra mixed conifer 2 ac ponderosa pine 14 ac montane hardwood 10 ac montane chaparral	100% ground-based equipment	Some areas of riverwash
24G / 823	90	120 and 50ac bio-mass	Indian Falls	Very cobbly loam to sandy loam soils Low to high erosion hazard Elev: 4,900–7,200 feet Slope: 0–55% Aspect: predominantly W	576 ac Sierra mixed conifer 242 ac white fir 5 ac red fir	45% ground-based equipment 55% aerial yarding New system road construction Temporary road construction, decommissioned after use	Some rock outcrop and rubble lands

a. The group selection harvest would be distributed across all 24 planning areas. An estimate of the acres of groups in each planning area is given. The actual acres of groups would depend upon feasibility determined during project layout.

b. ITS – Individual tree selection acres. Biomass would be harvested from four planning areas, as shown.

c. These large treatment units include several tree size and density classes of each CWHR type listed. This additional detail is not shown to keep the table from being too large, but the information is available at the Mt. Hough Ranger District office.

d. Logging system needs are based on the group selection harvest.

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Appendix D

Proposed Actions
for Each Road in Each Watershed

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Appendix D
Proposed Actions for Each Road in Each Watershed

Table D.1. Proposed actions for each road in each watershed.

Treatment	Road Number	Length (miles)
Alternative A — Big Blackhawk Creek Watershed		
System Road Construction	24N14Z	0.6
Temporary Road Construction	Non system	4.0
Closure	25N12YA	0.4
Closure	25N12YB	0.7
Closure	25N12YE	0.8
Closure	25N14F1	0.1
Closure	25N58	3.6
Decommission	24N86	0.4
Decommission	25N12C	0.2
Decommission	25N12C1	0.4
Decommission	25N12YC	0.4
Decommission	25N12YD	0.6
Decommission	Non system	2.6
Reconstruction (heavy)	25N73B	1.2
Reconstruction (moderate)	25N19	5.4
Reconstruction (moderate)	25N73	7.2
Reconstruction (light)	25N12Y	5.4
Reconstruction (light)	25N53	1.4
Reconstruction (light)	25N73A	0.5
Reconstruction (moderate)	Non system	7.0
Reconstruction (moderate/heavy)	25N14	13.3
Alternative A — Estray Creek Watershed		
System Road Construction	24N16Z	0.6
Temporary Road Construction	Non system	1.3
Closure	24N19A	0.9
Decommission	23N61	0.7
Decommission	25N41C	0.5
Decommission	Non system	0.6
Reconstruction (heavy)	25N18A	0.7
Reconstruction (moderate)	24N51B	0.4
Reconstruction (moderate)	Plumas County 508	1.4
Reconstruction (light)	24N02X	8.3
Reconstruction (light)	24N31Y	1.4
Reconstruction (light)	24N66	2.2
Reconstruction (light)	24N67	2.0
Reconstruction (light)	25N18	3.6
Reconstruction (light)	25N29	6.6
Reconstruction (light)	25N42	0.2

Table D.1. Proposed actions for each road in each watershed (continued).

Treatment	Road Number	Length (miles)
Alternative A — Estray Creek Watershed (continued)		
Reconstruction (light/moderate)	24N35Y	0.5
Reconstruction (moderate)	Non system	0.7
Indian Falls Watershed		
Temporary Road Construction	Non system	1.6
Closure	25N14F	0.7
Closure	25N14F1	0.1
Decommission	26N19Y	0.8
Reconstruction (light)	25N10Y	0.5
Reconstruction (light)	25N29	0.3
Reconstruction (moderate)	Non system	0.1
Reconstruction (moderate/heavy)	25N14	0.8
Alternative A — Sockum Creek Watershed		
System Road Construction	25N10YB	0.1
Temporary Road Construction	Non system	0.6
Closure	24N16X	1.6
Closure	24N51A	1.4
Closure	24N52Y	0.7
Closure	25N10YB	0.5
Closure	25N41B	0.2
Closure	25N41G	0.3
Decommission	24N15X	0.3
Decommission	24N17XA	0.3
Decommission	24N33Y	0.8
Decommission	24N51D	0.3
Decommission	24N77	1.1
Decommission	24N85	1.2
Decommission	25N10YB	0.4
Decommission	25N14	0.4
Decommission	25N41D	0.3
Decommission	Non system	3.2
Reconstruction (heavy)	25N10YA1	0.8
Reconstruction (heavy)	25N18A	1.9
Reconstruction (heavy) & Closure	25N07B	1.8
Reconstruction (heavy) & Closure	25N07C	0.7
Reconstruction (moderate)	24N20Y	0.8
Reconstruction (moderate)	24N33Y	1.1
Reconstruction (moderate)	24N51B	1.3
Reconstruction (moderate)	24N80	2.2
Reconstruction (moderate)	25N18D	0.4
Reconstruction (moderate)	25N73	0.0
Reconstruction (moderate) & Closure	25N14B	1.5
Reconstruction (moderate) & Closure	25N18E	1.0
Reconstruction (light)	24N16	3.0
Reconstruction (light)	24N51	2.6
Reconstruction (light)	25N07	1.0

Table D.1. Proposed actions for each road in each watershed (continued).

Treatment	Road Number	Length (miles)
Reconstruction (light)	25N10Y	2.4
Reconstruction (light)	25N18	0.7
Reconstruction (light)	25N29	1.9
Reconstruction (light)	25N41A	1.0
Reconstruction (light/heavy)	25N10YA	1.4
Reconstruction (light/moderate)	24N35Y	0.9
Reconstruction (moderate)	Non system	4.0
Reconstruction (moderate/heavy)	25N14	6.3
Reconstruction (moderate/heavy)	25N14	5.8

Treatment	Road Number	Length (miles)
Alternative C — Big Blackhawk Creek Watershed		
System Road Construction	24N14Z	0.6
Temporary Road Construction	Non system	4.0
Closure	25N12YA	0.4
Closure	25N14F1	0.1
Closure	25N58	3.6
Decommission	24N86	0.4
Decommission	25N12C	0.2
Decommission	25N12C1	0.4
Decommission	25N12YC	0.4
Decommission	25N12YD	0.6
Decommission	Non system	2.6
Reconstruction (heavy)	25N73B	1.2
Reconstruction (moderate)	25N19	5.4
Reconstruction (moderate)	25N73	7.2
Reconstruction (light)	25N12Y	5.4
Reconstruction (light)	25N53	1.4
Reconstruction (light)	25N73A	0.5
Reconstruction (moderate)	Non system	7.0
Reconstruction (moderate/heavy)	25N14	13.3
Alternative C — Estray Creek Watershed		
System Road Construction	24N16Z	0.6
Temporary Road Construction	Non system	1.3
Closure	24N19A	0.9
Decommission	23N61	0.7
Decommission	25N41C	0.5
Decommission	Non system	0.6
Reconstruction (heavy)	25N18A	0.7
Reconstruction (moderate)	24N51B	0.4
Reconstruction (moderate)	508	1.4
Reconstruction (light)	24N02X	2.4
Reconstruction (light)	24N31Y	1.4

Table D.1. Proposed actions for each road in each watershed (continued).

Treatment	Road Number	Length (miles)
Reconstruction (light)	24N66	2.2
Reconstruction (light)	24N67	2.0
Reconstruction (light)	25N18	3.6
Reconstruction (light)	25N29	6.6
Reconstruction (light)	25N42	0.2
Reconstruction (light/moderate)	24N35Y	0.5
Reconstruction (moderate)	Non system	0.7
Alternative C — Indian Falls Watershed		
Temporary Road Construction	Non system	1.6
Closure	25N14F	0.7
Closure	25N14F1	0.1
Decommission	26N19Y	0.8
Reconstruction (light)	25N10Y	0.5
Reconstruction (light)	25N29	0.3
Reconstruction (moderate)	Non system	0.1
Reconstruction (moderate/heavy)	25N14	0.8
Alternative C — Sockum Creek Watershed		
System Road Construction	25N10YB	0.1
Temporary Road Construction	Non system	0.6
Closure	25N41G	0.3
Decommission	24N15X	0.3
Decommission	24N17XA	0.3
Decommission	24N33Y	0.8
Decommission	24N51D	0.3
Decommission	24N85	1.2
Decommission	25N41D	0.3
Decommission	Non system	1.4
Reconstruction (heavy)	25N10YA1	0.8
Reconstruction (heavy)	25N18A	1.9
Reconstruction (heavy) & Closure	25N07B	1.8
Reconstruction (heavy) & Closure	25N07C	0.7
Reconstruction (moderate)	24N20Y	0.8
Reconstruction (moderate)	24N33Y	1.1
Reconstruction (moderate)	24N51B	1.3
Reconstruction (moderate)	24N80	2.2
Reconstruction (moderate)	25N18D	0.4
Reconstruction (moderate)	25N73	0.0
Reconstruction (moderate) & Closure	25N14B	1.5
Reconstruction (moderate) & Closure	25N18E	1.0
Reconstruction (light)	24N16	3.0
Reconstruction (light)	24N51	2.6
Reconstruction (light)	25N07	1.0
Reconstruction (light)	25N10Y	2.4
Reconstruction (light)	25N18	0.7
Reconstruction (light)	25N29	1.9

Table D.1. Proposed actions for each road in each watershed (continued).

Treatment	Road Number	Length (miles)
Reconstruction (light)	25N41A	1.0
Reconstruction (light/heavy)	25N10YA	1.4
Reconstruction (light/moderate)	24N35Y	0.9
Alternative C — Sockum Creek Watershed (continued)		
Reconstruction (moderate)	Non system	4.0
Reconstruction (moderate/heavy)	25N14	6.3

Alternatives D and E — Big Blackhawk Creek Watershed		
Treatment	Road Number	Length (miles)
System Road Construction	24N14Z	0.6
System Road Construction	25N73B	0.2
Temporary Road Construction	Non system	4.0
Closure	25N12YA	0.4
Closure	25N14F1	0.1
Closure	25N58	3.6
Decommission	24N86	0.4
Decommission	25N12C	0.2
Decommission	25N12C1	0.4
Decommission	25N12YC	0.4
Decommission	25N12YD	0.6
Decommission	Non system	2.6
Decommission	25N73B	0.2
Reconstruction (heavy)	25N73B	1.0
Reconstruction (moderate)	25N19	5.4
Reconstruction (moderate)	25N73	7.2
Reconstruction (light)	25N12Y	5.4
Reconstruction (light)	25N53	1.4
Reconstruction (light)	25N73A	0.5
Reconstruction (moderate)	Non system	7.0
Reconstruction (moderate/heavy)	25N14	13.3
Alternatives D and E — Estray Creek Watershed		
System Road Construction	24N16Z	0.6
Temporary Road Construction	Non system	1.3
Closure	24N19A	0.9
Decommission	23N61	0.7
Decommission	25N41C	0.5
Decommission	Non system	0.6
Reconstruction (heavy)	25N18A	0.7
Reconstruction (moderate)	24N51B	0.4
Reconstruction (moderate)	508	1.4

Table D.1. Proposed actions for each road in each watershed (continued).

Reconstruction (light)	24N02X	2.4
Reconstruction (light)	24N31Y	0.7
Reconstruction (light)	25N18	3.6
Reconstruction (light)	25N29	6.6
Reconstruction (light/moderate)	24N35Y	0.5
Reconstruction (moderate)	Non system	0.7
Alternatives D and E — Indian Falls Watershed		
Temporary Road Construction	Non system	1.6
Closure	25N14F	0.7
Closure	25N14F1	0.1
Decommission	26N19Y	0.8
Alternatives D and E — Indian Falls Watershed (continued)		
Reconstruction (light)	25N10Y	0.5
Reconstruction (light)	25N29	0.3
Reconstruction (moderate)	Non system	0.1
Reconstruction (moderate/heavy)	25N14	0.8
Alternatives D and E — Sockum Creek Watershed		
System Road Construction	25N10YB	0.1
Temporary Road Construction	Non system	0.6
Closure	25N41G	0.3
Decommission	24N15X	0.3
Decommission	24N17XA	0.3
Decommission	24N33Y	0.8
Decommission	24N51D	0.3
Decommission	24N85	1.2
Decommission	25N41D	0.3
Decommission	Non system	1.4
Reconstruction (heavy)	25N10YA1	0.8
Reconstruction (heavy)	25N18A	1.9
Reconstruction (heavy) & Closure	25N07B	1.8
Reconstruction (heavy) & Closure	25N07C	0.7
Reconstruction (moderate)	24N20Y	0.8
Reconstruction (moderate)	24N33Y	1.1
Reconstruction (moderate)	24N51B	1.3
Reconstruction (moderate)	24N80	2.2
Reconstruction (moderate)	25N18D	0.4
Reconstruction (moderate)	25N73	0.0
Reconstruction (moderate) & Closure	25N14B	1.5
Reconstruction (moderate) & Closure	25N18E	1.0
Reconstruction (light)	24N16	3.0
Reconstruction (light)	24N51	2.6

Table D.1. Proposed actions for each road in each watershed (continued).

Reconstruction (light)	25N07	1.0
Reconstruction (light)	25N10Y	2.4
Reconstruction (light)	25N18	0.7
Reconstruction (light)	25N29	1.9
Reconstruction (light)	25N41A	1.0
Reconstruction (light/heavy)	25N10YA	1.4
Reconstruction (light/moderate)	24N35Y	0.9
Reconstruction (moderate)	Non system	4.0
Reconstruction (moderate/heavy)	25N14	6.3

Treatment	Road Number	Length (miles)
Alternative F — Big Blackhawk Creek Watershed		
Closure	25N12YA	0.4
Closure	25N14F1	0.1
Closure	25N58	3.6
Decommission	24N86	0.4
Alternative F — Big Blackhawk Creek Watershed (continued)		
Decommission	25N12C	0.2
Decommission	25N12C1	0.4
Decommission	25N12YC	0.4
Decommission	25N12YD	0.6
Decommission	Non system	2.6
Reconstruction	25N19A	0.4
Reconstruction	25N46	0.5
Reconstruction (heavy)	25N73B	0.9
Reconstruction (light)	25N53	1.4
Reconstruction (light)	25N73A	0.4
Reconstruction (moderate)	25N19	8.1
Reconstruction (moderate)	25N73	7.2
Reconstruction (moderate)	Non system	0.9
Reconstruction (moderate/heavy)	25N14	6.1
Temporary Road Construction	Non system	1.1
Alternative F — Estray Creek Watershed		
Closure	24N19A	0.9
Decommission	23N61	0.7
Decommission	25N41C	0.5
Decommission	Non system	0.6
Reconstruction (light)	24N02X	0.0
Reconstruction (light)	24N31Y	3.1
Reconstruction (light/moderate)	24N35Y	0.5
Reconstruction (moderate)	24N51B	0.0
Reconstruction (moderate)	508	1.5
Temporary Road Construction	Non system	0.9

Table D.1. Proposed actions for each road in each watershed (continued).

Treatment	Road Number	Length (miles)
Alternative F — Indian Falls Watershed		
Closure	25N14F	0.7
Closure	25N14F1	0.1
Decommission	26N19Y	0.8
Reconstruction (light)	25N10Y	0.8
Reconstruction (moderate)	Non system	0.1
Reconstruction (moderate/heavy)	25N14	0.8
Alternative F — Sockum Creek Watershed		
Closure	25N07B	1.8
Closure	25N07C	0.7
Closure	25N14B	1.5
Closure	25N18E	1.0
Closure	25N41G	0.3
Decommission	24N15X	0.3
Decommission	24N17XA	0.3
Decommission	24N33Y	0.8
Decommission	24N51D	0.3
Alternative F — Sockum Creek Watershed (continued)		
Decommission	24N85	1.2
Decommission	25N41D	0.3
Decommission	Non system	1.4
Reconstruction (light)	25N07	1.0
Reconstruction (light)	25N10Y	2.4
Reconstruction (light)	25N29	1.8
Reconstruction (light/moderate)	24N35Y	0.9
Reconstruction (moderate)	24N20Y	2.6
Reconstruction (moderate)	25N73	0.0
Reconstruction (moderate)	Non system	1.1
Reconstruction (moderate/heavy)	25N14	5.8

Notes:

a. Heavy reconstruction may include road relocation as well as light and heavy treatments.

b. Moderate reconstruction may include light treatment as well as construction of drainage structures, which would require use of heavy equipment such as bulldozers and back hoes.

c. Light reconstruction involves clearing the brush along the roadside and grading the road surface.

Appendix E

Site-Specific Details on Proposed Group Selection, Individual Tree Selection, and Biomass Harvest Acres by Planning Area by Alternative

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Table E.1. Harvest acres proposed by alternative by planning area.

			Alternative A			Alternative C			Alternative D			Alternative E			Alt F
Plan Area Code	Plan Area Acres	Plan Area Available Acres	GS Acres	ITS Acres	Biomass Acres	GS Acres	ITS Acres	Biomass Acres	GS Acres	ITS Acres	Biomass Acres	GS Acres	ITS Acres	Biomass Acres	Acres of Groups, ITS Biomass
1G	545	305	26	80	0	0	0	0	0	0	0	0	0	0	0
2G	1,010	912	36	55	0	0	0	0	0	0	0	0	0	0	0
3G	314	253	16	90	0	23	55	0	0	0	0	0	0	0	0
4G	562	366	51	20	0	84	0	0	42	20	0	42	20	0	0
5G	881	652	50	240	0	98	250	0	70	100	0	70	100	0	0
6G	1,626	1,203	85	300	0	85	700	0	85	300	0	85	300	0	0
7G	99	77	12	54	0	15	62	0	0	0	0	0	0	0	0
8G	502	439	26	0	0	30	0	0	0	0	0	0	0	0	0
9G	135	83	8	32	0	0	0	0	0	0	0	0	0	0	0
10G*	561	368	43	100	0	43	190	0	42	100	0	42	100	0	0
11G	391	261	22	100	0	30	50	0	30	50	0	30	50	0	0
12G	1,178	677	42	348	0	61	180	0	77	217	0	77	217	0	0
13G*	509	355	40	140	0	60	140	0	40	140	0	40	140	0	0
14G	3,277	2,048	234	873	100	261	873	100	233	600	100	233	600	100	0
14G DFPZ Unit No. 18	0	200	20	0	0	20	0	0	20	0	0	20	0	0	0
15G	309	177	20	80	0	20	50	0	20	60	0	20	60		0
16G	503	303	30	159	0	20	80	0	25	80	0	25	80		0
17G	659	281	27	23	0	25	23	0	24	23	0	24	23		0
18G*	1,246	517	54	308	100	84	308	100	55	100	100	55	100	100	0
18 G DFPZ Unit No. 18	0	300	30	0	0	30	0		30	0	0	30	0	0	0
19G*	5,162	2,060	234	801	100	384	919	100	234	500	100	234	500	100	0
19G DFPZ Unit No. 13, 14, 16, 17	0	1,052	97		0	97			105		0	105		0	0
20G	92	65	10	0	0	0	0		0	0	0	0	0	0	0
21G	193	153	10	0	0	15	0		15	0	0	15	0	0	0

Table E.1. Harvest acres proposed by alternative by planning area (continued).

			Alternative A			Alternative C			Alternative D			Alternative E			Alt F
Plan Area Code	Plan Area Acres	Plan Area Available Acres	GS Acres	ITS Acres	Biomass Acres	GS Acres	ITS Acres	Biomass Acres	GS Acres	ITS Acres	Biomass Acres	GS Acres	ITS Acres	Biomass Acres	Acres of Groups, ITS Biomass
22G	198	181	14	0	0	18	0		18	0	0	18	0	0	0
23G	302	234	20	77	0	0	0		0	0	0	0	0		0
24G	823	532	90	120	50	97	120	50	61	80	50	61	80	50	0
Total	**21,077**	**14,054**	**1,347**	**4,000**	**350**	**1,600**	**4,000**	**350**	**1,226**	**2,370**	**350**	**1,226**	**2,370**	**350**	**0**

Notes:

The planning area available acres are the total acres of CWHR class 4M, 4D, 5M, and 5D within the planning areas but outside the protected activity centers and riparian habitat conservation areas.

Alternatives D, E, and F are at or below 11.4% density for group selection acres.

Table E.2. Proposed group selection harvest system by planning area by alternative.

Planning Area Number	Unit Number	Logging System			Total Net Acres	Alternative A			Alternative C			Alternative D & E			Alternative F GS, ITS and Biomass Acres
		Helicopter	Tractor	Yarding		GS Acres	ITS Acres	Biomass Acres	GS Acres	ITS Acres	Biomass Acres	GS Acres	ITS Acres	Biomass Acres	
1g	**1**	**0**	**113**	**0**		**9**	**50**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	2	0	0	70		6	0	0	0	0	0	0	0	0	0
	3	0	89	0		8	30	0	0	0	0	0	0	0	0
	4	33	0	0		3	0	0	0	0	0	0	0	0	0
1G TOTAL		**33**	**202**	**70**	**305**	**26**	**80**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
2g	1	0	0	370		10	0	0	0	0	0	0	0	0	0
	2	372	0	0		16	0	0	0	0	0	0	0	0	0
	3	0	35	0		2	25	0	0	0	0	0	0	0	0
	4	0	47	0		3	30	0	0	0	0	0	0	0	0
	5	0	0	88		5	0	0	0	0	0	0	0	0	0
2G TOTAL		**372**	**82**	**458**	**912**	**36**	**55**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
3g	1	0	223	0		14	90	0	23	55	0	0	0	0	0
	2	0	0	30		2	0	0	0	0	0	0	0	0	0
3G TOTAL		**0**	**223**	**30**	**253**	**16**	**90**	**0**	**23**	**55**	**0**	**0**	**0**	**0**	**0**
4g	1	300	0	0		45	0	0	74	0	0	36	0	0	0
	2	0	66	0		6	20	0	10	0	0	6	20	0	0
4G TOTAL		**300**	**66**	**0**	**366**	**51**	**20**	**0**	**84**	**0**	**0**	**42**	**20**	**0**	**0**

Table E.2. Proposed group selection harvest system by planning area by alternative (continued).

Planning Area Number	Unit Number	Logging System			Total Net Acres	Alternative A			Alternative C			Alternative D & E			Alternative F GS, ITS and Biomass Acres
		Helicopter	Tractor	Yarding		GS Acres	ITS Acres	Biomass Acres	GS Acres	ITS Acres	Biomass Acres	GS Acres	ITS Acres	Biomass Acres	
5g	1	0	160	0		12	120	0	32	120	0	20	30	0	0
	2	0	142	0		11	45	0	28	50	0	15	40	0	0
	3	0	201	0		15	45	0	28	50	0	20	10	0	0
	4	0	113	0		10	30	0	10	30	0	15	20	0	0
	5	0	0	36		2	0	0	0	0	0	0	0	0	0
5G TOTAL		**0**	**616**	**36**	**652**	**50**	**240**	**0**	**98**	**250**	**0**	**70**	**100**	**0**	**0**
6g	1	0	486	0		30	100	0	36	250	0	30	100	0	0
	2	0	355	0		30	100	0	33	225	0	30	100	0	0
	3	0	362	0		25	100	0	34	225	0	25	100	0	0
6G TOTAL		**0**	**1203**	**0**	**1203**	**85**	**300**	**0**	**85**	**700**	**0**	**85**	**300**	**0**	**0**
7g	1	0	77	0		12	54	0	15	62	0	0	0	0	0
7G TOTAL		**0**	**77**	**0**	**77**	**12**	**54**	**0**	**15**	**62**	**0**	**0**	**0**	**0**	**0**
8g	1	0	439	0		26	0	0	30	0	0	0	0	0	0
8G TOTAL		**0**	**439**	**0**	**439**	**26**	**0**	**0**	**30**	**0**	**0**	**0**	**0**	**0**	**0**
9g	1	0	70	0		4	32	0	0	0	0	0	0	0	0
	2	0	0	9		2	0	0	0	0	0	0	0	0	0
	3	0	0	5		2	0	0	0	0	0	0	0	0	0

Table E.2. Proposed group selection harvest system by planning area by alternative (continue).

Planning Area Number	Unit Number	Logging System			Total Net Acres	Alternative A			Alternative C			Alternative D & E			Alternative F GS, ITS and Biomass Acres
		Helicopter	Tractor	Yarding		GS Acres	ITS Acres	Biomass Acres	GS Acres	ITS Acres	Biomass Acres	GS Acres	ITS Acres	Biomass Acres	
9G TOTAL		**0**	**70**	**14**	**84**	**8**	**32**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
10g	1	0	368	0		43	100	0	43	190	0	42	100	0	0
10G TOTAL		**0**	**368**	**0**	**368**	**43**	**100**	**0**	**43**	**190**	**0**	**42**	**100**	**0**	**0**
11g	1	0	261	0		22	100	0	30	50	0	30	50	0	0
11G TOTAL		**0**	**261**	**0**	**261**	**22**	**100**	**0**	**30**	**50**	**0**	**30**	**50**	**0**	**0**
12g	1	0	277	0		16	138	0	19	100	0	32	100	0	0
	2	0	215	0		16	140	0	20	40	0	24	50	0	0
	3	0	149	0		6	70	0	11	40	0	17	50	0	0
	4	0	36	0		4	0	0	0	0	0	4	7	0	0
12G TOTAL		**0**	**677**	**0**	**677**	**42**	**348**	**0**	**61**	**180**	**0**	**77**	**217**	**0**	**0**
13g	1	0	33	0		6	20	0	6	20	0	3	20	0	0
	2	0	123	0		14	40	0	24	40	0	14	40	0	0
	3	0	199	0		20	80	0	30	80	0	23	80	0	0
13G TOTAL		**0**	**355**	**0**	**355**	**40**	**140**	**0**	**60**	**140**	**0**	**40**	**140**	**0**	**0**
14g	1	0	521	0		35	300	50	50	300	50	59	200	50	0
	2	0	0	37		6	8	0	7	8	0	4	8	0	0
	3	0	45	0		8	8	0	9	8	0	5	8	0	0

Table E.2. Proposed group selection harvest system by planning area by alternative (continued).

Planning Area Number	Unit Number	Logging System			Total Net Acres	Alternative A			Alternative C			Alternative D & E			Alternative F GS, ITS and Biomass Acres
		Helicopter	Tractor	Yarding		GS Acres	ITS Acres	Biomass Acres	GS Acres	ITS Acres	Biomass Acres	GS Acres	ITS Acres	Biomass Acres	
	4	0	182	0		25	40	0	20	40	0	21	40	0	0
	5	0	798	0		86	400	50	100	400	50	90	269	50	0
	6	234	0	0		30	0	0	47	0	0	27	0	0	0
	7	0	0	31		6	25	0	6	25	0	4	25	0	0
	8	0	0	86		16	0	0	0	0	0	10	0	0	0
	9	0	114	0		22	92	0	22	92	0	13	50	0	0
	DFPZ Unit 18	0	200	0		20	0	0	20		0	20		0	0
14G TOTAL		**234**	**1860**	**154**	**2247**	**254**	**873**	**100**	**281**	**873**	**100**	**253**	**600**	**100**	**0**
15g	1	0	177	0		20	80	0	18	50	0	20	60	0	0
15G TOTAL		**0**	**177**	**0**	**177**	**20**	**80**	**0**	**20**	**50**	**0**	**20**	**60**	**0**	**0**
16g	1	0	130	0		14	66	0	10	40	0	12	40	0	0
	2	0	173	0		16	93	0	10	40	0	13	40	0	0
16G TOTAL		**0**	**303**	**0**	**303**	**30**	**159**	**0**	**20**	**80**	**0**	**25**	**80**	**0**	**0**
17g	1	0	0	154		10	0	0	10	0	0	10	0	0	0
	2	0	0	61		6	0	0	10	0	0	6	0	0	0
	3	0	29	0		4	23	0	5	23	0	4	23	0	0
	4	0	14	0		3	0	0	0	0	0	2	0	0	0

Table E.2. Proposed group selection harvest system by planning area by alternative (continue).

Planning Area Number	Unit Number	Logging System			Total Net Acres	Alternative A			Alternative C			Alternative D & E			Alternative F GS, ITS and Biomass Acres
		Helicopter	Tractor	Yarding		GS Acres	ITS Acres	Biomass Acres	GS Acres	ITS Acres	Biomass Acres	GS Acres	ITS Acres	Biomass Acres	
	5	0	23	0		4	0	0	0	0	0	2	0	0	0
17G TOTAL		**0**	**66**	**215**	**280**	**27**	**23**	**0**	**25**	**23**	**0**	**24**	**23**	**0**	**0**
18g	1	0	264	0		27	160	50	50	160	50	27	40	50	0
	2	0	0	110		12	40	0	0	40	0	0	0	0	0
	3	0	23	0		4	19	0	4	19	0	4	19	0	0
	4	0	0	23		4	10	0	4	10	0	4	0	0	0
	5	0	97	0		7	79	50	26	79	50	20	41	50	0
	DFPZ Unit 18	0	300	0		30	0	0	30	0	0	30	0	0	0
18G TOTAL		**0**	**684**	**133**	**817**	**84**	**308**	**100**	**114**	**308**	**100**	**85**	**100**	**100**	**0**
19g	1	90	90	0		15	58	0	36	144	0	21	50	0	0
	3	0	12	0		2	10	0	2	10	0	1	5	0	0
	4	0	169	0		14	80	0	30	80	0	19	40	0	0
	5	0	114	0		7	20	0	20	20	0	13	20	0	0
	6	0	33	0		4	27	0	6	27	0	4	10	0	0
	7	0	19	0		2	0	0	2	0	0	2	0	0	0
	8	0	52	0		7	30	0	10	30	0	6	20	0	0
	9	0	59	0		7	49	0	10	49	0	7	20	0	0

Table E.2. Proposed group selection harvest system by planning area by alternative (continued).

Planning Area Number	Unit Number	Logging System			Total Net Acres	Alternative A			Alternative C			Alternative D & E			Alternative F GS, ITS and Biomass Acres
		Helicopter	Tractor	Yarding		GS Acres	ITS Acres	Biomass Acres	GS Acres	ITS Acres	Biomass Acres	GS Acres	ITS Acres	Biomass Acres	
	10	0	29	0		6	23	0	6	23	0	3	12	0	0
	11	0	57	0		8	30	0	11	30	0	7	20	0	0
	12	0	86	0		10	30	0	16	30	0	10	20	0	0
	13	0	33	0		5	10	0	6	10	0	4	10	0	0
	14	0	41	0		5	10	0	8	10	0	5	10	0	0
	15	0	65	0		5	10	0	12	10	0	7	10	0	0
	16	0	0	54		5	0	0	10	0	0	6	0	0	0
	17	0	13	0		2	11	0	2	11	0	1	5	0	0
	18	0	60	0		10	25	0	12	25	0	7	25	0	0
	19	0	46	0		10	20	0	9	20	0	5	20	0	0
	20	0	248	0		30	120	100	50	153	100	35	75	100	0
	21	0	158	0		25	50	0	30	50	0	18	30	0	0
	22	0	76	0		10	30	0	14	40	0	9	20	0	0
	23	0	0	24		5	0	0	5	0	0	3	0	0	0
	24	0	16	0		3	0	0	3	0	0	2	0	0	0
	25	0	47	0		3	10	0	9	10	0	5	10	0	0
	26	0	80	0		4	33	0	12	33	0	9	20	0	0

Table E.2. Proposed group selection harvest system by planning area by alternative (continue).

Planning Area Number	Unit Number	Logging System			Total Net Acres	Alternative A			Alternative C			Alternative D & E			Alternative F GS, ITS and Biomass Acres
		Helicopter	Tractor	Yarding		GS Acres	ITS Acres	Biomass Acres	GS Acres	ITS Acres	Biomass Acres	GS Acres	ITS Acres	Biomass Acres	
	27	0	13	0		3	11	0	2	11	0	1	2	0	0
	29	0	124	0		6	81	0	20	70	0	14	30	0	0
	30	0	41	0		3	10	0	8	10	0	5	10	0	0
	31	73	0	0		10	0	0	15	0	0	8	0	0	0
	32	0	16	0		3	13	0	3	13	0	2	6	0	0
	33	0	0	24		5	0	0	5	0	0	3	0	0	0
	DFPZ Unit 13	0	28	0		28	0	0	28	0	0	28	0	0	0
	DFPZ Unit 14	0	0	0		0	0	0	0	0	0	0	0	0	0
	DFPZ Unit 16	0	2	0		2	0	0	2	0	0	2	0	0	0
	DFPZ Unit 17	0	67	0		67	0	0	67	0	0	67	0	0	0
19G TOTAL		**163**	**2847**	**101**	**3111**	**331**	**801**	**100**	**481**	**919**	**100**	**339**	**500**	**100**	**0**
20g	1	0	0	65		10	0	0	0	0	0	0	0	0	0
20G TOTAL		**0**	**0**	**65**	**65**	**10**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
21g	DFPZ Unit 25	0	153	0		10	**0**	0	15	**0**	0	15	**0**	0	0
21G TOTAL		**0**	**153**	**0**	**153**	**10**	**0**	**0**	**15**	**0**	**0**	**15**	**0**	**0**	**0**
22g	DFPZ Unit 21	0	181	0		14	**0**	0	18	**0**	0	18	**0**	0	0

Table E.2. Proposed group selection harvest system by planning area by alternative (continued).

Planning Area Number	Unit Number	Logging System			Total Net Acres	Alternative A			Alternative C			Alternative D & E			Alternative F GS, ITS and Biomass Acres
		Helicopter	Tractor	Yarding		GS Acres	ITS Acres	Biomass Acres	GS Acres	ITS Acres	Biomass Acres	GS Acres	ITS Acres	Biomass Acres	
22G TOTAL		**0**	**181**	**0**	**181**	**14**	**0**	**0**	**18**	**0**	**0**	**18**	**0**	**0**	**0**
23g	2	0	22	0		4	10	0	0	0	0	0	0	0	0
	3	0	0	41		4	0	0	0	0	0	0	0	0	0
	4	0	113	0		8	50	0	0	0	0	0	0	0	0
	5	0	58	0		4	17	0	0	0	0	0	0	0	0
23G TOTAL		**0**	**193**	**41**	**235**	**20**	**77**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
24g	1	0	0	250		50	0	0	39	0	0	28	0	0	0
	2	0	92	0		15	50	0	18	50	0	10	30	0	0
	3	0	190	0		25	70	50	38	70	50	22	50	50	0
24G TOTAL		**0**	**282**	**250**	**532**	**90**	**120**	**50**	**97**	**120**	**50**	**61**	**80**	**50**	**0**
					14,055	1,347	4,000	350	1,600	4,000	350	1,226	2,370	350	0

Table E.3. Acres of proposed group selection harvest and subsequent percent intensity or distribution by alternative.

			Alternative A		Alternative C		Alternative D		Alternative E		Alternative F
Plan Area Code	Plan Area Acres	Plan Area Available Acres	Acres of Groups	Percent GS Intensity	Acres of Groups	Percent GS Intensity	Acres of Groups	Percent GS Intensity	Acres of Groups	Percent Gs Intensity	Acres of Groups
1G	545	305	26	9	0	0	0	0	0	0	0
2G	1,010	912	36	4	0	0	0	0	0	0	0
3G	314	253	16	6	23	9	0	0	0	0	0
4G	562	366	51	14	84	23	42	11	42	11	0
5G	881	652	50	8	98	15	70	11	70	11	0
6G	1,626	1,203	85	7	85	7	85	7	85	7	0
7G	99	77	12	16	15	19	0	0	0	0	0
8G	502	439	26	6	30	7	0	0	0	0	0
9G	135	83	8	10	0	0	0	0	0	0	0
10G	561	368	43	12	43	12	42	11	42	11	0
11G	391	261	22	8	30	11	30	11	30	11	0
12G	1,178	677	42	6	61	9	77	11	77	11	0
13G	509	355	40	11	60	17	40	11	40	11	0
14G	3,277	2,048	234	11	261	13	233	11	233	11	0
14G DFPZ Unit No. 18	0	200	20	10	20	10	20	10	20	10	0
15G	309	177	20	11	20	11	20	11	20	11	0
16G	503	303	30	10	20	7	25	8	25	8	0
17G	659	281	27	10	25	9	24	9	24	9	0
18G*	1,246	517	54	10	84	16	55	11	55	11	0
18 G DFPZ Unit No. 18	0	300	30	10	30	10	30	10	30	10	0
19G*	5,162	2,060	234	11	384	19	234	11	234	11	0
19G DFPZ Unit No. 13, 14, 16, 17	0	1,052	97	9	97	9	105	10	105	10	
20G	92	65	10	15	0	0	0	0	0	0	0
21G	193	153	10	7	15	10	15	10	15	10	0

Table E.3. Acres of proposed group selection harvest and subsequent percent intensity or distribution by alternative (continued).

Plan Area Code	Plan Area Acres	Plan Area Available Acres	Alternative A		Alternative C		Alternative D		Alternative E		Alternative F
			Acres of Groups	Percent GS Intensity	Acres of Groups	Percent GS Intensity	Acres of Groups	Percent GS Intensity	Acres of Groups	Percent Gs Intensity	Acres of Groups
22G	198	181	14	8	18	10	18	10	18	10	0
23G	302	234	20	9	0	0	0	0	0	0	0
24G	823	532	90	17	97	18	61	11	61	11	0
Total	**21,077**	**14,054**	**1,347**		**1,600**		**1,226**		**1,226**		**0**

Appendix F

Standard Management Requirements and Monitoring Plan

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Appendix F
Standard Management Requirements and Monitoring Plan

Wildlife and Fisheries

The Standard Management Requirements (SMRs) are displayed in the *Biological Assessment / Biological Evaluation for the Empire Vegetation Management Project*. This report is part of the Empire Project Record on file at the Mount Hough Ranger District; a copy is available upon request.

California Spotted Owl: Implementation of the action alternatives during the nesting season around known spotted owl nest sites may cause disturbance that could disrupt nesting behaviors and potentially lead to nest failure. To prevent disturbance to nest sites, the following planning areas / roads should not have any land disturbance activities occurring between March 1 and August 15 due to location of known nest site in relation to a proposed harvest unit: planning areas 3G and 14G (Units 2 and 4), planning area 24G (Unit 1), and FS 25N10YA.

Northern Goshawk: Implementation of the action alternatives during the nesting season around known nest sites could may disturbance that could disrupt nesting behaviors and potentially lead to nest failure. To prevent disturbance to nest sites, the following planning areas, Defensible Fuel Profile Zones (DFPZ), and roads should not have any land disturbing activities occurring between March 1 and September 15 due to location of known nest site in relation to a proposed harvest unit: planning area 10G (eastern portion); planning area 13 (Unit 1); planning area 21G; DFPZ Unit 3; FS 24N33Y; and DFPZ unit 13 and the groups within unit 13; and DFPZ unit 14 and the groups within unit 14.

Hydrology and Soils

These SMRs are displayed in the "Cumulative Watershed Effects and Soils Assessment for the Empire Vegetation Management Project." This report is part of the Empire Project Record on file at the Mount Hough Ranger District; a copy is available upon request.

The following items describe standard management requirements that were incorporated into the design of Alternatives A, C, D, E, and F:

1. Water quality would be protected through the use of Best Management Practices (BMPs) (USDA Forest Service, 2000). BMPs are the primary method employed by the Forest Service and the State of California to prevent water quality degradation and to meet State Water Quality objectives relating to non-point sources of pollution. BMPs were incorporated in the design of the action alternatives, and are listed in this appendix.

2. Site-specific measures that relate directly to these BMPs would be utilized on this project to minimize erosion and resultant sedimentation. Measures would also be employed to minimize negative changes in other water quality parameters such as dissolved oxygen, water temperature, and turbidity. These mitigation measures follow the Scientific Analysis Team (SAT) Guidelines for areas adjacent to stream courses, lakes and wetland areas and streamside guidelines presented in the Plumas Land Management Plan. Protection and improvement measures would include minimizing disturbance of riparian zones, retention of snags for wildlife, stream shading, recruitment of large organic debris in stream channels, maintenance of side slope and stream channel stability, and prevention of an over-accumulation of activity-generated organic debris in stream channels. These measures, which were incorporated in the design of the action alternatives, will reduce the risk of cumulative and local impacts to water quality and channel stability.

3. Apply the Scientific Analysis Team (SAT) Guidelines, as set forth in the HFQLG EIS and ROD.

4. Incorporate the soil standards from the PNF Forest Plan (pages 4-43 to 4-45), as amended by the 2004 Sierra Nevada Forest Plan Amendment ROD (page 69, Table 2), and incorporate design elements to maintain soil compaction at or below the compaction threshold.

5. Soil and water quality protection measures are described below:
    a. Restrict all ground-based operations to less than 35 percent slopes outside of riparian habitat conservation areas (RHCAs), and less than 30 percent slopes within designated treatment areas of RHCAs. RHCAs with sensitive areas (e.g., springs, bogs, highly erodible or unstable soils, etc.) will not be entered with ground-based equipment.

    b. Within RHCAs, bare ground resulting from operations should be mulched. If slash or wood chips are not available, certified weed free straw or rice straw will be used. Consult with the district soil scientist and botanist prior to mulching.

    c. Within RHCAs, utilize wider skid trail spacing and implement mechanical operations in a manner that will reduce ground disturbance. Consult with the district soil scientist during unit layout, contract administration, and project implementation to minimize ground disturbance and erosion risk from mechanical operations.

    d. Unless otherwise agreed to by the physical scientist and sale administrator, landings and skid trail approaches to landings (to a distance of 200 feet) would be subsoiled through the full depth of compaction to restore soil porosity. New temporary roads would be decommissioned, which may include subsoiling of the road bed. To achieve the best results and prevent additional soil damage, a winged subsoiler should be used. A drawing with design specifications is included below. The subsoiler would be lifted where substantial root and bole damage to larger trees would occur from subsoiling. Skids with slopes greater than 25 percent would not be subsoiled. Subsoiling would not occur on shallow soils where the displacement of rocks disrupts soil horizons or where there are concerns about the spread of root disease, or damage to tree boles. Install water-bars prior to subsoiling operations.

    e. Implement the following winter or unseasonably wet weather standards in all units:

Operations may occur when the upper 8 inches of soil is dry, based on the field method: reach down and collect a small quantity of soil and try to mold it into a ball. If a ball is formed that holds together under repeated tosses, the soil is too wet for equipment operation.

Winter operations may occur only when the ground is frozen to a depth of 5 inches or over 8 inches of packed snow

    f. In their existing condition, three planning areas (units 6G, 7G, and 9G) exceed the compaction threshold for skid trails and landings, and three more (3G, 5G, 11G) are predicted to exceed

this compaction threshold. If these units are treated, they would be reevaluated and additional subsoiling would occur in skid trails, landings, and/or group selection areas to reduce the extent of skid trails and landings. Planning areas 3G, 7G and 9G would not be treated in alternatives D, E, or F. These additional subsoiling practices would leave these planning areas in an improved state that is at or below the compaction threshold.

6. All standard timber sale contract provisions will be included in timber sales. A number of these provisions are designed to protect water quality, control and limit erosion and sedimentation to watercourses. These provisions include, but are not limited to, the following:

a. B5.0 Transportation facilities
B5.12 Use of roads by purchaser
B5.2 Specified roads
B5.21 Engineering
B5.211 Contract plans
B5.212 Construction staking
B5.23 Use of partially constructed roads
B5.3 Road maintenance

b. B6.0 Operations
B6.312 Plan of operations for road construction
B6.34 Sanitation and servicing
B6.341 Prevention of oil spills
B6.342 Hazardous substances

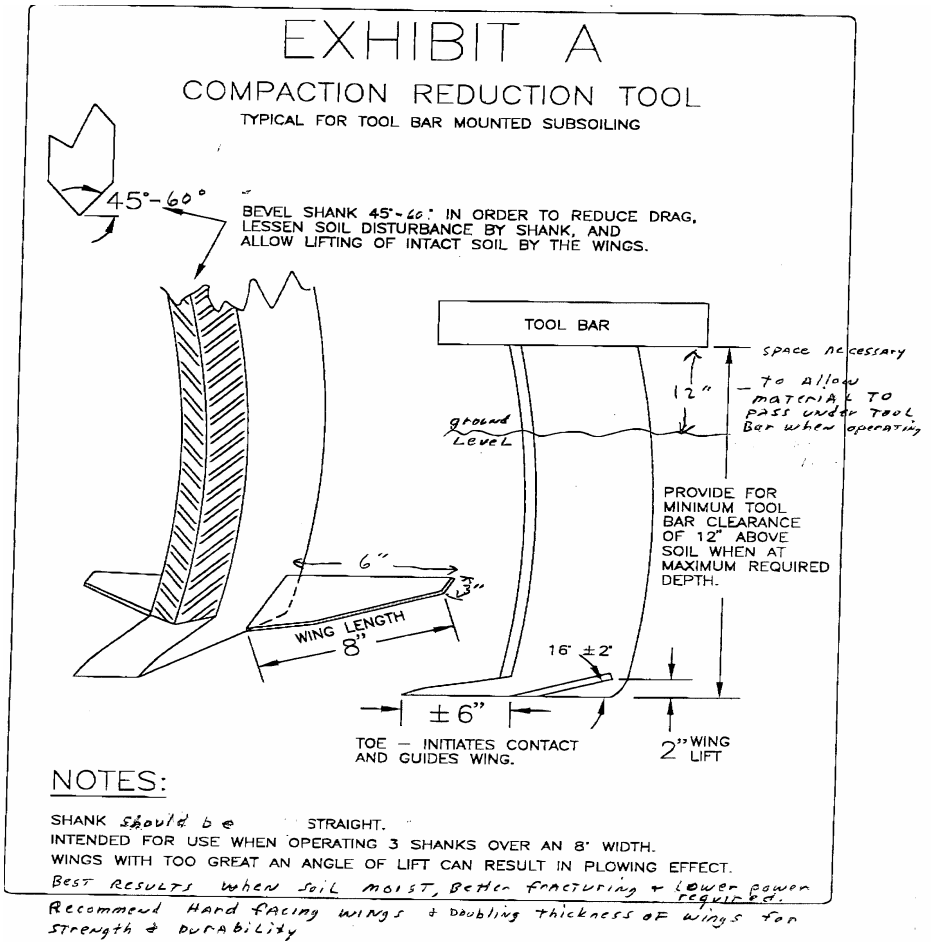
c. B6.4 Conduct of logging
B6.42 Skidding and yarding
B6.422 Landings and skid trails

d. B6.5 Streamcourse protection

e. B6.6 Erosion prevention and control
B6.61 Meadow protection
B6.62 Wetlands protection
B6.63 Temporary roads
B6.64 Landings
B6.6.65 Skid trails and firelines
B6.66 Current operating areas
B6.67 Erosion control and structure maintenance

f. C provisions as applicable

Winged subsoiler Shank Design For The Ripper Tool Bar



Best Management Practices. Water quality would be protected through the use of Best Management Practices (BMPs) (USDA Forest Service 2000). BMPs are the primary method employed by the Forest Service and the State of California to prevent water quality degradation and to meet California State Water Quality objectives relating to nonpoint sources of pollution. BMPs were incorporated in the design of the action alternatives and are listed under the regulatory framework. The following BMPs are applied when applicable:

	Standard Management Requirement (BMP)	Responsible person(s)	Timeframe
Timber management practices			
1.1	Timber Sale Planning Process	IDT, watershed specialist, prep officer, TSA	Project planning
1.2	Timber Harvest Unit Design	IDT watershed specialist	Project planning, implementation
1.3	Surface Erosion Hazard Determination for Timber Harvest Unit Design	Watershed specialist	Project planning, implementation
1.4	Use of Sale Area Maps For Designating Water Quality Protection Needs	Watershed specialist, prep officer, TSA	Project planning, implementation
1.5	Limiting Operating Period of Timber Sale Activities	IDT, watershed specialist, TSA	Project planning, implementation
1.6	Protection of Unstable Lands	IDT, watershed specialist	Project planning, implementation
1.8	Streamside Management Zone Designation	IDT, Watershed specialist, prep officer, TSA	Project planning,

Standard Management Requirement (BMP)		Responsible person(s)	Timeframe
			implementation
1.9	Determining tractor loggable ground	IDT, Watershed specialist	Project planning
1.10	Tractor Skidding Design	Watershed specialist, prep officer, TSA	Project planning, implementation
1.11	Suspended log yarding in timber harvesting	IDT, Watershed specialist	Project planning, implementation
1.12	Log Landing Location	Watershed specialist, prep officer,TSA	Project planning, implementation
1.13	Erosion Prevention And Control Measures During Timber Sale Operations	TSA, watershed specialist	Project implementation
1.14	Special Erosion Prevention Measures On disturbed Land	Watershed specialist, prep officer, TSA	Project planning, implementation
1.15	Re-vegetation of Areas Disturbed By Harvest	IDT, Watershed specialist, prep officer, TSA	Project planning, implementation
1.16	Log Landing Erosion Control	Prep officer, TSA	Project planning, implementation
1.17	Erosion Control On Skid Trails	Watershed specialist, prep officer, TSA	Project planning, implementation
1.18	Meadow Protection During Timber Harvesting	IDT, Watershed specialist, prep officer, TSA	Project planning, implementation
1.19	Streamcourse and aquatic Protection	IDT, Watershed specialist, prep officer, TSA	Project planning, implementation
1.20	Erosion Control Structure Maintenance	TSA	Project implementation
1.21	Acceptance of Timber Sale Erosion Control Measures Before Sale Closure	TSA, watershed specialist	Project implementation
1.22	Slash Treatment In Sensitive Areas	IDT, Watershed specialist, prep officer, TSA	Project planning, implementation
1.23	Five-Year Reforestation Requirement	IDT, Watershed specialist, prep officer, TSA	Project planning, implementation
1.24	Non-recurring C provisions that can be used for water quality protection	IDT, Watershed specialist, prep officer, TSA	Project planning, implementation
1.25	Modification Of The Timber Sale Contract	IDT, Watershed specialist, prep officer, TSA	Project planning, implementation
Road and Building Site Construction Practices			
2.1	General Guidelines For The Location And Design Of Roads	IDT, Watershed specialist, prep officer, TSA	Project planning, implementation
2.2	Erosion Control Plan	IDT, Watershed specialist, prep officer, TSA	Project planning, implementation
2.3	Timing of Construction Activities	IDT, Watershed specialist, prep officer, TSA	Project planning, implementation
2.4	Stabilization of Road Slope Surfaces and Spoil Disposal Areas	IDT, Watershed specialist, prep officer, TSA	Project planning, implementation
2.5	Road Slope Stabilization Construction Practices	IDT, Watershed specialist, prep officer, TSA	Project planning, implementation
2.6	Dispersion Of Subsurface Drainage From Cut and Fill Slopes	IDT, Watershed specialist, prep officer, TSA	Project planning, implementation
2.7	Control of Road Drainage	IDT, Watershed specialist, prep officer, TSA	Project planning, implementation
2.8	Constraints related to pioneer road construction	IDT, Watershed specialist, prep officer, TSA	Project planning, implementation
2.9	Timely Erosion Control Measures on Incomplete Roads and Stream crossing projects	IDT, Watershed specialist, prep officer, TSA	Project planning, implementation
2.10	Construction of stable embankments (fills)	IDT, Watershed specialist, prep officer, TSA	Project planning, implementation
2.11	Control of Sidecast Material during construction and maintenance	IDT, Watershed specialist, prep officer, TSA	Project planning, implementation
2.12	Servicing And Refueling Of Equipment	IDT, Watershed specialist, prep officer, TSA	Project planning, implementation
2.13	Control of Construction and maintenance activities adjacent to SMZs	IDT, Watershed specialist, prep officer, TSA	Project planning, implementation
2.14	Controlling In-channel Excavation	IDT, Watershed specialist, prep officer, TSA	Project planning, implementation
2.15	Diversion Of Flows Around Construction Sites	IDT, Watershed specialist, prep officer, TSA	Project planning, implementation
2.16	Stream crossings On Temporary Roads	IDT, Watershed specialist, prep officer, TSA	Project planning,

Standard Management Requirement (BMP)		Responsible person(s)	Timeframe
			implementation
2.17	Bridge and culvert installation	IDT, Watershed specialist, prep officer, TSA	Project planning, implementation
2.19	Disposal of right-of-way and roadside debris	IDT, Watershed specialist, prep officer, TSA	Project planning, implementation
2.20	Specifying riprap composition	IDT, Watershed specialist, prep officer, TSA	Project planning, implementation
2.21	Water source development consistent with water quality protection	IDT, Watershed specialist, prep officer, TSA	Project planning, implementation
2.22	Maintenance of Roads	IDT, Watershed specialist, prep officer, TSA	Project planning, implementation
2.23	Road Surface Treatment To Prevent Loss of Materials	IDT, Watershed specialist, prep officer, TSA	Project planning, implementation
2.24	Traffic Control During Wet Periods	IDT, Watershed specialist, prep officer, TSA	Project planning, implementation
2.25	Snow removal controls to avoid resource damage	IDT, Watershed specialist, prep officer, TSA	Project planning, implementation
2.26	Obliteration or decommissioning of roads	IDT, Watershed specialist, prep officer, TSA	Project planning, implementation
Vegetation Manipulation Practices			
5.2	Slope Limitations for Mechanical Equipment Operations	IDT, Watershed specialist, prep officer, TSA	Project planning, implementation
5.3	Tractor Operation Limitation in Wetlands and meadows	IDT, Watershed specialist, prep officer, TSA	Project planning, implementation
5.6	Soil Moisture limitations for Mechanical Equipment Operations	Watershed specialist, prep officer, TSA	Project planning, implementation
Fire Suppression and Fuels Management Practices			
6.1	Fire And Fuel Management Activities	IDT, Watershed specialist, prep officer, TSA	Project planning, implementation
6.2	Consideration of Water Quality In Formulating Fire Prescriptions	IDT, Fuels officer, Watershed specialist, prep officer, TSA	Project planning
6.3	Protection of water quality from prescribed burning effects	IDT, Fuels officer, Watershed specialist, prep officer, TSA	Project planning, implementation
Watershed Management Practices			
7.3	Protection of Wetlands	IDT, Watershed specialist, prep officer, TSA	Project planning, implementation
7.4	Oil And Hazardous Substance Spill Contingency Plan And Spill Prevention Control and Countermeasure (SPCC) Plan	Hazardous materials coordinator, Prep officer, TSA	Project planning, implementation
7.8	Cumulative Off-site Watershed Effects	IDT, Watershed specialist	Project planning, implementation

Site-specific measures that relate directly to these BMPs would be used on the Empire Project to minimize erosion and resultant sedimentation. The BMPs would also be used to minimize negative changes in other water quality parameters such as dissolved oxygen, water temperature, and turbidity. These measures follow the Scientific Analysis Team Guidelines for areas adjacent to stream courses, lakes and wetland areas. Protection and improvement measures would include minimizing disturbance of riparian zones, retention of snags for wildlife, stream shading, recruitment of large organic debris in stream channels, maintenance of side slope and stream channel stability, and prevention of an over accumulation of activity-generated organic debris in stream channels. Timber sale contracts contain many standard provisions that help ensure protection of soil and water resources. These include provisions for an erosion control plan, road maintenance, and skid trail spacing. The following measures, which were incorporated in the design of the action alternatives, would further reduce the risk of cumulative and local impacts on water quality and channel stability.

Botanical Resources and Noxious Weeds

These SMRs are displayed in the "Noxious Weed Risk Assessment for the Empire Vegetation Management Project." This report is part of the Empire Project Record on file at the Mount Hough Ranger District; a copy is available upon request.

The following SMRs will greatly reduce the risk of noxious weed invasion and spread of existing populations. These SMRs are consistent with the HFQLG FEIS (USDA Forest Service 1999a, USDA Forest Service 1999b), SNFPA FSEIS (USDA Forest Service 2004a, USDA Forest Service 2004b), USDA Forest Service Strategy for Noxious and Nonnative Invasive Plant Management (USDA Forest Service 1996), and Region 5's Regional Noxious Weed Strategy (USDA Forest Service 2000). Furthermore, these SMRs are the means by which the requirements of the FSM section 2081, Management of Noxious Weeds, are fulfilled.

The SMRs are ordered based on the priorities established in FSM 2081.2, which states, "Where funds and other resources do not permit undertaking all desired measures, address and schedule noxious weed prevention and control in the following order:

1. First Priority: Prevent the introduction of new invaders,
2. Second Priority: Conduct early treatment of new infestations, and
3. Third Priority: Contain and control established infestations.

Post implementation surveys of the Antelope Border DFPZ did not document noxious weeds (Merriam et al 2003), thus supporting the effectiveness of prevention SMRs.

Prevent the introduction of new invaders:

Cleaning of off-road equipment: Require all off-road equipment and vehicles (Forest Service and contracted) used for project implementation to be weed-free. Clean all equipment and vehicles of all attached mud, dirt and plant parts. This will be done at a vehicle washing station or steam cleaning facility before the equipment and vehicles enter the project area. Cleaning is not required for vehicles that will stay on the roadway. Also, all off-road equipment must be cleaned prior to leaving areas infested with noxious weeds.

Road Construction, Reconstruction, and Maintenance: All earth-moving equipment, gravel, fill, or other materials need to be weed free. Use onsite sand, gravel, rock or organic matter where possible.

Revegetation: Use weed-free equipment, mulches, and seed sources. Avoid seeding in areas where revegetation will occur naturally, unless noxious weeds are a concern. Save topsoil from disturbance and put it back to use in onsite revegetation, unless contaminated with noxious weeds. All activities that require seeding or planting will need to use only locally collected native seed sources. Plant and seed material should be collected from as close to the project area as possible, from within the same watershed and at a similar elevation whenever possible. Persistent non-natives such as timothy, orchardgrass, or ryegrass should be avoided. This will implement the USFS Region 5 policy that directs the use of native plant material for revegetation and restoration for maintaining "the overall national goal of conserving the biodiversity, health, productivity, and sustainable use of forest, rangeland, and aquatic ecosystems. As necessary, Plumas National Forest botanists will develop

project and site-specific revegetation and seeding guidelines that will be customized from existing general guidelines.

Post project monitoring will facilitate the early detection of new populations and allow for developing proposals for treatment before populations get large.

Reduce the likelihood of spreading known infestations:

Staging Areas: Do not stage equipment, materials, or crews in noxious weed infested areas where there is a risk of spread to areas of low infestation.

Flag and Avoid known sites in project treatment units (see maps at end of this appendix).

Flag roadside locations along access roads to project treatment units. Incorporate practical and feasible measures such as performing work from uninfested areas into infested areas and washing equipment immediately after operating in infested areas, into road maintenance, reconstruction, and construction contracts to minimize the spread of noxious weeds by these activities.

Flag and Avoid noxious weed locations discovered during project implementation.

Noxious Weed Mitigations (Conduct early treatment of new infestations, and Contain and control established infestations)

Mitigation measures are designed to control known infestations within project treatment units and along project access roads. These are to be implemented as soon as appropriate based on species phenology (development patterns) after a decision is made on the project. Treatments should continue yearly during project implementation in order to prevent seed set and dispersal into suitable habitat created by project activities.

Chondrilla juncea (rush skeletonweed) A-rated

One small site of three plants is known along Rattlesnake Creek Road (PC 508 / 24N02X), an access road to project treatment units.

ACTION: Hand pull plants at known location to prevent seed set and further spread. Monitor all roads in immediate vicinity for more locations of rush skeletonweed.

Centaurea maculosa (spotted knapweed) A-rated

Two small locations near the railroad tracks at the end of Roundhouse Road.

This population is small so eradication from the site is a reasonable goal. Other noxious weeds in the area are yellow starthistle on PNF and private land and Scotch broom on private land. None of the weeds in this area are likely to be spread by project activities. Spotted knapweed has a stout taproot and can reproduce vegetatively from lateral roots. Because of this resprouting, hand pulling, digging, and other mechanical methods are generally not effective methods of eradication. While biological agents exist for the control of spotted knapweed they most likely will be ineffective for the same reasons discussed under the rush skeletonweed section above. Fire alone also is generally not effective because burned areas create optimal conditions for seed

germination, seeds last up to 10 years in the soil, and fire is usually not hot enough to kill the lateral roots which sprout new plants. However, fire in conjunction with herbicides is method that has been successful.

Action: Continue on-going treatment of hand pulling plants at known location to prevent seed set and further spread. Flag location for avoidance.

Centaurea solstitialis (yellow starthistle) C-rated

Yellow starthistle is a winter annual (seed germinates in late summer or fall; overwinters; grows, flowers, and sets seed the following spring and summer) known from over 52 locations within the vicinity of the project area and is common in American and Indian valleys. Seed dispersal is generally poor with most seeds falling within 2 feet of the mother plant. Dispersal distances over 16 ft. are mainly attributed to wildlife or anthropogenic factors. Although experimental results are variable, seeds remain germinable in the soil for 3 to ten years (DiTomaso 2004).

Quarry Road (25N14 / OHV route 51) is a main access route through the project area. The yellow starthistle population extends from Hwy 70 to the train bridge, about 1/10 mile. The potential for project related activities to spread the infestation are high.

Taylor Creek / 25N14. This is a small roadside population that has been hand pulled for two years.

Thompson Creek: This occurrence is along the La Porte Road just before the crossing of Thompson Creek and the intersection with the 24N26.

Berry Creek. This occurrence is small but dense. It is next to the creek and railroad tracks.

Johnson Hill. There are several known locations in this area.

Mt Hough Road. There are three roadside locations in this area that may be spread due to project related traffic. These locations have been hand pulled for the last two years.

Massack. Eleven locations along railroad tracks and between railroad tracks and 25N41 crosses Massack Creek.

Action: Utilize a combination of hand pulling, weed whacking, or flaming to prevent seed set.

Cirsium vulgare (bull thistle) listed but not yet rated

Bull thistle is also common along roads and in other disturbed locations on the PNF. Neither the Forest Service nor Plumas County actively manages populations of Canada thistle, bull thistle, or Klamathweed. Plants observed in the project area occur as scattered individuals not in large, dense stands. Bull thistle is a tap rooted annual or short lived perennial. It does not spread by rhizomes or other types of creeping rootstock.

Action: no species-specific management is necessary.

Convolvulus arvensis (field bindweed) C-rated

Field bindweed is known from one location in the project area, DFPZ unit #7 adjacent to railroad tracks.

Action: no species-specific management is necessary.

Cytisus scoparius (Scotch broom) C-rated

Scotch broom is known from 9 locations in the vicinity of the project. Six occurrences are on Forest Service lands and three are located on private land off of Roundhouse Rd. The Plumas NF will continue to work with the Plumas County Department of Agriculture to control weed occurrences on private land. The locations on FS lands include the following:

3 locations west of FS 25N12Y

2 locations in unit 28 north of FS 25N12 near Empire Mine

Action: Hand pull or weed wrench plants and monitor locations for seedlings.

1 location on the Cascade trail. The plant along the Cascade trail was pulled in 2004.

Action: Monitor location for seedlings and pull if located.

Hypericum perforatum (Klamathweed) C-rated

Klamathweed is common along roads and other disturbed areas within the project area. Neither the Forest Service nor Plumas County actively manages populations of Canada thistle, bull thistle, or Klamathweed. The biological control agents *Chrysolina quadrigemina* and *C. hyperici*, leaf-feeding flea beetles, and *Agrilus hyperici* a root-boring beetle, largely control Klamathweed. These biological control agents have reduced infestations by 97% to 99% since 1940 (California Department of Food and Agriculture 2004). Klamathweed is found along many Forest Service roads on the Plumas National Forest. Populations rarely form dense stands or invade the adjacent forest.

Action: rely on existing biological agents to control populations.

Taeniatherum caput-medusae (medusahead) C-rated

In the project area, medusahead is known to occur along the Mt Hough Road, in the vicinity of Quincy Junction, along the railroad tracks and adjacent lands from Massack to Johnson Hill, numerous locations along the 25N14, in DFPZ units 2, 7, 9 (rx only), 1 (mechanical harvest), and planning areas 11g, 14g, and 16g.

Action: Continue to implement the proposed medusahead control project or perform late spring underburns.

Noxious weed locations not affected by the action alternatives.

Cirsium arvense (Canada thistle) B-rated

Canada thistle is known from Berry Creek, Cashman Creek, a Cashman Creek tributary, Squirrel Creek, and Butterfly Valley Botanical Area. Neither the Forest Service nor Plumas County actively manages populations of Canada thistle, bull thistle, or Klamathweed. Canada thistle is a perennial, rhizomatus plant. This species is generally not managed because of the cost of available treatments. Some mechanical/physical treatments may spread the population rather than eradicate it (Bossard et al 2000). Repeated hand-pulling has been found effective in eradication of Canada thistle (Bossard et al 2000) and is currently being evaluated at the Butterfly Valley Botanical Area location. To date the 2,000 ft ² area has been treated thirteen times in a two-year period taking 30-40 hrs and has produced little discernable impact to the population.

Action: Continue on-going treatment of hand pulling the plants at Butterfly Valley Botanical Area every two to three weeks during the growing season.

Centaurea solstitialis (yellow starthistle) C-rated

Oakland Camp. This area has been weed whacked for two years in conjunction with the Dancehouse RAC project and is flagged on the ground. Weeds at this location are unlikely to be spread by project activities.

Action: Continue current treatment i.e. flag and avoid area, continue to treat by weed whacking and hand pulling until eradicated.

Greenville wye, Hwy 70, Hwy 89. The roadside locations along these major routes are too extensive for treatments available to us at this time (hand pulling, mechanical). None of these weeds are likely to be spread by project activities.

Action: Work with Plumas County Agricultural Commissioner in developing a management plan for roadside weeds.

26N66. There are several locations along this road that will not be spread by this project.

Action: Incorporate these locations into a Forest/District long-term treatment plan.

Roundhouse Rd. Two large occurrences near railroad tracks. Spotted knapweed is nearby at the watertank (see above). Scotch broom and yellow starthistle are on private land south of the railroad tracks. None of the weeds in this area are likely to be spread by project activities.

Action: As funding allows, hand pull, flame, or mechanically treat locations. Flag for avoidance during road maintenance/reconstruction and other project related activities. Work with County for control of weeds on private land.

Lee Summit. The weeds at this location are unlikely to be spread by project activities.

Action: Work with CalTrans and Plumas County to develop a management plan for roadside weeds.

Cytisus scoparius (Scotch broom) C-rated

Roundhouse Rd.

Action: Work with County for control of weeds on private land.

Heritage Resources

These SMRs are displayed in the "Heritage Resource Report for the Empire Vegetation Management Project." This report is part of the Empire Project Record on file at the Mount Hough Ranger District; a copy is available upon request.

A. All proposed activities, facilities, improvements, and disturbances shall avoid heritage resource sites. "Avoidance" means that no activities associated with the project that may affect heritage resource sites shall occur within a site's boundaries, including any defined buffer zones. Portions of the project may need to be modified, redesigned, or eliminated to properly avoid heritage resource sites.

B. All heritage resource sites within the area of potential effect shall be clearly delineated prior to implementing any associated activities that have the potential to affect heritage resource sites.

C. Buffer zones may be established to ensure added protection where the forest or district archaeologist determines that they are necessary. The use of buffer zones in conjunction with other avoidance measures are particularly applicable where setting contributes to the property's eligibility under 36 CFR 60.4, or where it may be an important attribute of some types of heritage resource sites (e.g., historic buildings or structures; historic or heritage properties important to Native Americans). The size of buffer zones needs to be determined by the forest or district archaeologist on a case-by-case basis.

D. When any changes in proposed activities are necessary to avoid heritage resource sites (e.g., project modifications), these changes shall be completed prior to initiating any activities.

E. Monitoring during project implementation, in conjunction with other measures, may be used to enhance the effectiveness of protection measures.

F. If heritage resources are inadvertently discovered during project implementation, the Mount Hough Ranger District archaeologist will be contacted immediately. The heritage resources will be recorded, clearly delineated, and protected.

Treatment Implementation

In fuel treatments, individual tree selection, and group selection harvests, pre-existing skid trails and landings will be used whenever available, feasible, and in a desirable location. In order to avoid loss of land base productivity, no more than 15 percent of timber stands shall be dedicated to landings and permanent skid trails (*Plumas National Forest Land and Resource Management Plan* [PNF LRMP]). In areas where pre-existing skid trails and landings are not present, construction of such facilities will occur as agreed upon by the Forest Service and purchaser. All landings and skid trails utilized shall conform to the standards and guidelines set forth in the Timber Sale Administration Handbook (FSH 2409.15) and the PNF LRMP.

Group selection harvest units adjacent to transportation infrastructure may be used as landings rather than creating new facilities. Group selection harvest units that are used as landings will be subsoiled accordingly and planted to appropriate conifer stocking levels.

Whole-tree yarding is proposed for fuel treatment, group selection, and individual tree selection harvests. Under a whole-tree yarding harvest system, individual trees are directionally felled using a mechanical cutting head attached to a tractor or similar unit. Smaller trees (less than 10 inches dbh) are cut, gathered in bunches, and left as "doodles" in the harvest unit; these smaller trees are not typically bucked or limbed within the unit. A rubber tired, track laying, or similar machine is then used to yard these doodles to the landing. At the landing, trees are limbed and bucked to specified lengths. Bucked log sections are loaded onto a log truck and transported to the mill; limbs are typically either chipped and hauled away to a cogeneration (power) plant or burned at the landing.

Occasionally, larger diameter trees (greater than 20 inches dbh) cannot be skidded in whole tree sections as these sections may exceed 100 feet. Typically, these sections are bucked to lengths of 40 feet and skidded to the landing individually. At the landing, they are limbed and further bucked to specification as needed and hauled to the mill. In some cases, the amount of limbwood on a tree may not allow skidding of the tree without damage to the residual stand. This usually occurs on butt logs that are greater than 20 inches in diameter. In this case, limbwood will be removed within the unit to facilitate skidding to the landing. Additional limbwood may break off along skid trails during skidding.

Treatment of this residual slash (after whole-tree yarding) created during harvests will be handled differently depending on treatment type. Within group selection units, slash will either be grapple piled and burned or underburned to prepare the site for planting. In individual tree selection units, slash treatment will include piling and burning, whole-tree yarding, slash chipping, and lopping/scattering limbs and treetops. Fuel treatment units will be evaluated after treatment, and areas that do not meet desired conditions with respect to surface fuels will be treated with underburning, pile burning, or other appropriate method.

Mastication will be implemented using a mastication head attached to an excavator, small tractor, or other type of machine (Coulter et al. 2002). The mastication head is used to chip or shred ladder fuels from brush and small trees (up to ~9 inches dbh) in place. Shredded material is incorporated into the duff layer during operations, left on site, or reduced using a follow prescribed burn following post treatment evaluation. Mastication is typically implemented in areas of high brush cover or that need ladder fuel treatment where biomass removal is not feasible.

Monitoring

DFPZ Maintenance Monitoring

Although the DFPZs were designed to remain effective for 10 years, monitoring will begin no later than 4 years after construction is completed.

The monitoring plan would be completed at least every two years thereafter. Results of this monitoring would be available to the public.

When surface fuel conditions reach a level of five to seven tons per acre, DPFZ maintenance activities may be necessary.

Heritage Resources

Monitoring during project implementation would be completed by district personnel.

Noxious Weeds

Monitoring during project implementation would be completed by district personnel.

HFQLG Pilot Project

The Empire Vegetation Management Project, as part of the HFQLG Pilot Project, will be incorporated into this larger, pilot project-wide monitoring.

The HFQLG Pilot Project Monitoring Plan was initiated in fiscal year (FY) 2000 and provides a structure, in the form of questions, to gain information about (1) habitat concerns, (2) effects of implementing pilot project activities, (3) effectiveness of those activities, and (4) economic well-being. The monitoring plan, which includes a full description of these questions and their monitoring protocols, is available in the Empire Project Record.

The "Habitat Concerns" section includes methods to assess habitat connectivity, old forest habitat, and aquatic/riparian-dependent species monitoring. This section meets the requirement in the 1999 HFQLG Final Environmental Impact Statement (FEIS) Record of Decision that states, "over the course of the Pilot Project, suitable habitat for old-forest-dependent species and aquatic/riparian-dependent species (including amphibians) shall not be reduced by more than ten percent below 1999 levels."

The "Implementation Monitoring" section has three levels of assessment: project evaluations, interagency project reviews, and topic specific questions. This section provides information about the degree to which treatments are implemented according to standards and guidelines set forth in the HFQLG Act FEIS, each forest's land management plan, and site-specific direction. There are 10 topic-specific questions concerning forest structure, best management practices, soil quality, sensitive plants, noxious weeds, and air quality. These questions include information on objectives, scale, monitoring protocol, and estimated cost.

In the "Effectiveness Monitoring" section, 21 topic-specific questions address: (1) old-forest values and old-forest-dependent species; (2) watershed effects; (3) wildfire protection and fuels reduction; (4) threatened, endangered, and sensitive plants, and (5) noxious weeds. These questions assess the degree to which implemented treatments meet resource objectives. The topic-specific questions also include information on objectives, scale, monitoring protocol, and estimated cost.

The "Economic Well-Being" section has been contracted to the Center for Economic Development in Chico, CA, to collect and analyze data.

Plumas-Lassen Administrative Study

The Empire Vegetation Management Project is incorporated into the Plumas-Lassen Administrative Study, also known as the "case study." This study is interdisciplinary, examining at least five groups of response variables (spotted owls, small mammals, terrestrial birds, vegetation, and fuels conditions) through collaboration between researchers of the USDA Forest Service Pacific Southwest Research Station and cooperators from the University of California–Berkeley and Davis, and the Point Reyes Bird Observatory. The study addresses some of the most significant uncertainties that confound management decision in the Sierra Nevada today, including in the HFQLG Pilot Project area. How do old-forest-dependent species respond to vegetation management over space and time? Do fuels management approaches effectively address fuels loadings without negatively affecting species viability? How effective are landscape level fuels management strategies in modifying fire behavior and reducing the extent and severity of wildland fire? These and related questions are the focus of the work being done in this study. A copy of the study is in the Empire Project Record

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Appendix G

Past, Present, and Reasonably Foreseeable Future Projects

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Appendix G - Past, Present, and Reasonably Foreseeable Future Actions

Wildland Fires

There were 418 wildfires in the wildlife analysis area from 1970 to 2001. The fires ranged from 0.1 acre to approximately 1,600 acres. Eight fires were greater than 10 acres.
There were 355 fires in the subwatersheds from 1970 to 2001, ranging in size from less than 1 acre to over 1,600 acres. Of these 355 fires, 159 were lightning caused; the remaining 196 were human caused. Between 1916 and 2003, 22 fires have exceeded 100 acres in size, burning over 14,000 acres or approximately 14 percent of the 103,000-acre Empire Vegetation Management Project (Empire Project) area.

Recreation

Most of the recreational use in the Empire Project boundaries is by individuals and small groups participating in dispersed activities that include hiking, horseback riding, mountain biking, Christmas Tree cutting, dirt biking, pleasure driving, ATV riding, hunting, fishing, camping, rock hounding and mining, and firewood gathering.
There are two developed campgrounds:
Spanish Creek – Located 8 miles north of Quincy. Section 15, T25N, R9E. Approximately 1,000 campers used the campground from July 1st to October 15th in 2004. This was the first year the campground was fully developed. It is estimated that in the future, about 2,000 campers will visit the site from May 1 through October 15.
Brady's Camp – Sits just below the top of Grizzly Ridge, slightly to the north and east of Argentine Rock, in the SW 1/4, Section 9, T 24 N, R 11 E. Approximately 100 campers use Brady's Camp from June 1 through October 15, mainly by deer hunters in September and October.
There are over 70 mining claimants and 45 placer mining claims along the creeks. The time frame for dredging season is from the third week of May through October 15 each year.
There is a developed OHV track, with unloading ramp and trailhead at Four Corners, 0.25 mile west from the junction of FS 25N14 and County Road 403. Approximately 200 to 250 people use this track each year, and use is increasing. It is a fairly new development (reconstructed in 2003), so the Forest Service expects the track will be discovered by more users as time passes.
There are six designated off-highway vehicle routes within the Empire Project boundaries. The routes are comprised of approximately 103 miles, and about 50 to 100 people use the routes each year. This area is used heavily by horseback riders, dirt-bike riders, and ATV users, and it is estimated that about 50 to 75 mountain bikers use the routes each year.

Permits, Mount Hough Ranger District

Personal Use Woodcutting

The following shows the number of woodcutting permits sold; woodcutting is allowed throughout the Plumas National Forest.
2001 – 998 permits for 2,572 cords.
2002 – 938 permits for 2,401 cords.

2003 – 819 permits for 2,154 cords.
2004 – 758 permits for 2,400 cords

Commercial Woodcutting

2001 – 17 permits for 160 cords.
2002 – 15 permits for 135 cords.
2003 – 15 permits for 90 cords.
2004 – 19 permits for 95 cords.

Christmas Tree Permits

The following shows the number of permits sold; cutting is allowed throughout the Plumas National Forest.

2001 – 2,062

2002 – 2,348

2003 – 2,182

2005 – 2,124

Grazing Allotments

The Long Valley allotment overlaps onto subwatershed 033 and the wildlife analysis area. The allotment is vacant.
The Bear Creek allotment overlaps onto the wildlife analysis area. However, due to topography, cattle do not enter the analysis area portion of the allotment.

Hunters

The deer tag quota for Zone X6A is approximately 380 (2005). The season runs for approximately three weeks in October.

Special Use

There are 43 Special Use Permits in the wildlife analysis area and the subwatersheds. The Special Use Permits are for road use, TV antennas, a cemetery, power and telephone lines, microwave antennas, waterlines, reflectors, livestock areas, organizational camps, residences, irrigation and domestic waterlines, and horse trails.

Table G.1 displays the acres of timber harvest activities on private land in the wildlife analysis area. The acreages come from a summary of the Timber Harvest Plans.
Table G.2 displays the acres of Forest Service activities in the wildlife analysis area. The acreages come from timber sale stand record information.
Table G.3 displays the acres of timber harvest activities on private land in the subwatersheds. The acreages come from a summary of the Timber Harvest Plans.
Table G.4 displays the acres of Forest Service activities in the Diamond project area. The acreages come from timber sale stand record information.
Figures G.1 and G.2 display the cumulative effects analysis areas for vegetation, fuels, wildlife and watershed resources.

Table G.1. Timber harvest activities on private land in the wildlife analysis area.

Year	Shelterwood Seed	Comm. Thin	Selection	Shelterwood Removal	Group Selection	Clearcut	Sanitation Salvage	Rehab	Seed Tree Removal
1994	0	553	95	52	0	26	0	13	0
1995	0	931	287	88	0	226	927	66	0
1996		131	106	77	0	0	0	0	60
1997	0	117	90	7		0	0	59	0
1998	251	878	217	30	0	215	1,155	0	0
1999	0	0	0	0	0	0	0	0	0
2000	0	38	36	469	4	0	0	0	0
2001	20	981	41	20	49	139	0	0	0
2002	0	703	83	306	0	434	0	101	0
2003		85	5	0	0	249	0	0	0

Table G.2. Forest Service activities in the wildlife analysis area, 1969 through 2004.

Activity	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
Underburn													17				12				
Burn Piles											78			10							
Hand Piling																					
Tractor Piling																					
Clearcut								12			15	62	28		562	27	59	167	245	110	117
Shelterwood Seed Cut																0		74	246		
Overstory Removal				406		6		82			80	83	11	7	295	32	33	6	124	39	169
Selection	158	896		31	166						33				67		51			79	61
Group Selection																					
Salvage																			5		10
Sanitation																20	97	21	55	24	
Salvage Cull																					9
Planting		6	76			60	3		163		495	66	103	66		34		62	113		97
Site Prep - Burning												142								4	10
Site Prep - Mechanical						4			15			67		20		143					13
Site Prep - Manual										52										7	37
Release							55							23	29		44	33			
Precommercial Thinning						116	44				216	528	20		79			181			140
Hand Thinning																					
Mechanical Thinning																					
Activity	**1990**	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**2002**	**2004**										
Underburn										26											
Burn Piles				67	23																
Hand Piling	11																				
Tractor Piling	24																				
Clearcut	88	59	325																		
Shelterwood Seed Cut																					

Table G.3. Timber harvest activities on private land (continued).

Overstory Removal	468	209																				
Selection	52	161																				
Activity	**1990**	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**2002**	**2004**											
Group Selection		110																				
Salvage	272	165	151		39	2	4	16														
Sanitation		13																				
Salvage Cull																						
Planting	18	90		76	61	20	59															
Site Prep - Burning	18	11																				
Site Prep - Mechanical	46				78																	
Site Prep - Manual	15	30		84																		
Release		25				41																
Precommercial Thinning	101	76			178	48			11													
Hand Thinning											288											
Mechanical Thinning											95											

Table G.3. Timber harvest activities on private land.

Subwatershed	Year	Shelterwood Seed	Commercial Thinning	Selection	Shelterwood Removal	Group Selection	Clearcut	Sanitation/ Salvage	Rehabilitation	Seed Tree Removal
001	1998			52						
003	1994		9	0	7					
003	1996		76	76	289					
003	1997		1							
003	2001	17			35					
003	2003			357						
004	1994		30							
004	1995			32						
004	2000		82							
005	1998	5	2	40	70	61	4			12
008	1994			52	3					
008	1996				9					
008	1997		18	13					10	
008	1998		8							
008	2000		35							
008	2003		29	5			15			
009	1996		16		6					
010	1998		5		33					
012	1994				2					
012	1997		13	7					6	
013	1996				3					
016	1994				2					
016	1995		10		10					
016	1997		85	68					43	
016	2001									
016	2003		54	3		36	24			
017	1996		41	64	10					36

Table G.3. Timber harvest activities on private land (continued).

Subwatershed	Year	Shelterwood Seed	Commercial Thinning	Selection	Shelterwood Removal	Group Selection	Clearcut	Sanitation/ Salvage	Rehabilitation	Seed Tree Removal
018	2002		7	1			2		2	
019	1994		71	38			7		20	2
019	1997		3		67		4			
019	2002		20	2			3		6	
020	1995		1		11					
020	2002		266	20			45		80	
021	2002		52	4	144		6		12	
022	1994		35	18	3		5		9	
022	1997		2		23		4			
023	1997		1		71					
023	1998	160	96							
023	1999				12					
023	2000				10					
024	1994		1	1	4					
024	1995		174	49	1		45	185	13	
024	2000			5		1				
024	2003						41			
025	1995			3						28
025	1997		1		20					
025	1998		81				26			
025	2002		20	1			3		6	
026	1995			5						43
026	1998		123		14		40			
027	1998		60				21	115		
027	2002		5		66					
028	1998		492				182	981		
029	1995		20	17						
029	1998		30				10	57		
029	2001		346				62	554		
029	2002		20	2			113			

Table G.3. Timber harvest activities on private land (continued).

Subwatershed	Year	Shelterwood Seed	Commercial Thinning	Selection	Shelterwood Removal	Group Selection	Clearcut	Sanitation/ Salvage	Rehabilitation	Seed Tree Removal
030	2000		5		183					
030	2001		346				182	981		
030	2002		20	2			113			
031	1995		277				42	72		
031	1996				9					
031	1998				9					
031	1999		417	943		1	170	276		
031	2002		99	18	16		113			
032	1996				9					
032	2001		77				13	123		
032	2002		8		273					
033	1998				9					
033	1999		180	407			73	119		
033	2002		185	38	38					

Table G.4. Forest Service activities in the Empire Project area, 1966 through 2004.

Activity	1966	1969	1970	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
Activity Fuels Broadcast Burn						30															
Activity Fuels Jackpot Burn						25	65														
Activity Fuels Underburn													14	50	240				240		
Area release and weeding																	31	7			
Burn of Activity Fuels Piles								12			21	85	13	6					2		15
Burning site preparation for planting													25			39				186	61
commercial thin dancehouse																					
Group selection cut				14																	34

Table G.4. Forest Service activities in the Empire Project area, 1966 through 2004 (continued).

Individual tree release and weeding							20														
Activity	1966	1969	1970	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
Mechanical site preparation for planting						5		12	10	43	45	64	7	22		143	44		8	40	
Other site preparation for planting																					
Overstory removal cut			13	441		160		80		73	227	436	69		746	107	78	189	402	38	153
Patch clearcutting								12			15	37			222	27	29	31	20	61	73
Permanent Land Clearing																					30
Piling of Activity Fuels																					
Precommercial thinning - individual or selected trees																96					284
Salvage cut			366	64													161				13
Sanitation (salvage)									406												
Sanitation Cut															11	9	0	27	7		
Seed-tree seed cut															30			58	88		36
Single-tree selection cut	73	345	848	100	250						276				84		7		11	1.12	111
Site preparation for planting																2				2	13
Stand clearcutting (w/reserve)													6		301			75			
Stand Clearcutting												25	22		39		30	61	225	49	44
Wildlife Habitat Prescribed fire																	18				
Activity	1990	1991	1992	1993	1994	1995	1996	1997	2002	2004											
Activity Fuels Broadcast Burn																					
Activity Fuels Jackpot Burn																					
Activity Fuels Underburn			60						60												
Area release and weeding						201															
Burn of Activity Fuels Piles		26	30																		
Burning site preparation for planting		37																			
commercial thin dancehouse										31											

Table G.4. Forest Service activities in the Empire Project area, 1966 through 2004 (continued)**.**

Group selection cut																						
Activity	1990	1991	1992	1993	1994	1995	1996	1997	2002	2004												
Individual tree release and weeding																						
Mechanical site preparation for planting	11	48			141																	
Other site preparation for planting	11	123	7	176																		
Overstory removal cut	612	286	255																			
Patch clearcutting	6																					
Permanent Land Clearing																						
Piling of Activity Fuels	57																					
Precommercial thinning - individual or selected trees						147																
Salvage cut																						
Sanitation (salvage)	120	195	19		4		10	102														
Sanitation Cut		16																				
Seed-tree seed cut	49																					
Single-tree selection cut	95	172	79																			
Site preparation for planting					36																	
Stand clearcutting (w/reserve)	27	59	284																			
Stand Clearcutting	55		41																			
Wildlife Habitat Prescribed fire																						

Future Activities

The Empire Project Record contains a table that displays the Forest Service activities in the subwatersheds.

Some future activities are listed below.

2005	Dancehouse-Chandler Fuel Treatment Project	Approximately 33 acres of mechanical thinning in subwatershed 019, and approximately 50 acres of handpile burning and 250 acres of underburning. Subwatershed 014 – 75 acres of underburning; subwatershed 015 – 15 acres of underburning; subwatershed 018 – 80 acres of underburning; and subwatershed 019 – 80 acres of underburning. Approximately 25 acres of handpiling in subwatershed 018 and 25 in subwatershed 019.
2005–2006	Old Sloat Fuels Reduction Project	Mechanical thinning approximately 160 acres and 100 acres of maintenance hand thinning and burning. Sections 2, 3, and 10, T23N, R11E. This is located in the wildlife analysis but not within any of the subwatersheds.
	DFPZ maintenance	Future DFPZ maintenance is not proposed at this time. However, it is included in the cumulative effects section of the EIS as a possible future event. The following predicted maintenance treatments include approximately 6,034 acres of prescribed fire, 222 acres of mechanical treatment, and 380 acres of hand treatment for Alternative A. Alternatives C and D are predicted to include approximately 6,000 acres of prescribed fire, 230 acres of mechanical treatment, and 380 acres of hand treatment. Maintenance activities could occur at least 10 years after implementation.
2005	Roadside hazard sale	Approximately 5 acres of roadside hazard removal in subwatershed 030 – is in the wildlife analysis areas. Majority of the project is on the Beckwourth Ranger District.
2005–2010	Wildlife habitat improvement projects	About 12 guzzlers would be installed in the wildlife analysis area. These guzzlers would be located in the following subwatersheds: 002 – 1 guzzler; 011 – 1; 013 – 2; 014 – 1; 015 – 1; 018 – 1; 019 – 1; 025 – 2; 026 –1; 031 – 1. Two waterholes would be developed in the wildlife analysis area. One waterhole would be developed in subwatershed 010 and one in 011.
2006	Rhinehart Meadow OHV restoration	Barriers would be installed to prohibit vehicle access. This project includes rock barriers to prohibit vehicle access, meadow and stream restoration, and OHV interpretive signage.
	Routine maintenance / suppression	Routine road maintenance and suppression of wildland fires.
	Corridor Fuel Reduction Project	About 100 acres out of 550 acres within Empire Project area. Treatments include mechanical thinning, hand thinning, pile burning, chipping, and underburning.
2005–2010	Medusahead Treatment	After the initial treatment, the sites would be monitored and retreated over a 5-year period. Medusahead would be treated using a heat treatment, which would kill the target plant but not ignite them. Sections 30, 31, 32, 33, and 34, T25N, R10E; sections 3, 4, 5, 6, 9, 16, 22, and 23, T24N, R10E.

Table G.4. Forest Service activities in the Empire Project area, 1966 through 2004 (continued).

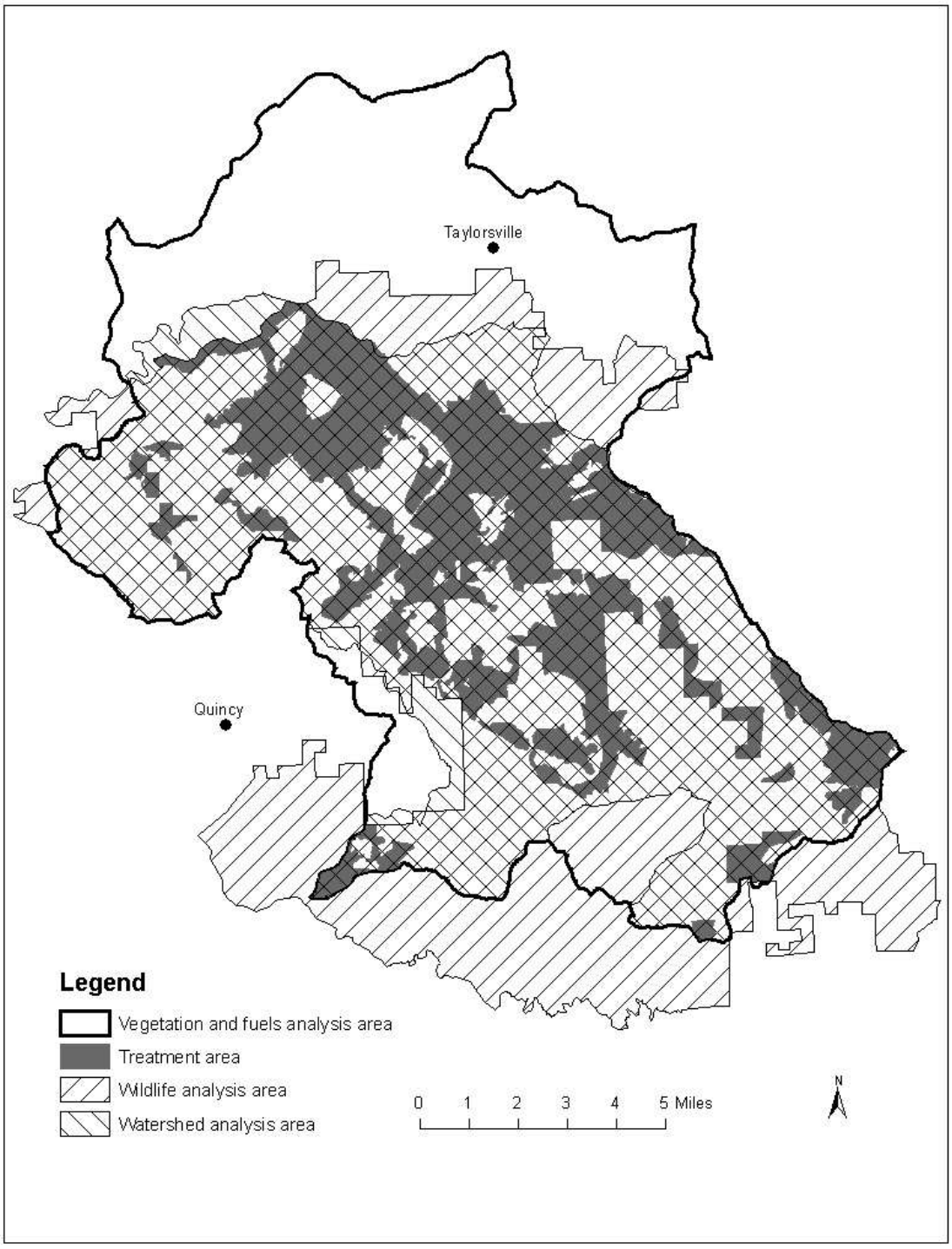
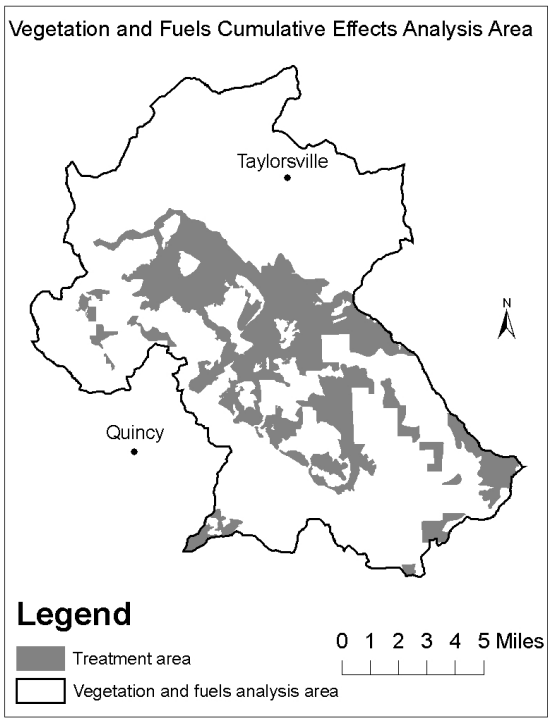
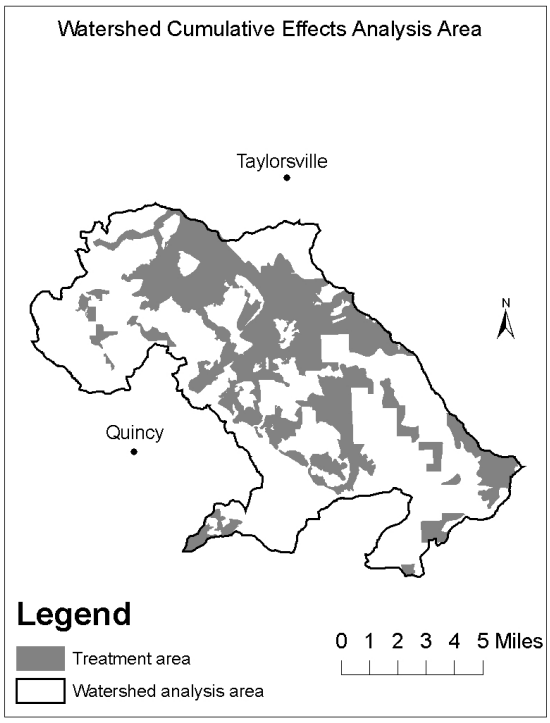


Figure G.1. Cumulative effects analysis areas, for vegetation, fuels, wildlife and watershed resources.

Table G.4. Forest Service activities in the Empire Project area, 1966 through 2004 (continued).





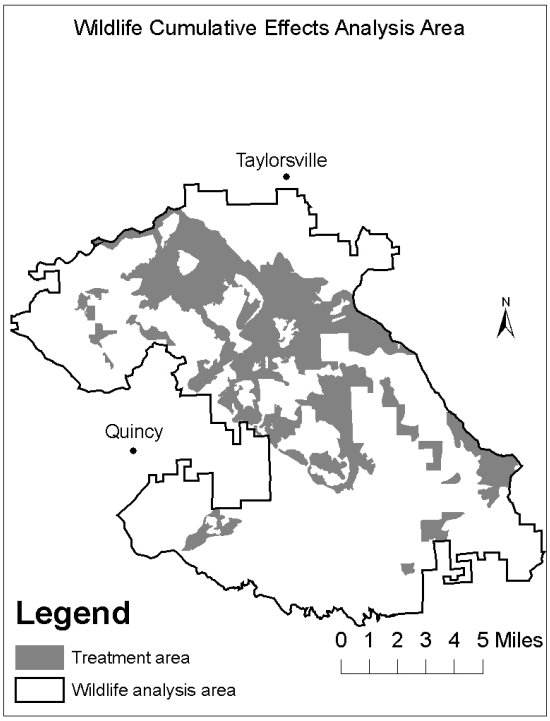


Figure G.2. Side by side display of the cumulative effects analysis areas for vegetation, fuels, wildlife and watershed resources.

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Appendix H

Economic Analysis

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Appendix H
Economic Analysis

The following assumptions apply to the economic analyses for each alternative, as shown on the tables below.

Assumptions

* Harvest Value Schedules, CA State Board of Equalization, Table 4, Area 7, Tractor, 23 inches–29.9 inches dbh

** Harvest Value Schedules, CA State Board of Equalization,, Misc. Harvest Values, Small Sawlogs, 14 inches–22.9 inches dbh

*** Timber Values for 10 inches–13.9 inches are $25, under 2 MBF/ac - $50

Deduction if average volume per acre under 5mbf/ac – $25/mbf

Skyline Yarding $30/mbf for 23 inch–29.9 inch (25% of volume) $80/mbf for 14 inches–22.9 inches (75% of volume)

Cost/ac for unit size increases 0% for 400 ac to 20% for 5 ac

Cost/ac for contract length decreases 10% every year after one year

Cost/ac for months of operation decreases 10% for 10 months or more and increases 10% for 4 months or less

Based on historical relationships between employment and harvest in California during the 1980s, each million board feet harvested supports 6.5 year-around jobs (1 in logging, 4 in sawmill, and 15 in US Forest Service employment). In regional economic models of employment for California and the Pacific Northwest, and estimate of one indirect or induced job for every direct timber job is added. Indirect jobs result from the employment created by the local purchase of materials for the sawmill, local expenditures by workers, and the demand for local government employees. Each million board feet harvested supports a total of 13 jobs that are timber related. The restoration and fuel work would support additional direct and indirect employment. There are approximately 1.4 indirect jobs for every full time field job. All jobs are equivalent to year-around employment.

Table H.1. Economic analysis for the proposed action (alternative A).

		ECONOMIC ANALYSIS						
		Empire Alternative " A "						4/30/2007
			Total Acres =	8661	acres			
VALUE - Groups			Total Acres =	1347		Low mbf/	$0	
PP 23"-29.9" sawtimber *	4.1%	712	mbf X	$400	/mbf +	$0	/mbf)	$284,971
SP 23"-29.9" sawtimber *	6.5%	1129	mbf X	$400	/mbf +	$0	/mbf)	$451,784
WF 23"-29.9" sawtimber *	17.0%	2954	mbf X	$200	/mbf +	$0	/mbf)	$590,794
DF 23"-29.9" sawtimber *	5.4%	938	mbf X	$410	/mbf +	$0	/mbf)	$384,711
IC 23"-29.9" sawtimber *	2.3%	400	mbf X	$460	/mbf +	$0	/mbf)	$183,841
ALL 10"-22.9" sawtimber **	64.7%	11242	mbf X	$130	/mbf +	$0	/mbf)	$1,461,521
		17376.3	mbf	12.9	mbf/acre			
Biomass Value when Removed		858	acres X	18.1	tons/acre X	$11.50	/ton =	$178,495
VALUE - DFPZ			Total Acres =	3314		Low mbf/	($25)	
PP 23"-29.9" sawtimber *	1.2%	58	mbf X	$400	/mbf +	($25)	/mbf)	$21,651
SP 23"-29.9" sawtimber *	1.8%	92	mbf X	$400	/mbf +	($25)	/mbf)	$34,325
WF 23"-29.9" sawtimber *	4.8%	239	mbf X	$200	/mbf +	($25)	/mbf)	$41,894
DF 23"-29.9" sawtimber *	1.5%	76	mbf X	$410	/mbf +	($25)	/mbf)	$29,277
IC 23"-29.9" sawtimber *	0.7%	32	mbf X	$460	/mbf +	($25)	/mbf)	$14,089
ALL 10"-22.9" sawtimber **	90.0%	4474	mbf X	$130	/mbf +	($25)	/mbf)	$469,760
		4971	mbf	1.5	mbf/acre			
Biomass Value when Removed		3314	acres X	18.1	tons/acre X	$11.50	/ton =	$689,809
VALUE - ITS			Total Acres =	4000	acres	Low mbf/	($25)	
PP 23"-29.9" sawtimber *	1.2%	46	mbf X	$400	/mbf +	($25)	/mbf)	$17,422
SP 23"-29.9" sawtimber *	1.8%	74	mbf X	$400	/mbf +	($25)	/mbf)	$27,620
WF 23"-29.9" sawtimber *	4.8%	193	mbf X	$200	/mbf +	($25)	/mbf)	$33,711
DF 23"-29.9" sawtimber *	1.5%	61	mbf X	$410	/mbf +	($25)	/mbf)	$23,558
IC 23"-29.9" sawtimber *	0.7%	26	mbf X	$460	/mbf +	($25)	/mbf)	$11,337
ALL 10"-22.9" sawtimber **	90.0%	3600	mbf X	$130	/mbf +	($25)	/mbf)	$378,000
		4000	mbf	1.0	mbf/acre			
Biomass Value when Removed		350	acres X	18.1	tons/acre X	$11.50	/ton =	$72,853
TOTAL VALUE		**26347 mbf**						**$5,401,424**
Total Biomass 1000 tons	168	82						
COSTS	28	(Assumes Harvesting Sawtimber and Biomass in One Operation)						
Add sawtimber skyline cost	196	2790	mbf X	$62	/mbf =			$172,980
Additional Cost	111	1431.9	mbf X	$250	/mbf			$357,975
Additional Cost		1590	mbf X	$20	/mbf			$31,800
		Average Unit Size =		50	acres	$24	/acre	
		Contract Length =		2	years	($24)	/acre	
		Months Operation =		5	months	$0	/acre	
Acres of 6"-9.9" biomass-tractor		0	acres X (	$245	/acre +	$0	/acre)	$0
Acres of 3"-9.9" biomass-tractor		4522	acres X (	$281	/acre +	$0	/acre)	$1,270,550
Acres of 6"-9.9" biomass-skyline		0	acres X (	$1,000	/acre +	$0	/acre)	$0
Acres of 3"-9.9" biomass-skyline		30	acres X (	$2,000	/acre +	$0	/acre)	$60,000
		4552	Biomass Acres					
# of sawtimber loads		26347	mbf /		4	mbf/truc	6587	
Additional Haul Cost (4 hr avg)		0	hours/trip X	$50	/hour X	6587	trips	$0
# of biomass loads	##	acres X	18.1	tons/acr	25	tons/tru	3295	
Haul Cost Biomass		4	hours/trip X	$50	/hour X	3295	trips	$659,000
Surface Replacement-sawtimber		26347	mbf X			$2.00	/mbf =	$52,695
Surface Replacement-biomass		4552	acres X	18.1	tons/acre X	0.33	/ton =	$27,461
Subsoiling Costs		400	acres X	$230	/acre			$92,000
BD Costs		26347	mbf X	$2.00	/mbf			$52,695
Road Construction-New		3.0	miles X	35,000	/mile			$105,000
Road Construction-Recon		113.0	miles X	7,000	/mile			$791,000
Temporary Road Construction		6.2	miles X	5,000	/mile			$31,000
Advertised Rate-sawtimber		26347	mbf X			$35.23	/mbf	$928,292
Advertised Rate-biomass		4552	acres X	18.1	tons/acre X	$0.20	/ton	$16,477
Yield Tax		$5,401,424	X	2.9%				$156,641
Scaling Sawtimber		6587	trips	$17	/trip			$111,979
Scaling Biomass		3295	trips	$3	/trip			$9,885
TOTAL COST								**$4,927,429**
NET VALUE								**$473,995**
					PERCENT ABOVE VALUE			**9%**
Groups:						Acre/job	Full Time Jobs	
Reforestation Costs		909	acres X	$775	/acre	110	18	$704,649
Grapple Pile		210	acres X	$820	/acre	120	4	$172,584
Hand line and Underburn		84	acres X	$450	/acre	400	0	$37,884
								$915,118
DFPZ:								
Grapple Pile		300	acres X	$250	/acre	120	6	$75,000
Hand Pile and Burn		50	acres X	$500	/acre	120	1	$25,000
Hand line and Underburn		1000	acres X	$150	/acre	400	6	$150,000
Mastication		500	acres X	$400	/acre	120	9	$200,000
Road Decommissioning		15.6	miles X	$5000	mile	40	1	$78,000
EA/Prep								$750,000
TOTAL NON-HARVEST COST								-$1,278,000
Reduced Fire Suppression Cost								$1,500,000
TOTAL PROJECT VALUE								**$695,995**
Harvest/Biomass							350	
TOTAL FULL TIME JOBS								**394**
TOTAL EMPLOYEE-RELATED INCOME								**$16,957,187**

Table H.2. Economic analysis for alternative C.

		ECONOMIC ANALYSIS						04/30/07
		Empire Alternative " C "						
			Total Acres =	8914	acres			
VALUE - Groups			Total Acres =	1600		Low mbf/	$0	
PP 23"-29.9" sawtimber *	4.1%	984	mbf X	$400	/mbf +	$0	/mbf)	$393,600
SP 23"-29.9" sawtimber *	6.5%	1560	mbf X	$400	/mbf +	$0	/mbf)	$624,000
WF 23"-29.9" sawtimber *	17.0%	4080	mbf X	$200	/mbf +	$0	/mbf)	$816,000
DF 23"-29.9" sawtimber *	5.4%	1296	mbf X	$410	/mbf +	$0	/mbf)	$531,360
IC 23"-29.9" sawtimber *	2.3%	552	mbf X	$460	/mbf +	$0	/mbf)	$253,920
ALL 10"-22.9" sawtimber **	64.7%	15528	mbf X	$130	/mbf +	$0	/mbf)	$2,018,640
		20640	mbf	12.9	mbf/acre			
Biomass Value when Removed		1168	acres X	18.1	tons/acre X	$11.50	/ton =	$243,119
VALUE - DFPZ		Actural PA	Total Acres =	3314		Low mbf/	($25)	
PP 23"-29.9" sawtimber *	1.2%	58	mbf X	$400	/mbf +	($25)	/mbf)	$21,651
SP 23"-29.9" sawtimber *	1.8%	92	mbf X	$400	/mbf +	($25)	/mbf)	$34,325
WF 23"-29.9" sawtimber *	4.8%	239	mbf X	$200	/mbf +	($25)	/mbf)	$41,894
DF 23"-29.9" sawtimber *	1.5%	76	mbf X	$410	/mbf +	($25)	/mbf)	$29,277
IC 23"-29.9" sawtimber *	0.7%	32	mbf X	$460	/mbf +	($25)	/mbf)	$14,089
ALL 10"-22.9" sawtimber **	90.0%	4474	mbf X	$130	/mbf +	($25)	/mbf)	$469,760
		4971	mbf	1.5	mbf/acre			
Biomass Value when Removed		3314	acres X	18.1	tons/acre X	$11.50	/ton =	$689,809
VALUE - ITS			Total Acres =	4000	acres	Low mbf/	($25)	
PP 23"-29.9" sawtimber *	1.2%	93	mbf X	$400	/mbf +	($25)	/mbf)	$34,875
SP 23"-29.9" sawtimber *	1.8%	147	mbf X	$400	/mbf +	($25)	/mbf)	$55,125
WF 23"-29.9" sawtimber *	4.8%	385	mbf X	$200	/mbf +	($25)	/mbf)	$67,375
DF 23"-29.9" sawtimber *	1.5%	122	mbf X	$410	/mbf +	($25)	/mbf)	$46,970
IC 23"-29.9" sawtimber *	0.7%	52	mbf X	$460	/mbf +	($25)	/mbf)	$22,620
ALL 10"-22.9" sawtimber **	90.0%	7200	mbf X	$130	/mbf +	($25)	/mbf)	$756,000
		4000	mbf	1.0	mbf/acre			
Biomass Value when Removed		350	acres X	18.1	tons/acre X	$11.50	/ton =	$72,853
TOTAL VALUE		**29611**	**mbf**					**$7,237,262**
Total Biomass 1000 tons	96	87						
COSTS	28	(Assumes Harvesting Sawtimber and Biomass in One Operation)						
Add sawtimber skyline cost	124	547	mbf X	$73	/mbf =			$96,906
Additional Cost - Heli	154	1986.6	mbf X	$250	/mbf			$496,650
Additional Cost - Long Skid		1590	mbf X	$20	/mbf			$31,800
		Average Unit Size =		50	acres	$24	/acre	
		Contract Length =		2	years	($24)	/acre	
		Months Operation =		5	months	$0	/acre	
Acres of 6"-9.9" biomass-tractor		0	acres X (	$245	/acre +	$0	/acre)	$0
Acres of 3"-9.9" biomass-tractor		4802	acres X (	$281	/acre +	$0	/acre)	$1,349,362
Acres of 6"-9.9" biomass-skyline		0	acres X (	$1,000	/acre +	$0	/acre)	$0
Acres of 3"-9.9" biomass-skyline		30	acres X (	$2,000	/acre +	$0	/acre)	$60,000
		4832	Biomass Acres					
# of sawtimber loads		29611	mbf /		4	mbf/truc	7403	
Additional Haul Cost (4 hr avg)		0	hours/trip X	$50	/hour X	7403	trips	$0
# of biomass loads	##	acres X	18.1	tons/acr	25	tons/tru	3498	
Haul Cost Biomass		4	hours/trip X	$50	/hour X	3498	trips	$699,600
Surface Replacement-sawtimber		29611	mbf X			$2.00	/mbf =	$59,222
Surface Replacement-biomass		4832	acres X	18.1	tons/acre X	0.33	/ton =	$29,153
Subsoiling Costs		400	acres X	$230	/acre			$92,000
BD Costs		29611	mbf X	$2.00	/mbf			$59,222
Road Construction-New		3.0	miles X	35,000	/mile			$105,000
Road Construction-Recon		107.1	miles X	7,500	/mile			$803,250
Temporary Road Construction		6.2	miles X	5,000	/mile			$31,000
Advertised Rate-sawtimber		29611	mbf X			$37.21	/mbf	$1,101,806
Advertised Rate-biomass		4832	acres X	18.1	tons/acre X	$0.20	/ton	$17,492
Yield Tax		$7,237,262	X	2.9%				$209,881
Scaling Sawtimber		7403	trips	$17	/trip			$125,851
Scaling Biomass		3498	trips	$3	/trip			$10,494
TOTAL COST								**$5,378,688**
NET VALUE								**$1,858,574**
					PERCENT ABOVE VALUE			**26%**
Groups:						Acre/job	Full Time Jobs	
Reforestation Costs		1080	acres X	$775	/acre	110	22	$837,000
Grapple Pile		250	acres X	$820	/acre	120	5	$205,000
Hand line and Underburn		100	acres X	$450	/acre	400	1	$45,000
								$1,087,000
DFPZ:								
Grapple Pile		300	acres X	$250	/acre	120	6	$75,000
Hand Pile and Burn		50	acres X	$500	/acre	120	1	$25,000
Hand line and Underburn		1000	acres X	$150	/acre	400	6	$150,000
Mastication		500	acres X	$400	/acre	120	9	$200,000
Road Decommissioning		12	miles X	$5000	mile	40	1	$60,000
EA/Prep								$750,000
TOTAL NON-HARVEST COST								-$1,260,000
Reduced Fire Suppression Cost								$1,500,000
TOTAL PROJECT VALUE								**$2,098,574**
Harvest/Biomass							392	
TOTAL FULL TIME JOBS								**441**
TOTAL EMPLOYEE-RELATED INCOME								**$18,954,852**

Table H.3. Economic analysis for alternative D.

		ECONOMIC ANALYSIS						04/30/07
		Empire Alternative " D "						
			Total Acres =	6910	acres			
VALUE - Groups			Total Acres =	1226		Low mbf/	$0	
PP 23"-29.9" sawtimber *	4.1%	648	mbf X	$400	/mbf +	$0	/mbf)	$259,373
SP 23"-29.9" sawtimber *	6.5%	1028	mbf X	$400	/mbf +	$0	/mbf)	$411,200
WF 23"-29.9" sawtimber *	17.0%	2689	mbf X	$200	/mbf +	$0	/mbf)	$537,724
DF 23"-29.9" sawtimber *	5.4%	854	mbf X	$410	/mbf +	$0	/mbf)	$350,153
IC 23"-29.9" sawtimber *	2.3%	364	mbf X	$460	/mbf +	$0	/mbf)	$167,327
ALL 10"-22.9" sawtimber **	64.7%	10233	mbf X	$130	/mbf +	$0	/mbf)	$1,330,233
		15815.4	mbf	12.9	mbf/acre			
Biomass Value when Removed		925	acres X	18.1	tons/acre X	$11.50	/ton =	$192,630
VALUE - DFPZ		Actural PA	Total Acres =	3314		Low mbf/	($25)	
PP 23"-29.9" sawtimber *	1.2%	58	mbf X	$400	/mbf +	($25)	/mbf)	$21,651
SP 23"-29.9" sawtimber *	1.8%	92	mbf X	$400	/mbf +	($25)	/mbf)	$34,325
WF 23"-29.9" sawtimber *	4.8%	239	mbf X	$200	/mbf +	($25)	/mbf)	$41,894
DF 23"-29.9" sawtimber *	1.5%	76	mbf X	$410	/mbf +	($25)	/mbf)	$29,277
IC 23"-29.9" sawtimber *	0.7%	32	mbf X	$460	/mbf +	($25)	/mbf)	$14,089
ALL 10"-22.9" sawtimber **	90.0%	4474	mbf X	$130	/mbf +	($25)	/mbf)	$469,760
		4971	mbf	1.5	mbf/acre			
Biomass Value when Removed		3314	acres X	18.1	tons/acre X	$11.50	/ton =	$689,809
VALUE - ITS			Total Acres =	2370	acres	Low mbf/	($25)	
PP 23"-29.9" sawtimber *	1.2%	28	mbf X	$400	/mbf +	($25)	/mbf)	$10,323
SP 23"-29.9" sawtimber *	1.8%	44	mbf X	$400	/mbf +	($25)	/mbf)	$16,365
WF 23"-29.9" sawtimber *	4.8%	114	mbf X	$200	/mbf +	($25)	/mbf)	$19,974
DF 23"-29.9" sawtimber *	1.5%	36	mbf X	$410	/mbf +	($25)	/mbf)	$13,958
IC 23"-29.9" sawtimber *	0.7%	15	mbf X	$460	/mbf +	($25)	/mbf)	$6,717
ALL 10"-22.9" sawtimber **	90.0%	2133	mbf X	$130	/mbf +	($25)	/mbf)	$223,965
		2370	mbf	1.0	mbf/acre			
Biomass Value when Removed		350	acres X	18.1	tons/acre X	$11.50	/ton =	$72,853
TOTAL VALUE		**23156 mbf**						**$4,913,599**
Total Biomass 1000 tons	74	83						
COSTS	28	(Assumes Harvesting Sawtimber and Biomass in One Operation)						
Add sawtimber skyline cost	102	514	mbf X	$62	/mbf =			$96,906
Additional Cost - Heli	81	1044.9	mbf X	$250	/mbf			$261,225
Additional Cost - Long Skid		1590	mbf X	$20	/mbf			$31,800
		Average Unit Size =		50	acres	$24	/acre	
		Contract Length =		2	years	($24)	/acre	
		Months Operation =		5	months	$0	/acre	
Acres of 6"-9.9" biomass-tractor		0	acres X (	$245	/acre +	$0	/acre)	$0
Acres of 3"-9.9" biomass-tractor		4559	acres X (	$281	/acre +	$0	/acre)	$1,281,202
Acres of 6"-9.9" biomass-skyline		0	acres X (	$1,000	/acre +	$0	/acre)	$0
Acres of 3"-9.9" biomass-skyline		30	acres X (	$2,000	/acre +	$0	/acre)	$60,000
		4589	Biomass Acres					
# of sawtimber loads		23156	mbf /		4	mbf/truc	5789	
Additional Haul Cost (4 hr avg)		0	hours/trip X	$50	/hour X	5789	trips	$0
# of biomass loads	##	acres X	18.1	tons/acr	25	tons/truc	3323	
Haul Cost Biomass		4	hours/trip X	$50	/hour X	3323	trips	$664,600
Surface Replacement-sawtimber		23156	mbf X			$2.00	/mbf =	$46,313
Surface Replacement-biomass		4589.4375	acres X	18.1	tons/acre X	0.33	/ton =	$27,690
Subsoiling Costs		400	acres X	$230	/acre			$92,000
BD Costs		23156	mbf X	$2.00	/mbf			$46,313
Road Construction-New		3.0	miles X	35,000	/mile			$105,000
Road Construction-Recon		101.8	miles X	7,500	/mile			$763,500
Temporary Road Construction		6.2	miles X	5,000	/mile			$31,000
Advertised Rate-sawtimber		23156	mbf X			$36.47	/mbf	$844,492
Advertised Rate-biomass		4589.4375	acres X	18.1	tons/acre X	$0.20	/ton	$16,614
Yield Tax		$4,913,599	X	2.9%				$142,494
Scaling Sawtimber		5789	trips	$17	/trip			$98,413
Scaling Biomass		3323	trips	$3	/trip			$9,969
TOTAL COST								**$4,619,530**
NET VALUE								**$294,069**
					PERCENT ABOVE VALUE			**6%**
Groups:						Acre/job	Full Time Jobs	
Reforestation Costs		828	acres X	$775	/acre	110	17	$641,351
Grapple Pile		192	acres X	$820	/acre	120	4	$157,081
Hand line and Underburn		77	acres X	$450	/acre	400	0	$34,481
								$832,914
DFPZ:								
Grapple Pile		300	acres X	$250	/acre	120	6	$75,000
Hand Pile and Burn		90	acres X	$500	/acre	120	2	$45,000
Hand line and Underburn		410	acres X	$150	/acre	400	2	$61,500
Mastication		931	acres X	$400	/acre	120	17	$372,400
Road Decommissioning		12	miles X	$5000	mile	40	1	$60,000
EA/Prep								$750,000
TOTAL NON-HARVEST COST								-$1,363,900
Reduced Fire Suppression Cost								$1,500,000
TOTAL PROJECT VALUE								**$430,169**
Harvest/Biomass							308	
TOTAL FULL TIME JOBS								**356**
TOTAL EMPLOYEE-RELATED INCOME								**$15,309,797**

Table H.4. Economic analysis for alternative E.

		ECONOMIC ANALYSIS								04/30/07
		Empire Alternative " E "								
			Total Acres =	6910	acres					
VALUE - Groups			Total Acres =	1226		Low mbf/	$0			
PP 23"-29.9" sawtimber *	4.1%	648	mbf X	$400	/mbf +	$0	/mbf)			$259,373
SP 23"-29.9" sawtimber *	6.5%	1028	mbf X	$400	/mbf +	$0	/mbf)			$411,200
WF 23"-29.9" sawtimber *	17.0%	2689	mbf X	$200	/mbf +	$0	/mbf)			$537,724
DF 23"-29.9" sawtimber *	5.4%	854	mbf X	$410	/mbf +	$0	/mbf)			$350,153
IC 23"-29.9" sawtimber *	2.3%	364	mbf X	$460	/mbf +	$0	/mbf)			$167,327
ALL 10"-22.9" sawtimber **	64.7%	10233	mbf X	$130	/mbf +	$0	/mbf)			$1,330,233
		15815.4	mbf	12.9	mbf/acre					
Biomass Value when Removed		925	acres X	18.1	tons/acre X	$11.50	/ton =			$192,630
VALUE - DFPZ		Actural PA	Total Acres =	3314		Low mbf/	($25)			
PP 23"-29.9" sawtimber *	0.0%	0	mbf X	$400	/mbf +	($25)	/mbf)			$0
SP 23"-29.9" sawtimber *	0.0%	0	mbf X	$400	/mbf +	($25)	/mbf)			$0
WF 23"-29.9" sawtimber *	0.0%	0	mbf X	$200	/mbf +	($25)	/mbf)			$0
DF 23"-29.9" sawtimber *	0.0%	0	mbf X	$410	/mbf +	($25)	/mbf)			$0
IC 23"-29.9" sawtimber *	0.0%	0	mbf X	$460	/mbf +	($25)	/mbf)			$0
ALL 10"-22.9" sawtimber **	###	1657	mbf X	$130	/mbf +	($25)	/mbf)			$173,985
		1657	mbf	0.5	mbf/acre					
Biomass Value when Removed		3314	acres X	18.1	tons/acre X	$11.50	/ton =			$689,809
VALUE - ITS			Total Acres =	2370	acres	Low mbf/	($25)			
PP 23"-29.9" sawtimber *	1.2%	28	mbf X	$400	/mbf +	($25)	/mbf)			$10,323
SP 23"-29.9" sawtimber *	1.8%	44	mbf X	$400	/mbf +	($25)	/mbf)			$16,365
WF 23"-29.9" sawtimber *	4.8%	114	mbf X	$200	/mbf +	($25)	/mbf)			$19,974
DF 23"-29.9" sawtimber *	1.5%	36	mbf X	$410	/mbf +	($25)	/mbf)			$13,958
IC 23"-29.9" sawtimber *	0.7%	15	mbf X	$460	/mbf +	($25)	/mbf)			$6,717
ALL 10"-22.9" sawtimber **	90.0%	2133	mbf X	$130	/mbf +	($25)	/mbf)			$223,965
		2370	mbf	1.0	mbf/acre					
Biomass Value when Removed		350	acres X	18.1	tons/acre X	$11.50	/ton =			$72,853
TOTAL VALUE		**19842**	**mbf**							**$4,476,588**
Total Biomass 1000 tons	74	83								
COSTS	28	(Assumes Harvesting Sawtimber and Biomass in One Operation)								
Add sawtimber skyline cost	102	412	mbf X	$62	/mbf =					$96,906
Additional Cost - Heli	81	1044.9	mbf X	$250	/mbf					$261,225
Additional Cost - Long Skid		1590	mbf X	$20	/mbf					$31,800
		Average Unit Size =		50	acres	$24	/acre			
		Contract Length =		2	years	($24)	/acre			
		Months Operation =		5	months	$0	/acre			
Acres of 6"-9.9" biomass-tractor		0	acres X (	$245	/acre +	$0	/acre)			$0
Acres of 3"-9.9" biomass-tractor		4559	acres X (	$281	/acre +	$0	/acre)			$1,281,202
Acres of 6"-9.9" biomass-skyline		0	acres X (	$1,000	/acre +	$0	/acre)			$0
Acres of 3"-9.9" biomass-skyline		30	acres X (	$2,000	/acre +	$0	/acre)			$60,000
		4589	Biomass Acres							
# of sawtimber loads		19842	mbf /		4	mbf/truc	4961			
Additional Haul Cost (4 hr avg)		0	hours/trip X	$50	/hour X	4961	trips			$0
# of biomass loads	##	acres X	18.1	tons/acr	25	tons/tru	3323			
Haul Cost Biomass		4	hours/trip X	$50	/hour X	3323	trips			$664,600
Surface Replacement-sawtimber		19842	mbf X			$2.00	/mbf =			$39,685
Surface Replacement-biomass		4589.4375	acres X	18.1	tons/acre X	0.33	/ton =			$27,690
Subsoiling Costs		400	acres X	$230	/acre					$92,000
BD Costs		19842	mbf X	$2.00	/mbf					$39,685
Road Construction-New		3.0	miles X	35,000	/mile					$105,000
Road Construction-Recon		101.8	miles X	7,500	/mile					$763,500
Temporary Road Construction		6.2	miles X	5,000	/mile					$31,000
Advertised Rate-sawtimber		19842	mbf X			$42.48	/mbf			$842,835
Advertised Rate-biomass		4589.4375	acres X	18.1	tons/acre X	$0.20	/ton			$16,614
Yield Tax		$4,476,588	X	2.9%						$129,821
Scaling Sawtimber		4961	trips	$17	/trip					$84,337
Scaling Biomass		3323	trips	$3	/trip					$9,969
TOTAL COST										**$4,577,868**
NET VALUE										**($101,280)**
					PERCENT ABOVE VALUE					**-2%**
Groups:						Acre/job	Full Time Jobs			
Reforestation Costs		828	acres X	$775	/acre	110	17			$641,351
Grapple Pile		192	acres X	$820	/acre	120	4			$157,081
Hand line and Underburn		77	acres X	$450	/acre	400	0			$34,481
										$832,914
DFPZ:										
Grapple Pile		300	acres X	$250	/acre	120	6			$75,000
Hand Pile and Burn		90	acres X	$500	/acre	120	2			$45,000
Hand line and Underburn		410	acres X	$150	/acre	400	2			$61,500
Mastication		931	acres X	$400	/acre	120	17			$372,400
Road Decommissioning		12	miles X	$5000	mile	40	1			$60,000
EA/Prep										$750,000
TOTAL NON-HARVEST COST										-$1,363,900
Reduced Fire Suppression Cost										$1,500,000
TOTAL PROJECT VALUE										**$34,820**
Harvest/Biomass							265			
TOTAL FULL TIME JOBS										**313**
TOTAL EMPLOYEE-RELATED INCOME										**$13,457,271**

Table H.5. Economic analysis for alternative F.

		ECONOMIC ANALYSIS						04/30/07
		Empire Alternative " F "						
			Total Acres =	3314	acres			
VALUE - Groups			Total Acres =	0		Low mbf/	$0	
PP 23"-29.9" sawtimber *	4.1%	0	mbf X	$400	/mbf +	$0	/mbf)	$0
SP 23"-29.9" sawtimber *	6.5%	0	mbf X	$400	/mbf +	$0	/mbf)	$0
WF 23"-29.9" sawtimber *	17.0%	0	mbf X	$200	/mbf +	$0	/mbf)	$0
DF 23"-29.9" sawtimber *	5.4%	0	mbf X	$410	/mbf +	$0	/mbf)	$0
IC 23"-29.9" sawtimber *	2.3%	0	mbf X	$460	/mbf +	$0	/mbf)	$0
ALL 10"-22.9" sawtimber **	64.7%	0	mbf X	$130	/mbf +	$0	/mbf)	$0
		0	mbf	0.0	mbf/acre			
Biomass Value when Removed		0	acres X	18.1	tons/acre X	$11.50	/ton =	$0
VALUE - DFPZ		Actural PA	Total Acres =	3314		Low mbf/	($25)	
PP 23"-29.9" sawtimber *	0.0%	0	mbf X	$400	/mbf +	($25)	/mbf)	$0
SP 23"-29.9" sawtimber *	0.0%	0	mbf X	$400	/mbf +	($25)	/mbf)	$0
WF 23"-29.9" sawtimber *	0.0%	0	mbf X	$200	/mbf +	($25)	/mbf)	$0
DF 23"-29.9" sawtimber *	0.0%	0	mbf X	$410	/mbf +	($25)	/mbf)	$0
IC 23"-29.9" sawtimber *	0.0%	0	mbf X	$460	/mbf +	($25)	/mbf)	$0
ALL 10"-22.9" sawtimber **	###	1657	mbf X	$130	/mbf +	($25)	/mbf)	$215,410
		1657	mbf	0.5	mbf/acre			
Biomass Value when Removed		3314	acres X	18.1	tons/acre X	$11.50	/ton =	$689,809
VALUE - ITS			Total Acres =	0	acres	Low mbf/	$0	
PP 23"-29.9" sawtimber *	1.2%	0	mbf X	$400	/mbf +	$0	/mbf)	$0
SP 23"-29.9" sawtimber *	1.8%	0	mbf X	$400	/mbf +	$0	/mbf)	$0
WF 23"-29.9" sawtimber *	4.8%	0	mbf X	$200	/mbf +	$0	/mbf)	$0
DF 23"-29.9" sawtimber *	1.5%	0	mbf X	$410	/mbf +	$0	/mbf)	$0
IC 23"-29.9" sawtimber *	0.7%	0	mbf X	$460	/mbf +	$0	/mbf)	$0
ALL 10"-22.9" sawtimber **	90.0%	0	mbf X	$130	/mbf +	$0	/mbf)	$0
		0	mbf	0.0	mbf/acre			
Biomass Value when Removed		0	acres X	18.1	tons/acre X	$11.50	/ton =	$0
TOTAL VALUE		**1657 mbf**						**$905,219**
Total Biomass 1000 tons		60						
COSTS	28	(Assumes Harvesting Sawtimber and Biomass in One Operation)						
Add sawtimber skyline cost	28	14	mbf X	$80	/mbf =			$96,906
Additional Cost - Heli		0	mbf X	$250	/mbf			$0
Additional Cost - Long Skid		0	mbf X	$20	/mbf			$0
		Average Unit Size =		50	acres	$24	/acre	
		Contract Length =		2	years	($24)	/acre	
		Months Operation =		5	months	$0	/acre	
Acres of 6"-9.9" biomass-tractor		0	acres X (	$245	/acre +	$0	/acre)	$0
Acres of 3"-9.9" biomass-tractor		3284	acres X (	$281	/acre +	$0	/acre)	$922,804
Acres of 6"-9.9" biomass-skyline		0	acres X (	$1,000	/acre +	$0	/acre)	$0
Acres of 3"-9.9" biomass-skyline		30	acres X (	$2,000	/acre +	$0	/acre)	$60,000
		3314	Biomass Acres					
# of sawtimber loads		1657	mbf /		4	mbf/truc	414	
Additional Haul Cost (4 hr avg)		0	hours/trip X	$50	/hour X	414	trips	$0
# of biomass loads	##	acres X	18.1	tons/acr	25	tons/truc	2399	
Haul Cost Biomass		4	hours/trip X	$50	/hour X	2399	trips	$479,800
Surface Replacement-sawtimber		1657	mbf X			$2.00	/mbf =	$3,314
Surface Replacement-biomass		3314	acres X	18.1	tons/acre X	0.33	/ton =	$19,994
Subsoiling Costs		400	acres X	$230	/acre			$92,000
BD Costs		1657	mbf X	$2.00	/mbf			$3,314
Road Construction-New		0.0	miles X	35,000	/mile			$0
Road Construction-Recon		48.3	miles X	7,500	/mile			$362,250
Temporary Road Construction		1.9	miles X	5,000	/mile			$9,500
Advertised Rate-sawtimber		1657	mbf X			$15.00	/mbf	$24,855
Advertised Rate-biomass		3314	acres X	18.1	tons/acre X	$0.20	/ton	$11,997
Yield Tax		$905,219	X	2.9%				$26,251
Scaling Sawtimber		414	trips	$17	/trip			$7,038
Scaling Biomass		2399	trips	$3	/trip			$7,197
TOTAL COST								**$2,127,221**
NET VALUE								**($1,222,001)**
					PERCENT ABOVE VALUE			**-135%**
Groups:						Acre/job	Full Time Jobs	
Reforestation Costs		0	acres X	$775	/acre	110	0	$0
Grapple Pile		0	acres X	$820	/acre	120	0	$0
Hand line and Underburn		0	acres X	$450	/acre	400	0	$0
								$0
DFPZ:								
Grapple Pile		300	acres X	$250	/acre	120	6	$75,000
Hand Pile and Burn		90	acres X	$500	/acre	120	2	$45,000
Hand line and Underburn		410	acres X	$150	/acre	400	2	$61,500
Mastication		931	acres X	$400	/acre	120	17	$372,400
Road Decommissioning		12	miles X	$5000	mile	40	1	$60,000
EA/Prep								$750,000
TOTAL NON-HARVEST COST								-$1,363,900
Reduced Fire Suppression Cost								$1,500,000
TOTAL PROJECT VALUE								**-$1,085,901**
Harvest/Biomass							22	
TOTAL FULL TIME JOBS								**49**
TOTAL EMPLOYEE-RELATED INCOME								**$2,092,996**

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Appendix I

Response to Comments

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Appendix I
Response to Comments

EMPIRE VEGETATION MANAGEMENT PROJECT
Draft Supplemental Environmental Impact Statement
(DSEIS)
4/27/07

Introduction

The following appendix displays Forest Service responses to public comments on the Draft Supplemental EIS released in March 2007. This appendix includes (1) a table listing the name and location of the commenter, the organization or entity each commenter represents, and the date of the comment, and (2) a table of comment statements and Forest Service responses. The comment statement is taken from the comment letters. A complete copy of each letter received is available in the project record, hereby incorporated by reference.

Summary of Comments Received

The Responsible Official received verbal or written comments from two agencies, five organizations, and fifty-two individuals. The Council on Environmental Quality (CEQ) regulation 40 CFR 1503.4 states that an agency preparing a final environmental impact statement shall assess and consider comments both individually and collectively, and shall respond by one or more of the means listed below, stating its response in the final statement. Possible responses are to:

1) Modify alternatives including the proposed action,
2) Develop and evaluate alternatives not previously given serious consideration by the agency,
3) Supplement, improve, or modify its analyses,
4) Make factual corrections,
5) Explain why comments do not warrant further agency response.

Table I-1 – Commenters on the Empire Vegetation Management Project Draft Supplemental EIS.

Comment ID Code	Commenter	Entity	Location	Date of Comment
Agencies				
NSAQMD	Shaun McCloud	Northern Sierra Air Quality Management District	Grass Valley, CA	**3/22/2007**
EPA	Nova Blazej	U.S. Environmental Protection Agency	San Francisco, CA	**4/3/2007**
Organizations				
Lazzarino	Mike Lazzarino	Sierra Access Coalition	Quincy, CA	**3/27/2007 – 5/6/2007**
SPI	Tom Downing	Sierra Pacific Industries	Quincy, CA	**3/29/2007**
PRR	Doug Teeter	Paradise Ridge Riders	Paradise, CA	**4/12/2007**
JMP	Chad Hanson, Director	John Muir Project	Cedar Ridge, CA	**4/16/2007**
SNFPC	Graf, Thomas, Gallagher, Preschutti	Sierra Forest Legacy	Sacramento, CA	**4/16/2007**
Individuals				
OHV-FL	Cory Jauch		Quincy, CA	**4/3/2007**
OHV-FL	Michael Dollarhide		Quincy, CA	**4/3/2007**
OHV-FL	Brandon Childress		Quincy, CA	**4/3/2007**
OHV-FL	Owen Masters		Quincy, CA	**4/3/2007**
OHV-FL	Jeff Jackman		Quincy, CA	**4/3/2007**
OHV-FL	Daniel Dobson		Quincy, CA	**4/3/2007**
OHV-FL	Blake Dedeker		Quincy, CA	**4/3/2007**
OHV-FL	Dwight Toftdahl		Quincy, CA	**4/3/2007**
OHV-FL	Joe Buckley		Quincy, CA	**4/3/2007**
OHV-FL	Oliver Wam		Quincy, CA	**4/3/2007**
OHV-FL	Billy May		Quincy, CA	**4/3/2007**
OHV-FL	Martin Matallana		Quincy, CA	**4/3/2007**
OHV-FL	Derek Gay		Quincy, CA	**4/3/2007**
OHV-FL	Randy Marble		Quincy, CA	**4/3/2007**
OHV-FL	Harlon Sevier		Quincy, CA	**4/3/2007**
OHV-FL	Steven Betts		Quincy, CA	**4/3/2007**
OHV-FL	Joe Zimmer		Oregon House, CA	**4/3/2007**
OHV-FL	Charlene Lovato		Loma Rica, CA	**4/3/2007**
OHV-FL	Bob and Diane Baxley		Litchfield, CA	**4/3/2007**
OHV-FL	Jim Epting		Palermo, CA	**4/3/2007**

Table I-1 – Commenters on the Empire Vegetation Management Project Draft Supplemental EIS (continued).

Comment ID Code	Commenter	Entity	Location	Date of Comment
OHV-FL	Chad Lawson		Etna, CA	**4/3/2007**
OHV-FL	Garrett Bernd		Santa Rosa, CA	**4/3/2007**
OHV-FL	Kenneth Gaines		Paynes Creek, CA	**4/3/2007**
OHV-FL	Michelle Zimmer		Dobbins, CA	**4/3/2007**
OHV-FL	Jake Trujillo		Loma Rica, CA	**4/3/2007**
OHV-FL	Coy LaPierie		Napa, CA	**4/3/2007**
OHV-FL	R. Dale and Cindy Tobiassen		Grass Valley, CA	**4/3/2007**
OHV-FL	Steve Savy		Glendale, CA	**4/3/2007**
OHV-FL	Brad and Peggy Donaldson		Orangerale, CA	**4/3/2007**
OHV-FL	Marc Tillotson		Santa Rosa, CA	**4/3/2007**
OHV-FL	Carlos Trahia		Oroville, CA	**4/3/2007**
OHV-FL	Juan Mundo		Hamilton City, CA	**4/3/2007**
OHV-FL	Eric Santillan		Auberry, CA	**4/3/2007**
OHV-FL	Douglas Linn		Auberry, CA	**4/3/2007**
OHV-FL	Don Conner		Vesalia, CA	**4/3/2007**
OHV-FL	Lawrence and Dana Lockwood		Auberry, CA	**4/3/2007**
OHV-FL	Monty McCown		Auberry, CA	**4/3/2007**
OHV-FL	Ed Fadeley		O'Neals, CA	**4/3/2007**
OHV-FL	Glenn Overstreet		Wishon, CA	**4/3/2007**
OHV-FL	Dick Burke		Clovis, CA	**4/3/2007**
OHV-FL	Dennis Paul Melkonian		Fresno, CA	**4/3/2007**
OHV-FL	Jonathan Wright		Kingsburg, CA	**4/3/2007**
OHV-FL	Willard Smith		Fresno, CA	**4/3/2007**
OHV-FL	Toby Cripe		Madera, CA	**4/3/2007**
OHV-FL	JT Hutchens		North Fork, CA	**4/3/2007**
OHV-FL	Daniel Deubner, Sr.		Fresno, CA	**4/3/2007**
OHV-FL	Matt Hines		Fresno, CA	**4/3/2007**
Anonymous	Anonymous			**4/11/2007**
Britting	Susan Britting	Supplement to SNFPC		**4/16/2007**
Johannson	Wayne Johannson	Supplement to SNFPC		**4/16/2007**
Rice	Carol Rice	Supplement to SNFPC		**4/16/2007**
Stewart	Frank Stewart	Quincy Library Group	Chico, CA	**4/17/2007**

Table I-2 – Comments and Responses on the Empire Vegetation Management Project Draft Supplemental EIS. Sorted by Comment number. (E – Economics; FFA – Fire, Fuels, Air Quality; FV – Forest Vegetation; NEPA – National Environmental Policy Act; OHV – Off-highway Vehicles; S – Soils; W – Wildlife)

Comment ID Code	Comment	Com-ment No.	Response to Comment
SNFPC	The Empire Project fails to take a hard look at alternatives that can meet economic objectives. The Forest Service also states that alternatives E and F do not meet the project purpose derived from the QLG to contribute to community economic stability. The problem with this analysis is that the Forest Service identifies no threshold to determine whether the economic benefits of different proposed alternatives meet or do not meet the stated project purpose.	E 1	Please refer to the FSEIS chapter 1. The purpose and need for the Empire Project not only includes the objective of "promoting an adequate timber supply that contributes to the economic stability of rural communities", but also includes "employ(ing) treatments using the most cost effective means available. Please refer to the FSEIS: figures 2.1 and 2.2; table 2.11; chapter 3, socioeconomics section; and appendix H. While alternatives E and F do create full time jobs and generate income, these alternatives also result in net negative values and thus are not cost effective. In comparison alternatives A, C, and D create more full time jobs and generate more income while resulting in positive net values, and thus are cost effective.
NSAQMD	No comment at this time.	FFA 1	None.
Stewart	The project needs to incorporate potential impacts of global warming and potential for reducing CO_2 from forest fires and through carbon sequestration.	FFA 2	Potential CO_2 emissions are shown in the FSEIS. Total emissions from group selection site preparation, burning of landing piles, road construction, and hazardous fuels reduction will be comparable to a large wildfire. In conjunction with mechanical fuel treatments, underburn activities are expected to reduce accumulated fuels and reduce the "unacceptable risk of wildfire" and related uncontrollable emissions as described in U.S. Environmental Protection Agency's Final Rule on "Treatment of Data Influenced by Exceptional Events" (2007). In the long run, reduced fuels will reduce potential for a large catastrophic wildfire, thereby reducing potential for future wildfire smoke, emissions, and associated impacts to Quincy and adjacent communities. Enhancement of carbon sequestration is not part of the Purpose and Need nor design criteria and was therefore not included as part of the project analysis.
EPA	The Fire, Fuels and Air Quality Report emphasizes the benefit of treatments that enhance the efficiency of fire retardant	FFA 3	Established fire suppression procedures as documented in the USFS Hauling Charts indicate that control efforts, including use of retardant, is not effective on flame lengths greater than 8-11 feet. Because flame lengths from a crown fire can easily exceed 20 to 100 feet or more; retardant cannot be used to put out a crown fire in most cases, especially in a mature forest

Comment ID Code	Comment	Com-ment No.	Response to Comment
	application.		where trees may be over 100 feet tall. Retardant is used to extinguish, or hold surface or smoldering fires in surface fuels. The more retardant which can penetrate the canopy to surface fuels, the more effective and efficient the use of retardant will be. Conditions in the treatment areas are such that fire intensity is predicted to be high and is completely supported by current stand conditions as reflected under the "pretreatment" conditions modeled for each alternative. Finally, retardant may be applied again as needed and is supported by decades of local fire experience. This statement assumes that fire behavior will be such that direct attack will not always be safe and feasible by hand crews, engines, and dozers. This is often the case on large fires where combinations of these resources, in conjunction with retardant use are required to safely contain large fires. A relative increase in the amount of retardant penetrating tree crowns to surface fuels in a thinned area was observed on the Bell fire of 2005 on the Plumas National Forest and documented in Moghaddas (2006- "A fuel treatment reduces potential fire severity and increases suppression efficiency in a Sierran mixed conifer forest. Fuel Management- How to Measure Success, March 27-30, Portland, Oregon).
EPA	Air quality needs to be considered during road construction.	FFA 4	Road construction will be done in compliance with local air quality standards in conjunction with the Northern Sierra Air Quality Management District. Hauling on roads will be done under a "Dust Abatement Plan". Vehicle emissions will comply with State Emission Control Laws as regulated by the state through the vehicle registration and smog check process.
JMP	The DSEIS asserts that intensive mechanical thinning up to 30 inch DBH is necessary to reduce potential for severe fire. However, recent scientific studies have found that precommercial thinning of sapling and pole-sized trees only (up to 8-10 inches in diameter) effectively reduce fire severity. See, for example: Perry, D.A., et al. 2004, Omi, P.N., and E.J. Martinson. 2002, Hanson and Odion 2006	FFA 5	For a detailed discussion on scientific literature pertinent to fuel treatments, see section on "Background on Fuel Treatments" in the Empire Fire and Fuels Report. The Fire and Fuels report acknowledges the effectiveness of fuel treatments analyzed in the Perry et al. (2004) and Omi and Martinson (2002) studies. These findings are consistent with other findings that surface fuel reduction combined with thinning from below can reduce the chance of tree torching (by raising the torching index). These findings are also supported by other peer reviewed scientific studies (Agee and Skinner, in press, Stephens and Moghaddas, in press, a and b, Peterson et al., 2005, Raymond and Peterson, 2005, Graham et al., 2004, Agee, 2002) cited in the Fire and Fuels Report. The study by Perry et al. (2004) also notes that "Reducing the risk of active crown fire may necessitate heavier thinning, depending on stand structure and acceptable degree of risk" (Perry et al., 2004, p 924). The Empire proposed action (FSEIS Ch. 2) states that an

Comment ID Code	Comment	Com-ment No.	Response to Comment
			objective of fuel treatments within the Empire Project "…would be to leave vigorous stands with adequate vertical and horizontal crown separation in order to reduce the likelihood of crown fire, and potential mortality of residual trees for at least the next 10 years…..Crown base height will be raised to 15-25'." Again, as stated directly by the Perry et al. (2004) study, meeting the goal of crown fire reduction may "necessitate heavier thinning." The principles of fuel reduction discussed in Perry et al. (2004) are being applied to fuel treatments in the Empire Project. The removal of trees up 30 inches dbh is necessary for operational flexibility in creating an effective fuel treatment with adequate horizontal and vertical crown separation to modify fire behavior, to implement the HFQLG Act Title IV Section 401 "most cost effective means in conducting the Pilot Project", and is the operational diameter limit range identified in the 2004 SNFPA ROD (p 68, Table 2). Removal of only trees up to 8, 10, 12, or 15 inches dbh is not the "most cost effective means in conducting the Pilot Project." The paper by Hanson and Odion (2006) finds a lower occurrence of high severity fires within 3 large wildfires. The use of soil burn severity maps for the analysis in this paper instead of vegetation severity maps makes it difficult if not impossible to strongly support the conclusions about burn severity trends made by the authors of this paper.
JMP	The fire modeling analysis makes assumptions or relies upon modeling results, which are based upon assumptions that may not reflect actual real-world fire behavior. Explain how modeling accounted for increased mid-flame wind speeds due to a reduction in the buffering effect of mature tree boles.	FFA 6	The methods used to model potential fire behavior are described in detail in the Empire Fire, Fuels, and Air Quality Report ("Analysis Area and Methods" section) and the Empire FSEIS ("Analysis Area and Methods" section). The wind speed reduction factors (WRF), other fire weather parameters, and fuel models used for modeling are displayed in tables F-6 and F-7 in the Fire, Fuels, and Air Quality Report. The WRF and fuel models were adjusted to account for decreased canopy and potential increases in fuels and brush cover due to proposed treatments. The WRF used to model all treatments are consistent with recommendations by Rothermel (1983) for the fire model used in this analysis, Fuels Management Analyst (Carlton 2005). A WRF of 0.4 was used to adjust wind speeds in group selection units which have a fuel model 10, 11, and 5 over the modeling period. A wind speed reduction factor of 0.3 was used to model wind speeds in DFPZ and ITS treatments; a wind speed of 0.2 was used to model wind speeds in untreated areas. These wind speed factors are all consistent with Rothermel's (1983) recommendations in Table II-6, p33 of his publication.
JMP	Explain how modeling accounted for	FFA 7	The methods used to model potential fire behavior are described in detail in the Empire Fire,

Comment ID Code	Comment	Com-ment No.	Response to Comment
	the following slash debris. Please describe in detail in the final document when exactly slash debris would be piled and burned following thinning, and what will be the potential adverse impacts on human health and safety if a fire occurs after thinning but prior to piling/burning or broadcast burning.		Fuels, and Air Quality Report ("Analysis Area and Methods" section) and the Empire FSEIS ("Analysis Area and Methods" section). See appendix F and FSEIS Ch 3 for detail on post treatment slash removal. Post treatment slash conditions for fuel treatments (DFPZs), individual tree selection, and group selection were modeled using a slash model 11 (Final Fire and Fuels Report, Table F-7) (Rothermel, 1983). The slash model depicts a post treatment condition with a 1, 10, and 100 combined fuel load of 12 tons per acre. Results from post treatment without further slash treatment modeling are depicted for each alternative (Final Empire Fire and Fuels Report, Appendix, Tables F-13, 16, 19, 22, 25, and 32). Whole tree harvesting will be utilized, resulting in minimal slash contributions to the existing slash condition. Existing fuel conditions are primarily represented by a fuel model 10. Fuel model 10 is representative of naturally accumulated slash resulting from branch shed, needle drop, and deadfall. Rothermel (1983) describes the fuel model 10 as having 3 tons per acre of 1 hour fuels, 2 tons per acre of 10 hour fuels, and 5 tons an acre of 100 hour fuels for a total of 10 tons an acre. The current conditions fuel of the model 10 already presents a hazard to the community. Even under no treatment, fires burning in these conditions will remain hazardous to firefighters and homeowners WITHOUT the additional slash contribution. Note that at least 3 fires over 1,000 acres in size have already burned within the Adjacent and Extended WUI Zones of communities at risk adjacent to the Empire Project area (Final Fire and Fuels Report, Table F-1). With completion of fuel treatments, the threat to both homes and fire fighters will be reduced from existing conditions. With respect to increases in surface fuels due to whole tree harvesting, Agee and Skinner (2005, Basic principles of forest and fuels reduction, For Ecol and Man., in press) note "Whole tree harvest, with disposal of tops at the landing (chipping, burning) is most effective at preventing surface fuel increases in the residual stand…". Stephens (1998, Evaluation of the effects of silvicultural and fuels treatments on potential fire behavior in Sierra Nevada mixed conifer forests, For Ecol and Man. 105:21-35) work demonstrates that treatments, which leave limbs and slash in the forest as well as a "no treatment" alternative, had a higher probability of passive crown fire and crowning. Stephens (1998) also concludes that whole tree thinning integrated with biomass harvest of smaller materials followed by prescribed burning was an effective fuel treatment within the area studied. Whole tree harvest with biomass, followed by

Comment ID Code	Comment	Com-ment No.	Response to Comment
			prescribed burning where surface fuels do not meet desired conditions specified in the proposed action is prescribed for DFPZ units in the Empire Planning Area. The minimum expected lag time between the creation of harvest slash and its removal by pile burning or under burning is between 6 months and 2 years. Prescribed burning can be used to remove natural and mechanically created accumulations of slash, but the risks associated with prescribed and pile burning, constraints to air quality, desirable burning conditions, and resource availability can all delay the time it takes to remove surface fuels using these methods. Slash created during the late spring can be burned the following winter or spring. Typically slash that is created in the summer or late fall must go through an additional summer of drying in order to allow efficient, clean combustion. Clean combustion is essential to protect air quality and to achieve desired consumption. While slash disposal will not occur immediately after treatment, there is no treatment which can instantaneously remove all naturally accumulated fuel and project created slash from any project. The amount of slash created by breakage during felling and skidding regardless of size is anticipated to be incidental and is not anticipated to exceed the desired post treatment condition of less than 5 tons per acre. Removal of limbs and tops by whole tree harvest methods notably reduces activity generated surface fuels (Agee and Skinner, In Press). In other published work (McIver et al., 2003, p243, table 2), whole tree harvesting in which all tops and limbs were left in the woods increased the amount of combined 1, 10, and 100-hour activity fuels by only ~3 percent. Recently published works (Stephens and Moghaddas, in press a, table 6) showed a difference of 9 percent in activity fuels in units that were harvested using a complete lop and scatter of all limb wood and tops compared with a control. Considering that whole tree harvest which includes removal of tops and limbs will be used in the Empire Project, the 1, 10, and 100 hour fuels would not be expected to increase by more than 3 percent-9 percent. Based on the 1, 10, and 100 hour fuel loadings, a fuel model 10 (pretreatment conditions) represents 12 tons per acre (Anderson, 1982), consequently a 3 percent-9 percent increase would only result in an increase of surface fuels of less than 2 tons per acre. With respect to 3”-10” fuels, the study by McIver et al. (2003) noted a 71 percent reduction in surface fuels 6-9 inches in diameter. The diameter class category breakdown within this paper does not allow exact computation of fuel change in the 3-10 inch class. Stephens and

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			Moghaddas (in press c, table 8) also showed a general decrease in woody debris 6-10 inches in diameter. Net loss of woody debris in both of these cases can be explained by breakup of existing debris, particularly rotten debris, by equipment harvest with low additions of new large woody debris. From both of these studies which left most activity fuels (limbs and tops) in the harvest unit, whole tree harvest, which removes most if not all limbwood and tops, can be expected to contribute very little additional fuels across all treatments implemented in the Empire Project Area.
JMP	Explain how modeling accounted for the accelerated brush growth due to increased sun exposure.	FFA 8	The methods used to model potential fire behavior are described in detail in the Empire Fire, Fuels, and Air Quality Report ("Analysis Area and Methods" section) and the Empire FSEIS ("Analysis Area and Methods" section). To account for potential brush, a brush fuel model 5a (Fire and Fuels specialist report, Table F-7)) was used to model treatments at 20 years. Several fuel breaks have been established on the Mt. Hough RD, including Antelope Border, Keddie Ridge, Spanish Camp, Slate, and Ridge. Based on field observations of these fuel treatments, it appears that brush growth has not initiated to any level which would substantially affect potential fire behavior within these fuel existing fuel breaks, some of which are over 10 years old. Brush cover is typically discontinuous and makes up less than 30 percent of total understory vegetative cover. As time goes on, canopy and ground cover will increase in these fuel breaks making the establishment of brush even less likely.
JMP	Explain how modeling accounted for desiccation of surface fuels due to increased sun and wind exposure.	FFA 9	The methods used to model potential fire behavior are described in detail in the Empire Fire, Fuels, and Air Quality Report ("Analysis Area and Methods" section) and the Empire FSEIS ("Analysis Area and Methods" section). A 20-foot wind speed of 6 miles per hour was used for fire modeling (Fire and Fuels Report, table F-6). These wind speeds were adjusted using the Windspeed Reduction Factor to reflect increased winds resulting from canopy reduction due to treatments. The windspeeds and other 90th percentile weather variables (fuel moisture, etc) were computed using data from the Quincy Remote Automated Weather Station (RAWS). These methods and assumptions are all documented in the Fire and Fuels Report "Methods" section. Furthermore, recent findings by Faiella and Bailey (2007) find that "amplified fire behavior as a consequence of reduced fuel moisture contents in treated versus untreated forest stands in similar treatments in semi-arid ponderosa pine forests of northern Arizona therefore appear to be unwarranted".

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JMP	Please explain your proposal of a 30" DBH limit for mechanical thinning, in the context of a fire/fuels management proposal, when no peer-reviewed, published scientific literature recommends such a prescription as being necessary or effective in the context of fire/fuels management.	FFA 10	The 30 inch diameter limit is consistent with standards and guidelines as analyzed and described in the 2004 Sierra Nevada Forest Plan Amendment. We could find no published literature which make recommendations for specific diameter limits, rather several studies that report results from prescriptions which used a range of diameters from 10 to greater than 30 inches DBH. Findings from several of these studies are summarized, in part, in the "Background on Fuel Treatments" section of the final Fire, Fuels, and Air Quality Report.
JMP	The FSEIS must fully consider a reasonable range of alternatives, including an alternative with a 12" DBH limit in mechanical thinning units. The FSEIS must include a full comparison of all fire/fuel modeling output results for all of the final alternatives--as they are described in the FSEIS—that are fully considered (including the 12" diameter limit alternative described above).	FFA 11	Alternative H, which had 12 and 15 inch diameter limits, does not meet the purpose and need of the HFQLG Act (Empire FEIS). Alternative E was fully analyzed. Alternative F implements a 20 inch upper diameter at breast height (DBH) limit and retains 50 percent canopy cover. Alternative F maintains 50 percent canopy cover with a 20" upper diameter limit and does not implement group selection in Riparian Habitat Conservation Areas (RHCAs) or anyplace else in the Empire Landscape Assessment Area (LAA). Results from post treatment without further slash treatment modeling are depicted for each alternative (Final Empire Fire and Fuels Report, Appendix, Tables F-13, 16, 19, 22, 25, and 32).
SNFPC (Rice)	The Empire Project fails to take a hard look at alternatives that can meet applicable fuel reduction goals.	FFA 12	Three separate Alternatives with a lower diameter limit and corresponding higher canopy cover were already considered (E, F, and H) in response to public comment. Alternative E was fully analyzed as part of the Empire EIS, DSEIS, and FSEIS. Implementation of alternatives E and F would result in a negative net value of $1 million. Alternative H was considered but eliminated from detailed study as it would not meet Project Purpose and Need of "Economically viable removal of commercial timber while accomplishing vegetation and watershed management activities" (FSEIS). Alternative H would result in an even greater negative net value than alternatives E and F. Please refer to FSEIS Chapter 2 pg. 2-18.
SNFPC (Rice)	The Fire, Fuels and Air Quality Report contends that the Crowning Index is relative, and that its only use is to portray the relative benefits	FFA 13	In terms of using crowning index (CI) as a relative comparison, a recent publication by Fule et. Al (2004) note: "Thus it would be unrealistic to expect that CI values are precise estimates of the exact windspeed at which any real crown fire will be sustained. ***However, it is reasonable to compare CI values across space and time to assess crown fire susceptibility in***

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	in crown fire spread potential between alternatives. In contrast, the Glossary of the DSEIS definition is as follows: "Crowning index — The open (20 foot) wind speed at which active crown fire is possible for the specified fire environment" (Scott and Reinhardt 2001)." This definition refutes the assertion that it is only a relative term.		***relative terms***". Several variables including flame length, rate of spread, fireline intensity, and predicted mortality were used in the analysis and are displayed in the Fire and Fuels specialist report (appendix tables F-10, 13, 16, 19, 25, 29, and 32). The use of the crowning and torching index (wind speeds where passive and active crown fires occur) is appropriate for comparing the effect of proposed treatments. These indices integrate ladder fuel, fire behavior, and weather information into a quantified number. The model, methods, and indices (torching index, crowning index) used to analyze potential fire behavior within treated and untreated units have been used in recently published studies (Stephens and Moghaddas, in press a and b; Perry et al, 2004). Model outputs were discussed and validated among local experienced fire management personnel who have expertise in local fire behavior to determine if model outputs reasonably predict what has been observed on real fires on the Mt. Hough District. The objective of the fuel treatment (DFPZ) is not just to limit fire severity but to "…reduce the potential for a crown fire and to allow fire suppression personnel a safer location from which to take action against a wildfire" (Empire FSEIS chapter 1; Empire Purpose and Need). The higher crowning index seen in the 30" upper DBH limit treatment means that for a given wind speed, there is less likelihood of active crown fire propagating through the stand under 90th percentile weather conditions, which in turn more effectively meets stated fire performance goals. The integration of the change in forest structure (reduction of ladder and canopy fuels) combined with surface fuel treatments is why there is an increase in the crowning and torching indices between the 20" (50 percent canopy cover retention) and 30" DBH fuel treatments. With respect to crown fire, the DFPZ with a 20" upper DBH limit and 50 percent canopy cover (Alts E & F) and the ITS with biomass had crowning indexes of 21 and 20 MPH, respectively; fuel treatments with a 30" UDL have a crowning index of 36-39 mph (CWHR 4D and 4M). It is acknowledged that the modeled fire performance between fuel treatments in A, C, D, E, and F is similar for potential passive crown fire (torching) at 90th percentile weather conditions as these wind speeds are relatively high compared with probable wind speeds. Higher wind speeds (>20 MPH) do occur in the project area. Under these more extreme conditions, fuel treatments in alternatives A, C, and D would perform relatively better than those in alternatives E and F with respect to potential crown fire (crowning). The primary difference between these alternatives under 90th percentile conditions is relative efficiency of penetration of aerial

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			retardant to surface fuels, operational flexibility, and increased cost effectiveness of treatments.
SNFPC (Rice)	The Fire, Fuels, and Air Quality Report did not include a landscape analysis of the fire behavior. While this project is not technically required to conduct the type of analysis required everywhere else in the Sierra Nevada Framework planning area, the approach has become a de-facto standard for describing the environment and comparing alternatives. Analysis of Strategically Placed Area Treatments (SPLATS) is required.	FFA 14	Project level locations of DFPZs are consistent with recommendations for locating these treatments within the HFQLG EIS. A summary of unit and treatment location are located in the FSEIS, under the direct effects of Alternative A in the Fire, Fuels, and Air Quality Section. Analysis of the HFQLG project was completed in the 2003 HFQLG EIS - two models, FARSITE and FLAMMAP, were used as part of this analysis. Proposed fuel treatments (DFPZs) locations are displayed in the EIS (Appendices A and E). The DFPZ unit locations and overall network were established as required by the HFQLG Forest Recover Act and analyzed in the 2003 HFQLG EIS. Unit prescriptions were based on existing fuels and vegetation conditions on a unit by unit level. Locations and prescriptions incorporate factors including establishment of the DFPZ network, unit location, vegetation type, existing hazard, access, feasibility of implementation, and local knowledge of fire behavior in the Empire Project Area. The establishment of “SPLATS” or “SPOTS” is not a part of the direction of the HFQLG Act authorized by Congress. The Act directs the forest to construct…” a strategic system of defensible fuel profile zones, including shaded fuel breaks, utilizing thinning, individual tree selection, and other methods of vegetation management consistent with the Quincy Library Group Community Stability Proposal.”
SNFPC (Rice)	When comparing Tables F-32 and F-16 one notices that the Crowning Indices for Alt H, Upper Diameter Limit of 15 inches ranges from 29 mph post-treatment to 31 mph 50 years after treatment. In contrast, Table F-16 notes the highest crowning index with a diameter limit of 20 inches is 21 mph post-treatment and 24 mpg 50 years after treatment. This would indicate that there is more benefit in terms of	FFA 15	Alternative H did not have a canopy cover limit of 50 percent. The stands with a 12 and 15 inch upper DBH limit were thinned down to 44 percent and 36 percent, respectively, which enhanced their fire performance by increasing the crowning index. This information was e-mailed to Sue Britting by J. Moghaddas on July 5, 2005. The 4p size class is the dominant vegetation type proposed for the fire only treatment.

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	reduction of crown fire potential to reducing the diameter limit to 15 inches. The fire only treatment only displays results for the 4p size class.		
SNPFC (Rice)	Firefighter safety is related closely to operations in addition to fuel conditions. More firefighters are killed in fine fuels than crown fires, possibly because the conditions appear benign and thus safety is not paramount in operations. The argument of fuel treatment for firefighter safety does not withstand a close scrutiny, because most fatalities are not associated with high-intensity fires.	FFA 16	Over the past 13 fire seasons, there have been 27 fatalities and 4 serious burn injuries caused by intense fire behavior. 5 firefighters were killed in a burnover on the Esperanza Fire (2006), 2 were killed in the Cramer Fire (2003), 4 fire fighters were killed in the Thirty Mile fire (2001), 4 fire fighters were seriously burned in the New York Peak fire, and 14 were killed in the Storm King fire (1994). These burnovers all occurred with experienced fire crews who were over run by fast moving, high intensity fires.
Stewart	The forest needs to commit to monitoring the project as part of the adaptive management process.	FFA 17	Monitoring protocols and funding are already in place for the Empire Project. Monitoring will occur within specific treatment units using established HFQLG Monitoring Protocols. In addition, monitoring of Best Management Practices (BMPs) will take place following the protocols established by the BMP Evaluation Program (BMPEP). BMP evaluations are included in the National Forest System Inventory and Monitoring (NFIM) program, which is funded by the NFIM budget line item. Adaptive management is achieved by addressing the corrective actions included in BMPEP monitoring reports.
SPI	The preferred Alternative (D) displays a volume of 34 mmbf, while the individual timber sales add up to approximately 18.2 mmbf. What happened to the other 15.8 mmbf?	FV 1	Preliminary volume estimates that were analyzed in the planning process were based on a rule of thumb using past projects (Snake and Silver timber sales from the Meadow Valley Project) which produced more volume per acre than was realized in the layout, design, and mark on the Empire Project. Consequently, volume may be overestimated during the planning process. Between the FEIS and the FSEIS, the economic analysis was updated using the data gathered through the timber sale planning process. Discrepancies between planned and prepped volumes were realized as a result of 1) the planned acres were not fully implemented, as 871 acres of DFPZ were not implemented due to low volume per acre and

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			high biomass costs, 189 acres of group selection were not implemented as they were classified as "economically infeasible" due to low volume per acre (of which 90 acres were helicopter units) and high associated road costs, and 191 acres of ITS were not implemented; 2) initial marking did not fully meet the silvicultural prescription; and 3) using the rule of thumb for past projects, volumes were overestimated. Volume estimates used by the commenter pertain only to timber sales previously advertised. Timber sales and service contracts associated with the project are currently being developed and will be advertised. Timber sale and service contract volumes will be determined when advertised and based on timber cruises.
SPI	There is a high amount of biomass removal relative to sawlog removal.	FV 2	The project purpose and needs (chapter 1) for implementing fuel treatment strategies and implementing group selection and individual tree selection identify the need for reducing ladder fuels and canopy fuels, reducing stand density, and promoting the regeneration, growth, and development of shade intolerant species. In addition, the Forest Vegetation analysis (Chapter 3, Figure 3.12) displays the existing large number of trees per acre of 0-10 inch dbh trees (biomass) which contribute ladder fuels and higher stand densities. Silvicultural prescriptions focus on low thinning (a.k.a. thinning from below) to address these existing conditions and meet the purpose and needs identified in Chapter 1. Figures 3.5, 3.7, and 3.9 also display the amount of biomass trees to be removed relative to sawlog sized trees.
SPI	Narrow the size and scope of the project to revenue producing acres not cost generating acres.	FV 3	The project size and scope were developed to meet the purpose and needs identified in Chapter 1.
SNFPC	The Forest Service should consider the less intensive logging that was permitted under the 2001 framework.	FV 4	Alternative F was fully analyzed. Alternative F implements a 20" upper DBH limit, retains 50 percent canopy cover, and does not implement group selection in RHCAs or anyplace else in the Empire LAA. Please refer to Chapter 2 – Alternatives including the Proposed Action, section titled Alternatives Considered in Detail, Alternative F p. 2-23.
SNFPC	Group selection is likely to establish an even-aged, single story canopy highly prone to crown fires.	FV 5	Shade tolerant species (white fir, incense cedar) are currently favored by regeneration conditions within the project area (Draft and Final Empire Vegetation Report). Under current high canopy conditions, it is unlikely that shade intolerant species will naturally regenerate, even with the use of prescribed fire. Currently, group selection is a known effective tool in regenerating a new age class of shade intolerant species. Multiple age classes of species will

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			be regenerated over multiple entries. Group selection units are even-aged at the unit level but contribute to a the development of uneven-aged stands and a multi-aged forest at a landscape level (Carl Skinner Declaration, Meadow Valley Project, 1/27/2005).
SNFPC	Post treatment stand densities for Alternative E or F are well beyond the Regional direction for lowering stand density, which suggests retaining SDI below the 60 percent level for at least 20 years post harvest. See e.g. Vegetation Report, p. 11, Table 6; p. 21, Table 9.	FV 6	The commenter's reference is in regards to an earlier version of the Vegetation report (June 2006 version) for the project and has been replaced by the February 2007 Vegetation report that was developed specifically for this current FSEIS. This new version replaced the old version referenced in the comment letter. For a comparison of relative stand densities in fuel treatments by alternative, please see the 2007 FSEIS Vegetation report, figure 3.5b. In his letter of direction regarding conifer density management, the Regional Forester directs Forest Service employees to "ensure that density does not exceed an upper limit (for example: 90 percent of normal basal area, or 60 percent of maximum stand density index); this is a prudent way to avoid the health risks associated with density. Design thinnings to ensure that this level will not be reached again for at least 20 years after thinning." Personal communication with Michael Landram (September 2006), the Regional Silviculturist and an original drafter of the letter, emphasizes that the letter of direction provided by the Regional Forester offers 60 percent of maximum stand density as an example not as a standard. As disclosed in the FEIS Chapter 3, Forest Vegetation, Affected Environment, Stand Density section: "For the purpose of this analysis 55 percent was used as a conservative measure of the onset of competition related mortality (also referred to as "density dependent mortality") because stress induced by competition increases tree susceptibility to drought, insects, disease, and fire. This threshold serves as an appropriate measure for forest health as stands managed below this threshold are less likely to incur mortality due to the agents mentioned above." In addition, Figure 3.5b in the 2007 FSEIS Forest Vegetation Report displays a comparison of the fuel treatment effects on relative stand density for alternatives A, C, D, E, and F. While fuel treatments in alternative E and F do reduce stand density to approximately 47 percent below the threshold used in the Empire analysis (55 percent), the effect is shorter lived (approximately 10 years). In comparison, fuel treatments in alternatives A, C, and D reduce the stand density to a lower threshold supported by regional direction and stand density management literature (See response to comment FV 7) for a longer duration (at least 20 years).

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			The greater and longer reduction in stand density in fuel treatments for alternatives A, C, and D also contributes to the greater diameter growth for residual trees over time (See FSEIS Forest Vegetation Report 2007, tables 3.4a for alternatives A, C, and D, versus table 3.9a for alternatives E and F). These beneficial effects prove to be a good example of the "interactive" and interconnected nature of stand density management, fuels management, and forest health objectives as described by Oliver (1996) and described in the FSEIS Chapter 3 Forest Vegetation, Affected Environment, Insects and Disease Management.
SNFPC	The Campaign notes that, to the extent the Forest Service is intending to rely on Powell (1999) as supporting thinning to 35 percent SDI, this paper actually identifies a "lower limit of the management zone" (LLMZ) at about 40 percent. Powell notes that "stand densities below the LLMZ could be considered understocked because growing space is not fully occupied (utilized) by the trees." Thus at best, the 35 percent SDI figure goes below the minimum level necessary to ensure normal growth rates for the forest.	FV 7	Personal communication with the author, David C. Powell (September 21, 2006), confirms that the analysis is consistent with the literature cited such as Powell (1999). Powell emphasized that the lower limit of the management zone should relate to land management objectives; some objectives could be favored by lower stand densities that maximize individual tree growth and vigor. This concept is also reinforced in the literature (Dean and Baldwin 1996; Long and Shaw 2005; Shepperd 2007; Sherlock 2007), where the multiple researchers have presented stand density management ranges that vary from 50-60 percent as the maximum threshold down to 20-35 percent as the lower threshold. Mechanical Fuel Treatments under Alternatives A, C, and D thin down to 25-40 percent relative stand density (See 2007 FSEIS Vegetation Report, Figure 3.5b). These lower densities are appropriate given the fuel treatment objectives to reduce ladder and canopy fuels and provide for more crown separation to reduce the probability of crown fire spreading from tree crown to tree crown. (Please refer to response to comment FV 8 and FV 9). These post treatment stand densities under alternatives A, C, and D are consistent with direction provided by the Regional Forester (Blackwell 2004). In this letter direction, the Regional Forester specified to "ensure that density does not exceed an upper limit (for example: 90 percent of normal basal area, or 60 percent of maximum stand density index); this is a prudent way to avoid the health risks associated with density. Design thinnings to ensure that this level will not be reached again for at least 20 years after thinning." Personal communication with Michael Landram (September 2006), the Regional Silviculturist and an original drafter of the letter, confirms that the thinnings designed comply and are fully consistent with the letter of direction provided by the Regional Forester (Blackwell 2004). Mr. Landram emphasizes that the letter of direction provided by the Regional Forester offers 60 percent of maximum stand density as an example not as a standard.

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SNFPC	The Forest Service does not provide a reasoned explanation for why stand density must be lowered by removing co-dominant 20-30" dbh trees as opposed to a thinning from below prescription.	FV 8	All alternatives employ thinning from below prescriptions. The difference is that the fuel treatment prescriptions in alternatives A, C, and D have an upper diameter limit of 30 inches dbh and thin to 30 to 45 percent canopy cover, whereas fuel treatment prescriptions in alternatives E and F have an upper diameter limit of 20 inches dbh and thin to 50 percent canopy cover. Consequently, prescriptions for fuel treatments in alternatives A, C, and D prove to be more effective at reducing stand density. (Please refer to comment FV 6) Please refer to the FSEIS Forest Vegetation discussion in Chapter 3. The discussion under Alternative A, Fuel Treatments, and Individual Tree Selection explains that the proposed treatments would use a combination of both low thinning (thinning from below) and crown thinning. In the Fuel treatments, thinning from below would reduce ladder fuels while the crown thinning would reduce canopy fuels. In the individual tree selection treatments, both thinning from below and crown thinning would be used to reduce stand density, tree competition, and reduce the potential for insect and disease infestations. In addition, FSEIS Figures 3.5, 3.7, and 3.9 show the existing and post treatment levels of basal area (a measure of stand density) by ten inch diameter class. While fuel treatment prescriptions in alternatives A, C, and D propose a 30 inch upper diameter limit, these figures show that the emphasis is on thinning from below. For fuel treatments, FSEIS table 3.4 discloses the existing stocking and predicted retention of trees between 20 and 29.9 inches dbh.
SNFPC	The Forest Service has not provided any evidence to support the idea that the threshold of "density related mortality," whether 55 percent as the Empire Project claims, or the 60 percent standard proposed by Region 5, is synonymous with forest health. For other disease, the Forest Service provides no information showing that such low stand densities are necessary to avoid outbreaks	FV 9	The Regional Forester's 2004 letter of direction on Conifer Forest Density Management for Multiple Objectives (Blackwell 2004) directly addresses the concept of using stand density management to address forest health concerns including susceptibility to negative effects from fire, drought, insects, and disease. This concept is also documented in the scientific literature including the Sierra Nevada Ecosystem Project report to Congress (Oliver 1995; Ferrell 1996; Oliver et al 1996, Guarin and Taylor 2005). The use of the 55 percent relative stand density threshold for "density dependent mortality" has also been widely used and recommended to manage forests at lower densities to increase individual tree growth and vigor and improve susceptibility to forest insects and disease (Drew and Flewelling 1977, 1979; Long 1985; Long and Daniel 1990; Smith et al. 1997; Powell 1999; Long 2005). In addition, Powell (1999) describes in detail how reducing stand density through thinning can improve stand resistance to insects and disease that occur within the project area such as

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			bark beetles and root disease. Please refer to the discussion and references on stand density and Insects, Disease, and Management in the Forest Vegetation, Affected Environment section of the FSEIS, Chapter 3 and the 2007 Forest Vegetation report.
SNFPC	The Forest Service provides no evidence that it is necessary to reduce canopy to 35 percent or 45 percent in order to encourage regeneration of intolerant conifers. Research at Blodgett Forest and elsewhere (Lilieholm, 1990) demonstrates that regeneration of all species in a Sierra Mixed Conifer forest is more than adequate following periodic harvesting, which occurs at post-harvest canopy cover levels of 50 percent to 70 percent.	FV 10	Please refer to the Purpose and Need in the FSEIS Chapter 1 and the Fuel Treatment and Individual tree selection treatment discussion in Chapter 3 Forest Vegetation, Environmental consequences, Alternative A. The FSEIS specifically discloses that "individual tree selection would not be used as a regeneration method." However, these prescriptions are designed to preferentially retain existing shade intolerant species and enhance their *growth* and *development*; not regeneration of new seedlings. The objective of the Group Selection treatments is specifically to provide for openings to encourage the regeneration of shade intolerant conifers (Please refer to the purpose and need in Chapter 1 and the Group selection discussion in Chapter 3 Forest Vegetation, Environmental consequences, Alternative A. This is based on research at Blodgett Forest (Helms and Olson 1996; York et al. 2003; York et al. 2004) and other scientific literature (Bonnicksen and Stone 1981, 1982; McDonald and Abbott 1994; Helms and Tappeiner 1996; McDonald and Reynolds, 1999). Although the Lilieholm et al. study on "The effects of single tree selection harvests on stand structure, species compositions, and understory tree growth in a Sierra Mixed Conifer Forest" (1990) at Blodgett Forest reported that "intolerant ponderosa and sugar pines account for nearly 20 percent of trees in the seedling class," the findings also included that "intolerant pines are virtually absent from the small and large sapling classes (Table 3)." In addition research at Blodgett Forest (Helms and Olson 1996) has shown that pines "did not survive as well as the more shade tolerant incense-cedar and white fir" and that "naturally regenerated pine does not seem to be surviving well into the sapling stage." This point was recognized by Lilieholm et al. (1990) who concluded that "the relevant question is whether forest conditions can be created that will allow less tolerant seedlings to survive and grow to merchantability." This research emphasizes the concept that in managing forest structure and species composition in the future, it is important to create conditions that not only encourage *regeneration* of shade intolerant species, but also facilitate the future *growth* and *development* of those seedlings into saplings, poles, and large trees. The results in Lileholm et al. (1990) suggest that maintaining high amounts of canopy (e.g. 50 percent canopy cover) are

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			inadequate to promote the regeneration, growth, and development of these shade intolerant species into the future. Consequently, other research at Blodgett (Helms and Olson 1996; York et al. 2003; York et al. 2004) and elsewhere (Bonnicksen and Stone 1981, 1982; McDonald and Abbott 1994; Helms and Tappeiner 1996; McDonald and Reynolds, 1999) has focused on the use of group selection silvicultural treatments to provide for managing and maintaining the regeneration, growth, and development of shade intolerant species into the future.
JMP	In the FSEIS, please describe in detail each of the following for all of the final alternatives (including figures): a) the existing density of trees in each size class (e.g., 0-4", 4-8", 8-12", 12-16" dbh, etc.); b) the existing species composition of trees in each size class; c) the existing range of variability in density and species composition across the project area; d) your expected post-logging density of trees in each size class; e) your expected post-logging composition of trees in each size class; your post-logging expected range of variability in density and composition; and f) the historic data that you rely upon for your assertion that you are restoring historic conditions. Without this information, it is impossible to evaluate the scientific accuracy and integrity of the analysis.	FV 11	Please refer to the Empire Project Purpose and Needs in the FSEIS Chapter 1; the purpose and need does not include restoring historic conditions. The FSEIS Chapter 3, Forest Vegetation, affected environment section and the associated FSEIS Forest Vegetation Report 2007 discusses the disturbance history that has contributed to existing conditions and the existing and post-treatment stand structure, species composition, and stand density; this includes average variation in stand characteristics between CWHR types. Size classes by ten-inch diameter class were used as they directly relate to prescription design elements and subsequent economic effects.
JMP	The VTM data set from the late 1920's and early 1930's is a direct	FV 12	Bouldin (1999, Figure 89) reproduced the structural data for mixed conifer stands from the Minnich et al. (2000) study and compared the density between three mixed conifer forest

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	historical data set which established plots throughout the central and northern Sierra Nevada. It shows that, in the mixed-conifer forest type, there were approximately 60 trees per acre over 12" dbh, including 18 trees per acre for trees 24-36" dbh, on average (See Bouldin 1999, Fig. 89).		subtypes in the Sierra San Pedro Martir in 1992 and the Sierra Nevada in 1935. This figure shows total trees per acre for Sierra Nevada mixed conifer stand ranging from approximately 75 to 100 trees per acre in 1935. For mixed conifer forest subtypes in the Sierra San Pedro Martir in 1992, total trees per acre range from approximately 30 to 60 trees per acre. Under alternatives E and F, fuel treatments implementing a minimum canopy cover of 50 percent would result in consistently higher trees per acre (approximately 121 to 147 Trees per acre, See Forest Vegetation Report 2007, Table 3.9a) than those presented in Bouldin (1999, Figure 89). Under alternatives A, C, and D, the fuel treatment prescription would result in approximately 43 to 86 trees per acre (See Forest Vegetation report Table 3.4a) at the minimum canopy cover requirements (30 percent canopy cover) to slightly less than the values reported for alternative E and F. Fuel treatments in alternatives A, C, and D would create the most similar structure and density to those shown in Bouldin (1999, Figure 89); however, it must be noted that re-creating or restoring these conditions is not the over-arching purpose and need of the Empire Project or the fuel treatment prescriptions. Individual tree selection treatments throughout all alternatives are consistently higher than those shown in Bouldin (1999); however it should also be noted that these prescriptions are designed to reduce stand density while maintaining a minimum of 50 percent canopy cover per the SNFPA 2004 Table 2 guidelines. These treatments are not designed to "restore historical conditions" nor are these objectives included in the purpose and need for the Empire Project.
SNFPC	The Forest Service did not consider a reasonable range of alternatives.	NEPA 1	A reasonable range of alternatives is where each alternative fully meets the purpose and need, as well as has significant issues incorporated. These reasonable alternatives are studied in detail, while those alternatives that do not fully meet the purpose and need are not studied in detail. Please refer to Chapter 2 – Alternatives including the Proposed Action pp. 2-11 – 2-25.
SNFPC	The Forest Service improperly rejected Alternative H.	NEPA 2	Alternative H does not meet the purpose and need of the Empire Project. Please refer to response FFA 11.
Stewart	The protection measures of the Healthy Forest Restoration Act must be declared and incorporated into the ROD.	NEPA 3	The HFRA was mentioned in reference to fire condition classes on pg 3-71 of the Empire FSEIS. The Healthy Forest Restoration Act (HFRA) requires "…meaningful public participation during preparation of authorized hazardous fuel reduction projects. Agencies need to plan ahead to provide adequate time for collaboration." To incorporate HFRA authority at this time into the Empire Project would violate the "…special procedures..." established within Section 104 of the HFRA. In addition, not all treatment units of the Empire Project "qualify" for

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			expedited NEPA review under the HFRA; therefore the Empire Project does not fall under HFRA authority. Please refer to *The Healthy Forest Initiative and Healthy Forests Restoration Act Interim Field Guide February 2004* pp. 9 and 15. The HFRA was referenced, not as an authority, but as a means of setting the stage for discussion of the effects of treatments on fire condition classes.
Anonymous	Closing roads is not necessary; you are forgetting the American Disability Act for the handicap and mobility impaired, which will not allow them to access public lands.	NEPA 4	All individuals who depend on a road(s), that have been proposed for decommissioning or closure within the Empire Project area, would have to use a different road and possibly change their travel activities. This would include individuals with limited mobility who utilize motorized vehicles for Forest access. People with limited mobility were not singled out for special analysis because individual situations vary, and the effects to individuals with limited mobility are already encompassed in the general effects to all motorized vehicle users. Section 504 of the Rehabilitation Act of 1973, as amended, requires that programs and activities are to be accessible to people with disabilities. However federal laws, regulations, and policies, including Section 504 do not require agencies that restrict or prohibit OHV use for all people to make exceptions for such use because a person has a disability.
Lazzarino	Extend comment period due to conflict with OHV route designation process. Projects are in conflict with OHV public meetings, no roads or trails were supposed to be closed except with extreme damage. Don't decommission non system roads U6351 from Rhinehart Meadow, U6450 & U6451 near Four Corners, or 24N33Y.	OHV 1	As the spokesperson for Sierra Access Coalition, Mike Lazzarino provided information, photographs, and field verification to the Mount Hough Ranger District. The interdisciplinary team (IDT) assigned to this project analyzed alternative D relative to all roads proposed for decommissioning or closure in the original 2005 FEIS. This analysis and recommendations are available in the project file located at the Mount Hough Ranger District, Quincy, CA. Roads may be decommissioned or closed at the project level under the authority of the May 31, 2005 letter from the Forest Supervisor, titled "OHV Route Designation Process". This letter provides direction for "…completing NEPA analysis or making other decisions, which will result in the closure of routes or their omission from the Interim Forest Order, please ensure that those actions are limited to the following criteria: 1) Dead end spurs or routes that show no evidence of OHV use, which are *also* contributing to resource damage. 2) User created routes in areas that are already closed by existing Forest Orders (please

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			see map). 3) Routes that are creating egregious resource damage, to the extent that a delay in their closure would result in unacceptable and irretrievable impacts to the resource." Implementation of the Empire Project would comply with the Off-highway Vehicle (OHV) Route Designation Process, and with the December 2006 Motorized Vehicle Restriction Forest Order 01-07. A total of 7.6 miles of proposed road decommissioning and 11.1 miles of proposed road closures have been removed from the project by the FSEIS ROD.
Lazzarino	Public is being denied the opportunity to evaluate OHV routes/roads/trails/spurs within and outside of Empire treatment areas. Is the district decommissioning routes outside of the Empire Project area? The district has overestimated hydrologic concerns. The following routes should not be closed: non-system road of 25N14, 25N29, and 24N27.	OHV 2	The Plumas National Forest (PNF) is currently conducting public scoping for the OHV Route Designation Process. Information on specific routes and areas within the forest are currently being accepted by the PNF Supervisor's Office. Routes identified in each alternative will be evaluated and analyzed by interdisciplinary team members and effects will be discussed in the OHV Route Designation EIS. Once the Proposed Action for the OHV EIS project is distributed to the public there will be a formal 45-day opportunity to comment period consistent with 36 CFR 215 appeal regulations. Please refer to the response for OHV 1.
Lazzarino	On Friday, May 4, 2007 a Forest level decision was made that dispersed camping and game retrieval will be limited to one vehicle length off a designated route, I don't want any roads or trails closed.	OHV 3	The Plumas National Forest is currently considering the Region 5 guidance for dispersed camping and game retrieval. The final decision on dispersed camping and game retrieval will be brought forward by the OHV Route Designation EIS. Please refer to the response for OHV 1.
OHV-FL	We object to closing any existing road or trail, including the 17 miles of road closure and 15 miles of decommissioning proposed in the Empire Project area and any other	OHV 4	The Empire Project is a project designed to meet the purpose and need to implement the resource management activities, as identified in the HFQLG FEIS (1999) for the pilot project. As one of four resource management activities identified for implementation with the HFQLG Pilot Project, and analyzed in the HFQLG FEIS (page 2-19), road management activities would focus on repairing resource degradation caused by existing roads (page 2-22).

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	area of the Plumas National Forest.		Resource degradation repair methods include road decommissioning (page 2-22). Roads would be decommissioned in compliance with the Clean Water Action Plan (pages 2-22, 3-8). The HFQLG FEIS estimates approximately 230 miles of road decommissioning or obliteration for the HFQLG planning area during the term of the project (page 3-8) under the Clean Water Action Plan and that total road miles decommissioned under alternative 2 of the HFQLG EIS (the selected alternative) are 430 miles (Table 3.7 page 3-20). During the term of the pilot project, the decommissioning goal is for watershed improvement and engineering needs. Primary access roads would not be included in the decommissioning target, but rather unclassified roads and those Forest Development Roads that are degrading water quality, receiving little to no maintenance, and determined to not be needed for management of National Forest System lands (page 3-8). Please refer to the response for OHV 1.
OHV-FL	OHV users are from all over the country and it is unfair that they will not be notified of these proposed actions. A small public notice ad is insufficient.	OHV 5	Public involvement for this project meets requirements under the 36 CFR 215 regulations. The Notice of Availability (NOA) for the DSEIS was published in the Federal Register on March 2, 2007 and the 45-day comment period ended April 16, 2007. The public involvement section is described in the 2007 FSEIS on pp. 1-6 and 1-7. Public involvement for this project dates back to 2004. Also, comments were assessed and considered as required by Council on Environmental Quality (CEQ) regulation 40 CFR 1503.4. Please refer to response for OHV 11.
PRR (Teeter)	Consider impacts on the OHV route infrastructure.	OHV 6	The purpose and need for transportation management in the Empire Project are identified on pp. 1-5 and 1-6 of the 2007 Empire FSEIS. These needs included: road reconstruction and maintenance, temporary road construction, new system road construction, and harvest landing construction and reconstruction. In addition road decommissioning and spur road closure is needed to reduce erosion, sedimentation, soil compaction, road density, and wildlife impacts. Culvert replacement are needed to allow fish passage at three locations. OHV route infrastructure is not an objective, purpose, or need of the Empire Project.
PRR (Teeter)	None of the alternatives address protection of OHV routes submitted by contractors and the public during the OHV Route Designation Process that are in treatment zones as well as non-inventoried routes discovered during the project. Avoid	OHV 7	The OHV Route Designation Process public collaboration effort and Environmental Impact Statement (referred to as OHV EIS) will provide an opportunity for the assessment and considerations of design criteria development (e.g. buffer strips and relocation or replacement of OHV routes). OHV route protection is not an objective, purpose, or need of the Empire Project. Please refer to the response for OHV 6.

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	OHV routes when possible, and leave buffer strips on each side of the route, to prevent the loss of physical and aesthetic values of the trail experience, or allow the route to be relocated or replaced to accommodate the same type of use.		
PRR (Teeter)	Include an objective to protect and maintain the character of all inventoried routes, not limited to the December 2006 Interim Forest Order (Motor Vehicle Restriction maps) within treatment areas. No negative impacts to OHV routes from road construction or reconstruction.	OHV 8	Road reconstruction and maintenance are needed to bring existing National Forest System roads into compliance with current maintenance standards and to provide access to the fuel reduction, group selection, and individual tree selection treatment areas. Reconstruction and road maintenance are also necessary to reduce erosion and sedimentation and to provide for public and firefighter safety. Protecting and maintaining the character of all inventoried routes on the December 2006 Motorized Vehicle Restriction Forest Order 01-07 within the Empire Project would reduce the vegetative and fuel treatment effectiveness, the economic viability, and the efficiency of implementation of the Empire Project. Effects to off highway vehicle recreation are addressed in the 2007 Empire FSEIS, chapter 3, Environmental Consequences Section—Recreation and Mining, pp. 3-239 – 3-241. OHV route character is not an objective, purpose, or need of the Empire Project. Please refer to the response for OHV 6.
PRR (Teeter)	Include an objective to identify and protect new and non-inventoried OHV routes. Include new route information in OHV Route Designation inventory.	OHV 9	OHV routes included in the OHV Route Designation Process will be determined by routes that were included on the December 2006 Plumas National Forest Motorized Vehicle Restrictions Forest Order 01-07 maps (eight maps total), and by routes submitted by the public during the OHV Route Designation Process IDT's public collaboration effort. The OHV Route Designation Process IDT will then develop logical alternatives.
PRR (Teeter)	Include an objective to maintain all existing routes, trails, and roads for public access and use with no unfavorable fuel reduction project impacts caused by road construction or reconstruction.	OHV 10	Public access would be maintained through implementation of this project, with the exception of short term road closure activities due to project implementation. OHV route character is not an objective, purpose, or need of the Empire Project. Please refer to the response for OHV 6.
PRR (Teeter)	Include an objective to keep the OHV public informed and updated on protecting OHV routes in	OHV 11	The public would be notified by publishing a Notice of Intent (NOI) in the Federal Register and through a legal ad in selected distribution newspapers. After distribution of the Proposed Action the public has a 45-day opportunity to comment period in an effort to identify significant

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	treatment areas and new route inventory.		issues and develop alternatives. A Notice of Availability (NOA) would be published in the Federal Register and a legal ad published in selected distribution newspapers. The Plumas National Forest Schedule of Proposed Actions via the world wide web is updated quarterly. Individuals who commented would be notified of the decision through formal correspondence from the Forest Service at the time a decision was issued. Informing and updating the public on OHV route inventory information and route treatment status is not an objective, purpose, or need of the Empire Project.
PRR (Teeter)	Include an objective to maintain and increase OHV recreation opportunities in the Empire Project.	OHV 12	Effects on recreation opportunities is addressed in the 2007 Empire FSEIS, chapter 3, Environmental Consequences Section—Recreation and Mining. Increasing recreation related opportunities is not an objective, purpose, or need of the Empire Project. Please refer to the response for OHV 6.
PRR (Teeter)	Include an objective to maintain a 15 foot buffer on every trail, road, and route to preserve the recreational and visual character.	OHV 13	Treatments proposed in the Empire Project would meet Visual Quality Objectives (VQOs) identified in the PNF Land Management Plan (1988). Maintaining buffers on every trail would reduce the vegetative and fuel treatment effectiveness, the economic viability, and the efficiency of implementation of the Empire Project. Maintaining a buffer for trails, roads, and routes is not an objective, purpose, or need of the Empire Project. Please refer to the response for OHV 6 and OHV 7.
PRR (Teeter)	Include an objective to determine if a vegetative buffer alongside of trails would protect wildlife.	OHV 14	Analyzing a vegetative buffer is not an objective, purpose, or need of the Empire Project. Please refer to the responses for OHV 6 and OHV 7.
PRR (Teeter)	Include an objective to remove all slash or burn piles on any roads within the project area.	OHV 15	Designated burn piles would not be placed on any system roads used for the project, roads that will be reconstructed, or temporary roads that will be constructed and then decommissioned. Most piles would be burned after the first year of thinning treatments. Please refer to the response for OHV 6.
PRR (Teeter)	Include an objective to monitor fuel reduction project activities with project specifications during construction activities to assure compliance with NEPA commitments.	OHV 16	Appendix F - Standard Management Requirements and Monitoring Plan discusses monitoring efforts that will be made for the Empire Project. Timber sale, road construction, and reconstruction activities would be administered by a Forest Service Contract Inspector and/or Timber Sale Administrator, who would ensure that timber sale contract specifications are followed. Contract specifications would be designed to match commitments within the 2007 Empire FSEIS.

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PRR (Teeter)	Include an objective to minimize skidding perpendicular to roads, trails, and routes. Repair roads, trails, and routes where skidding is necessary.	OHV 17	Design elements and standards and guidelines within the Empire Project proposed action, as well as contract specifications of the timber sale contract will provide necessary mitigation for roads and skid trials and their impacts to other forest resources.
PRR (Teeter)	Include an objective to use funds from timber sales to pay for restoration of OHV routes used.	OHV 18	Designating timber sale funds to restore OHV routes is outside of the purpose and need of the Empire Project. The fund use designation process is an internal process that does not require environmental documentation. Current agency standards and guidelines require that roads used for hauling are maintained by the timber sale purchaser commensurate with their use. Post-haul maintenance would be required on all roads used for hauling. At a minimum, road surface repair and drainage control measures would meet Forest Service contract specifications.
SNFPC And SNFPA (Johannson)	The requirements of the Region 5 soil quality standards are not met. This is a violation of NFMA.	S 1	As per the letter of direction from the Regional Forester (dated Feb 5 2007), the R5 Soil Management Handbook, R5 Supplement No 2509.18-95-1 is not a set of mandatory standards or requirements. Their intended use is to aid analysis or evaluation of soils by providing thresholds and indicators. Standards and guidelines in the Plumas Land Resource and Management Plan (LRMP) as amended provide the relevant substantive standards to comply with National Forest Management Act (NFMA).
SNFPC	Levels of large woody debris were not adequately assessed, and do not meet the requirements of the Region 5 soil quality standards.	S 2	As per the letter of direction from the Regional Forester (dated Feb 5 2007), the R5 Soil Management Handbook, R5 Supplement No 2509.18-95-1 is not a set of mandatory standards or requirements. Standards and guidelines for down wood in the Empire Project are based on Forest Plan direction and are discussed in the Soil and Watershed Resources section of Chapter 3 in the FSEIS, in the sections titled “Applicable Soil Quality Standards” (p 3-190), “Affected Environment” (p 3-201 to 3-202), and “Environmental Consequences” (pp 3-213 to 3-214). Discussions of down wood are also found on pages 11-12, 25-26, and 39-40 of the Cumulative Watershed Effects (CWE) and Soils Assessment.
SNFPC And SNFPA (Johannson)	The Forest Service did not analyze what proportion of the activity area has a loss of 10 percent or more of soil porosity, as required by the Region 5 soil quality standards for detrimental compaction.	S 3	As per the letter of direction from the Regional Forester (dated Feb 5 2007), the R5 Soil Management Handbook, R5 Supplement No 2509.18-95-1 is not a set of mandatory standards or requirements. The compaction threshold used in the Empire soil effects analysis is based on the Forest Plan standards and guidelines, as discussed in the Soil and Watershed Resources section of Chapter 3 in the FSEIS, in the sections titled “Applicable Soil Quality Standards” (p 3-190), “Affected Environment” (pp 3-201; 3-203 to 3-204), and “Environmental

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			Consequences" (pp 3-207 to 3-212). Discussions of soil compaction are also found on pages 11, 25, 27-29, 38-39, and 46-51 of the CWE and Soils Assessment.
SNFPC And SNFPA (Johannson)	The Empire Project does not disclose or misrepresents local monitoring data such as HFQLG Soil Monitoring Reports.	S 4	Local monitoring data was used to inform the soils analysis. The 2006 HFQLG monitoring report that summarized all 3 years of post-treatment soil monitoring was used to estimate increases in skid trails and landings. In addition, local monitoring designed specifically to measure the extent of skid trails and landings was also used to estimate increases in skid trails and landings. These data are discussed in the "Environmental Consequences" section of the FSEIS on pages 3-208 to 3-212. These are also discussed in the CWE and Soils Assessment on pages 47-51. These monitoring data show that detrimental compaction following HFQLG treatments increased in some cases and decreased in others. However, only average increases were used to formulate estimates of post-treatment compaction.
SNFPC	The area estimated to be occupied by skid trails and landings is underestimated because landings were not assessed.	S 5	Field surveys did not exclude landings. Transects were designed to include landings located at the start, end, or along any point of a transect. Soil field methods are described on pages 3-195 to 3-196 of the FSEIS, under the heading "Soil Assessment." Soil field methods are also described on pages 17-18 of the CWE and Soils Assessment.
SNFPC And SNFPA (Johannson)	The area estimated to be occupied by skid trails and landings is underestimated because it does not consider the impact solely on the acres harvested.	S 6	The Forest Plan standards and guidelines for compaction limit the extent of skid trails and landings within timber stands. For the Empire Project, the extent of skid trails and landings were determined within planning areas. Planning areas are aggregations of California Wildlife Habitat Relationships (CWHR) type stands, and represent areas of relatively uniform forest structure. Group selection and thinning are proposed in planning areas, but not on every acre. In each planning area, the increase in skid trails and landings was estimated based on the number of acres to be treated within that planning area. However, the cumulative total area occupied by skid trails and landings was based on the entire planning area, and included legacy skid trails that currently exist within the planning area. When implementing the group selection regeneration method, the typical management unit or stand in which growth is regulated consists of an aggregation of groups, not individual groups. By following this management strategy, more groups would be proposed in the planning areas in the future. At that time, the total skid trail and landing density within the planning area would again be evaluated to assure compliance with Forest Plan standards and guidelines. This is not "dilution" of the effects, but a cumulative assessment of project impacts across each planning area.

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SNFPC	Following treatment, units 6G, 7G, and 9G will not comply with the Forest Plan standards. This is a violation.	S 7	As part of the project design, units that are predicted to exceed 15 percent would be reevaluated after treatment. Under the direction of the district soil scientist, subsoiling would be prescribed to ameliorate detrimental compaction and place the units in an improved condition that does not exceed the compaction threshold. This is stated in the "Environmental Consequences" section of the FSEIS (p. 3-208) and page 47 of the CWE and Soils Assessment.
SNFPC	Effectiveness of mitigation measures is unclear. Many skid trails will remain intact following treatment.	S 8	Subsoiling effectiveness is discussed on pages 3-210 and 3-211 of the FSEIS in the subsection titled "compaction remediation with subsoiling." Effectiveness of subsoiling varies with equipment used, soil type, amount of rockiness, and soil moisture; and is expected to range between 60-80 percent. Landings, skid trail approaches to landings, and new temporary road would be subsoiled following harvest activities to reduce the impacts of compaction. This will leave the remainder of the skid trail network intact and subject to a slower recovery rate. However, all units that are predicted to exceed the 15 percent threshold would be reevaluated after treatment. Under the direction of the district soil scientist, subsoiling would be prescribed to ameliorate detrimental compaction and place the units in an improved condition that does not exceed the compaction threshold. This is stated in the "Environmental Consequences" section of the FSEIS (p. 3-208) and page 47 of the CWE and Soils Assessment.
SNFPC (Johannson)	Site specific assessment of individual group selection locations did not occur and is a fatal flaw.	S 9	When implementing the group selection regeneration method, the typical management unit or stand in which growth is regulated consists of an aggregation of groups, not individual groups. As such, individual groups are not the most appropriate scale at which to address impacts to forest stand productivity. The 2006 HFQLG Soil Monitoring Report states that group selection locations "are not stand level units due to their small size" and "it may not be appropriate to consider Group Selection units as 'activity areas' in the context of meeting the FLRMP [Forest Land and Resource Management Plan] standards and guidelines."
SNFPC (Johannson)	Soil type and characteristics can change across the large treatment units proposed in the Empire Project. These changes should be verified in the field.	S 10	As described in the soil "Field Methods" section of the FSEIS (page 3-195), soil type changes within treatment units were incorporated into the field sampling protocol. Units were stratified by soil type and separate transects were measured in separate soil types. Parent materials and soil surface characteristics were evaluated in the field to confirm that the area was accurately mapped.
SNFPC	The Forest Service should provide a	S 11	Delineations of the fuel treatment units and planning areas have not changed from the original

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(Johannson)	set of maps showing the evolution of the proposed treatment units and planning areas in 2004 and 2007.		2004 delineations. Based on additional analysis of air quality impacts and further field reconnaissance, six fuel treatment units identified for prescribed burning in the proposed action (units 2, 9, 10, 15, 20, and 21) would be modified under alternative D. These units are too steep and rocky to implement prescribed burns safely, or would create substantial smoke impacts to Quincy. Portions of these treatment units would be masticated, hand thinned, or not treated. Other treatment changes in Alternative D include changes to Sporax treatments and RHCA prescriptions. All changes are described in Chapter 2 of the FSEIS under the heading "Alternative D" (p. 2-11).
SNFPC (Johannson)	The CWESA states that group selection harvests will impact up to 15 percent of a planning area (p. 17). The CWESA states that group selections will affect about 25 percent of planning areas (p 25). Which is it?	S 12	The commenter correctly read page 17 of the CWE and Soils Assessment (CWESA). Page 25 of the CWESA indicates that *treatments* in planning areas would occur on about 25 percent of the acres in planning areas. These treatments include both group selection and individual tree selection.
SNFPC (Johannson)	The HFQLG monitoring of "footprint" data was misused. The Forest Service assumed that some landings and nonsystem roads were mapped that were not used for the HFQLG harvest entry. This is not true.	S 13	The HFQLG Soils Monitoring/Soil Disturbance Report indicates that the monitoring was conducted "to document the location and area extent of skid trails, landings, and nonsystem roads contained with the boundary of harvest units." It further states that "Only skid trials used for this entry were measured." As there was no similar statement that only landings and nonsystem roads used for the HFQLG entry were measured, it was assumed that all landings and nonsystem roads existing in the unit were measured. As there was no indication that other landings or nonsystem roads existed in the units, this assumption was incorporated in the analysis.
SNFPC (Johannson)	The wet weather standards lack adequate description.	S 14	The wet weather standards were modified to clarify the depth of soil to consider for allowing equipment operations. They are found in Appendix F of the FSEIS.
SNFPC (Johannson)	Soil monitoring is only proposed on the units estimated to exceed the compaction threshold. This is not acceptable.	S 15	Professional judgment was used to select the units for post-treatment evaluation. These were the units most likely to exceed the Empire compaction threshold, and therefore the units most likely to require compaction remediation. Selection of these units was based on 3 different methods of estimating the extent of landings and skid trails following the harvest activities, as described on pages 3-208 to 3-212 of the FSEIS.
Stewart	The continual promotion that the standards & guidelines in the 2004	W 1	Canopy cover is one attribute of suitable habitat. Foraging habitat as defined in the BA/BE and used for this analysis was taken from the definition and description from SNFPA EIS. Foraging

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	ROD for the SNFPA are the cause for turning suitable owl nesting and foraging habitat into "unsuitable" habitat is wrong and needs to be corrected in the ROD. Prescriptions in alternatives A, C and D thinning foraging habitat to a 30-45 percent crown closure needs to be corrected because canopy cover of 40 percent and greater is suitable foraging habitat. This sentiment is based on the 70 Federal Register that describes foraging habitat as stands of trees 12" dbh or greater, with canopy cover of 40 percent or greater. So 40 percent canopy cover should be the lower thinning target to maintain foraging habitat.		habitat is described as having at least two canopy layers, dominant and codominant trees in the canopy averaging at least 11 inches in dbh, at least 40 percent canopy closure, and higher than average levels of snags and downed woody material (15-30 square foot basal area in snags, 10-15 tons/acre downed woody debris) (Verner et al. 1992). Although canopy covers down to 40 percent are considered suitable for foraging, they appear to be only marginally so (based on owl occurrence and productivity threshold at around 50 percent canopy cover SNFPA 2001). Fuel treatments are designed to reduce the fuel ladders, and this is accomplished by eliminating the lower tree layer and modifying the mid- and upper layer by removing trees that create open spacing between residual crowns. Alternatives A, C, and D remove the lower vegetation canopy layer and modify both the mid and upper canopy layers to achieve 30-45 percent canopy cover. This action can create less diverse, monotypic, evenly spaced structure, removing thickets that provide hiding/roosting habitat for both fledgling and adult owls, creating a warmer site with increase light and heat penetration which reduces cool microclimates owls seem to prefer, and modifying structural diversity with removal of trees across all size classes up to 30." Removal of up to 30" structures usually results in a decrease in potential future snags/down woody materials, and deformities within structures that could benefit owls and owl prey. With these alternatives, as well as with alternative E, suitable habitat is removed. The removal/opening up of the understory with biomass removal, along with removal of sawlogs from the dominant or co-dominant layer proposed with ITS, also results in reduction in structure of the stand in addition to removal of canopy cover. Suitable foraging habitat is found in the same forest types listed for nesting habitat (CWHR 6, 5D, 5M) as well as 4D (trees 11" to 24" dbh with dense canopy (60 to 100 percent), and 4M (trees 11" to 24" dbh and moderate canopy between 40 and 59 percent). In its most recent notice concerning the California spotted owl, the Fish & Wildlife Service states that owl foraging habitat "is generally described as stands of trees 30 cm (12 in) in diameter or greater, with canopy cover of 40 percent or greater" (70 Federal Register, 35610, June 21, 2005), with no other habitat parameters for foraging habitat described. Thus there appears to be an element of uncertainty associated with what constitutes foraging habitat.
JMP	The project will harm some MIS and SAR species for which annual population monitoring is required by Appendix E from the 2001 SNFPA, but for which no such monitoring	W 2	As per "MIS Analysis and Documentation in Project Level NEPA" dated May 23, 2006 (PSW Region 5), when a governing Forest LRMP "requires population monitoring or population surveys, the MIS effects analysis for the project must be informed by population monitoring data. When the governing LRMP does not require population monitoring or surveys, the MIS effects analysis for the project may be informed by habitat monitoring and/or analysis". There

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	has been conducted.		is no such requirement to analyze effects of SAR species that are not MIS. Forest level population monitoring data has been presented in the November 2006 Plumas NF MIS Report, which was incorporated by reference and served as the main source for Forest level population information for the Management Indicator Species Report developed for the Empire Project. For the Empire MIS analysis, habitat and population information for each Plumas MIS was gathered from several sources. Population status is the current condition of the MIS related to the type of population monitoring data (population measure) required in the LRMP for that MIS. Population trend is the direction of change in that population measure over time. As discussed in Appendix E of the 2001 SNFPA (USDA 2001), there is a wide range of monitoring data that can be used to describe the status and trend (or change) of populations, ranging from describing changes in distribution based on presence-absence data to describing changes in population structure. A distribution population monitoring approach is identified for most MIS listed in Appendix E (Tables E-9 to E-11). Distribution population monitoring consists of collecting presence data for the MIS across a number of sample locations; over time, changes in the distribution of the MIS can then be identified and tracked. Presence data is collected using a number of direct and indirect methods, such as surveys (population surveys), bird point counts, tracking number of hunter kills, counts of species sign (such as deer pellets), and so forth. Presence population data for MIS are collected and consolidated by the Plumas NF in cooperation with State and Federal agency partners (including the California Department of Fish and Game, USFS PSW Research, U.S. Geological Survey, and USDI Fish and Wildlife Service) or conservation partners (including Partners in Flight and various avian joint ventures). The Plumas NF's MIS monitoring program for species typically hunted, fished, or trapped was designed to be implemented in cooperation with California Department of Fish and Game (CDFG), consistent with direction in the 1982 Planning Rule to monitor forest-level MIS population trends in cooperation with State fish and wildlife agencies to the extent practicable (36 CFR 219.19(a)(6)). To be biologically meaningful for wide-ranging MIS, presence data are collected and tracked not only at the forest scale, but also at larger scales, such as range-wide, state, province (Sierra Nevada), or important species management unit (for example,

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			Deer Assessment Unit or waterfowl migratory routes). Population data at various scales are important to both assess and provide meaningful context for population status and trend at the forest scale. Monitoring requirements, and how these requirements are being met, for each PNF MIS analyzed for the Empire Project, is discussed in the Empire MIS Report (pages 7-11). For several MIS, such as California spotted owl and American marten, Appendix E of the 2001 SNFPA FEIS and Chapter 2 of the 2004 SNFPA FSEIS identify other population monitoring requirements. For these species, population data are collected and compiled at the bioregional (Sierra Nevada) scale, not the forest scale (SNFPA 2001). Species listed by the commenter (Olive-sided flycatcher, Swainson's Thrush, black bear, pileated woodpecker and red-breasted sapsucker) are not MIS for the Plumas NF. Nevertheless habitat suitability has been described, and potential changes to habitat suitability has been discussed for the olive-sided flycatcher, Swainson's thrush and pileated woodpecker in the Empire Project Supplemental wildlife Report and the FSEIS.
SNFPC (Britting)	Disagreement regarding the analysis of potential habitat changes in spotted Owl PAC PL133, referencing an analysis Britting conducted September 2006.	W 3	The center point used by the USFS is based on the latest, best owl location within both the Plumas NF database and DFG BIOS database for California spotted owl. This best location is based on a non-nesting pair found in 1990 in the northern half of Section 23. This detection location, found in the USFS records, was used to identify the center point of the nest core, which was essentially in the center of the PAC. Based on this center point, the analysis disclosed in the BA/BE (Table 22) indicates that there would be no harvest in the nest core of PL133 and there would be no change in the amount of suitable habitat. Britting used a different center point location than that used for the Empire BA/BE analysis; her center point is based on a non-nesting pair in 1989 located in Section 23, SW1/4 SE1/16th. Thus this center point pushes the 500 acre nest core circle further south compared to what the USFS analyzed. Thus acres analyzed between the two nest core circles are not comparable. The center points in both analyses are based on pair location, not nest sites. The figures in Table 22 in the BABE that document nest core habitat are based on the USFS activity centers, not on the center point used by Britting.
SNFPC Britting	The nest core areas of PL331, 352, and G1 may be affected.	W 4	The effects of Alternatives on these three PACs, HRCAs, and associated 500 acre nest cores are displayed in Tables 19-22 in the BA/BE. Table 22 indicates that with implementation of

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			Alternatives D & E, PL331 will have ½ acre within the nest core treated, PL352 will have 11.5 acres treated and G1 will have no acres of treatment in the 500 acre nest core. This same table is in the FSEIS (Table 3.28).
SNFPC Britting	Nest Core habitat for PL334 is not evaluated. The nest cores for PL038 and PL275, located on private land, were not evaluated.	W 5	All known designated spotted owl PACs with delineated PAC boundaries were evaluated in the BA/BE. The Nest core analysis was conducted on all PACs where the 500 acre nest core intercepted, or appeared to be very close, to proposed treatment units under alternative D. This analysis is at pages 93-95 of the BA/BE and pages 3-131 to 3-133 in EIS. As for the PACs identified by Britting in her comment: 1) PL334 is not a designated PAC on the Plumas NF. No PAC boundary or HRCA was ever delineated, nor was a Department of Fish & Game (DFG) PAC number ever requested by the Plumas. DFG established a number for this site based on a 1997 observation. There are no plans to designate a 300 acre PAC in this area. No owls have been detected in surveys conducted by the Plumas/Lassen Administrative Study (PLAS) owl crew in 2003, 2004, and 2005. The PLAS owl crew states, based on what they have been finding with banded and telemetry birds, that the area is well within the foraging distance of the pair in the established PAC PL139, and that the observation that led to the establishment of the DFG number is well within the home range of PL139. PL139 was included in the analysis of effects for the Empire Project. The Plumas and PLAS has recommended that DFG treat data point PL334 as an observation associated with PL139. Since no PAC PL334 has been established or nest site found, no 500 acre nest core analysis needed to be conducted. 2) The private land PAC PL275 has not been recognized as a PAC by the Plumas. Instead PAC PL331 was established and delineated on National Forest adjacent to the private land where the one data point that established PL275 exists. Observation data for this area indicate that 3 of the 4 detections within the Greenhorn Creek watershed are within PAC PL331. Additional analysis of both the DFG and Plumas database indicate that PL331 and DFG PL275 are in fact the same PAC. PL331was included in the analysis of effects for the Empire Project. The Plumas will change the PAC designation from PL331 to PL275 to conform to the DFG database. 3) PL038 did not have a designated PAC boundary associated with it in the PNF GIS coverage. This PAC number now has a delineated PAC and HRCA boundary (attachment 12 of the Empire BA/BE). Treatment units planned within PL038 PAC/HRCA have been removed

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			from the project by the FSEIS ROD.
SNFPC	Not enough analysis regarding impacts to spotted owl habitat at each relevant scale: the core area around the nest, the home range core, the home range area and a larger landscape area.	W 6	The wildlife analysis area for the Empire Project was developed to include owl PACs/SOHAs/HRCAs that would incur direct impacts as a result of changes to habitat due to project effects, as well as additional PACs/SOHAs/HRCAs that would not be directly impacted by project activities and habitat modifications. This resulted in a 94, 502 acre analysis area which include private land holdings, 76, 121 acres composed of National Forest. There are a total of 23 PACs/SOHAs/HRCAs designated in this analysis area (see response W5, as PL038 establishment brings it up to 24). Changes to suitable owl habitat across this analysis area have been disclosed in the BA/BE and the FSEIS (for instance Table 3.18, pages 3-127 to 3-129, 3-134 to 3-150). Impacts to habitat within individual home range core areas was analyzed and documented in the Project BA/BE and FSEIS (3-129 to 3-131). This analysis included changes to habitat as a result of fuel treatments, group selection and ITS in terms of acres treated and acres of suitable habitat changed to unsuitable habitat within HRCAs. In addition the 500 acre area around a nest site or activity center (NEST CORE) has been analyzed in the BA/BE and FSEIS (3-131 to 3-133). Also see responses W2-W5.
SNFPC	The risk to owls from the proposed project is not correctly analyzed, and does not acknowledge the continued uncertainty regarding the owl's status, particularly in the northern Sierra.	W 7	The analysis of effects and subsequent risk to spotted owl in the Empire Project area on the Plumas National Forest used the information provided in the 2006 Meta analysis and the 12-month finding by the USFWS. The Draft 2006 Meta analysis "Demography of the California Spotted Owl in the Sierra Nevada: Report to the US Fish and Wildlife Service on the January 2006 Meta-Analysis" has been reviewed by the Empire IDT. The 2006 meta-analysis was similar to the 2001 meta-analysis (Franklin et al. 2004) but included 5 years of additional data (2001-2005), excluded the San Bernardino study, and included a population viability analysis. This 2006 meta-analysis indicates that 1) demographic studies show lambda (rate of population change) was either relatively stationary for the Lassen and Sierra studies (lambda below 1), or increasing on the El Dorado and Sequoia-Kings Canyon Studies (lambda above one); 2) only the Lassen population decreased significantly based on the 95 percent confidence interval with steady decreases from 1995-1998, and 2002-2004, suggesting the Lassen owl population may be declining; 3) the population viability analysis (PVA) indicated two of the four study areas (Lassen and Sierra) are likely to experience population declines within 7 years and very unlikely to experience population increases under current population

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			trends, but there was great uncertainty in the PVA analyses for time intervals of >10 years; 4) positive trend in adult survival in all studies and estimates of apparent survival increased with time; and 5) spotted owl management needs to maintain a high survival rate of territorial owls in order to maintain spotted owl populations, but that management directed at increasing reproductive output and subsequent recruitment may be the most successful way to maintain or increase spotted owl populations in the Sierra Nevada, as long as these actions do not decrease adult survival. Population growth rate (lambda) can be viewed as the sum of apparent survival probability and the per capita recruitment rate. The study indicates high adult survival and that the majority of immigrating owls onto the study areas considered in the meta-analysis "were likely natal dispersers rather than breeding dispersers". The 2006 meta-analysis concludes that the potential consequences of the Forest Service management plan to spotted owls are unknown because: (1) the extent of vegetation manipulations is largely under the control of local managers and will likely vary across the Sierra Nevada; and (2) threshold levels of quality habitat necessary to maintain individual pairs of spotted owls on a site are largely unknown. The recommendations from the meta-analysis are to develop well designed experimental studies coupled with the spotted owl demographic studies. The PLAS administrative study is mentioned as quasi-experimental limiting the scope of the results of the studies. In its 12-month finding on a petition to list the California spotted owl under the Endangered Species Act, the USFWS considered the new meta-analysis (Blakesley, et al 2006). The USFWS found that populations in the Sierra's showed little evidence of a decline, and concluded that the owl status in the Sierra Nevada is not deteriorating as is evidenced by the increasing adult survival and stationary trend of the populations (Federal Register, May 24, 2006, Volume 71, Number 100).
SNFPC	Asserts that the Empire Project "overall poor habitat conditions in the project area" and its relationship to owl occupancy has not been assessed.	W 8	Definitions of suitable habitat are derived from the California spotted owl (CASPO) Report (Verner et al. 1992) and updated with California Wildlife Habitat Relationship (CWHR) definitions from the 2001 SNFPA FEIS and the 2004 SNFPA FSEIS and ROD, and 70 Federal Register. CWHR 4M, 4D, 5M, and 5D are considered suitable habitat, with suitable nesting defined further as 5M, 5D, and 6. The definitions of nesting and foraging habitat used in the Empire analysis are consistent with the 2004 SNFPA FSEIS and ROD, which analyzed full implementation of the HFQLG Pilot Project. Although owls may nest in other CWHR types (based on habitat availability), the clear preference is for the larger, dense CWHR types. The

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			amounts of suitable habitat, both pre and post project implementation are discussed in the BA/BE and FSEIS. Impacts of alternatives have discussed potential occupancy of PACs, 500 acre nest cores and HRCAs across the 94, 502 acre analysis area. See response W11 regarding “lower quality habitat”.
SNFPC	No analysis on future habitat reduction related to fragmenting owl habitat and isolating owl pairs.	W 9	The degree of fragmentation depends on 1) the degree of habitat dissimilarity between suitable habitat for a species and that created (high contrast versus low contrast), 2) size of the existing suitable habitat as well as the newly created habitat, and 3) the permanency of the dissimilar habitat created. Thus low contrast fragmentation is used to reflect conditions that do not show a high degree of dissimilarity between habitats and are not permanent changes in habitat. The key to decreasing impacts of fragmentation of owl habitat within DFPZs is to maintain forest cover composed of the largest, fire resistant conifer species, while also providing structural attributes needed for prey species (snag/large logs). Removal of some trees up to 29.9” dbh would occur, with the overall objective of leaving enough dominant and co-dominant trees to provide from 30- 45 percent canopy cover. This tree retention opens up the treated stand but does not isolate stands from surrounding forest or create habitat islands isolated by non-forest, thus increasing the likelihood for successful dispersal of wildlife. All action alternatives are designed to retain these attributes within DFPZs and ITS treated areas. Group selection openings up to 2 acres tends to mimic natural regeneration patterns and other harvests (intermediate harvests), while variable in appearance, tend to leave sufficient forest vegetation that a perception of continuous forest cover is maintained (CASPO IG EA, page IV- 62, 1993). The BA/BE and EIS acknowledge that the density of groups within planning areas proposed for the action alternatives pose an uncertain risk to species that prefer forest interior habitat over edge habitat. This risk has been analyzed and discussed in the EIS. Alternatives A, C, and D are designed to maintain 30- 45 percent canopy cover. Trees over 29.9” dbh will not be removed. Alternatives E and F are designed to maintain 50 percent canopy cover; trees over 20” dbh will not be removed. All alternatives would maintain forest cover, thus not breaking stands up into isolated islands. Alternatives A, C and D increase the amount of open forest cover, while alternatives E and F provide denser forest cover, but still open the canopies from existing condition. This opening of the canopy will not create isolated islands of forest cover and is referred to in the analysis as low contrast fragmentation. High contrast fragmentation refers to actions that isolate habitat patches of forest cover by creating

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			large openings and discontinuous habitat, often the result of stand altering wildfires. All alternatives are designed to prevent large scale fragmentation that could result from wildfire. Interior forest (habitat) is a conservation biology concept applicable to the idea of fragmentation and increased edge effect (references provided in FSEIS). This habitat measure was used to create additional alternatives and provide the decision maker a comparison of alternatives for modifying stands at various group densities, providing a mechanism to consider the risk of potentially leaving habitat less functional to those species associated with blocks of homogenous habitat. Four of the five action alternatives implement group selection: Alternative C creates more edge than Alternative A, which creates more edge than alternatives D and E.
SNFPC	Blakesley (2001): habitat that supports adult survival, not reproduction, is the critical factor to address. This comes with ”increased retention and recruitment of large trees and retention of closed-canopy conditions throughout the Sierra Nevada landscape”.	W 10	Approximately 60 percent of the National Forest land within the wildlife analysis area is composed of CWHR types considered suitable owl habitat. Post project (alternative D) approximately 54 percent of the Wildlife analysis area would be composed of these same CWHR types, where post project implementation would be in a more fire resilient condition than currently exists, thus better at increasing retention and recruitment of large trees over the entire area.
SNFPC	Reliance on lower quality habitat (4M-22,186 acres, and 4D-11,577 acres, pg 83) in the Empire Project (which encompasses 2/3 of the total owl habitat) has the greatest potential to threaten long-term persistence on owls in the project area and in the QLG Pilot area in general.	W 11	The definition of owl habitat has been displayed in the BA/BE (see response W1 and W8). As the BA/BE indicates, these definitions were taken from the CASPO Technical Report, SNFPA EIS (2001) and the 70 Federal Register of June 21, 2005. It is acknowledged that the majority of owl habitat in the analysis area is composed of 4M and 4D. It is also acknowledged (BA/BE) that research indicates that owls nest and roost in this type of habitat (14 percent found in 4D and 11 percent in 4M, whereas 9 percent occur in 5D and 18 percent in 5M, (SNFPA 2001). In a presentation by Keane with updated owl information gathered from the PLAS, approximately 17 percent of nest sites in the PLAS area were located in 4M. This was further defined as 15 of 18 nests found in 4M with large trees and 3 of 18 found in 4M without large trees. Approximately 21 percent of nest sites were located in 4D. This was further defined as 13 of 23 found in 4D with large trees and 10 of 23 found in 4D without large trees. Thus in the PLAS, approximately 39 percent of all nest sites were found in 4M/4D. These results are based on overlaying the recent survey results on the VESTRA vegetation maps.

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			As mentioned in the project BA/BE, CWHR habitat typing was derived from VESTRA mapping. Forest Inventory Analysis (FIA) plot data gathered in the Empire Project indicated that the Quadratic Mean Diameter (QMD) for all trees (>1.0") ranged from 7.7" to 12.5", indicating a dominance of small trees in the inventory areas. The relationship between QMD and trees/acre make it difficult to crosswalk between the VESTRA data and the plot data because of different methods for quantifying size classes. VESTRA utilizes aerial photo interpretation to estimate crown diameter as a proxy for dbh, which is used to determine CWHR size class, while stand inventory data utilizes QMD to estimate size class. Stand Inventory considers stocking and diameter of smaller, subordinate canopy trees, thus providing a more conservative estimate of CWHR size class. This difference between the current CWHR classification and the stand exam plots represents uncertainty in the accuracy of the amount of each CWHR habitat type in the analysis area, including habitat quality. The FIA plot data was run through the Forest Vegetation Simulator model (FVS), and for the most part, all VESTRA CWHR size classes matched the appropriate size class based on the QMD for all trees >10" dbh. But it is acknowledged that there are some disparities and that the acres of CWHR types used for analysis could be inexact estimates of habitat availability. The VESTRA generated CWHR classification continues to be used as the habitat baseline for wildlife habitat analysis during the life of the HFQLG project as it maintains consistency for monitoring changes in species habitat over the life of the HFQLG Pilot Project. This includes the requirement to not cumulatively reduce old forest dependent species habitat (5M, 5D, & 6) more than 10 percent below 1999 levels (HFQLG FEIS, 1999).
SNFPC	EIS fails to differentiate between amount of high quality and low quality habitat and lumps all levels of suitable habitat together.	W 12	See responses W1 and W8 for owl habitat definitions. Within the FEIS, a discussion of what constitutes nesting and foraging habitat, as defined, is presented on pages 3-107 and 3-108. Table 3.18 shows the amount of pre and post CWHR acres in the wildlife analysis area that make up defined owl habitat. Table 3.22 identifies suitable nesting and foraging habitat acres. The rationale and approach for direct changes in these CWHR types as a result of implementing fuel treatments, ITS and group selections is presented on pages 3-127 to 3-128. The project was evaluated consistently throughout the wildlife analysis; actions either created unsuitable habitat (4M/4D, 5M/5D being reduced to "P" or CWHR 1-2) or actions maintained suitable habitat, with potential changes from D to M. It was acknowledged that there are uncertainties with CWHR classifications. See responses to comments W11.
SNFPC	Information regarding the amount of suitable habitat within the 500 acre	W 13	The 500 acre nest core analysis for alternative D is provided within the BA/BE (pages 93-94) and discussed in the FSEIS on pages 3-131 through 3-133 and Table 3.28. The amount of

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	nest core, or the harvesting that would occur in the nest core is not provided.		suitable habitat within each nest core is displayed pre and post alternative implementation. See response W17.
SNFPC	No hard look at the impacts to owl home range core areas in terms of reductions in dense, higher quality habitat. Cannot ascertain what levels of canopy cover currently and post treatment occur in HRCAs.	W 14	Impacts to habitat within individual home range core areas was analyzed and documented in the Project BA/BE and EIS. This analysis included changes to habitat as a result of fuel treatments, group selection and ITS in terms of acres treated and acres of suitable habitat changed to unsuitable habitat within HRCAs. Analysis of changes in habitat within individual HRCAs and potential impacts to occupancy is discussed in the project BA/BE. HRCAs are discussed within the FSEIS (pages 3-129 to 3-131 and Table 3.27 and within the BA/BE (analysis of effects page 90-93, HRCAs displayed on map (location) at attachments 4, 8a-8c, history and acreage of each PAC/HRCA is attachment 5, acres changes in each HRCA by alternative is displayed in attachment 7a-7e.
SNFPC	Reference is made to Blakesley finding 32 percent of the larger core area – approximately the same size as the home range core area – were in stands with large trees. USFS proposes to eliminate size class 5 habitat and remove 20-30” trees.	W 15	Analysis of owl habitat changed as a result of project implementation was discussed at the 500 ace Nest core, 1000 acre Home Range Core Area, and the larger wildlife analysis area. The analysis on the amount of change in size class 5 habitat is discussed in the BA/BE (Tables 18a & b, Table 21, and attachment 7a-7e). Blakesley’s larger core area is actually 2011 acres (814 ha), about twice the size of a Home Range Core Area used in this analysis and is thus not comparable for analysis. In addition the amount of size class 5 habitat that will be removed, and subsequently retained, is displayed in the FSEIS at Table 3.18. This table indicates that approximately 83-110 percent of the analysis area will support 5M and 88.3 to 100 percent of the analysis area will support 5D post project implementation. Size class 5 is composed of trees greater than 24” dbh, and does not consist of trees 20-23.9” dbh as implied by the comment.
SNFPC	A science based analysis should examine the amount of pre- and post treatment canopy cover ≥ 70 percent in stands with large trees at the 300 acre PAC, 500 acre nest core, 1000 acre HRCA and the larger home range area.	W 16	See response at W6. A pre- and post analysis has been conducted, discussed and displayed for the amount of suitable habitat present within PACs, HRCA,s, 500 acre nest cores and across the 94, 500 acre landscape in both the BA/BE and FSEIS. Suitable habitat was defined as stated in responses W1 and W8.
SNFPC	USFS should provide a map of nest	W 17	Maps have been developed and are available at the Mt. Hough Ranger District, Quincy,

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	core locations for each site evaluated.		California.
SNFPC	Protection of PACs alone is inadequate to ensure owl survival and protecting occupied as well as suitable but unoccupied habitat is important to insure species viability	W 18	See response W6 and W16. The BA/BE and FSEIS discloses that the spotted owl PACs (a minimum 300 acres each) and SOHAs (a minimum 1000 acres each) will not be treated with any of the proposed actions. In addition, the amount of habitat altered at the 500 acre nest core, the 1000 acre Home range core area, and the larger 94,500 acre (76, 121 NF land) landscape (wildlife analysis) area is disclosed. Table 3.18 in FSEIS discloses the amount of habitat present and the percent available in the Analysis Area before and after implementation of the analyzed alternatives.
SNFPC	The claim that the population trend for owl is stable is erroneous because data collected cannot be compared.	W 19	On page 2 of the comment letter, SNFPC asserts that the PNF incorrectly assumes that the spotted owl population on the PNF appears to have an upward trend, then on page 8 acknowledges that the BA/BE and MIS report states that population trend for the spotted owl on the PNF is stable. Occupancy rates of spotted owl sites on the Forest appear to have remained stable; inferring that this is reflective of the owl population on the forest could be in error. But it appears that by comparing data on occupancy rates for owls in 1991 and occupancy rates in 2004/2005, that the percentage of owl pairs in occupied sites is similar over these 14 years (PNF MIS Report). Thus this comparison was used in deciding on the site specific status and trend of owls on the PNF.
SNFPC	Based on the 2006 PLAS Report, the crude density “observed in 2006 may suggest a decline in CSO numbers or could reflect lower detection rates for individual owls during a second consecutive year of low reproduction and high Spring population”. These numbers indicate a decline in owl numbers thus ”no way” indicate that population numbers are stable.	W 20	This comment is part of the comment addressed at W19. There is no doubt that owl numbers, including the number of reproductive pairs, fluctuates from year to year and that there are individual years where owl numbers are up, including the number of pair nesting and the number of young produced, and other years where owl numbers and reproductive effort are down. This has been demonstrated at least a couple times, with 1992 and 2002 being “boom” years for owl reproduction. It is inferred that during those boom years, detection rates were high, number of young produced was high, and overall would have indicated not a decline but an increase in owl numbers. The statement by the PNF that occupancy rates appear stable is based on a comparison of occupancy rates collected at different points in time over a 14 year period. Wildlife populations all fluctuate, slightly or greatly, about a constantly changing carrying capacity, which can be abruptly lowered by severe weather, as being the case experienced during the 2006 PLAS. This can cause owls to either forego nesting or abandon nest attempts and disperse in order to find prey species that also fluctuate with changing conditions.

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SNFPC	Stand density prescriptions are likely to eliminate small pockets of large trees and old forest.	W 21	Prescriptions are designed to reduce stand density and fuels "from below" through thinning. No trees over 30 inch dbh would be removed in DFPZ, group Selection or ITS. Canopy covers would be retained between 35-45 percent in DFPZ and 40 percent+ in ITS. The amount of suitable owl habitat retained across the wildlife analysis area is disclosed (Table 3.18 in FSEIS). Effects of alternatives on CWHR types that make up suitable habitat (4M, 4D, 5M, 5D) is described in BA/BE pages 58-66 and 89-90. Total amount of acres treated in each type by alternative is disclosed in 18a and 18b. The residual basal area and number of 30" trees/acre retained is disclosed on pages 89-90. All actions are staying out of PACs, SOHAs, LSOGs. Clearly far less suitable habitat, including large trees and old forest, is being treated across the wildlife analysis area than what is not being treated.
SNFPC	USFS fails to analyze adequately impacts to spotted owl prey species such as flying squirrels.	W 22	The BA/BE acknowledges uncertainty as to the response of these species to group selection/ fuels treatments but anticipates some insightful information forthcoming from the Plumas Lassen Administrative Study over the next few years. The BA/BE discloses impacts to owl prey species at pages 97-98 and refers to habitat modeling and analysis for spotted owl prey species, including the woodrat and flying squirrel, conducted in the SNFPA, in terms of trends in these species habitat over time as a result of fuel treatments and full implementation of HFQLG. Prey species habitat impacts are in the FSEIS pages 3-133 to 3-134. Impacts to habitat attributes such as snags and down woody material is discussed in the FSEIS pages 3-184 to 3-186.
SNFPC	The gap in marten distribution is not analyzed with the hard look because it assumes, without information, that further reductions in habitat will not limit marten survival in the PNF. No discussion on spatial arrangement of older, high quality forest is provided. No long term measures necessary to avoid long term fragmentation of marten populations are determined.	W 23	The analysis of effects on marten and marten habitat is described in the BA/BE, the MIS Report, and documented in the FSEIS (3-159 to 3-166) and impacts to forest interior species/habitat is at 3-167 to 3-170. Maps showing habitat continuity are provided as attachments 10 and 11 of the BA/BE. The known information, including disclosure that numerous surveys have been conducted with limited detections of marten across the forest, is disclosed. Forest interior habitat is basically non-fragmented, contiguous large blocks of habitat dominated by coniferous forest that offer relatively darker, cooler and usually more humid conditions than open, fragmented forest. Forest Interior Species are defined as species that require large patches of a relatively homogenous habitat type that may be negatively affected by management practices that fragment larger patches of habitat into smaller patches with numerous edges (Harris, 1984; Scalet, et al. 1996). Sensitive species considered forest interior species include spotted owl, fisher (Hunter 1990), goshawk, and marten (Luman & Neitro, 1979).

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			As explained in the BA/BE the SNFPA standards & guidelines do not address carnivore networks, allowing each Forest to decide on the management need for carnivore management. The PNF carnivore network is not incorporated into its LRMP as a land allocation with standards & guidelines; it is a plan to project analysis tool designed to maintain future options. The network is a tool to evaluate impacts of specific projects on habitat connectivity. Disposition of the forest carnivore network will occur at the LRMP revision. Discussion of impacts to this carnivore network are in the BA/BE (122-128). Large scale habitat fragmentation of mature forest has been identified as a concern for overall forest carnivore (marten) management (FSEIS 3-112 to 3-117). The analysis on marten habitat and the carnivore network for the Empire Project concludes that "Marten habitat could be better protected from stand replacement fires (from the existing condition) for the next 10-20 years with implementation of the proposed action. The project-level habitat impacts will contribute to the current forest-wide trends for short term habitat reductions for longer term protection of old forest habitat. Based on known detections of marten on the PNF, no changes in marten occupancy or distribution on the PNF would occur". Fuel reduction, as planned in the Empire Project, is a strategy to reduce loss of forested habitat by stand replacement fire, which is a strategy to avoid long term fragmentation of marten habitat.
SNFPC	Effects on marten habitat from DFPZ thinning, snag and down woody material are not discussed.	W 24	A discussion of the impacts of implementing DFPZs, ITS, group selection, and biomass removal has on CWHR types considered suitable habitat for marten are discussed in the BA/BE (pages 58-66) and specifically on marten habitat in direct/indirect section on pages 120-124. This is also discussed in the FSEIS. Impacts to snags and down woody material are addressed in the FSEIS (pages 3-184 to 3-186).
SNFPC	DSEIS does not address monitoring required for MIS and SAR as originally adopted or amended by Appendix E.	W 25	See response to W2. Table 2 submitted by SNFPC (page 15) showing species that may be affected by the Empire Project and listed in Appendix E as requiring population monitoring, and that were not discussed in the analysis, contains the peregrine falcon and Townsends (pacific western) big-eared bat; both were discussed in the BA/BE and the peregrine was further discussed in the MIS Report for the Empire Project. This is because the Townsend Bat is a TES species and the peregrine is a sensitive species and a PNF MIS Species. The rest of the species in this table are neither MIS or TES.
SNFPC	Not an adequate discussion of the cumulative impacts that are likely to affect owl or forest carnivore habitat.	W 26	The cumulative effects of fully implementing HFQLG pilot project were modeled, analyzed, and displayed in the 2004 SNFPA FSEIS. This documented cumulative effects to habitat across the entire Sierra Nevada range, including the HFQLG pilot project area. This analysis

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			formed the basis for the determination on owl and marten viability across the entire Sierra Nevada range. The Empire Project site specific cumulative effects were based on a 94,502 acre analysis area, of which 76,121 acres are composed of National Forest. This analysis area is defined as the project treatment areas plus an additional larger land base determined by potential direct, indirect and cumulative effects on spotted owl Protected Activity Centers and associated Home Range Core Area distribution. Cumulative effects are analyzed, based on this defined analysis area, in the Project BA/BE and DSEIS. Quantification of acre change as a result of project actions was based on 76,121 National Forest acres. Activities occurring on private land within the cumulative effects analysis area were considered for both indirect and cumulative effects. The analysis area is composed of 94,502 acres (NF and Private). All quantification of acre changes as a result of the Empire Project was based on 76,121 National Forest acres. Within the Wildlife and Fisheries section of the EIS, the tables are clear that acres presented are based on 76,121 acres of National Forest land. Past, present, and future actions were described to present what has been occurring on both National Forest and Private land. General cumulative effects are discussed in the BA/BE on pages 66-74 to provide an aggregate framework from which the existing condition baseline has been established. Cumulative effects to spotted owl were discussed on pages 99-105. Past projects that impacted owl habitat were discussed and acres of change quantified at different scales, including projects within the analysis area and projects within the Mt. Hough RD. At the larger HFQLG Pilot Project scale, cumulative changes in owl habitat and old forest were displayed/discussed on pages 135-136. These same items were discussed in the FSEIS (pages 3-134 to 3-143). The cumulative effects on marten were based on the wildlife analysis area used for the other TES species. No known locations of marten exist in the analysis area. So for the Empire Project, the spotted owl is used as a surrogate for bounding marten effects due to known owl locations across the landscape and the fact that similar habitats are used by these species (4M, 4D, 5M, 5D) (FSEIS 3-100). Cumulative effects to marten were discussed in the BA/BE on pages 124-126. Past projects that impacted 4M, 4D, 5M, 5D habitat were discussed; acres of change were quantified at different scales, including projects within the analysis area and projects within the Mt. Hough RD. At the larger HFQLG Pilot Project scale, cumulative

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			changes in old forest habitat were displayed/discussed on pages 135-136. These same items were discussed in the FSEIS (3-134 to 3-138, 3-160 to 3-164). Cumulative effects on the carnivore network are displayed in Table 29 in the BA/BE and indicates <1 percent of the network has been treated for that portion of the network occurring on the Mt. Hough RD.
SNFPC	Projects listed in Table 2, page 19 of comment letter "in the meadow valley region" have not been included in the cumulative effects analysis for Empire.	W 27	The projects listed in the second "Table 2" (page 19 of comment letter) are not within the area designated as the Wildlife analysis area used to assess cumulative effects of the Empire Project, thus they were not addressed. The exception is of course the Empire Project itself, as well as a small portion of the Meadow Valley DFPZ/GS project. This has been addressed in the BA/BE (page 15). The cumulative impact on the amount of 5M, 5D and 6 habitat across the HFQLG area is discussed in the BA/BE (page 135) and in the FSEIS (page 3-141, and Table 3.29).
SNFPC	Projects listed in Table 2, page 19 of the comment letter are located directly between Areas of Concern identified by CASPO and the potential cumulative effect is not considered in the FEIS.	W 28	The CASPO Technical Report (Verner et al 1992) identified Areas of Concern (AOC) within the range and distribution of the California spotted owl. These AOCs are identified simply to indicate potential areas where future problems may limit owl populations and where future problems may be greatest if the owl's status were to deteriorate. Two AOCs identified in the CASPO Report are adjacent to the Plumas National Forest (page 46-49 of CASPO Report). The Empire Project is not located within these AOCs; AOC 1 is approximately 20 miles to the north and AOC 2 is approximately 10 miles to the northwest. The factors identified for the 2 AOCs above are not applicable to the Empire Project area. Thus AOCs are discussed in BA/BE and EIS to dismiss them as a potential concern. The BA/BE and FEIS make it clear that the Empire Project is not located in any AOC, nor does the Empire Project have the characteristics described for why an area has been designated an AOC. As far as the projects listed in Table 2, page 19 of the comment letter, none of those projects are located in either AOC.
SNFPC	At the landscape scale, suitable owl habitat must be distributed across the Sierra Nevada, in sufficient amounts to facilitate natal and breeding dispersal among territories and maintain spotted owls well	W 29	See responses to comments W6, W10, W16, W18, W21, and W26. These responses indicate that analysis of owl habitat across the wildlife analysis area has been conducted and what the extent of habitat alteration would be at four different scales (PAC/SOHA, 500 acre nest core, HRCA, and landscape in the Analysis area). The total amount of suitable habitat present in spotted owl PACs within the Empire Project amount to approximately 8,600 acres (from attachment 5 in BA/BE). Total acres of suitable habitat within the Empire Project is 45,927

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	distributed across the landscape. Need to maintain habitat quality in matrix lands outside of designated HRCAs.		(Table 3.18 in FSEIS). Thus approximately 19 percent of all suitable habitat is within spotted owl PACs, with the remainder (81 percent) distributed in HRCAs and the matrix between PACs/HRCAs. After implementation of Alternative D, approximately 79 percent of the suitable habitat would be outside of PACs distributed in HRCAs and the forest matrix.
SNFPC	There are a variety of snag/cavity associated species on the PNF that require annual monitoring to be consistent with 1988 LRMP. The comment references DSEIS MIS report Table 7, p. 24).	W 30	This reference is in regards to an earlier version of the MIS report for the project and has been replaced by the "Management indicator Species Report, Empire Project" that was developed specifically for this current FSEIS and that was sent hardcopy to the SNFPC on 3/20/07. This new version replaced the old version referenced in the comment letter. Impacts to snags/cavity associated species were addressed in the Empire Project Supplemental Wildlife Report: Affected Environment and Environmental Consequences – Neotropical Migratory Birds, Woodpecker Group, Gray Squirrel, and Willow/Alder Community, dated February 2007. This was also sent to SNFPC 3/20/07. The whole section of the Comment letter labeled as section H.1. seems to be commenting on old information. Regardless, see responses W31 and W32 below
SNFPC	Annual monitoring of MIS snag dependent-cavity nesting bird species required by 1988 LRMP. Appendix E-64 of the 2001 Framework makes explicit that population data must be collected for the hairy woodpecker, Williamsons Sapsucker, pileated woodpecker, and other snag associated species.	W 31	The Woodpecker Group is not identified as a Management Indicator Species (MIS) within the Plumas Land and Resource Management Plan (LRMP) Appendix G, and is therefore not subject to Appendix E of the 2001 Sierra Nevada Forest Plan Amendment (Framework). For the Woodpecker Group, the Plumas LRMP Monitoring plan speaks to monitoring habitat, specifically in regards to meeting standards & guidelines for snags, and does not discuss monitoring populations of woodpeckers. Effects of the Empire Project on snags, and subsequently woodpecker species, was collectively discussed in the Empire Wildlife Supplemental Report. The Regional Forester goes on to say in the 2004 SNFPA ROD: "Based on my review of the record, including the FSEIS, Biological Assessment (BA), Biological Evaluation (BE) and Biological Opinion (BO), I believe that the management approach embodied in this ROD represents a balance of wildlife conservation measures that considers the available science and the risks associated with wildfires. It will provide the fish and wildlife habitat and other ecological conditions necessary to maintain well-distributed viable populations of vertebrate species in the planning area, and maintain the diversity of plants and animals".
SNFPC	Snag reduction will occur, and the conclusion that snag levels will	W 32	Within the approximately 8,000 acres of fuel treatments and individual tree selection units with Alternative D snag retention would fall between 2 and 4 snags/acre. Although 2 snags/acre is

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	provide for habitat needs of woodpeckers is a wrong conclusion.		allowed for retention in group selection, possibly no snags within the 1,226 acres of group selections units would be retained. Thus snags could be reduced on 9,151 acres, but standards & guidelines provided by the 2004 SNFPA would be implemented for snag retention; approximately 12 percent of the NF land within the analysis area would be treated, meaning approximately 88 percent would not be treated, and thus not subject to snag reduction. The snag levels within the approximately 61,000 acres of National Forest terrestrial forested habitat capable of supporting snags within the analysis area that would not be treated would fluctuate above and/or below existing levels, as snags fall and trees die over time.
SNFPC	Analysis of impacts to gray squirrels is inadequate, as the MIS report lacks site-specific analysis.	W 33	The gray squirrel is not an MIS on the Plumas NF (Appendix G1, PNF LRMP 1988). Impacts to black oaks and gray squirrels has been discussed in the Empire Project Supplemental Wildlife Report developed for this FSEIS.
SNFPC	MIS Report lacks several project categories that are discussed in the DSEIS document.	W 34	Direct/indirect and cumulative effects of the Empire Project are addressed for all MIS in the FSEIS and MIS Report, Cumulative effects are confined to the Empire Wildlife analysis area. As explained in the MIS Report, all MIS species identified within the Plumas LRMP were selected for analysis for the Empire Project except for Largemouth bass and Canada goose, as no habitat was present for these species. Cumulative effects to those TES species that are MIS are discussed in the Project BA/BE and FSEIS. Cumulative effects for non-TES MIS are discussed for the MIS Report developed for the Empire Project.
SNFPC	Model populations, not habitat	W 35	CWHR models were used primarily for identifying the existing habitat suitability ratings of existing conditions. This model-based approach allowed the line officer to assess what forest types were currently providing high, moderate, or low suitability and, based on potential changes to this habitat as a result of project actions, ascertain what the project trend in habitat suitability would be following project implementation. Habitat and population monitoring will be an ongoing effort at the Forest and Bioregional scales, as described in the PNF MIS Report, pages 3-9.