

Chapter 5 Environmental Impact Analysis and Mitigation

5.0 Introduction and Summary of Proposed Program and Alternatives

The purpose of Chapter 5.0 is to summarize the environmental impacts that might occur as a result of implementing either the Proposed Program or the Alternatives. Environmental impacts are a function of both the extent and the intensity of the effects. *Intensity* of effects refers to the degree of change in biological and physical characteristics that are likely to result from carrying out the treatment. *Extent* of effects refers to the quantity of acres treated and their distribution across the landscape.

As previously described in Chapters 2 and 3, treatments would be applied across each bioregion by willing landowners implementing practices designed to accomplish one or more of the purpose/goals outlined in Section 1.7. An individual treatment by itself, or multiple treatments might take place all in one year, or might be spread out over several years. Most treatments would be applied in order to meet the several goals that focus on achieving desired future conditions such as reducing the severity and extent of wildland fire. In addition, in every bioregion, treatments would tend to be focused on a subset of the purpose and goals, as described below:

- North Coast/Klamath - Maintain/ enhance forest and rangeland resources.
- Modoc - Reduce noxious weeds and invasive plants and improve browse and forage for wildlife and domestic stock, also maintain/ enhance forest and range land resources.
- Sacramento Valley - Maintain/improve air quality through vegetation treatments that reduce the severity of large, uncontrolled fires, also restore the natural range of fire-adapted plant communities through periodic low intensity vegetation treatments.
- Sierra - Reduce effects to watersheds from wildfire by varying the distribution of vegetation treatments within and across watersheds, also modify wildfire behavior to reduce losses to life and property and reduce the severity of wildfires by altering the volume/continuity of wildland fuels.
- Bay Area - reduce the severity of wildfires by altering the volume/continuity of wildland fuels, modify wildfire behavior to reduce losses to life and property and reduce the severity of wildfires by altering the volume/continuity of wildland fuels, and restore the natural range of fire-adapted plant communities through periodic low intensity vegetation treatments.
- San Joaquin - Maintain/improve air quality through vegetation treatments that reduce the severity of large, uncontrolled fires and modify wildfire behavior to reduce losses to life and property, and reduce the severity of wildfires by altering the volume/continuity of wildland fuels.
- Central Coast - Modify wildfire behavior to reduce losses to life and property, reduce the severity of wildfires by altering the volume/continuity of wildland fuels, and restore the natural range of fire-adapted plant communities through periodic low intensity vegetation treatments
- Mojave - Reduce noxious weeds and invasive plants and improve browse and forage for wildlife and domestic stock, also maintain/ enhance forest and rangeland resources

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- South Coast - Restore the natural range of fire-adapted plant communities through periodic low intensity vegetation treatments, maintain/improve air quality through vegetation treatments that reduce the severity of large, uncontrolled fires, modify wildfire behavior to reduce losses to life and property, and reduce the severity of wildfires by altering the volume/continuity of wildland fuels
- Colorado Desert - Reduce noxious weeds and invasive plants and improve browse and forage for wildlife and domestic stock, also maintain/enhance forest and rangeland resource.

For analysis purposes, the number of acres treated yearly is assumed to be 1/10th of the ten-year totals shown in chapter 2 and 3. However, the actual acres treated annually in any bioregion will vary substantially year-to-year based on several factors, such as availability of cooperating landowners; but the total acres treated in any bioregion at the end of the 10-year period would not exceed the estimated total shown in the tables. In addition, it is assumed that the 10-year total acreage treated would never all occur within one year or any one bioregion, but would be distributed across several years and several bioregions within any 10-year period. Finally, if the acreage being treated in a bioregion exceeded 110% of the yearly average, then further analysis would be required at the project level to ensure that significant effects did not take place.

It is also important to note that both the Proposed Program and the Alternatives describe potential herbicide treatments (both hand spray and aerial application) implemented by landowners at their own cost outside of the Program (or Alternatives) in order to conduct maintenance and follow-up treatments. CAL FIRE/applicants are more apt to use herbicides post VTP-funded treatment for treatment maintenance compared to other treatments such as prescribed fire, as both the cost per acre and the liability are less with herbicides than prescribed fire. In general, it is assumed that approximately 10% of the annual acres initially treated during the first decade of the program (19,500 acres) annually and up to 20% of all annual acres treated in the second decade (39,000 acres) would be treated with herbicides outside the Program in addition to the acres proposed for herbicide treatment in the Program. For instance, even though Alternative 2 does not fund any herbicide use within the VTP, under Alternative 2 CAL FIRE/applicants would still be able to use herbicides at some point after their VTP contract expired. Thus, while Alternative 2 (the “No Herbicide” Alternative) would not fund any herbicide treatments, by the 2nd decade, up to 39,000 acres of off-program herbicide treatments could be expected if Alternative 2 were implemented.

The distribution of treatments in the Proposed Program is described for each bioregion in terms of both the acres that would be treated (Table 5.0.1), number of VTP projects that would occur in each bioregion (Table 5.0.4) and the number of VTP projects that would be implemented per CalWat 2.2 watershed at the end of one year and after ten years of treatments (Tables 5.0.6 and 5.0.7). Table 5.0.1 is a summary of the information from Tables 2.4 and 3.2 through 3.7 which shows the potential acreage likely to be treated by the Proposed Program and each of the alternatives for each treatment type.

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| Bioregion | Total Landscape Acres in Bioregion | Distribution of Treatments | Acres Treated During Decade | | | | |
|--|------------------------------------|----------------------------|-----------------------------|----------------|------------------|------------------|----------------|
| | | | Program | Alt 1 | Alt 2 | Alt 3 | Alt 4 |
| North Coast/Klamath | 8,158,000 | 11.7% | 253,500 | 61,100 | 253,500 | 253,500 | 104,600 |
| Modoc | 3,616,900 | 10.3% | 223,200 | 7,050 | 223,200 | 223,200 | 137,300 |
| Sacramento Valley | 1,524,300 | 14.4% | 312,000 | 75,200 | 312,000 | 312,000 | 128,700 |
| Sierra | 6,605,500 | 19.8% | 429,100 | 103,400 | 429,100 | 429,100 | 176,900 |
| Bay Area | 3,346,500 | 7.2% | 156,000 | 37,600 | 156,000 | 156,000 | 64,300 |
| San Joaquin | 1,799,800 | 5.4% | 117,100 | 28,200 | 117,100 | 117,100 | 48,200 |
| Central Coast | 4,989,200 | 17.5% | 380,000 | 94,000 | 380,000 | 380,000 | 150,900 |
| Mojave | 3,112,800 | 0.9% | 20,000 | 2,350 | 20,000 | 20,000 | 8,100 |
| South Coast | 2,737,600 | 9.5% | 205,600 | 42,300 | 205,600 | 205,600 | 84,800 |
| Colorado Desert | 2,067,800 | 3.3% | 72,600 | 18,800 | 72,600 | 72,600 | 26,800 |
| Total | 37,958,400 | 100.0% | 2,169,100 | 470,000 | 2,169,100 | 2,169,100 | 930,600 |
| Percent prescribed fire | | | 53% | 63% | 56% | 56% | 8% |
| Percent Mechanical | | | 18% | 21% | 22% | 19% | 25% |
| Percent Hand | | | 10% | 12% | 12% | 11% | 38% |
| Percent Herbicides | | | 9% | 4% | 0% | 4% | 5% |
| Percent Prescribed Herbivory | | | 10% | 0% | 10% | 10% | 24% |
| Total | | | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |
| Total acreage treated with herbicides first decade on and off program | | | 413,110 | 65,800 | 216,910 | 295,290 | 142,860 |
| Total acreage treated with herbicides/decade, decades 2 and beyond on and off program | | | 630,020 | 112,800 | 433,780 | 512,180 | 235,920 |

It is important to note that some bioregions have a proportionately higher number of acres treated annually than other bioregions; Sacramento Valley being a prime example. Conversely, some bioregions have a very small number of acres treated annually compared to the size of the bioregion (Modoc and Mojave in particular treat as little as 0.6% and 0.06% of all jurisdiction lands annually). The Sacramento Valley bioregion stands out as an example of a bioregion, which, based on treatment history between 2000-2005, annually treats about 2.0% of the bioregion jurisdiction lands. Part of the difference between bioregions is the fact that the VTP is based on willing landowners applying to the Program with CAL FIRE/applicants applying in much higher numbers in the Sacramento bioregion than CAL FIRE/applicants in the Modoc or Mojave bioregions. Thus the historical application rate (and the rate projected into the future) is both a matter of how aggressive the VTP coordinator within a specific CAL FIRE Ranger Unit is at soliciting landowners as well as how receptive landowners are to engaging with a state agency such as CAL FIRE.

Grouping vegetation types based on fire regime is one way to simplify the varying effects of treatment intensity based on vegetation types as shown below in Table 5.0.2. In general, vegetation types with multiple canopy layers and vertical diversity, such as coniferous forests, are adapted to a high frequency/low intensity surface/mixed fire regime and vegetation treatments tend to mimic this effect by focusing on understory treatments. On the other hand single canopy layer vegetation types with low vertical diversity, such as grasslands and chaparral, are adapted to a low

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frequency/high severity crown fire regime and vegetation treatments tend to focus on crown (or overstory) level treatments. Essentially, the intensity of treatment depends on how much vegetation is left after treatment and the degree of soil disturbance.

| Table 5.0.2 | | |
|---|--|--|
| WHR Types by WHR Lifeform and Disturbance Type | | |
| WHR Lifeform | Treatment/Disturbance Type | WHR Types |
| Conifer Forest | Low Intensity Treatments Surface/Mixed Fire Regimes | Closed-Cone Pine-Cypress, Douglas Fir, Eastside Pine, Jeffrey Pine, Klamath Mixed Conifer, Lodgepole Pine, Montane Hardwood-Conifer, Ponderosa Pine, Red Fir |
| Conifer Woodland | Low Intensity Treatments Surface/Mixed Fire Regimes | Juniper, Pinyon-Juniper |
| Desert Shrub | Low Intensity Treatments Surface/Mixed Fire Regimes | Desert Scrub, Desert Succulent Shrub, Desert Wash |
| Desert Woodland | Low Intensity Treatments Surface/Mixed Fire Regimes | Joshua Tree |
| Hardwood Forest | Low Intensity Treatments Surface/Mixed Fire Regimes | Aspen, Montane Hardwood, Montane Riparian |
| Hardwood Woodland | Low Intensity Treatments Surface/Mixed Fire Regimes | Blue Oak Woodland, Blue Oak-Foothill Pine, Coastal Oak Woodland, Eucalyptus, HDW, Valley Foothill Riparian, Valley Oak Woodland |
| Herbaceous | High Intensity Treatments/Crown Fire Regimes | Annual Grassland, Pasture, Perennial Grassland |
| Shrub/Chaparral | High Intensity Treatments/Crown Fire Regimes | Alpine-Dwarf Shrub, Bitterbrush, Chamise-Redshank Chaparral, Coastal Scrub, Low Sage, Mixed Chaparral, Montane, Chaparral, Sagebrush, Undetermined Shrub |

The intensity of each treatment type is related primarily to the techniques and tools used in that treatment type, and secondarily to the vegetation type being treated. Differences between treatment types are relatively clear, e.g., broadcast burning relies on controlled use of fire to burn vegetation while mechanical thinning relies on use of motorized equipment to remove vegetation. However, a less obvious effect results from the same treatment type being applied to different vegetation types. For example, a prescribed broadcast burn in a conifer forest will not likely affect overstory canopy closure, while the same prescribed burn in a chaparral field will likely destroy up 75 percent or more of the overstory shrub canopy.

The relative proportion of crown fire versus surface/mixed fire regime vegetation types varies significantly by bioregion, as do the number of treatments within each vegetation type. Generally, the proportion of crown fire regime vegetation in each bioregion increases as you move from Northern California to Southern California (Table 5.0.4). Thus it is likely that the intensity of treatment will increase as the proportion of crown fire vegetation in the bioregion increases. Tables 5.0.4 and 5.0.5 show the number of acres and projects treated by vegetation type annually and at the end of ten years of treatments.

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| Treatment type | Surface/mixed Fire Regime Vegetation Types (Conifer Forest, Conifer Woodland, Hardwood Forest, Hardwood Woodland, Desert Shrub, Desert Woodland) | Crown Fire Regime Vegetation Types (Shrub, Herbaceous) | | |
|---|---|--|------------------------------|-----------------------------|
| | Reduction in Canopy Cover | Percent Soil Disturbance | Reduction in Canopy Cover | Percent Soil Disturbance |
| Broadcast burn | <10% | <40% | <70% | <50% |
| Underburn | <10% | <40% | N/A | N/A |
| Jackpot burn | <10% | <40% | N/A | N/A |
| Pile burn | <10% | <40% | N/A | N/A |
| Tractor Pile | <10% | <40% | <75% | <75% |
| Masticate | 10-50% | <25% | <75% | <40% |
| Chain | N/A | N/A | <75% | <25% |
| Till | N/A | N/A | <90% | <80% |
| Hand Treatments (Thin) | <25% | <25% | N/A | N/A |
| Hand Spray | <5% | <10% | <75% | <5% |
| Graze for Fuel | <5% | <10% | <50% | <10% |
| Graze for Range Improvement | <5% | <10% | <50% | <10% |
| Expected Outcomes of Non Treatment Disturbance | | | | |
| High Severity Wildfire | >75% | >50% | >90% | >70% |

| Bioregion | Total Landscape Acres in Bioregion | Surface/Mixed Fire Regimes | | | Crown Fire Regimes | | |
|---------------------|---|----------------------------|--|--|-----------------------|---|--|
| | | Acres in Bioregion | Potential Annual Acres Treated in Bioregion | Potential # of Annual Projects in Bioregion | Acres in Bioregion | Potential Annual Acres Treated in Bioregion | Potential # of Annual Projects in Bioregion |
| Klamath/North Coast | 8,158,000 | 6,198,500 | 19,300 | 74 | 1,959,500 | 6,100 | 23 |
| Modoc | 3,616,900 | 2,112,700 | 13,100 | 50 | 1,504,200 | 9,300 | 36 |
| Sacramento Valley | 1,524,300 | 541,300 | 11,100 | 43 | 983,000 | 20,100 | 77 |
| Sierra Nevada | 6,605,500 | 4,087,400 | 26,600 | 102 | 2,518,100 | 16,300 | 63 |
| Bay Area / Delta | 3,346,500 | 1,657,400 | 7,700 | 30 | 1,689,100 | 7,900 | 30 |
| San Joaquin | 1,799,800 | 98,700 | 600 | 2 | 1,701,100 | 11,100 | 43 |
| Central Coast | 4,989,200 | 1,470,700 | 11,200 | 43 | 3,518,500 | 26,800 | 103 |
| Mojave | 3,112,800 | 2,889,100 | 1,900 | 7 | 223,700 | 100 | |
| South Coast | 2,737,600 | 469,300 | 3,500 | 13 | 2,268,300 | 17,100 | 66 |
| Colorado Desert | 2,067,800 | 1,586,600 | 5,600 | 22 | 481,200 | 1,700 | 7 |
| Total | 37,958,400 | 21,111,400 | 100,600 | 386 | 16,846,700 | 116,500 | 448 |

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**Table 5.0.5
Proposed Program Potential Treatments Over 10 Years by Disturbance Type by Bioregion**

| Bioregion | Total Landscape Acres in Bioregion | Surface/Mixed Fire Regimes | | | Crown Fire Regimes | | |
|---------------------|------------------------------------|----------------------------|--|--|--------------------|--|--|
| | | Acres in Bioregion | Proportion of Bioregion Treated per Decade | Potential No. Of Projects in Bioregion | Acres in Bioregion | Proportion of Bioregion Treated per Decade | Potential No. Of Projects in Bioregion |
| Klamath/North Coast | 8,158,000 | 6,198,500 | 3.1% | 740 | 1,947,600 | 3.1% | 230 |
| Modoc | 3,616,900 | 2,112,700 | 6.2% | 500 | 1,499,200 | 6.2% | 360 |
| Sacramento Valley | 1,524,300 | 541,300 | 20.5% | 430 | 980,700 | 20.5% | 770 |
| Sierra Nevada | 6,605,500 | 4,087,400 | 6.5% | 1,020 | 2,509,400 | 6.5% | 630 |
| Bay Area / Delta | 3,346,500 | 1,657,400 | 4.6% | 300 | 1,684,300 | 4.7% | 300 |
| San Joaquin | 1,799,800 | 98,700 | 6.1% | 20 | 1,698,500 | 6.5% | 430 |
| Central Coast | 4,989,200 | 1,470,700 | 7.6% | 430 | 3,511,300 | 7.6% | 1,030 |
| Mojave | 3,112,800 | 2,889,100 | 0.7% | 70 | 219,200 | 0.5% | |
| South Coast | 2,737,600 | 469,300 | 7.5% | 130 | 2,318,500 | 7.4% | 660 |
| Colorado Desert | 2,067,800 | 1,586,600 | 3.5% | 220 | 478,200 | 3.6% | 70 |
| Total | 37,958,400 | 21,111,400 | | 3,860 | 16,846,900 | | 4,480 |

The number of potential projects within a single watershed could vary from as few as one project per watershed to as many as seven projects per watershed. The number of potential projects per watershed (and bioregion) is estimated to be a function of the past history of the willingness of landowners to apply for projects as well as the size of the watersheds (e.g. six bioregions have watersheds which range between 7,500 acres and 21,000 acres while the Sacramento Valley bioregion has an average watershed size of 55,000 acres and the Colorado Desert bioregion has an average watershed size of 178,000 acres).

In order to analyze the consequences of implementing the Proposed Program or the Alternatives, the following approach was used to model the probability of where treatments might occur on the landscape (see Appendix A for a complete description of the modeling approach).

1. Each CalWat 2.2 (see Glossary) watershed was assigned to either a high or low “assets at risk” category based on combining numerous factors in a GIS, the principle factors being assets such as location in or out of a WUI, high proportion of special status wildlife species, etc., along with fuel rank, number of times burned, etc.
2. Watersheds with a high-assets-at-risk value and more than 35% of the watershed in CAL FIRE jurisdiction (e.g. SRA, DPA or LRA) were assigned a high probability of treatment, while watersheds with 2-35% jurisdiction were assigned a low probability of treatment. Watersheds with less than 2% jurisdiction lands were not considered as a probable location for treatment (although there is nothing to rule out a treatment on these lands given a willing landowner). As a result, treatments could be applied to any one of 5,600 of the 7,808 watersheds within the state with more than 2% jurisdiction.
3. Seventy-five percent of all annual projects within a bioregion (project size = 260 acres, number of projects per bioregion = total acres treated annually within a bioregion divided by 260 acres) were randomly assigned to watersheds with a high probability for treatment and

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25% of all projects were randomly assigned to watersheds with a low probability of treatment. The randomization process was thought to best represent the fact that projects are based on willing landowners coming forward with requests to complete projects rather than CAL FIRE determining where projects would go. Also, since 99.4% of the 5,600 watersheds within the State with more than 2% CAL FIRE jurisdiction comprise over 1,000 acres, the randomization process was allowed to allocate more than one project into a watershed in any one year.

4. The randomization process was also run for five and ten years in order to allocate projects over time. Again, one or more projects could be assigned to a watershed at any time during the five-year analysis period or the ten-year analysis period.
5. Maps of the watersheds randomly selected for projects were developed to assist with analyzing the consequences. However, since the spatial location of the projects is for modeling purposes only, and actual projects would be based on willing landowner participation, these maps are not displayed here.

As a result of the modeling process, the annual number of projects is shown in Table 5.0.6. Table 5.0.7 shows the proportion of watersheds potentially receiving treatment by percent of watershed likely to be treated after one year of treatments and after ten years of treatments (e.g. 8.9% of all watersheds in the South Coast bioregion would have 15-20% of their acreage treated in any 10 year period). Table 5.0.8 is similar to 5.0.7 in that it shows for Alternatives 1-4 the proportion of watersheds within the bioregion by percent watershed by disturbance class treated during ten years. Note that the Sacramento, San Joaquin and Colorado Desert bioregions have a small number of watersheds and each of these bioregions has a number of very small watersheds, some as small as 500 acres. As a result of the modeling process, a number of these small watersheds are modeled as 100% treated after ten years. Although a small watershed could be completely treated in 10 years, the likelihood is low, and is an artifact of the modeling results and not necessarily an indicator of effects.

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**Table 5.0.6
Proposed Program Potential Number of Projects per Watershed for One Year of Treatments**

| BIOREGION | Acres | | Number | | Average Watershed Size | Number of Projects per Watershed <u>1/</u> | | | | | | | |
|---------------------|-------------------|----------------|--------------|------------|------------------------|--|------------|-----------|-----------|----------|----------|----------|----------|
| | Landscape | Treated | Watersheds | Projects | | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Klamath/North Coast | 8,158,000 | 25,350 | 1,529 | 97 | 7,884 | 1,436 | 89 | 4 | | | | | |
| Modoc | 3,616,900 | 22,320 | 577 | 85 | 12,995 | 502 | 65 | 10 | | | | | |
| Sacramento Valley | 1,524,300 | 31,200 | 70 | 120 | 55,715 | 23 | 13 | 14 | 9 | 7 | 1 | 2 | 1 |
| Sierra Nevada | 6,605,500 | 42,910 | 1,425 | 164 | 8,679 | 1,277 | 133 | 14 | 1 | | | | |
| Bay Area / Delta | 3,346,500 | 15,600 | 496 | 60 | 11,592 | 438 | 56 | 2 | | | | | |
| San Joaquin | 1,799,800 | 11,710 | 153 | 44 | 50,063 | 121 | 22 | 8 | 2 | | | | |
| Central Coast | 4,989,200 | 38,000 | 816 | 145 | 8,867 | 695 | 101 | 16 | 4 | | | | |
| Mojave | 3,112,800 | 2,000 | 204 | 8 | 81,342 | 197 | 6 | 1 | | | | | |
| South Coast | 2,737,600 | 20,560 | 293 | 78 | 21,710 | 225 | 58 | 10 | | | | | |
| Colorado Desert | 2,067,800 | 7,260 | 37 | 18 | 178,274 | 24 | 5 | 5 | 1 | 2 | | | |
| Grand Total | 37,958,400 | 216,900 | 5,600 | 819 | | 4,938 | 548 | 84 | 17 | 9 | 1 | 2 | 1 |

1/ Numbers may not add due to rounding

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| Table 5.0.7 Proportion of Watersheds Within a Bioregion Potentially Treated by Proposed Program at One Year and After Ten Years of Treatments | | | | | | | | | | | | | |
|--|-------------------|------------------|--------------|--------------|------------------------|-----------------------------|--------------|--------------|-------------|-------------|-------------|-------------|-------------|
| One Year After Treatment | | | | | | | | | | | | | |
| Bioregion | Acres | | Number | | Average Watershed Size | Watershed Disturbance Class | | | | | | | |
| | Landscape | Treated | Projects | Watersheds | | 0% | <5% | 5-10% | 10-15% | 15-20% | 20-30% | 30-50% | 50-100% |
| Percent of All Watersheds in Bioregion <u>1/</u> | | | | | | | | | | | | | |
| Klamath/North Coast | 8,158,000 | 25,350 | 97 | 1,529 | 7,884 | 93.9% | 4.1% | 1.5% | 0.3% | 0.0% | 0.1% | 0.0% | 0.0% |
| Modoc | 3,616,900 | 22,320 | 85 | 577 | 12,995 | 87.0% | 10.7% | 1.9% | 0.2% | 0.0% | 0.2% | 0.0% | 0.0% |
| Sacramento Valley | 1,524,300 | 31,200 | 120 | 70 | 55,715 | 32.9% | 25.7% | 20.0% | 7.1% | 8.6% | 2.9% | 0.0% | 2.9% |
| Sierra Nevada | 6,605,500 | 42,910 | 164 | 1,425 | 8,679 | 89.6% | 7.7% | 2.2% | 0.4% | 0.0% | 0.0% | 0.0% | 0.0% |
| Bay Area / Delta | 3,346,500 | 15,600 | 60 | 496 | 11,592 | 88.3% | 8.7% | 2.8% | 0.0% | 0.2% | 0.0% | 0.0% | 0.0% |
| San Joaquin | 1,799,800 | 11,710 | 44 | 153 | 50,063 | 79.1% | 15.0% | 2.6% | 1.3% | 1.3% | 0.0% | 0.7% | 0.0% |
| Central Coast | 4,989,200 | 38,000 | 145 | 816 | 8,867 | 85.2% | 10.4% | 3.8% | 0.4% | 0.1% | 0.1% | 0.0% | 0.0% |
| Mojave | 3,112,800 | 2,000 | 8 | 204 | 81,342 | 96.6% | 3.4% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| South Coast | 2,737,600 | 20,560 | 78 | 293 | 21,710 | 76.8% | 15.7% | 3.1% | 2.0% | 0.3% | 1.7% | 0.3% | 0.0% |
| Colorado Desert | 2,067,800 | 7,260 | 26 | 37 | 178,274 | 64.9% | 29.7% | 2.7% | 2.7% | 0.0% | 0.0% | 0.0% | 0.0% |
| Grand Total | 37,958,400 | 216,910 | 827 | 5,600 | Total | 88.2% | 8.4% | 2.5% | 0.5% | 0.2% | 0.2% | 0.0% | 0.0% |
| Ten Years of Treatments | | | | | | | | | | | | | |
| Percent of All Watersheds in Bioregion <u>1/</u> <u>2/</u> | | | | | | | | | | | | | |
| Klamath/North Coast | 8,158,000 | 253,500 | 970 | 1,529 | 7,884 | 57.9% | 23.0% | 12.4% | 4.1% | 4.1% | 1.2% | 0.3% | 0.3% |
| Modoc | 3,616,900 | 223,200 | 850 | 577 | 12,995 | 42.3% | 28.9% | 12.5% | 7.3% | 7.3% | 4.2% | 1.2% | 1.2% |
| Sacramento Valley | 1,524,300 | 312,000 | 1,200 | 70 | 55,715 | 0.0% | 22.9% | 5.7% | 4.3% | 4.3% | 5.7% | 15.7% | 15.7% |
| Sierra Nevada | 6,605,500 | 429,100 | 1,640 | 1,425 | 8,679 | 39.6% | 26.9% | 20.2% | 6.8% | 6.8% | 3.0% | 0.4% | 0.4% |
| Bay Area / Delta | 3,346,500 | 156,000 | 600 | 496 | 11,592 | 36.5% | 27.4% | 21.2% | 6.3% | 6.3% | 4.2% | 0.6% | 0.6% |
| San Joaquin | 1,799,800 | 117,100 | 440 | 153 | 50,063 | 30.1% | 32.7% | 7.8% | 6.5% | 6.5% | 3.9% | 6.5% | 6.5% |
| Central Coast | 4,989,200 | 380,000 | 1,450 | 816 | 8,867 | 29.7% | 25.1% | 21.2% | 9.8% | 9.8% | 6.4% | 1.8% | 1.8% |
| Mojave | 3,112,800 | 20,000 | 80 | 204 | 81,342 | 87.7% | 9.3% | 0.5% | 0.5% | 0.5% | 0.0% | 0.5% | 0.5% |
| South Coast | 2,737,600 | 205,600 | 780 | 293 | 21,710 | 11.9% | 38.9% | 19.1% | 7.8% | 7.8% | 4.8% | 5.1% | 5.1% |
| Colorado Desert | 2,067,800 | 72,600 | 260 | 37 | 178,274 | 5.4% | 64.9% | 10.8% | 0.0% | 0.0% | 8.1% | 5.4% | 5.4% |
| Grand Total | 37,958,400 | 2,169,100 | 8,270 | 5,600 | Total | 42.5% | 26.2% | 16.2% | 6.2% | 6.2% | 3.3% | 1.3% | 1.3% |

1/ Numbers may not add due to rounding. 2/ The randomization process resulted in 25.7% of the Sacramento Valley, 2.0% of the San Joaquin, and 2.0% of the South Coast watersheds having more than 100% of the watershed treated during the 10 year period. As noted above, this is considered an artifact of the modeling process and not likely in the “real world”.

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| Table 5.08 Proportion of Watersheds by Disturbance Class | | | | | | | | | |
|---|---|---------------|--------------|---------------|---------------|---------------|---------------|----------------|-----------------|
| | DISTURBANCE CLASS (PERCENT OF WATERSHED DISTURBED AT 10-YEARS) <u>1/</u> | | | | | | | | |
| | 0% | <5% | 5-10% | 10-15% | 15-20% | 20-30% | 30-50% | 50-100% | >100% |
| Alternative 1 | | | | | | | | | |
| Klamath/North Coast | 86.2% | 9.5% | 3.5% | 0.5% | 0.2% | 0.1% | 0.0% | 0.0% | 0.0% |
| Modoc | 95.7% | 3.5% | 0.7% | 0.2% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Sacramento Valley | 7.1% | 35.7% | 18.6% | 5.7% | 5.7% | 8.6% | 11.4% | 7.1% | 0.0% |
| Sierra Nevada | 76.8% | 16.8% | 5.1% | 0.8% | 0.2% | 0.2% | 0.0% | 0.1% | 0.0% |
| Bay Area / Delta | 75.4% | 15.1% | 7.7% | 0.8% | 0.2% | 0.0% | 0.4% | 0.4% | 0.0% |
| San Joaquin | 62.7% | 20.9% | 7.8% | 3.9% | 2.0% | 1.3% | 0.7% | 0.7% | 0.0% |
| Central Coast | 67.5% | 19.5% | 10.8% | 1.5% | 0.4% | 0.4% | 0.0% | 0.0% | 0.0% |
| Mojave | 96.6% | 3.4% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| South Coast | 59.7% | 25.9% | 5.1% | 3.4% | 1.4% | 2.4% | 0.7% | 1.4% | 0.0% |
| Colorado Desert | 27.0% | 62.2% | 5.4% | 2.7% | 0.0% | 2.7% | 0.0% | 0.0% | 0.0% |
| Total | 78.1% | 14.3% | 5.3% | 1.0% | 0.4% | 0.4% | 0.2% | 0.2% | 0.0% |
| Alternative 2 | | | | | | | | | |
| Klamath/North Coast | 58.1% | 22.4% | 13.1% | 3.8% | 3.8% | 1.0% | 0.3% | 0.3% | 0.1% |
| Modoc | 43.7% | 25.8% | 14.0% | 8.3% | 8.3% | 3.8% | 1.0% | 1.0% | 0.2% |
| Sacramento Valley | 0.0% | 22.9% | 5.7% | 4.3% | 4.3% | 5.7% | 15.7% | 15.7% | 25.7% |
| Sierra Nevada | 39.0% | 26.8% | 20.6% | 7.6% | 7.6% | 3.2% | 0.6% | 0.6% | 0.1% |
| Bay Area / Delta | 34.3% | 30.2% | 20.6% | 7.5% | 7.5% | 3.8% | 0.6% | 0.6% | 0.2% |
| San Joaquin | 30.1% | 32.0% | 9.2% | 6.5% | 6.5% | 2.6% | 7.8% | 7.8% | 2.0% |
| Central Coast | 29.8% | 24.9% | 20.2% | 10.3% | 10.3% | 7.6% | 1.7% | 1.7% | 0.0% |
| Mojave | 87.3% | 9.8% | 0.5% | 0.5% | 0.5% | 0.5% | 0.5% | 0.5% | 0.0% |
| South Coast | 12.6% | 37.5% | 18.4% | 9.2% | 9.2% | 5.1% | 4.1% | 4.1% | 2.7% |
| Colorado Desert | 5.4% | 67.6% | 5.4% | 5.4% | 5.4% | 0.0% | 8.1% | 8.1% | 0.0% |
| Total | 42.4% | 25.8% | 16.4% | 6.8% | 6.8% | 3.4% | 1.3% | 1.3% | 0.6% |
| Alternative 3 | | | | | | | | | |
| Klamath/North Coast | 58.7% | 21.2% | 14.1% | 4.0% | 4.0% | 0.7% | 0.4% | 0.4% | 0.1% |
| Modoc | 42.8% | 27.4% | 13.5% | 9.2% | 9.2% | 2.9% | 0.9% | 0.9% | 0.3% |
| Sacramento Valley | 0.0% | 22.9% | 4.3% | 7.1% | 7.1% | 5.7% | 14.3% | 14.3% | 22.9% |
| Sierra Nevada | 39.6% | 27.1% | 19.0% | 7.8% | 7.8% | 3.1% | 1.3% | 1.3% | 0.1% |
| Bay Area / Delta | 37.3% | 24.4% | 22.6% | 9.3% | 9.3% | 4.0% | 0.8% | 0.8% | 0.0% |
| San Joaquin | 29.4% | 34.0% | 9.8% | 6.5% | 6.5% | 0.7% | 9.8% | 9.8% | 2.0% |
| Central Coast | 31.6% | 21.4% | 21.6% | 11.9% | 11.9% | 6.1% | 1.7% | 1.7% | 0.0% |
| Mojave | 87.3% | 8.8% | 1.5% | 0.0% | 0.0% | 1.0% | 0.5% | 0.5% | 0.0% |
| South Coast | 10.9% | 38.2% | 17.4% | 11.6% | 11.6% | 4.8% | 6.1% | 6.1% | 1.4% |
| Colorado Desert | 2.7% | 64.9% | 8.1% | 5.4% | 5.4% | 5.4% | 5.4% | 5.4% | 0.0% |
| Total | 43.0% | 24.8% | 16.6% | 7.5% | 7.5% | 2.9% | 1.7% | 1.7% | 0.5% |
| Alternative 4 | | | | | | | | | |
| Klamath/North Coast | 77.9% | 15.0% | 5.8% | 1.2% | 1.2% | 0.0% | 0.1% | 0.1% | 0.0% |
| Modoc | 56.3% | 23.6% | 12.3% | 4.0% | 4.0% | 1.7% | 0.5% | 0.5% | 0.2% |
| Sacramento Valley | 4.3% | 27.1% | 10.0% | 7.1% | 7.1% | 8.6% | 12.9% | 12.9% | 5.7% |
| Sierra Nevada | 64.8% | 22.5% | 9.7% | 2.1% | 2.1% | 0.7% | 0.1% | 0.1% | 0.0% |
| Bay Area / Delta | 63.7% | 21.4% | 11.7% | 1.6% | 1.6% | 1.2% | 0.4% | 0.4% | 0.0% |
| San Joaquin | 51.0% | 24.8% | 7.8% | 7.8% | 7.8% | 2.6% | 3.3% | 3.3% | 0.7% |

Environmental Impact Analysis

| | | | | | | | | | |
|-----------------|-------|-------|-------|------|------|------|------|------|------|
| Central Coast | 55.4% | 24.4% | 13.7% | 4.4% | 4.4% | 1.1% | 0.2% | 0.2% | 0.0% |
| Mojave | 93.6% | 3.9% | 1.5% | 0.5% | 0.5% | 0.5% | 0.0% | 0.0% | 0.0% |
| South Coast | 37.2% | 34.1% | 13.3% | 4.1% | 4.1% | 3.4% | 2.4% | 2.4% | 0.7% |
| Colorado Desert | 27.0% | 54.1% | 10.8% | 2.7% | 2.7% | 5.4% | 0.0% | 0.0% | 0.0% |
| Total | 64.3% | 21.0% | 9.5% | 2.6% | 2.6% | 1.0% | 0.5% | 0.5% | 0.1% |

Environmental Impact Analysis

5.1 Potentially Significant Effects

Based on an Environmental Impact Report prepared by Jones and Stokes in April, 2000 (Environmental Impact Report Handbook for Vegetation Management Program, California Department of Forestry and Fire Protection) as well as the Notice of Preparation the State Board of Forestry and Fire Protection filed with the State Clearing House on August 12, 2005, (SCH #2005082054), the following potentially significant effects could result from implementation of the Proposed Program. These effects are described in the following sections, as noted below:

- There is a potentially significant impact to air quality from smoke generated from prescribed fire treatments. (See Section 5.6 – *Air Quality*)
- There is a potentially significant impact to water quality as a result of implementation of prescribed fire, mechanical, hand, herbicide and herbivory treatments. (See Section 5.7, *Hydrology and Water Quality*)
- There is a potentially significant impact to visual quality associated with Program implementation for community-wide fuel reduction purposes. (See Section 5.13, *Visual/Aesthetic Resources*)
- There may be a potential for significant cumulative effects resulting from treatments under the Proposed Program combined with treatments proposed or being implemented by other federal and state agencies and CAL FIRE/applicants. (See Chapter 6, *Cumulative Effects*)
- There may be a potential for significant impacts to plants, animals and to human health from the application of herbicides. (See Section 5.17, *Herbicides*)
- There may be significant impacts to special status plant or animal species. (See section 5.5, *Biological Resources*)
- There may be potential for significant impacts to cultural and historical resources associated with Proposed Program treatments. (See Section 5.8, *Cultural, Archaeological and Historic Resources*)