

Monitoring Land Cover Changes in California

California Land Cover Mapping and Monitoring Program



Southern Sierra Project Area

Cycle II

September 2005

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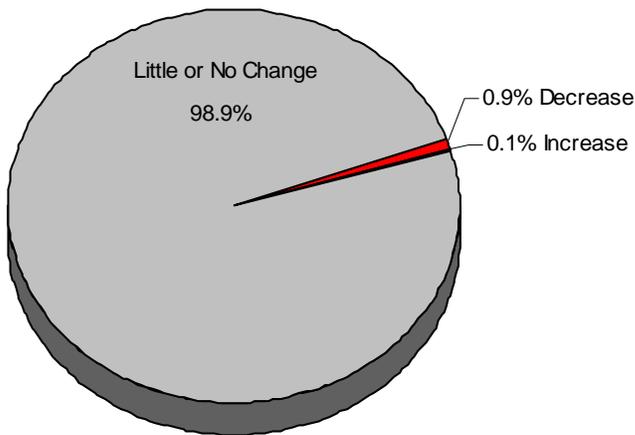
SUMMARY & HIGHLIGHTS

The California Land Cover Mapping and Monitoring Program (LCMMP) uses Landsat Thematic Mapper (TM) satellite imagery to map vegetation and derive land cover change (losses and gains) within five-year time periods. TM satellite imagery has a spatial resolution of 900 square meters (each pixel within a TM image is 30 meters on each side), or about 1/5 of an acre. The purpose of this program is to monitor vegetation changes over time and to provide information about trends. This data can inform managers as to whether landscape management plans and policies are accomplishing their intended purposes. Land cover monitoring information is a key source of information for consultation when starting land management plan revision, preparing wildlife conservation assessments, and developing fire and vegetation policies.

This report focuses on land cover change from 1995/1997 through 2001 in the Southern Sierra project area, which is one of five project areas in the state. The Southern Sierra project area covers 9.5 million acres, including large portions of Inyo, Fresno, Kern, Madera, Mariposa, Mono and Tulare Counties, as well as a very small piece of Los Angeles County. It also encompasses all or most of three national forests (Sierra, Inyo and Sequoia), a small portion of the Toiyabe National Forest and other federal, state and privately owned lands. This report assesses vegetation cover changes on 9.3 million acres within hardwood, conifer, shrub/chaparral and grass/forb vegetation types. Although the total project area spans 9.5 million acres, 219,933 acres are not forest, shrub/chaparral or grass/forb (e.g., urban, agriculture, and water) and are not assessed in this report.

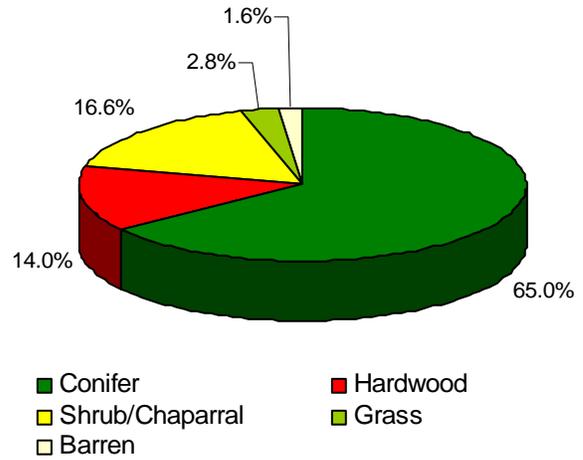
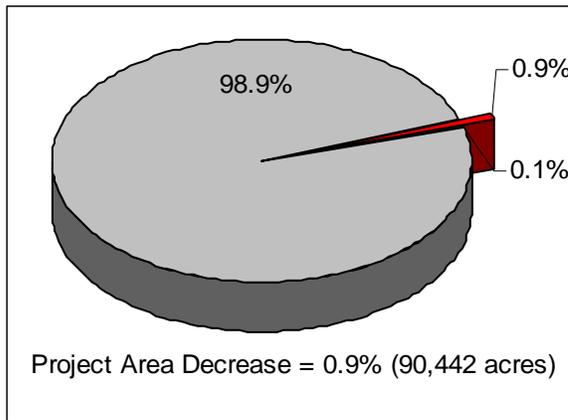
Change classes for LCMMP monitoring data are based on change in cover (CC). For hardwood and conifer cover loss, change classes are broken down into three categories: -71 to -100% CC (71 to 100% decrease in canopy cover), -41 to -70% CC and -16 to -40% CC. For hardwood and conifer canopy cover gain, change classes are broken down into two categories: +16 to +40% CC and +41 to +100% CC. In the shrub/chaparral and grass/forb vegetation types, the change classes are quantified as a decrease or increase in vegetation cover of 16% or greater. The cause of change is also determined when possible. Monitoring data for this project area have an overall accuracy of 85.4%.

Project Area Summary

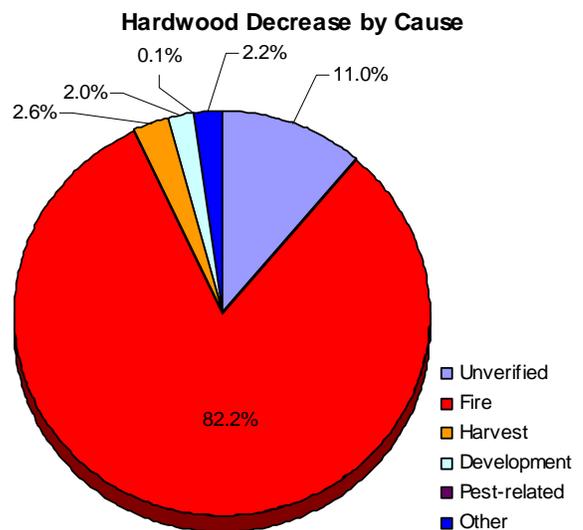
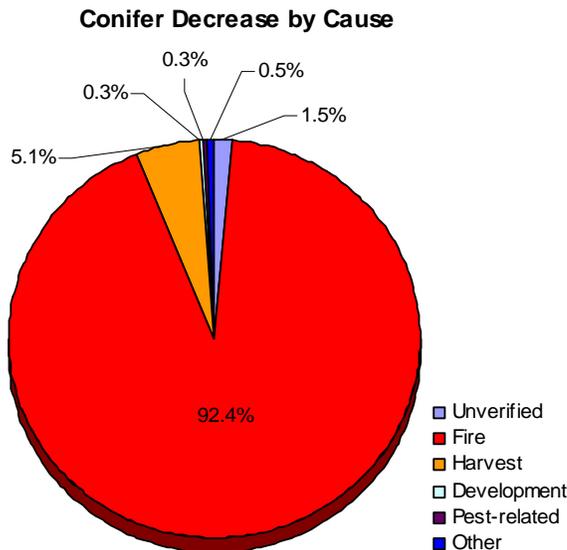


- Results show that 98.9% of the vegetation in the assessed 9.3 million acres did not have a detectable change between 1995/97 and 2001.
- Decreases across all vegetation types occurred on approximately 90,442 acres (0.9% of the project area). Increases occurred on about 10,376 acres (0.1% of the project area).

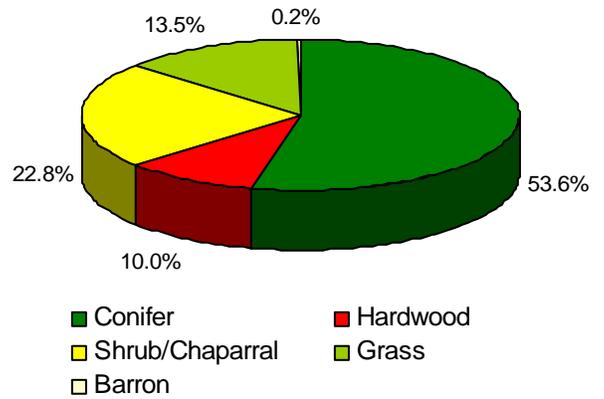
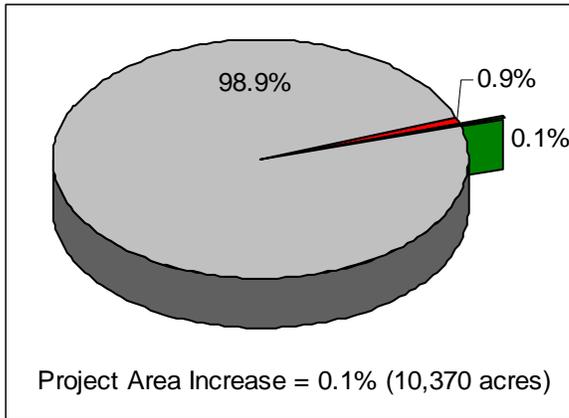
Decrease in Vegetation Cover



- Decreases in conifer accounted for about 58,800 acres of the total decrease in vegetation within the project area.
- Hardwood and shrub/chaparral showed a decrease on about 12,600 acres and 15,000 acres, respectively.
- Fire was the primary cause of change in both the conifer and the hardwood vegetation types, affecting about 54,350 acres and 10,370 acres, respectively.
- Harvest accounted for approximately 2,900 acres of the total decrease.

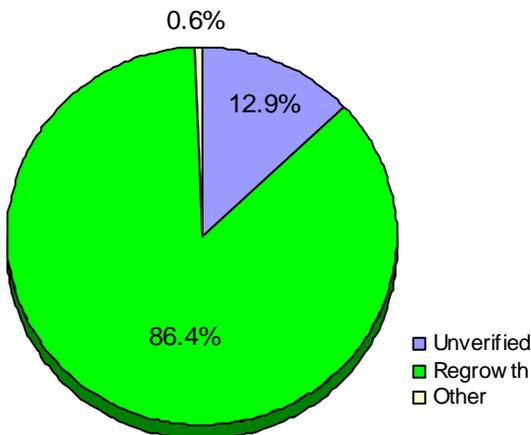


Increase in Vegetation Cover

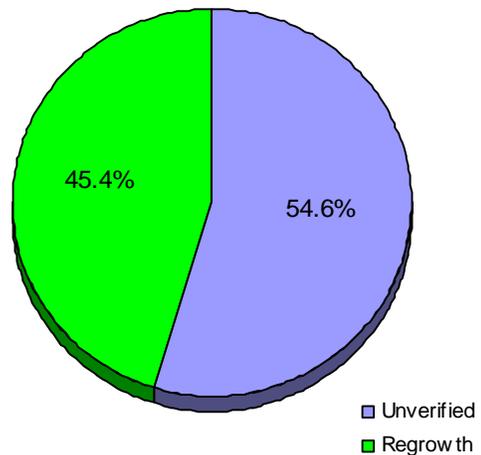


- Increases in conifer accounted for approximately 5,500 acres of the total increase in vegetation in the project area.
- Shrub/chaparral showed an increase on about 2,400 acres.
- Regrowth was the primary cause for increase in both conifer and shrub/chaparral types, affecting about 4,800 acres and 2,000 acres, respectively.
- Cause of change was unverified on less than one-fifth of the increase in both the conifer and the shrub/chaparral types.

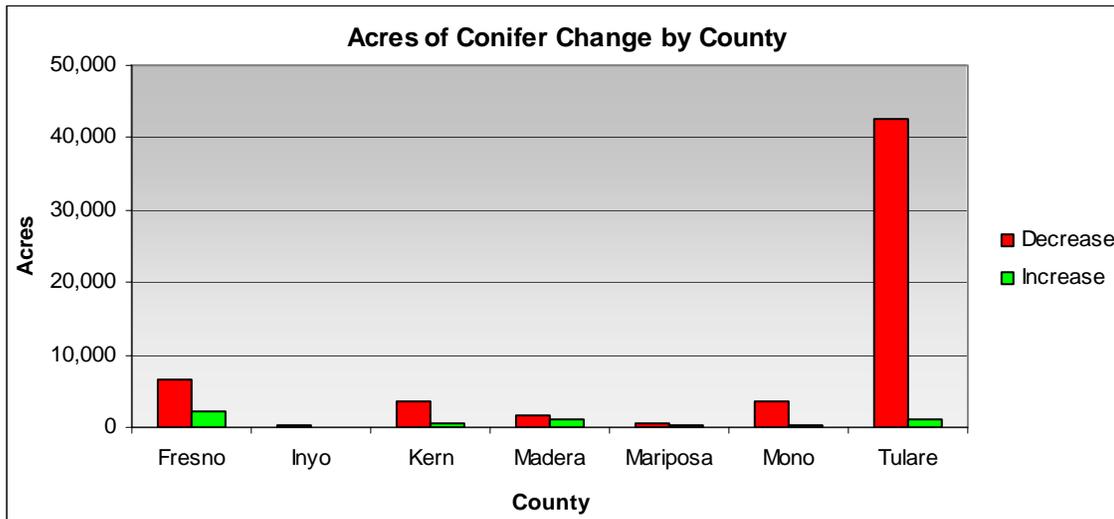
Conifer Increase by Cause



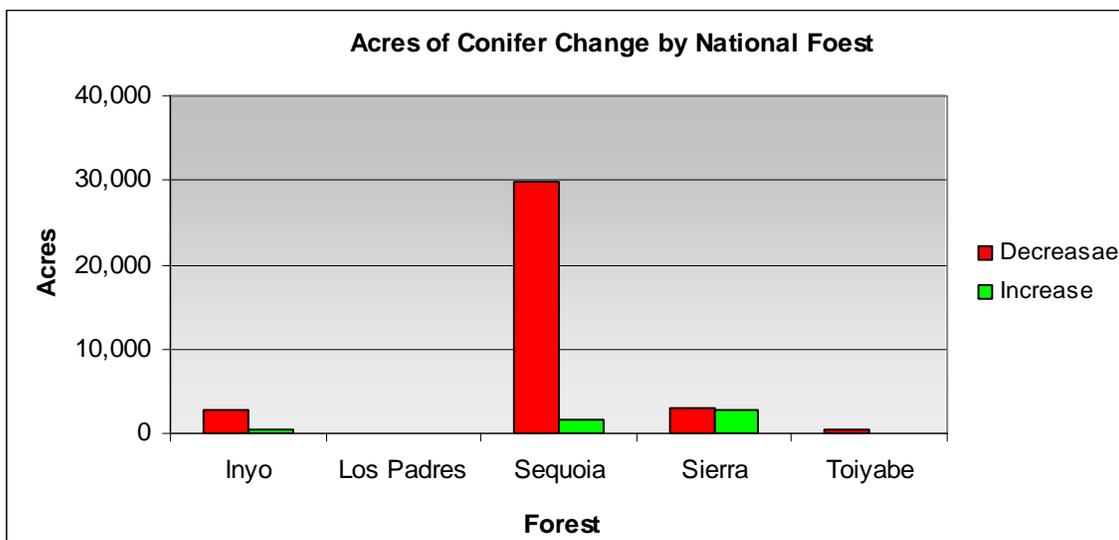
Hardwood Increase by Cause



Conifer Highlights

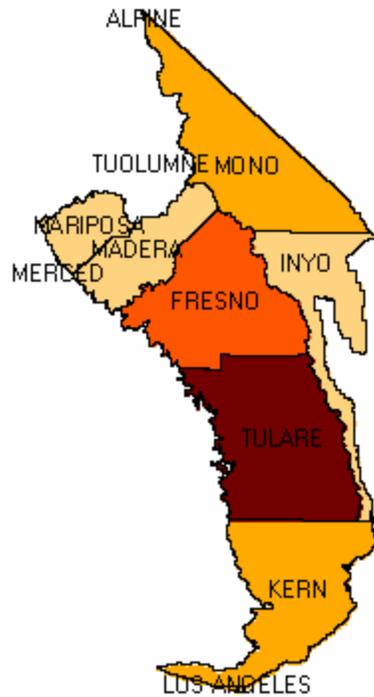


- Decreases in conifer were present in every county analyzed, with the largest amounts occurring in Tulare and Fresno Counties (approximately 41,300 acres and 6,650 acres affected, respectively).
- Increases in conifer were largest in Fresno County, with about 2,100 acres.
- At the National Forest Level, Sequoia National Forest showed the most decrease in conifer, with about 29,700 acres affected, while the Sierra National Forest showed the largest amount of increase in conifer, with about 2,790 acres affected.

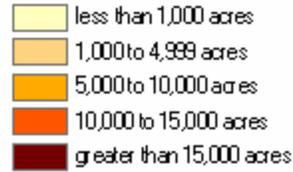


Total Vegetation Change by County

Decrease

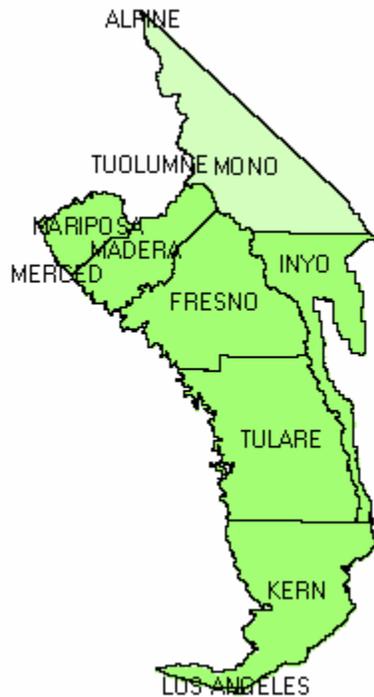


Decrease



- Tulare County had the greatest amount of decrease in vegetation, with about 56,700 acres
- Fire was the predominant cause of decrease in all counties

Increase



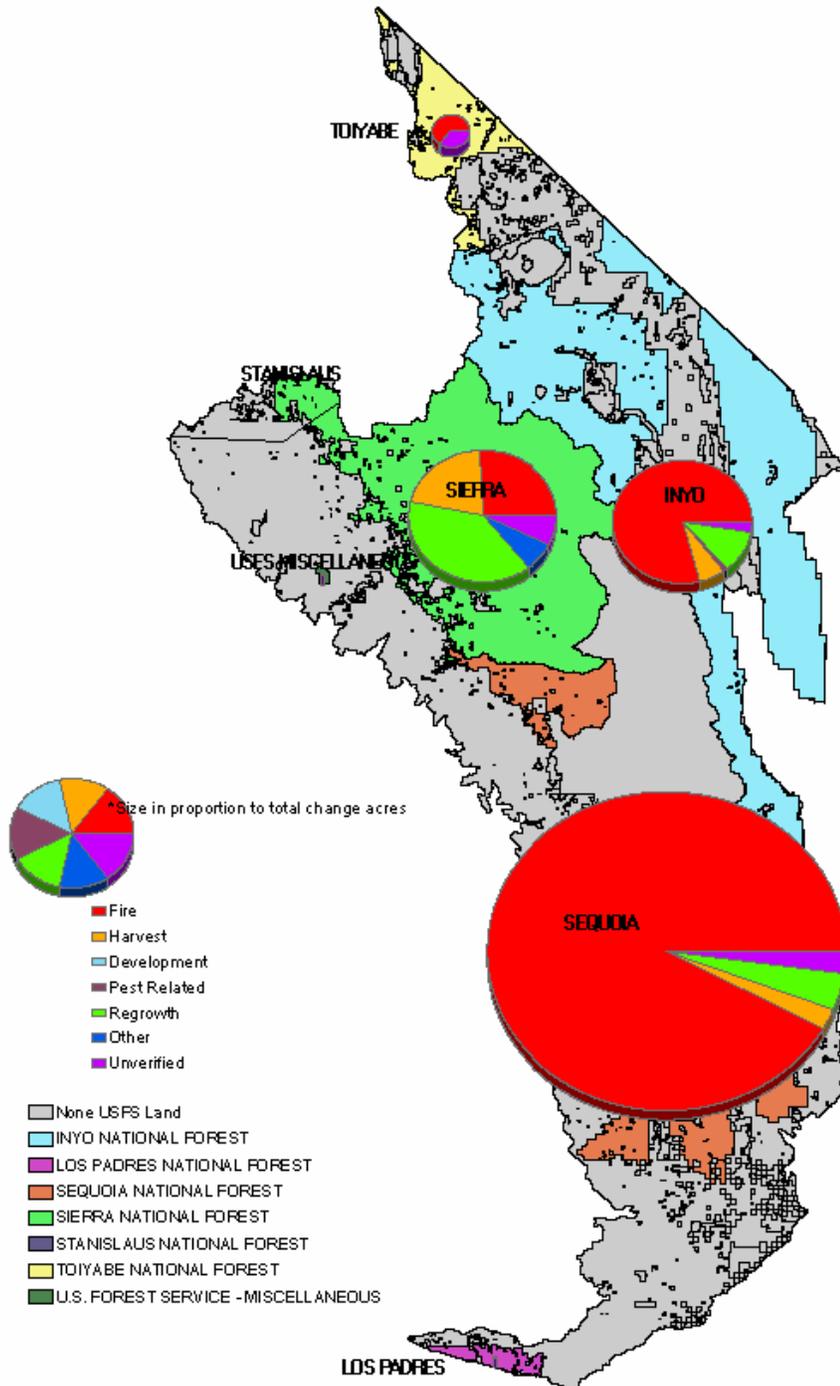
Increase



- Fresno County had the largest amount of increase in vegetation, with about 2,500 acres affected.
- The primary cause for increase in vegetation in all counties was regrowth.

Cause of Change by National Forest *

* size of pie charts are in proportion to the amount of change on each forest



- Fire was the predominant cause of vegetation change on the Sequoia, Inyo and the Toyabe, affecting about 36,800, 5,900 and 470 acres, respectively.
- Harvest accounted for some change within the Sierra, Sequoia and Inyo forests; the largest proportion of change was found on the Sierra (~1,700 acres).
- Regrowth was most evident on the Sierra NF (3,300 acres).

INTRODUCTION

The California Land Cover Mapping and Monitoring Program (LCMMP¹) is a collaboration between the USDA Forest Service (FS) and the California Department of Forestry and Fire Protection (CDF) to create seamless vegetation and monitoring data across all ownerships within the Forest and Rangeland vegetation types in California. This program uses Landsat Thematic Mapper (TM) satellite imagery to derive land cover change (vegetation decreases and increases) within five-year time periods. It also determines the cause of change through fieldwork, aerial photo interpretation and Geographic Information Systems (GIS) analysis. Monitoring data created by the LCMMP quantify changes in California's landscape and provide necessary information for regional assessment across jurisdictional boundaries. These data provide consistent, high quality information to help manage, assess and protect California's diverse vegetation resources at a low per acre cost (approximately 2 cents per acre).

Monitoring of land cover change occurs in one of five distinct project areas per year (Figure 1). Analysis is complete for all project areas in the first statewide cycle. Each project area will be revisited during the next statewide cycle. Land cover monitoring maps can be downloaded from <http://frap.cdf.ca.gov/data/frapgismaps/select.asp> or <http://www.fs.fed.us/r5/spf/about/fhp-change.shtml>. Reporting is complete or in progress for all areas. Completed reports can be downloaded from <http://frap.cdf.ca.gov/titles/publications.asp>. Additionally, an interactive mapping application is available for some project areas on a CDF internet map sever (IMS) at http://frap.cdf.ca.gov/projects/land_cover/monitoring/index.html.

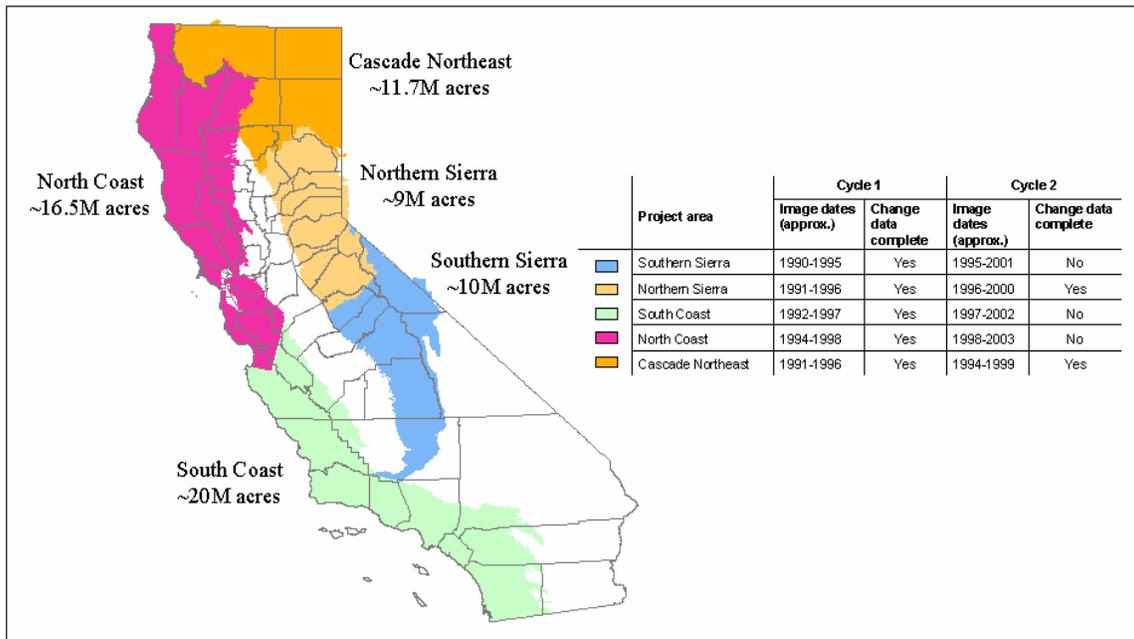


Figure 1. Location and extent of project areas with monitoring schedule

¹For additional information visit our web pages at http://frap.cdf.ca.gov/projects/land_cover/index.html or <http://www.fs.fed.us/r5/spf/about/fhp-change.shtml>

The FS and CDF have mapping, resource management and resource protection responsibilities across much of the non-irrigated and non-urban land in the Southern Sierra region. The FS manages most of the resource activities within the national forests, such as timber management, recreation, forest health programs, fire protection and grazing allotments. CDF is responsible for providing fire protection on most private and state lands, regulating timber harvests on private lands and monitoring resource conditions across all wildlands in the area. The LCMMP monitoring information provides a single consistent source of current landscape level and site-specific change to the FS and CDF as well as other interested federal agencies (e.g., Fish and Wildlife Service, National Park Service, Bureau of Land Management), state agencies (Fish and Game, Parks and Recreation, State Water Resources Control Board), county governments, city governments and other interested parties. The Southern Sierra project area covers 9.5 million acres, including large portions of Inyo, Fresno, Kern, Madera, Mariposa, Mono and Tulare Counties, as well as a very small piece of Los Angeles County. It also encompasses all or most of three national forests (Sierra, Inyo and Sequoia), a small portion of the Toiyabe National Forest and other federal, state and privately owned lands (Figures 2 and 3). This report assesses land cover changes on 9.3 million acres within conifer, hardwood, shrub/chaparral and grass/forb vegetation types. Although the total project area spans 9.5 million acres of land, 219,933 acres are not forest, shrub, chaparral or grass lands (e.g., urban, agriculture and water) and are not included in this analysis.

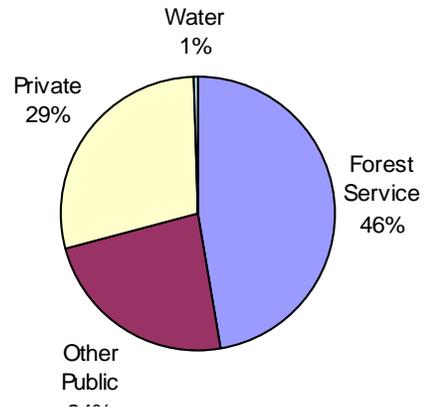


Figure 2. Land Ownership Distribution

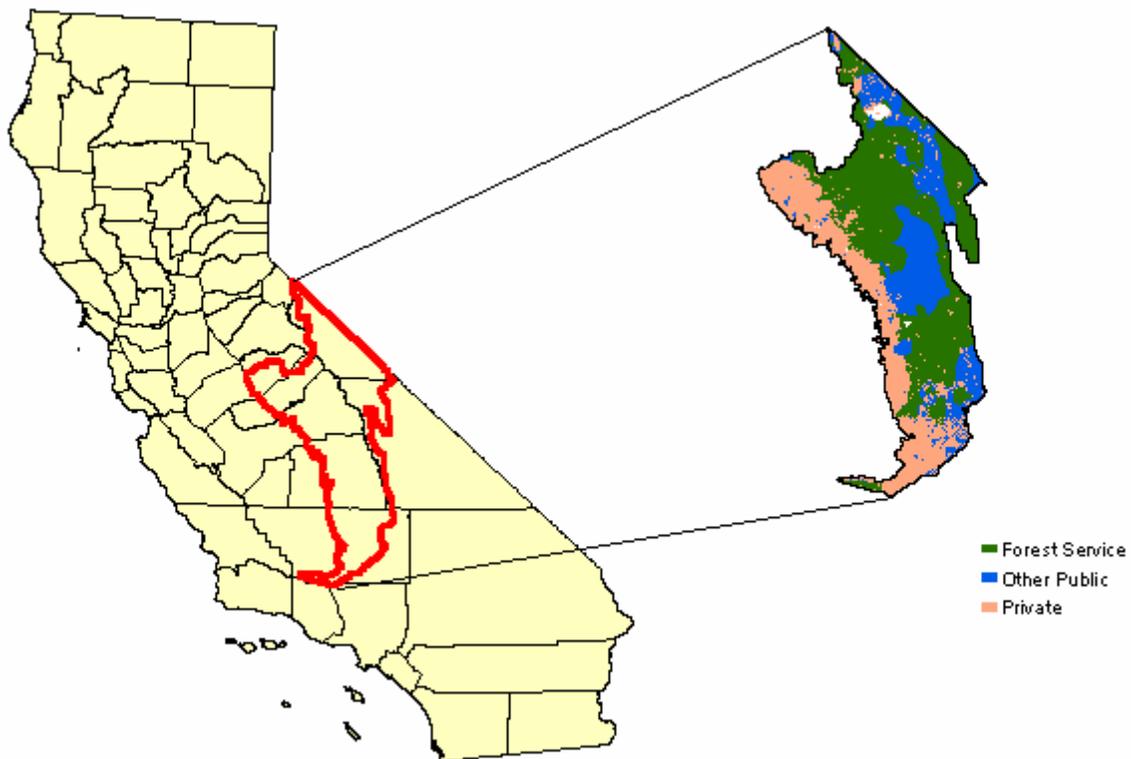


Figure 3. Location of Southern Sierra Project Area and corresponding land ownership.

Table 1 shows the proportion of each county covered by the project area. In this report, some counties are only partially analyzed, as the boundary of the Southern Sierra project area does not overlap completely with these counties. This is because project area boundaries are predominantly defined by ecological zones. Other factors are also taken into account in defining project area boundaries, such as national forest and TM scene boundaries. Additionally, agriculturally dominated areas are excluded from the project area.

Table 1. Acres of County Analyzed by Private and Public Ownership

County	Forest Service	Other Public	Private	Water	Total Acres Analyzed	Total Acres in County	% Analyzed
Alpine	1,128	43	114		1,285	474,383	0.27%
Fresno	988,092	363,569	363,972		1,715,633	3,851,458	44.55%
Inyo	791,789	256,278	14,128		1,062,196	6,539,207	16.24%
Kern	351,793	328,733	979,789		1,660,315	5,218,610	31.82%
Los Angeles		58	6,674		6,732	2,524,893	0.27%
Madera	413,530	15,666	350,292		779,488	1,377,927	56.57%
Mariposa	87,484	19,572	332,371		439,428	935,978	46.95%
Merced			469		469	1,263,276	0.04%
Mono	1,003,534	579,621	157,508	47,969	1,788,633	2,002,618	89.31%
Tulare	878,856	686,578	520,079		2,085,513	3,097,572	67.33%
Tuolumne	0	156			156	1,458,298	0.01%
Total	4,516,206	2,250,276	2,725,398	47,969	9,539,849	28,744,218	33.19%

CHANGE DETECTION MONITORING PROCEDURES

Images and Maps

The LCMMP uses two dates of TM imagery to derive land cover change. Change detection techniques interpret differences in spectral reflectance between image dates to produce a map depicting various levels of vegetation change. A difference in spectral reflectance (the amount of sunlight reflected from surface features to the satellite in space) between image dates indicates where change probably occurred (for further details, see Appendix B). For hardwood and conifer canopy cover (CC) loss, change classes are broken down into three categories: -71 to -100% CC (71 to 100% decrease in canopy cover), -41 to -70% CC and -16 to -40% CC. For hardwood and conifer canopy cover gain, change classes are broken down into two categories: +16 to +40% CC and +41 to +100% CC. In the shrub/chaparral and grass/forb vegetation types, the change classes are quantified as a decrease or increase in vegetation cover of 16% or greater (Figure 5; Table 2).

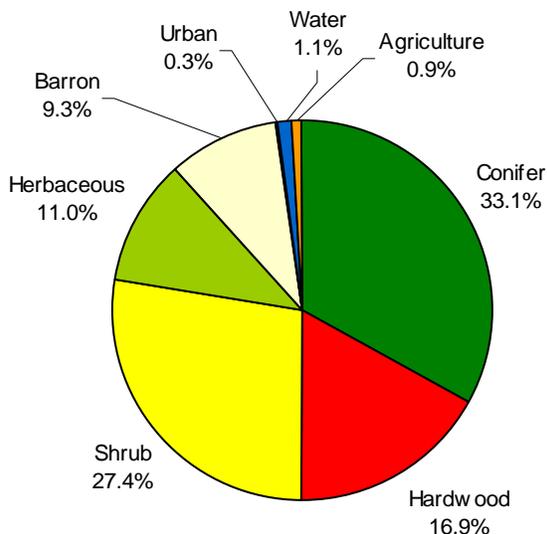


Figure 4. Proportion of each lifeform in project area.

The overall accuracy of the Southern Sierra change map is 85.4%. A total of 410 randomly selected change areas with known reference information were evaluated to assess the accuracy of the change map. Out of the 410 sample sites, 350 were correctly classified (see Appendix C for details on the accuracy assessment).

Vegetation data are used to determine which lifeforms, WHR types and CALVEG types are experiencing various magnitudes of change. “Lifeforms” are general land cover categories, such as conifer and hardwood (Figure 4). WHR stands for Wildlife Habitat Relationships System, and is a habitat classification system (e.g., Blue Oak Woodland, Klamath mixed conifer, and Coastal Scrub). CALVEG is a vegetation classification scheme based on the Classification and Assessment of Visible Ecological Groupings system. CALVEG types are more specific vegetation types (e.g., coast live oak and red fir) and are only used to summarize change on Forest Service land in this report (see Appendix A for more details on vegetation data). Every WHR and CALVEG type is represented by a lifeform (Appendix E and F).

Because many vegetation layers exist for different parts of the project area, the best available vegetation data are collected and combined into one seamless data layer. Vegetation layers not containing a WHR classification (Mayer and Laudenslayer, 1988) are given a WHR classification based on the information in that layer. LCMMP vegetation data are used for the entire project area, and contain lifeform, WHR and CALVEG type. See Appendix A for vegetation data sources.

Causes of Change

Once the final change map is complete, an attempt is made to verify cause on all change areas. Causes of change are verified through GIS analysis, fieldwork, photo interpretation and interpretation by land managers, landowners and other stakeholders. The GIS analysis uses the CDF forest practices database, FS stand record system and statewide fire history layer to attribute changes caused by harvests, regeneration and wildfires. Aerial survey mortality data are also often used to help identify pest-related changes. FS resource managers interpret change maps by applying local knowledge and fieldwork to identify sources of change on Forest Service lands. Similarly, University of California (UC) Integrated Hardwood Rangeland Management Program (IHRMP) personnel consult private landowners to verify causes of change in hardwood rangelands. Despite all of these efforts, complete cause verification is not always possible due to the large number of change areas, insufficient information and inaccessible lands (see Appendix B for more information on cause verification).

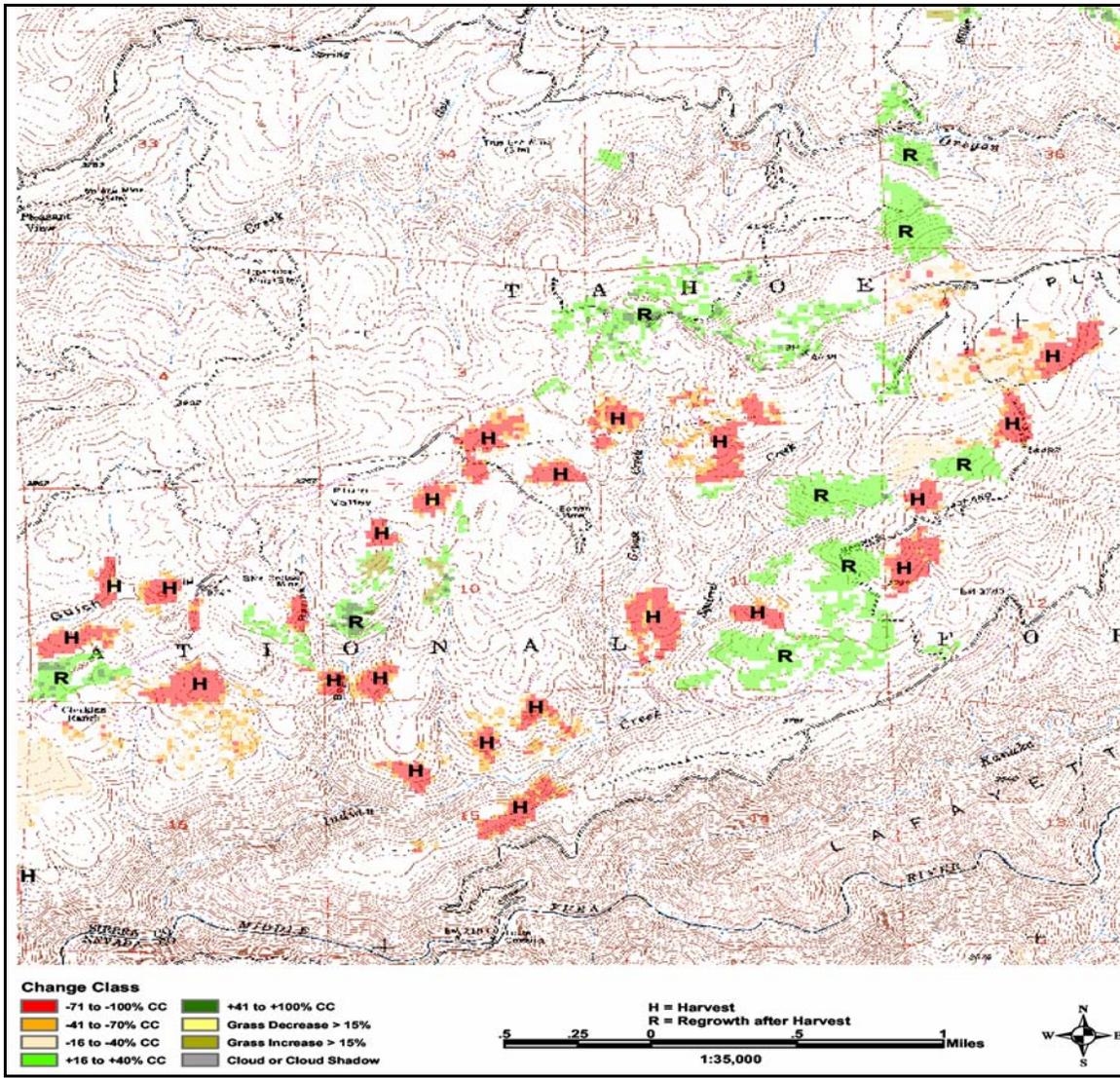


Figure 5. Portion of change map with typical harvest pattern in the REPLACE W/ SSCDP QUAD

INTERPRETING RESULTS

Interpreting Change

Mapped vegetation change indicates areas that have undergone some form of vegetation decrease or increase between image dates (refer to Figure 1a in Appendix A for exact dates). For hardwood and conifer cover loss, change classes are broken down into three categories: -71 to -100% CC (71 to 100% decrease in canopy cover), -41 to -70% CC and -16 to -40% CC. For hardwood and conifer cover gain, change classes are broken down into two categories: +16 to +40% CC and +41 to +100% CC. In the shrub/chaparral and grass/forb vegetation types, the change classes are quantified as a decrease or increase in vegetation cover of 16% or greater. The little to no change class indicates that change within the existing vegetation is either nonexistent or too subtle to detect. Table 2 describes the different change classes.

Multiple change classes are created to represent quantifiable levels of canopy cover change (Table 2). In the text and tables of the main report, however, changes are generalized and denoted simply as an “increase” or “decrease” in canopy cover. To see details on each change class, see the tables in Appendix G.

Table 2. Change Classes and Corresponding Description

CHANGE CLASS	DESCRIPTION
-71 to -100% CC	71 to 100% decrease in cover
-41 to -70% CC	41 to 70% decrease in cover
-16 to -40% CC	16 to 40% decrease in cover
+15 to -15% CC (Little or No Change)	Little or no change in cover
+16 to +40% CC	16 to 40% increase in cover
+41 to +100% CC	41 to 100% increase in cover
Shrub/Grass Decrease > 15%	16 to 100% decrease in shrub and/or grass
Shrub/Grass Increase > 15%	16 to 100% increase in shrub and/or grass
Cloud or Cloud Shadow	Cloud or cloud shadow (prevents change assessment)

Change values are reported in two ways: by area, or acres of change, and by proportion. A particular value in acres, such as 15,000 acres, indicates that 15,000 acres have undergone a vegetation change of 16% or more. Proportion refers to the amount of land undergoing a change relative to the total area of that particular vegetation type. As an example, if 1.3% of montane hardwood experienced a decrease in canopy cover, then 1.3% of the montane hardwood analyzed in the project area experienced a canopy cover change of 16% or more. This does not mean that 1.3% of montane hardwood is gone, that the canopy cover of montane hardwood has decreased by 1.3%, nor does it mean that the volume of montane hardwood has decreased by 1.3%.

Bear in mind that a detected vegetation cover increase, particularly a small increase, does not necessarily represent a gain in canopy or extent of a specific vegetation type. In some cases it represents understory regrowth or seasonal variation. The hardwood and shrub/chaparral types with low canopy cover are particularly sensitive to this phenomenon due to the presence of understory grasses and forbs within these types. Conversely, once vegetation fully covers a site, a change may not be detected even though biomass is increasing or stand structure is changing.

Results are particularly difficult to interpret for brushland types. Land uses that cause type conversion from brushlands (e.g., development) are most likely to result in detectable levels of vegetation change. Disturbances that do not result in type

conversion (e.g., changes in grazing or low intensity fires) may escape detection. For example, Figure 6 shows two fires that burned chaparral dominated areas in 1990. The monitoring process detected regrowth in the northernmost fire, but not in the southernmost, possibly because the area in the southernmost fire had burned and regrown prior to the second image date, causing the monitoring process to effectively “miss it” due to timing. Complex interactions between many factors such as site quality, vegetation composition and structure and fire intensity determine conditions at the two monitoring dates, and thus whether or not a change can be detected. Additional research is needed to explore potential improvements in the methodology for monitoring brushlands and changes due to seasonality.

Interpreting Cause

When interpreting results by cause, it is important to note that some ancillary data sources are more complete than others. Change caused by wildfire is generally easily verified because the FS and CDF maintain a fairly comprehensive fire perimeter data layer. Other sources of change are often more difficult to verify as data is unavailable and exhaustive fieldwork to identify all changes is impractical.

Cause is usually identified in one or more of three ways. First, ancillary data layers (e.g., FS plantation database, state fire history database, etc.) are used to identify cause. Second, regional experts familiar with a particular area are asked to identify causes of change. And lastly, photo interpretation is used to identify causes of vegetation change. Some error in cause attribution is expected as ground experts may make errors, ancillary data layers may not be perfect and photo interpreters may not be 100% correct.

Vegetation mapping errors may also contribute to change/cause combinations that seem unrealistic or inconsistent. For instance, Table 16 shows that ___ acres of shrub/chaparral change are caused by harvest. This could be due to the attribution errors mentioned in the previous paragraph, or this could be due to errors in the input vegetation data. In this case, it is likely that harvest is the identified cause of change according to data layers or ground experts, but because the input vegetation shows the area as shrub/chaparral, the area is classified as a shrub/chaparral decrease due to harvest.

Many causes are extremely difficult to verify, particularly causes that affect only small areas, such as development. However, just because a particular cause may have little or no affected area, it does not necessarily follow that this cause was not important. The unverified cause acreage could belong to any of the categories mentioned in this report, such as harvest or development. But the unverified cause could also be due to other causal agents, such as landslides, local mortality or management activity; therefore, acres listed for the various causes represent a minimum acreage of change.

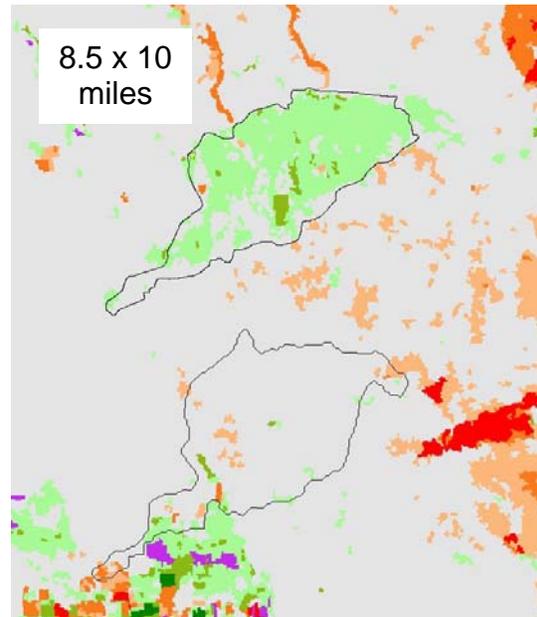


Figure 6. Comparison of two fires that burned in chaparral dominated areas.

Calculating a “net” change by simply comparing acres of decrease and increase does not necessarily provide a full and accurate portrait of change. Vegetation decreases are usually quick and dramatic, such as those caused by fire, harvest, and development, while increases in vegetation are often more gradual (particularly for hardwood and conifer), and may not increase at the minimum change class of at least 16% during a five year period. A decrease in large trees or other mature vegetation types will be followed by decades of net regrowth, although only the first five to ten years will have sufficient change in cover to register as an increase. Some decreases in vegetation, such as development and conversion to agriculture, are permanent losses to that particular vegetation. Comparing vegetation that is permanently lost or removed to vegetation that has temporarily increased mixes two different processes.

DISCUSSION OF RESULTS: ENTIRE PROJECT AREA

Of the 9.5 million acres in the project area, about 219,933 acres were bare rock, agriculture, water or urban. The remaining 9.3 million vegetated acres were composed of the conifer, hardwood, shrub/chaparral and grass/forb lifeforms, each covering about 3.1, 1.6, 2.6 and 1.1 million acres, respectively.

Approximately 98.9% of the vegetation in the project area does not exhibit a detectable change between 1995/1997 and 2001.

Decreases in vegetation cover occurred on approximately 0.97% (~90,442 acres) of the assessed 9.3 million acres in the project area and increases occurred on about 0.11% (~10,373 acres). Most of the change occurs in the conifer lifeform (Figure 7). All lifeforms show a larger area affected by a decrease in vegetation than by an increase in vegetation. Both the conifer and the hardwood lifeforms contain over twice as much decrease in vegetation as increase. See Appendix G for more detailed change tables.

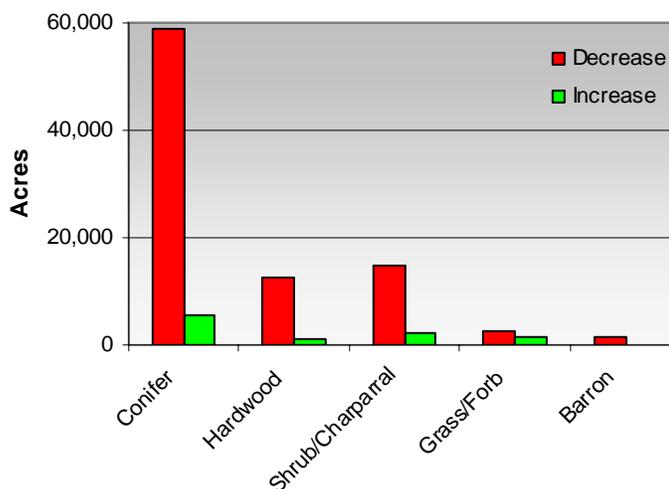


Figure 7. Acres of vegetation change by lifeform.

Cause of change was verified on 93,758 acres (93% of the vegetation change within the project area). Fire was the predominant cause of change, followed by regrowth and harvest. These causes were verified on about 81,030 acres, 7,371 acres and 3,423 acres, respectively. Cause of vegetation change could not be verified on 7,060 acres. See Appendix B for more information on unverified cause.

Conifers

The conifer lifeform encompassed about 3.1 million acres of the Southern Sierra project area. The predominant conifer types were pinyon-juniper, sierran mixed conifer, red fir, and subalpine fir; together they comprised about 74% of the conifer area. Pinyon-juniper covered about 22% of the conifer area as did the Sierran mixed conifer, red fir about 16% and subalpine fir about 14%. The remaining area was distributed among Jeffrey pine (9%), ponderosa pine (6.9%), lodgepole pine (6.6%), montane hardwood-conifer (2.4%), juniper (0.4%), white fir (<.03%), Douglas fir (<.01%) and closed cone pine-cypress (<. 01%).

Conifers showed a change in cover on 64,385 acres within the project area, or 2.0% of their total area (Table 3). Decreases occurred on 58,826 acres (1.9%) and increases occurred on 5,560 acres (0.2%). Cause was verified on 62,794 acres, or 95% of the conifer change. Fire was the overwhelming cause of conifer change (54,353 acres), followed by harvest (2,979 acres) and regrowth (4,806 acres).

Of the conifer types in the project area, pinyon-juniper displayed the largest area and proportion affected by a decrease in canopy cover with 24,942 acres affected (0.8%). The largest area and

proportion of increase were found in sierran mixed conifer having the largest area of increase with 3,117 acres affected (0.1%). Table 3 shows conifer cover change by WHR type.

Table 3. Acres of Conifer Cover Change by WHR Type

Conifer WHR Type	Decrease in Cover	% Decrease	Increase in Cover	% Increase	Total Change	Total % Change
Unknown Conifer Type	216	< 0.1	11	< 0.1	227	< 0.1
Closed Cone Pine-Cypress						
Douglas Fir	7	< 0.1	0	< 0.1	7	< 0.1
Jeffrey Pine	10,936	0.3	449	< 0.1	11,385	0.4
Juniper		< 0.1	2	< 0.1	2	< 0.1
Lodgepole Pine	1,124	< 0.1	18	< 0.1	1,142	< 0.1
Montane Hardwood-Conifer	779	< 0.1	131	< 0.1	911	< 0.1
Pinyon-Juniper	24,942	0.8	128	< 0.1	25,070	0.8
Ponderosa Pine	2,626	0.1	987	< 0.1	3,613	0.1
Red Fir	4,491	0.1	641	< 0.1	5,132	0.2
Subalpine Conifer	79	< 0.1	76	< 0.1	156	< 0.1
Sierran Mixed Conifer	13,625	0.4	3,117	0.1	16,741	0.5
White Fir						
Total	58,826	1.9	5,560	0.2	64,385	2.0

Fire was responsible for a majority of the conifer decrease within the project area and affected nearly every conifer type (Table 4). Pinyon-juniper (30,984 acres), Sierran mixed conifer (11,998), Jeffrey pine (10,379 acres) and red fir (3,707 acres) were the conifer types with the largest areas affected by fire. Sierran mixed conifer exhibits the largest area of change due to harvest. Harvest was a verified cause of change on 1,274 acres of sierran mixed conifer. Regrowth accounted for similar amounts of change within the conifer lifeform. Sierran mixed conifer, ponderosa pine and red fir had the largest areas of confirmed regrowth, with 2,845 acres, 936 acres and 569 acres affected, respectively. Within the cause category “Other” sierran mixed conifer showed minor areas of decrease (177 acres). Detailed cause information indicates that the primary source of these changes was site preparation. Development played a very minor role in conifer change, with only 154 acres verified, most of these in ponderosa pine (66 acres) and sierran mixed conifer (58 acres). Cause of change was unverified on 1,592 acres of conifer. Sierran mixed conifer (480 acres), red fir (320 acres), Jeffrey pine (208 acres) and Ponderosa pine (178 acres) had minor levels of unverified change. Although the unverified change could belong to any cause category, causes with the largest areas of change (i.e. fire, harvest, regrowth) were the most likely agents of change.

Table 4. Acres of Conifer Change by Cause and WHR Type

WHR Type	Fire	Harvest	Develop- ment	Pest Related	Regrowth	Other	Unverified Cause	All Causes
Closed Cone Pine-								
Cypress	192		4		11		20	227
Douglas Fir	7						0	7
Jeffrey Pine	10,379	441.5	12	7.3	329	8.9	208	11,385
Juniper							2	2
Lodgepole Pine	997	100.7		17.8	2		25	1,142
Montane Hardwood-								
Conifer	374	266.1	13	5.8	110	20.7	121	911
Pinyon-Juniper	24,835	1.1		39.1		40.2	155	25,070
Ponderosa Pine	1,797	541.3	66	51.8	936	43.1	178	3,613
Red Fir	3,707	354.6		5.1	569	176.7	320	5,132
Subalpine Conifer	68				4		83	156
Sierran Mixed Conifer	11,998	1,273.8	58	63.8	2,845	22.2	480	16,741
Total	54,353	2,979.0	154	190.7	4,806	311.9	1,592	64,386

At the county level, Tulare County showed the largest area of decrease in conifer cover, with 42,654 acres of decrease (4.2%; Table 5). Moderate areas of decreased conifer cover also occurred in Fresno County (6,657 acres; 0.8%) and Yuba County (3,652 acres; 1.3%). The largest area of increase in conifer cover takes place in Fresno County, with 2,112 acres, or 0.3%, showing an increase. Madera and Tulare Counties also contain moderate areas of increases in conifer cover, with 1,176 acres (0.4%) and 1,123 acres (0.1%) affected, respectively.

Table 5. Acres of Conifer Cover Change by County

County	Decrease in Cover	% Decrease	Increase in Cover	% Increase	Total Change	Total % Change
Mono	0	0.0	0	0.0	0	0.0
Alpine		0.0		0.0	0	0.0
Fresno	6,657	0.8	2,112	0.3	8,768	1.1
Inyo	156	0.1	10	0.0	167	0.1
Kern	3,642	1.3	530	0.2	4,172	1.5
Los Angeles		0.0		0.0	0	0.0
Madera	1,692	0.6	1,176	0.4	2,868	0.9
Mariposa	472	0.6	307	0.4	779	1.1
Mono	3,553	0.8	301	0.1	3,855	0.9
Tulare	42,654	4.2	1,123	0.1	43,777	4.4
Tuolumne		0.0		0.0	0	0.0
Total	58,826	1.9	5,560	0.2	64,385	2.0

Fire was responsible for large portions of conifer change in Tulare County (29,141 acres) and was the dominate cause of decrease in all counties (Table 6). Other counties with notable levels of conifer decrease caused by fire included Fresno (4,829 acres), Kern (3,525 acres) and Mono (3,012) Harvest was responsible for minor areas of decrease in Fresno County (1,186 acres) and has a role in most other counties. Other counties with notable levels of conifer decrease caused by harvest include Madera (626 acres), Tulare (583 acres) and Mono (474 acres caused by harvest). Regrowth was the verified cause of conifer increase on 1,957 acres in Fresno County, 1,164 acres in Madera County and 955 acres in Tulare County. Cause of change was unverified on 512 acres of conifer change in Fresno County and about 364 acres of conifer change in Plumas County.

Table 6. Acres of Conifer Change by Cause and County

County	Fire	Harvest	Develop- ment	Pest Related	Regrowth	Other	Unverified Cause	All Causes
Fresno	4,829	1,186	44	38	1,957	202	512	8,768
Inyo	91			46			29	167
Kern	3,525	15	12		379		241	4,172
Madera	891	626	13		1,164	46	127	2,868
Mariposa	233	95	70		286		95	779
Mono	3,012	474	14	17	65	49	223	3,855
Tulare	41,770	583		90	955	15	364	43,777
Total	54,353	2,979	154	191	4,806	312	1,592	64,385

When analyzed by ownership, Forest Service land showed the largest area of conifer cover decrease (35,899 acres; Table 7). Proportionally, private land showed a similar decrease at 1.4%. Increases in conifer cover were similar in proportion on both Forest Service and private land (0.2%).

Table 7. Acres of Conifer Canopy Cover Change by Owner

Owner	Decrease in Cover	% Decrease	Increase in Cover	% Increase	Total Change	Total % Change
Forest Service	35,899	1.6	4,813	0.2	40,712	1.8
Other Public	20,082	3.1	437	0.1	20,519	3.2
Private	2,844	1.4	310	0.2	3,154	1.5
Total	58,826	1.9	5,560	0.2	64,385	2.0

On Forest Service land, fire, regrowth and harvest were the main causes of change, verified on 32,522 acres, 4,261 acres and 2,774 acres, respectively (Table 8). Site preparation, which was included in the “other” cause category, was responsible for most of those 106 acres of change on Forest Service land. Harvest was verified on 205 acres of private land, and regrowth was verified on 126 acres. Cause of change could not be verified on 417 acres of private land and 909 acres of Forest Service land.

Table 8. Acres of Conifer Change by Cause and Owner

Owner	Fire	Harvest	Develop- ment	Pest Related	Regrowth	Other	Unverified Cause	All Causes
Forest Service	32,522	2,774	2	138	4,261	106	909	40,712
Other Public	19,617			42	418	177	266	20,519
Private	2,214	205	151	11	126	30	417	3,154
Total	54,353	2,979	154	191	4,806	312	1,592	64,385

Hardwoods

Hardwood vegetation types covered approximately 1.6 million acres within the project area. Over 94% of the hardwood lifeform was comprised of blue oak woodland, montane hardwood and blue-oak foothill pine (49.4%, 30.5% and 15.5%, respectively). The remainder of the hardwood lifeform was made up of valley oak woodland (2.0%), aspen (1.6%), montane riparian (1.2%), coastal oak woodland (<0.3), desert riparian (<0.3), joshua tree (<0.2) and valley foothill riparian (<0.1).

Between 1996/1997 and 2001 the hardwoods in the project area showed a canopy cover change on about 0.8% of their area (13,652 acres; Table 9). A decrease in cover of at least 16% was detected on 0.8% (12,617 acres) and an increase was detected on 0.1% (1,035 acres). The cause of change was verified on 11,702 acres, which was about 85.7% of the change in the hardwood lifeform. The overwhelming verified cause of change within the hardwood lifeform was fire, affecting 10,373 acres. Cause of change was unverified on 1,950 acres (Table 10).

Of the hardwoods within the project area, montane hardwood experienced the largest area and proportion of decrease in cover, with 6,229 acres affected (1.3%). Blue oak woodland also experienced a large decrease in area (4,255 acres). Though increases were relatively small for the hardwoods in the project area, montane hardwood and blue oak woodland had the largest area of increase, showing an increase in cover of 439 and 404 acres respectively. Table 9 shows change in cover by hardwood type.

Table 9. Acres of Hardwood Cover Change by WHR Type

WHR Type	Decrease in Cover	% Decrease	Increase in Cover	% Increase	Total Change	Total % Change
Aspen	100	0.4		0.0	100	0.4
Blue Oak-Foothill Pine	1,968	0.8	80	0.0	2,048	0.9
Blue Oak Woodland	4,255	0.5	404	0.1	4,659	0.6
Coastal Oak Woodland	0	0.0	4	0.1	5	0.1
Desert Riparian		0.0	0	0.0	0	0.0
Joshua Tree		0.0		0.0	0	0.0
Montane Hardwood	6,229	1.3	439	0.1	6,667	1.4
Montane Riparian	42	0.2		0.0	42	0.2
Valley Oak Woodland	22	0.1	108	0.3	131	0.4
Valley Foothill Riparian		0.0		0.0	0	0.0
Total	12,617	0.8	1,035	0.1	13,652	0.8

Fire was the major cause of change within the montane hardwood type (5,170 acres), and within the blue oak-foothill pine type (3,500 acres; Table 10). Most of the development was concentrated within the blue oak woodland and blue oak-foothill pine (3,387 acres and 1,685 acres, respectively). Overall, fire was the most significant agent of change in hardwood vegetation types.

Table 10. Acres of Hardwood Change by Cause and WHR Type

WHR Type	Fire	Harvest	Develop-ment	Pest Related	Regrowth	Other	Unverified Cause	All Causes
Aspen	97						3	100
Blue Oak-Foothill Pine	1,685		110		4	8	241	2,048
Blue Oak Woodland	3,387	45	18		177	60	972	4,659
Coastal Oak Woodland							5	5
Desert Riparian							0	0
Montane Hardwood	5,170	278	120	12	235	200	653	6,667
Montane Riparian	33					4	5	42
Valley Oak Woodland	0		4		54		72	131
Total	10,373	323	252	12	470	273	1,950	13,652

When examining the hardwood lifeform at the county level, the largest area and proportional decrease in cover occurred in Tulare County (6,087 acres; 1.3%; Table 11). Other counties with large areas or proportions of decrease in hardwood cover include Kern (2,116 acres; 0.6%) and

Fresno (1,826 acres; 0.6%). Areas of increase in hardwood cover were much smaller and were scattered fairly evenly throughout all of the counties in the project area.

Table 11. Acres of Hardwood Cover Change by County

County	Decrease in Cover	% Decrease	Increase in Cover	% Increase	Total Change	Total % Change
Fresno	1,826	0.6	166	0.1	1,992	0.7
Inyo	62	0.4	0	0.0	62	0.4
Kern	2,116	0.6	331	0.1	2,447	0.7
Los Angeles		0.0	5	0.6	5	0.6
Madera	1,063	0.5	262	0.1	1,324	0.6
Mariposa	1,425	0.7	182	0.1	1,606	0.8
Merced		0.0		0.0	0	0.0
Mono	38	0.2		0.0	38	0.2
Tulare	6,087	1.3	89	0.0	6,177	1.3
Tuolumne		0.0		0.0	0	0.0
Total	12,617	4.2	1,035	0.9	13,652	5.1

Most of the change in hardwood cover was caused by fire. This was especially evident in Tulare (5,437 acres), Kern (1,774 acres) and Fresno counties (1,312 acres; Table 12). Development was responsible for 116 acres of change in Mariposa County, and 103 acres of change in Madera County. Cause remains unverified on 549 acres in Kern County, 480 acres in Tulare County and 350 acres in Madera County.

Table 12. Acres of Hardwood Change by Cause and County

County	Fire	Harvest	Develop-ment	Pest Related	Regrowth	Other	Unverified Cause	All Causes
Fresno	1,312	86	12	5	125	192	261	1,992
Inyo	60						3	62
Kern	1,774		21		101	2	549	2,447
Los Angeles							5	5
Madera	639	62	103		98	72	350	1,324
Mariposa	1,052	11	116		124		303	1,606
Mono	38							38
Tulare	5,497	164		7	22	7	480	6,177
Total	10,373	323	252	12	470	273	1,950	13,652

When analyzed by ownership, private land displayed the largest area affected by a decrease in hardwood cover (4,864 acres; 0.5%; Table 13). Proportionally, however, the largest decreases in hardwood cover were seen on Forest Service and other public land (1.0%; 3,417 acres and 2.1%; 4,336 acres, respectively). Private land also exhibited the largest area affected by an increase in hardwood cover (728 acres; 0.1%).

Table 13. Acres of Hardwood Cover Change by Owner

Owner	Decrease in Cover	% Decrease	Increase in Cover	% Increase	Total Change	Total % Change
Forest Service	3,417	1.0	254	0.1	3,672	1.1
Other Public	4,336	2.1	53	0.0	4,389	2.1
Private	4,864	0.5	728	0.1	5,592	0.5
Total	12,617	3.6	1,035	0.2	13,652	0.8

Fire was the major cause of change across all ownerships, affecting 2,852 acres of Forest Service land, 3,307 acres of private land and 4,213 acres of “other public” land (Table 14). Development was found solely on private land and was verified on 252 acres. Change due to other causes was relatively insignificant within the hardwood lifeform. However, cause was unverified on 1,581 acres of private land and could conceivably belong to any of the verified cause categories.

Table 14. Acres of Hardwood Change by Cause and Owner

Owner	Fire	Harvest	Develop- ment	Pest Related	Regrowth	Other	Unverified Cause	All Causes
Forest Service	2,852	250		6	153	203	208	3,672
Other Public	4,213			6	4	4	162	4,389
Private	3,307	73	252	0	313	66	1,581	5,592
Total	10,373	323	252	12	470	273	1,950	13,652

Shrub/Chaparral

The shrub/chaparral lifeform encompassed 2.6 million acres within the Southern Sierra project area. The predominant shrub/chaparral types in the project area were sagebrush (40.4%) and desert scrub (19.6%); together they covered about 60% of the shrub/chaparral in the project area. The remainder was covered by the shrub/chaparral types of mixed chaparral (8.9%), alkali scrub (7.2%), montane chaparral (6.5%) and alpine dwarf shrub (6.3%). Low levels of bitterbrush (2.0%), chamise-redshank chaparral (1.1%), low sagebrush (0.3%), coastal scrub (<0.01%) and desert wash (<0.01%) were also present. Unknown shrub types made up 8.5% of the shrub/chaparral within the project area.

The shrub/chaparral within the project area displayed a decrease on 14,996 acres (9.0%) and an increase on 2,361 acres (2.3%; Table 15). The primary verified cause of change was fire, with 13,679 acres affected (Table 16). Regrowth was responsible for 2,033 acres of shrub/chaparral change. The cause of change was undetermined 929 acres of shrub/chaparral (Table 16).

Among the different shrub/chaparral types, sagebrush displayed the largest area of decrease in cover, with 6,482 acres of decrease (0.6%; Table 15). Montane chaparral also showed a large area of decrease in cover with 3,216 acres affected (1.9%). Proportionally, chamise-redshank chaparral showed the largest decrease in cover at 2.9% (815 acres). Montane chaparral exhibited the largest area of increase with 7,145 acres (0.7%). Proportionally, chamise-redshank chaparral showed the largest increase in cover at 3.5% (955 acres).

Table 15. Acres of Shrub/Chaparral Cover Change by WHR Type

WHR Type	Decrease in Cover	% Decrease	Increase in Cover	% Increase	Total Change	Total % Change
Alpine Dwarf Shrub	53	0.0	44	0.0	97	0.1
Alkali Scrub	173	0.1	5	0.0	178	0.1
Bitterbrush	995	1.9	625	1.2	1,620	3.1
Unknown Shrub Type	1,442	0.6	47	0.0	1,489	0.7
Chamise-Redshank Chaparral	815	2.9	140	0.5	955	3.5
Coastal Scrub		0.0	1	0.1	1	0.1
Desert Scrub	156	0.0	24	0.0	180	0.0
Desert Wash		0.0		0.0	0	0.0
Low Sagebrush		0.0		0.0	0	0.0
Mixed Chaparral	1,664	0.8	479	0.2	2,143	1.0
Montane Chaparral	3,216	1.9	333	0.2	3,549	2.1
Sagebrush	6,482	0.6	664	0.1	7,145	0.7
Total	14,996	9.0	2,361	2.3	17,357	11.3

About 88% of the shrub/chaparral change in the sagebrush and montane chaparral types was due to fire (Table 16). Regrowth was a verified cause of change on 599 acres of sagebrush and 243 acres of montane chaparral. Cause was undetermined on 8.3% of all of the shrub/chaparral change within the project area.

Table 16. Acres of Shrub/Chaparral Change by Cause and WHR Type

WHR Type	Fire	Harvest	Develop-ment	Pest Related	Regrowth	Other	Unverified Cause	All Causes
Alpine Dwarf Shrub	51					1	45	97
Alkali Scrub	173						5	178
Bitterbrush	994					624	1	1,620
Unknown Shrub Type	1,228	16	11		15	9	211	1,489
Chamise-Redshank Chaparral	713		15			126	101	955
Coastal Scrub							1	1
Desert Scrub	27					32	121	180
Mixed Chaparral	1,105	90			425	348	174	2,143
Montane Chaparral	3,125	13		23	243	2	143	3,549
Sagebrush	6,263	0	16	23	599	116	127	7,145
Total	13,679	120	42	46	2,033	508	929	17,357

Tulare and Mono Counties showed the largest decrease in shrub/chaparral cover, with decreases on 5,653 acres (3.1%) and 4,607 acres (0.5%) respectively (Table 17). Large decreases in shrub/chaparral cover were also seen in Inyo County (2,130 acres; 0.3%) and Fresno County (1,359 acres; 1.3%). Significant increases in shrub/chaparral cover occurred in the counties of Tulare (5,731 acres; 3.2%), Mono (4,674 acres; 0.5%), Inyo (3,400 acres; 0.5%), Fresno (1,812 acres; 1.7%) and Kern (1,031 acres; 0.2%).

Table 17. Acres of Shrub/Chaparral Cover Change by County

County	Decrease	% Decrease	Increase	% Increase	Total Change	Total % Change
Fresno	1,359	1.3	453	0.4	1,812	1.7
Inyo	2,130	0.3	1,270	0.2	3,400	0.5
Kern	762	0.1	269	< 0.1	1,031	0.2
Los Angeles		0.0	3	0.6	3	0.6
Madera	141	0.3	107	0.2	249	0.6
Mariposa	344	0.7	115	0.2	458	1.0
Mono	4,607	0.5	67	< 0.1	4,674	0.5
Tulare	5,653	3.1	78	< 0.1	5,731	3.2
Total	14,996	6.3	2,361	1.8	17,357	8.1

Fire was the primary cause of shrub/chaparral change in nearly every county within the project area (Table 18). In particular, the counties of Tulare (5,452 acres), Mono (4,483 acres), and Inyo (2,044 acres) showed notable levels of change due to fire. Regrowth accounted for 1,223 acres of shrub/chaparral change in Inyo County. Cause was unverified on 929 acres of shrub/chaparral within the project area, the largest portion of which was in Kern County (243 acres).

Table 18. Acres of Shrub/Chaparral Change by Cause and County

County	Fire	Harvest	Develop- ment	Pest Related	Regrowth	Other	Unverified Cause	All Causes
Fresno	856	17	1		424	347	166	1,812
Inyo	2,044			37	1,223		96	3,400
Kern	563		16		154	55	243	1,031
Los Angeles							3	3
Madera	97	7	9		106	4	26	249
Mariposa	184	36	16		92		130	458
Mono	4,483	0		10	1	95	84	4,674
Tulare	5,452	59			32	8	179	5,731
Total	13,679	120	42	46	2,033	508	929	17,357

The majority of decrease in shrub/chaparral cover occurred on forest service lands (8,746 acres; Table 19). The majority of increases were also seen on forest service land (1,192 acres).

Table 19. Acres of Shrub/Chaparral Cover Change by Owner

Owner	Decrease in Cover	% Decrease	Increase in Cover	% Increase	Total Change	Total % Change
Forest Service	8,746	0.7	1,192	0.1	9,937	0.8
Other Public	3,731	0.4	843	0.1	4,574	0.5
Private	2,520	0.5	327	0.1	2,847	0.6
Total	14,996	0.6	2,361	0.1	17,357	0.7

Fire was a verified cause of shrub/chaparral change on 1,957 acres of private land and 8,053 acres of Forest Service land (Table 20). Regrowth in shrub/chaparral occurred almost exclusively on Forest Service and other public land (1,008 and 830 acres; respectively). Development in shrub/chaparral occurred exclusively on private land (42 acres). About half of the unverified cause occurred on private land (451 acres).

Table 20. Acres of Shrub/Chaparral Change by Cause and Owner

Owner	Fire	Harvest	Develop- ment	Pest Related	Regrowth	Other	Unverified Causes	All Causes
Forest Service	8,053	50		37	1,008	371	418	9,937
Other Public	3,670			10	830	4	60	4,574
Private	1,957	69	42		195	132	451	2,847
Total	13,679	120	42	46	2,033	508	929	17,357

Grass/Forb and Non-Forested Other

The “Non-Forested Other” (NFO) category contains land classified as water, urban, agriculture and barren. In some instances, land classified as “barren” is actually sparsely vegetated grassland, and hence is able to undergo vegetation change. Additionally, there were a few instances where recent clearcuts have been classified as NFO (barren). Most of these areas had vegetation increase after the clearcut. Because of the confusion between these two lifeforms, they were combined. But because the NFO lifeform contains legitimately barren lands, no percentages of change are given due to the complexities of the calculation. See Appendix G for more details on the change in the grass/forb and NFO lifeform.

In the grass/forb and NFO lifeforms, fire was verified on 2,625 acres (Table 21). Regrowth was verified on 63 acres within these lifeforms. The cause of vegetation change was unverified on 2,589 acres.

At the county level fire was verified on 2,007 acres in Tulare County (Table 21). Regrowth was responsible for 42 acres of change in Mariposa County. Development was responsible 28 acres of change in Kern County.

Table 21. Acres of Grass/Forb and NFO Change by Cause and County

County	Fire	Harvest	Develop- ment	Regrowth	Other	Unverified Cause	All Causes
Fresno	137	0		12	17	67	233
Inyo	5					3	8
Kern	19		28	2	91	784	925
Los Angeles						6	6
Madera				0	2	461	463
Mariposa	0			42		1,005	1,048
Mono	458			2	4	144	607
Tulare	2,007	1		4	3	119	2,135
Total	2,625	1	28	63	117	2,589	5,423

Over 43% (2,372 acres) of the vegetation change in the grass/forb and NFO lifeform occurs on Forest Service land (Table 22). Fire was the major cause of change on Forest Service land, accounting for 2,006 acres of grass/forb/NFO change. Approximately 45% of the vegetation change in the grass/forb and NFO lifeform occurred on private land. The cause of change was unverified on the majority of private land (2,214 acres).

Table 22. Acres of Grass/Forb and NFO Change by Cause and Owner

Owner	Fire	Harvest	Development	Regrowth	Other	Unverified Causes	All Causes
Forest Service	2,006	1	2	14	5	343	2,372
Other Public	524		12	1	5	32	572
Private	95		14	48	107	2,214	2,479
Total	2,625	1	28	63	117	2,589	5,423

All Lifeforms

Table 23 offers an overview of all causes across the project area, showing all causes of vegetation change sorted by county. This includes the conifer, hardwood, shrub/chaparral, grass/forb and NFO lifeforms. In this way, a better understanding of each contributing cause and its magnitude compared to other causes can be obtained.

Fire was the predominant cause of change throughout the project area, verified on 81,030 acres or 80.4% of the change within the project area. Regrowth and harvest were the other significant causes of change, verified on 7,371 acres and 3,423 acres, respectively. Development was responsible for 476 acres of change throughout the project area. Cause remains unverified on 7,060 acres.

Tulare County experienced the most change due to fire, with 54,726 acres affected. Harvest primarily affected Fresno County (1,289 acres). Regrowth was verified on 2,518 acres in Fresno County, 1,368 acres in Madera County, 1,223 acres in Inyo County and 1,014 acres in Tulare County. Most of the change due to development was located in Mariposa and Madera counties (203 acres and 125 acres, respectively). Areas of change with an unverified cause were found throughout the project area.

Table 23. Acres of All Lifeform Change by Cause and County

County	Fire	Harvest	Development	Pest-related	Regrowth	Other	Unverified	All Causes
Fresno	7,134	1,289	57	43	2,518	758	1,005	12,805
Inyo	2,200			82	1,223		131	3,637
Kern	5,881	15	77		636	147	1,818	8,575
Los Angeles							14	14
Madera	1,627	695	125		1,368	124	964	4,903
Mariposa	1,470	142	203		544		1,533	3,892
Mono	7,991	474	14	26	68	148	451	9,174
Tulare	54,726	807		97	1,014	33	1,143	57,819
Total	81,030	3,423	476	249	7,371	1,209	7,060	100,818

DISCUSSION OF RESULTS: FOREST SERVICE LAND

In this portion of the report, in which Forest Service land was analyzed, CALVEG vegetation types are used instead of WHR vegetation types. This was done because Forest Service managers and personnel use the more detailed CALVEG classification. As CALVEG and WHR are different classification systems, it is not appropriate to compare the two. See Appendix A for more details on the WHR and CALVEG classification systems.

All Vegetation

Within the 9.5 million acres Southern Sierra project area, Forest Service land covers nearly 4.5 million acres. The Inyo National Forest (NF) covers around 1.8 million acres, the Sierra NF covers approximately 1.3 million acres, the Sequoia NF covers about 1.1 million acres and the Toiyabe NF covers about 200,000 acres. Small portions of the Los Padres and Stanislaus NF were also included within the project area; however, these forests were not analyzed in this project area, as they were covered more completely in another project area. The acres of change (17 for all non-analyzed forests) were included in the totals for national forest lands.

Overall, Forest Service land displayed a decrease in vegetation on 50,403 acres (1.1%) and an increase in vegetation on 6,289 acres (0.1%; Table 24). Cause has been verified on about 97% of the change on Forest Service land. Fire was verified on 45,434 acres, regrowth on 5,435 acres and harvest on 3,076 acres (Table 25). Cause of change was unverified on 1,878 acres or about 3.3% of the total conifer change within the project area.

Among the national forests, the Sequoia NF exhibited both the largest area as well as the highest proportion of decrease in vegetation, with 38,197 acres, or 3.4% affected (Table 24). The Sierra NF showed the largest area of increase in vegetation with 3,570 acres (0.3%) showing an increase.

Table 24. Acres of Change of All Vegetation by National Forest

Forest	Decrease	% Decrease	Increase	% Increase	Total Change	Total % Change
Inyo	6,642	0.4	934	0.1	7,576	0.4
Los Padres	3	0.0	3	0.0	6	0.0
Sequoia	38,197	3.4	1,638	0.1	39,835	3.5
Sierra	4,934	0.4	3,570	0.3	8,503	0.7
Stanislaus		0.0		0.0	0	0.0
Toiyabe	627	0.3	133	0.1	760	0.4
USFS Miscellaneous		0.0	11	0.2	11	0.2
Total	50,403	1.1	6,289	0.1	56,692	1.3

Examination of the causes of vegetation change on Forest Service land indicated that the majority of decrease due to fire was concentrated in the Sequoia NF, with 36,796 acres verified (Table 25). Regrowth was most prominent on the Sierra NF, with 3,337 acres verified. Harvest only accounted for around 5.4% of the total change on Forest Service land (3,076 acres), 57% of which occurred on the Sierra NF (1,765 acres). However, the cause of change could not be verified on 1,878 acres of National Forests.

Table 25. Acres of Change of All Vegetation by Cause and National Forest

Forest	Fire	Harvest	Develop- -ment	Pest- related	Regrowth	Other	Unverified Causes	All Causes
Inyo	5,961	474	2	99	771	62	205	7,576
Los Padres							6	6
Sequoia	36,796	837	2	49	1,327		824	39,835
Sierra	2,199	1,765		32	3,337	610	561	8,503
Stanislaus	478					12	270	760
Toiyabe							11	11
Total	45,434	3,076	5	181	5,435	685	1,878	56,692

Conifers

All Forest Service land within the project area exhibited a decrease in conifer canopy cover of 36,077 acres (1.6%) and an increase of 4,828 acres (0.2%; Table 26). Among the five national forests analyzed, the Sequoia NF showed the largest area of decrease in conifer cover, with 29,739 acres affected (4.4%). In conifer cover increases, the Sierra NF showed the largest area of increase with 2,798 acres (0.3%).

Of the conifer types within the national forests, singleleaf pinyon pine in the Sequoia NF showed the largest area and proportion affected by a decrease in canopy cover, with a decrease on 16,260 acres (17.2%; Table 26). Other CALVEG types displaying large areas or proportions of decrease include the Jeffrey pine and mixed conifer-fir on the Sequoia NF (8,027 acres; 8.0% and 3,074 acres; 1.8%, respectively), the Jeffrey pine on the Inyo NF (2,185 acres; 2.3%), and the ponderosa pine on the Sierra NF (1,766 acres; 1.3%). The largest increases in conifer canopy cover occurred in the mixed conifer-pine on the Sierra NF, with 1,215 acres showing an increase (0.9%). Proportionally, the largest increase occurred in the Jeffrey pine on the Toiyabe NF, which showed an increase on 3.6% of its area (95 acres).

Table 26. Acres of Conifer Cover Change by National Forest and CALVEG Type

Forest	CALVEG	Decrease	% Decrease	Increase	% Increase	Total Change	Total % Change
Inyo	BP		0.0		0.0	0	0.0
	FP	16	0.1		0.0	16	0.1
	JP	2,185	2.3	32	< 0.1f	2,217	2.3
	LP	99	0.1	2	< 0.1f	102	0.1
	MF	86	0.3	311	1.0	397	1.3
	MP		0.0		0.0	0	0.0
	PJ	245	0.1	51	< 0.1f	296	0.1
	RF	22	0.1	13	0.1	35	0.2
	SA	10	< 0.1f		0.0	10	< 0.1f
	Total		2,663	0.4	409	0.1	3,073
Sequoia	BT		0.0	3	0.4	3	0.4
	FP		0.0		0.0	0	0.0
	JP	8,027	8.0	285	0.3	8,312	8.3
	LP	56	0.5	4	< 0.1f	60	0.5
	MB		0.0	5	< 0.1f	5	< 0.1f
	MF	3,074	1.8	841	0.5	3,915	2.2
	MP	483	0.7	151	0.2	634	0.9
	PD		0.0		0.0	0	0.0
	PJ	16,260	17.2	2	< 0.1f	16,262	17.2
	PP	1,119	1.7	51	0.1	1,170	1.7
	RF	720	0.5	164	0.1	884	0.6
	SA	0	0.2		0.0	0	0.2
	Total		29,739	4.4	1,507	0.2	31,246
Sierra	BT		0.0		0.0	0	0.0
	JP	38	0.1			38	0.1
	LP	50	0.3	1	< 0.1f	51	0.3
	MB		0.0		0.0	0	0.0
	MF	587	0.4	567	0.3	1,155	0.7
	MP	541	0.4	1,215	0.9	1,757	1.3
	PD	12	0.2		0.0	12	0.2
	PP	1,766	1.3	877	0.6	2,642	1.9
	RF	269	0.2	138	0.1	407	0.2
	SA	7	< 0.1f		0.0	7	< 0.1f
Total		3,269	0.4	2,798	0.3	6,067	0.7
Stanislaus	DP		0.0		0.0	0	0.0
	PP		0.0		0.0	0	0.0
	Total	0	0.0	0	0.0	0	0.0
Toiyabe	JP	11	0.4	95	3.6	106	4.0
	LP		0.0	2	< 0.1f	2	< 0.1f
	MF	80	2.2	5	0.1	85	2.3
	PJ	284	0.7	7	< 0.1f	291	0.7
	SA	31	0.4	4	< 0.1f	35	0.4
	Total	406	0.7	112	0.2	519	0.8
All Forests		36,077	1.6	4,828	0.2	40,905	1.8

*CALVEG types composing less than 5% of the conifer lifeform in the particular forest are combined into this category

**See Appendix F for CALVEG code descriptions

***Includes acres from Inyo, Lassen, Sierra, and Toiyabe National Forest

On the Sequoia NF fire was the verified cause of change on over 92% of the total conifer change, occurring on 28,896 acres (Table 27). Fire was also responsible for about 68% of the change on the Inyo NF (2,089 acres). Regrowth was a verified cause of 44% of the change in the Sierra NF, with 2,649 acres verified. Harvest accounts for 28% of the change on the Sierra NF (1,723 acres). Harvest accounted for only modest amounts of change on the other forests. A minor amount of the cause of change was unverified on all the forests.

Over half of the decrease due to fire on the Sequoia NF was found in the singleleaf pinyon pine type, with 16,259 acres affected (Table 27). Fire also accounts for large amounts of change in the Jeffrey pine (8,012 acres), mixed conifer-fire (2,631 acres) and ponderosa pine (1,026 acres) on the Sequoia NF. Fire was found almost exclusively in the Jeffrey pine type (1,731 acres) on the Inyo NF. Regrowth was verified on 1,194 acres of mixed conifer-pine and 847 acres of ponderosa pine on the Sierra NF. Regrowth was verified on 675 acres of mixed conifer-fir and 269 acres of Jeffrey pine on the Sequoia NF. Harvest was verified on 2,528 acres of mixed conifer-pine and 1,702 acres of eastside pine on the Plumas NF. Harvest was also verified on 643 acres of ponderosa pine in the Sierra NF. The ponderosa pine on the Sierra NF had 64 acres of change categorized as “other”. Detailed cause information showed that the majority of this change was caused by site preparation. Cause of change could not be verified on 241 acres of mixed conifer-fir on the Sequoia NF, and 118 acres of ponderosa pine in the Sierra NF.

Table 27. Acres of Conifer Change by Cause, National Forest and CALVEG Type

Forest	CALVEG	Fire	Harvest	Development	Pest-related	Regrowth	Other	Unverified	All Causes
Inyo	FP	13						3	16
	JP	1,731	437		7	32	5	4	2,217
	LP	68	22		10			3	102
	MF	62	16	2	6	311			397
	PJ	185			39		39	33	296
	RF	22				13			35
	SA	9						2	10
	Total	2,089	474	2	63	356	44	44	3,073
Sequoia	BT							3	3
	JP	8,012	4			269		26	8,312
	LP	18	38			1		4	60
	MB					1		4	5
	MF	2,631	342		26	675		241	3,915
	MP	393	64		17	121		38	634
	PJ	16,259	1					2	16,262
	PP	1,026	77		4	46		17	1,170
	RF	556	107			158		63	884
	SA	0							0
Total	28,896	633	0	48	1,271	0	398	31,246	
Sierra	JP	15						22	38
	LP		42		8	1		1	51
	MF	23	514		7	529	5	77	1,155
	MP	228	277			1,194		58	1,757
	PD	5					6		12
	PP	962	643		8	847	64	118	2,642
	RF		248		5	78		76	407
	SA							7	7
Total	1,234	1,723	0	27	2,649	75	359	6,067	
Toiyabe	JP	11					0	95	106
	LP							2	2
	MF	80						5	85
	PJ	284						7	291
	SA	31						4	35
Total	406	0	0	0	0	0	0	112	519
All Forests	32,625	2,831	2	138	4,276	119	914	40,905	

*CALVEG types composing less than 5% of the conifer lifeform in the particular forest are combined into this category

**See Appendix F for CALVEG code descriptions

***Includes acres from Inyo, Lassen, Sierra, and Toiyabe National Forest

Hardwoods

All of the Forest Service land within the project area displayed a hardwood canopy cover decrease on 3,238 acres (1.1%) and an increase on 236 acres (0.1%). Approximately two-thirds of the decreases in hardwood cover on Forest Service land occurred in the Sequoia NF, which showed 2,073 acres of decrease, or 1.4% (Table 28). The cause for most of this decrease in canopy cover was fire (Table 29). Increases in hardwood cover were relatively small, with the largest amount seen on the Sierra NF (176 acres: 0.1%).

The largest area of decrease in hardwood cover was found in the canyon live oak and blue oak on the Sequoia NF, (1,101 acres; 1.1%; and 915 acres; 3.1%, respectively). Canyon live oak also showed large areas of decrease on the Stanislaus NF, with 912 acres (1.4%) affected.

Table 28. Acres of Hardwood Canopy Cover Change by National Forest and CALVEG Type

Forest	CAL VEG	Decrease	% Decrease	Increase	% Increase	Total Change	Total % Change
Inyo	QC		0.0		0.0	0	0.0
	QE		0.0		0.0	0	0.0
	QK		0.0		0.0	0	0.0
	QO		0.0		0.0	0	0.0
	QQ	70	0.3		0.0	70	0.3
	Total		70	0.3	0	< 0.1f	70
Sequoia	QC	1,101	1.1	43	< 0.1f	1,144	1.1
	QD	915	3.1	3	< 0.1f	918	3.1
	QF		0.0		0.0	0	0.0
	QK	25	0.6	3	0.1	28	0.6
	QO	32	5.9		0.0	32	5.9
	QW	0	< 0.1f		0.0	0	0.0
	Total		2,073	1.4	49	< 0.1f	2,122
Sierra	QC	912	1.4	132	0.2	1,044	1.7
	QD	85	0.2	45	0.1	130	0.3
	QK	1	< 0.1f		0.0	1	< 0.1f
	QO	4	0.5		0.0	4	0.5
	QW	92	0.7		0.0	92	0.7
	Total		1,095	0.9	176	0.1	1,271
Stanislaus	QC		0.0		0.0	0	0.0
	QD		0.0		0.0	0	0.0
	QW		0.0		0.0	0	0.0
	Total		0	0.0	0	0.0	0.0
Toiyabe	QQ		0.0		0.0	0	0.0
	Total		0	0.0	0	0.0	0.0
USFS Miscellaneous	QD		0.0	11	0.3	11	0.3
	Total		0	0.0	0.3	11	0.3
All Forests		3,238	1.1	236	0.1	3,474	1.2

*CALVEG types composing less than 5% of the conifer lifeform in the particular forest are combined into this category

**See Appendix F for CALVEG code descriptions

***Includes acres from Inyo, Lassen, Sierra, and Toiyabe National Forest

In the Sequoia NF more than 87% of the hardwood change was attributed to fire (Table 29). Approximately 65% of the hardwood change in the Sierra NF was due to fire. Other cause categories, such as harvest or regrowth, account for very insignificant amounts of change. CALVEG types with large areas affected by fire included blue oak (903 acres) and canyon live oak (895 acres) on the Sequoia NF, as well as canyon live oak (661 acres) on the Sierra NF.

Table 29. Acres of Hardwood Change by Cause, National Forest and CALVEG Type

Forest	CALVEG	Fire	Harvest	Pest-related	Regrowth	Other	Unverified	All Causes
Inyo	QQ	70						70
	Total	70						70
Sequoia	QC	895	161	1	16		71	1,144
	QD	903					14	918
	QK	25					3	28
	QO	32						32
	Total	1,855	161	1	16	0	89	2,122
Sierra	QC	661	31	5	121	178	48	1,044
	QD	80	2				46	130
	QK					1		1
	QO					4		4
	Total	825	32	5	121	189	99	1,271
USFS								
Miscellaneous	QD						11	11
	Total						11	11
All Forests		2,750	193	6	138	189	199	3,474

*CALVEG types composing less than 5% of the conifer lifeform in the particular forest are combined into this category

**See Appendix F for CALVEG code descriptions

***Includes acres from Inyo, Lassen, Sierra, and Toiyabe National Forest

Shrub/Chaparral

Combined, the five national forests in the project area showed a decrease on 8,746 acres of shrub/chaparral cover (0.7%; Table 30). Increases in shrub/chaparral cover on Forest Service land occurred on 1,192 acres, or 0.1%. The Sequoia NF had the largest decrease by both area and proportion, with 4,239 acres, or 2.3%, exhibiting a decrease. The largest area of increase in shrub/chaparral cover was found on the Sierra NF, with 583 acres displaying an increase (0.7%).

Among the CALVEG types in the national forests, upper montane mixed chaparral in the Sequoia NF experienced the largest area of decrease (3,043 acres; 3.3%). The largest proportion of decrease was seen in the chamise on the Sequoia NF, with a 7.1% decrease (524 acres). The largest increases in shrub/chaparral cover occurred in the ceanothus mixed chaparral on the Sierra NF (395 acres; 1.0%). Bitterbrush and basin sagebrush on the Inyo NF also increased 203 acres (1.8%) and 202 acres (0.0%), respectively.

Table 30. Acres of Shrub/Chaparral Cover Change by National Forest and CALVEG Type

Forest	CALVEG	Decrease	% Decrease	Increase	% Increase	Total Change	Total % Change
Inyo	AX	53	0.0	44	0.0	97	0.1
	BB	628	2.2	203	0.7	830	2.8
	BC	173	4.9		0.0	173	4.9
	BM	482	0.5	21	0.0	503	0.6
	BS	2,472	0.6	202	0.0	2,674	0.6
	CM		0.0		0.0	0	0.0
	CX	30	0.2	46	0.4	76	0.6
	DX	24	0.0	4	0.0	27	0.0
	Total		3,861	0.4	519	0.1	4,380
Sequoia	BR		0.0		0.0	0	0.0
	BS	7	0.1		0.0	7	0.1
	CA	524	7.1		0.0	524	7.1
	CC	666	0.9	10	0.0	676	0.9
	CH		0.0	4	0.1	4	0.1
	CM		0.0		0.0	0	0.0
	CX	3,043	3.3	56	0.1	3,099	3.4
	Total		4,239	2.3	70	0.0	4,310
Sierra	AX		0.0		0.0	0	0.0
	BS		0.0		0.0	0	0.0
	CA	17	0.7		0.0	17	0.7
	CC	524	1.3	395	1.0	919	2.3
	CM	14	0.1	20	0.1	34	0.1
	CX	9	0.1	169	1.4	178	1.5
	Total		564	0.7	583	0.7	1,148
Stanislaus	CA		0.0		0.0	0	0.0
	CC		0.0		0.0	0	0.0
	CX		0.0		0.0	0	0.0
	Total		0	0.0	0	0.0	0.0
Toiyabe	AX		0.0		0.0	0	0.0
	BB	40	0.7	0	0.0	41	0.7
	BM		0.0		0.0	0	0.0
	BS	38	0.1	18	0.0	56	0.1
	CM		0.0		0.0	0	0.0
	CX	2	0.0		0.0	2	0.0
	CZ		0.0		0.0	0	0.0
	Total		81	0.1	18	0.0	99
All Forests		8,746	0.7	1,192	0.1	9,937	0.8

*CALVEG types composing less than 5% of the conifer lifeform in the particular forest are combined into this category

**See Appendix F for CALVEG code descriptions

***Includes acres from Inyo, Lassen, Sierra, and Toiyabe National Forest

On Forest Service land, fire was the largest verified cause of shrub/chaparral change, with 8,053 acres, or over 80% of the total change, verified to be fire (Table 31). Regrowth was another major cause of change, with 1,008 acres affected. The cause of change remains unverified on 418 acres. Most of the change in shrub/chaparral due to fire was located on the Sequoia NF and the Inyo NF (4,081 acres and 3,763 acres, respectively). Most of the verified regrowth was found on the Sierra NF and the Inyo NF (555 acres and 414 acres, respectively).

Fire was the verified cause of change on 3,017 acres of upper montane mixed chaparral in the Sequoia NF, and on 2,412 acres of basin sagebrush in the Inyo NF (Table 31). Regrowth was verified on 381 acres of ceanothus mixed chaparral and 156 acres of upper montane mixed chaparral in the Sierra NF. On the Inyo NF 203 acres of bitterbrush and 190 acres of basin sagebrush were verified to be regrowth. Other forests and CALVEG types within the project area show little, if any, change for this time period.

Table 31. Acres of Shrub/Chaparral Change by Cause, National Forest and CALVEG Type

Forest	CALVEG	Fire	Harvest	Pest-related	Regrowth	Other	Unverified	All Causes
Inyo	AX	51			1		45	97
	BB	627			203		1	830
	BC	173						173
	BM	482			1	3	17	503
	BS	2,412	0	13	190	2	57	2,674
	CX	7		23	19		27	76
	DX	12				11	4	27
	Total	3,763	0	37	414	16	150	4,380
Sequoia	BS	7						7
	CA	455					68	524
	CC	603	41		3		29	676
	CH						4	4
	CX	3,017	1		36		46	3,099
	Total	4,081	42	0	39	0	147	4,310
Sierra	CA	17						17
	CC	122	4		381	341	70	919
	CM		2		18		14	34
	CX	0	3		156	2	17	178
	Total	140	9	0	555	343	101	1,148
Toiyabe	BB	40					0	41
	BS	26				12	18	56
	CX	2						2
	Total	69	0	0	0	12	19	99
All Forests		8,053	50	37	1,008	371	418	9,937

*CALVEG types composing less than 5% of the conifer lifeform in the particular forest are combined into this category

**See Appendix F for CALVEG code descriptions

***Includes acres from Inyo, Lassen, Sierra, and Toiyabe National Forest

DATA AVAILABILITY

The land cover monitoring data are available in Arc/Info GRID format and the cause data are available in Arc/Info polygon format. These data are available in UTM zone 10 and Albers projections using the North American datum of 1927 (NAD27). To obtain these data, visit the CDF-FRAP website at <http://frap.cdf.ca.gov> or the State and Private Forestry website at <http://www.fs.fed.us/r5/spf/about/fhp-change.shtml>, or contact CDF-FRAP at (916) 327-3939 or the USDA Forest Service at (916) 454-0803.

TERMINOLOGY

CALVEG – A vegetation classification scheme based on the Classification and Assessment with Landsat of Visible Ecological Groupings system. This classification system, developed by the USDA Forest Service, describes existing vegetation communities. It is appropriate for mapping vegetation using Landsat TM imagery and recognizes eight regions within California.

Change Classes – Categorical classes of vegetation change used for this program. These levels are relative amounts of change in vegetation cover (a -16 to -40% CC has less vegetation change than a -41 to -70% CC). The Cloud/Shadow class includes areas covered by clouds, cloud shadows and terrain shadows.

Co-registration – The process of aligning pixels in one date of imagery to the corresponding pixels in another date of imagery that are in the same path and row.

Landsat TM Imagery – Thematic Mapper image data from the Landsat satellite. Each image covers approximately 13,225 square miles, has a pixel resolution of 900 square meters (30 m on a side) and contains seven bands of data. Six of the bands (bands 1-5 and band 7) contain information on the amount of reflected sunlight from ground features within specific wavelengths. The sixth band is a thermal band and is not used in the change detection process.

Lifeform – A plant community aggregation into the broad land cover classes of conifer, hardwood, shrub and grass.

Minimum Mapping Unit – The minimum size or dimensions for features to be mapped as lines or areas.

Mosaic – The process of piecing together several images into one larger image.

Nearest Neighbor Resampling – A resampling method where the output pixel value is the same as the input pixel value, but whose coordinates are closest to the resampled coordinates of the output pixel.

Pixel – The smallest unit of information in an image or raster map, also referred to as a cell in an image.

Radiometric Correction – The process of correcting variations in atmospheric conditions and sun angles in multiple dates of imagery.

Supervised Classification – A process aggregating pixels into classes based on training data (known areas representing the different classes) and multivariate statistics.

Thresholding – A process in which easily identified change classes (large increases and decreases in vegetation, little or no change) are masked out in order to reduce the number of pixels submitted to the classifier.

Unsupervised Classification – Classification algorithms that examine the unknown pixels in an image and aggregate them into a number of classes based on the natural groupings or clusters present in the image values.

WHR – A vegetation classification scheme based on the California Wildlife Habitat Relationships System. This classification system describes wildlife habitats of vertebrate animals and tends to have broad vegetation classes.

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APPENDIX A – DATA SOURCES

Image Data

TM imagery provides the base data for deriving changes in vegetation cover. The Southern Sierra project area requires six TM images from each date (12 total TM images). Images for each year are selected as close to the anniversary date as possible to minimize differences in vegetation moisture content and shadow effects. Images are also selected for minimal cloud coverage and overall image quality. TM imagery consists of thousands of pixels, each having a spatial resolution of 900 m² (30 m on each side) or approximately 1/5 of an acre. Figure 1a shows the path and row (World Reference System), image boundaries and date for the imagery used in Southern Sierra project area.

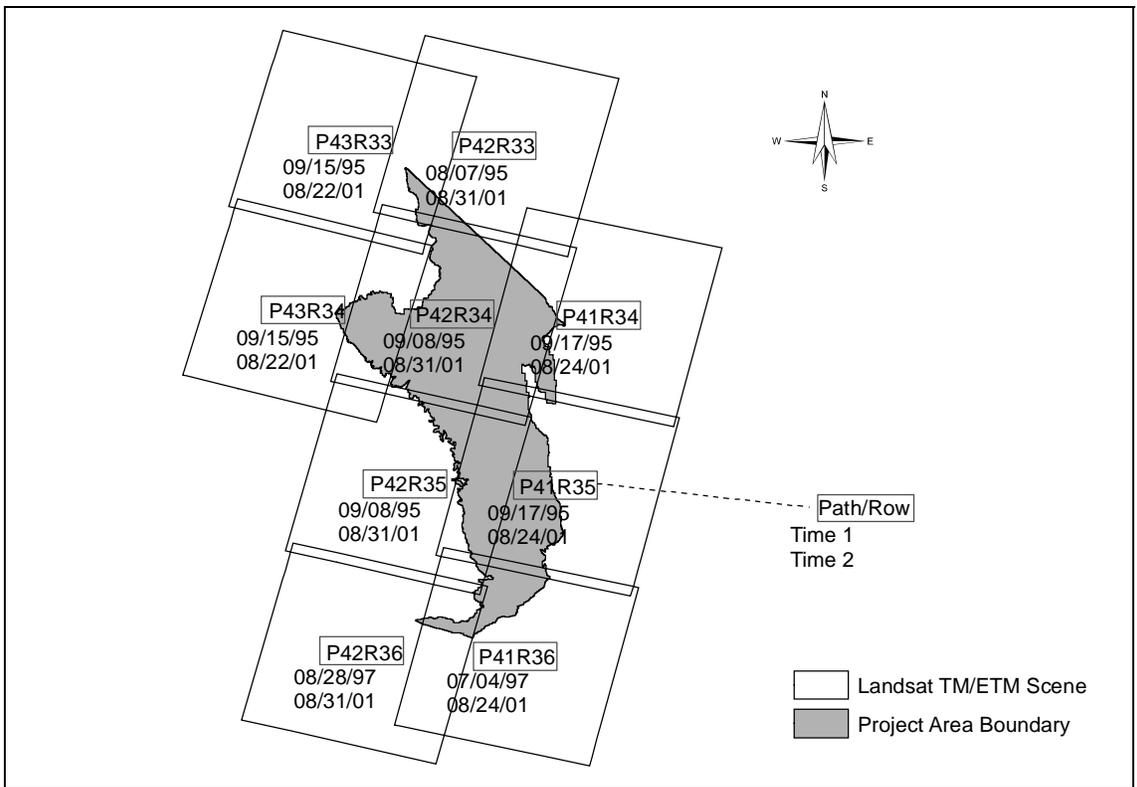


Figure 1a. TM imagery for the Southern Sierra Project Area.

Vegetation Data

Vegetation data are used to determine which lifeforms, WHR types and CALVEG types are experiencing various magnitudes of change. “Lifeforms” are general land cover categories, such as conifer and hardwood (Figure 2a). WHR stands for Wildlife Habitat Relationships System, and is a habitat classification system (e.g., Blue Oak Woodland, Ponderosa Pine, and Coastal Scrub). Every WHR type is represented by a lifeform (See Appendix E for WHR types and corresponding lifeforms). The more specific CALVEG types approximate alliance level and usually correspond to the primary overstory species. CALVEG is the principal label mapped and used by the LCMMP, so only LCMMP vegetation data carries the CALVEG label. Because the CALVEG label is more specific, it is not possible to extrapolate, or crosswalk, CALVEG types from WHR types or other vegetation labels from non-LCMMP

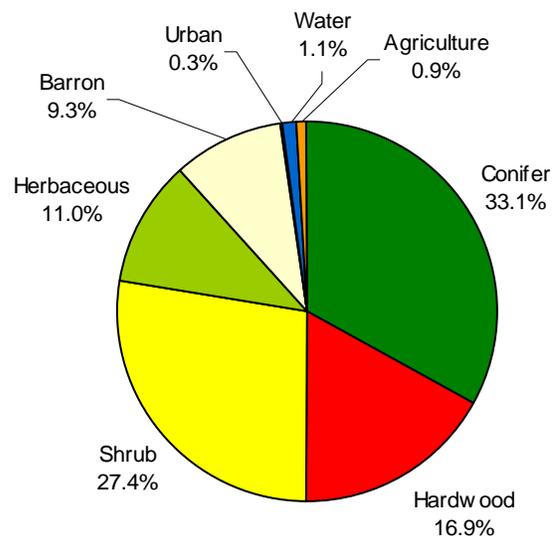


Figure 2a. Proportion of each lifeform in project area.

vegetation layers. However, WHR types can be ascertained, or crosswalked, from CALVEG labels, which is the current method for obtaining WHR types in areas mapped by LCMMP.

For the analysis of the Southern Sierra project area, CALVEG types were analyzed only on Forest Service land, because Forest Service managers and personnel prefer the detailed CALVEG label. For reporting that was not limited to Forest Service land, analysis was performed and summarized using the WHR type. See Appendix E and F for WHR and CALVEG code descriptions.

LCMMP vegetation data cover the entire project area and, as mentioned previously, were mapped to the CALVEG type. The WHR type and lifeform were extrapolated/crosswalked from the CALVEG label. In areas where two vegetation types exist, for example conifers and hardwoods coexisting, there was a primary CALVEG label and a secondary CALVEG label. The primary CALVEG label does not necessarily represent a more prominent vegetation type, as the secondary CALVEG type can represent larger trees and a higher density. In areas where both a primary and secondary CALVEG label exists, the lifeform was labeled as “mixed.” Since reporting on a mixed lifeform is somewhat confusing and less than optimal, a lifeform labeled as “mixed” was changed to hardwood, conifer or shrub/chaparral depending on what WHR type was assigned to the area. As an example, many areas have hardwood and conifer both present, and hence have a primary and secondary CALVEG label and are assigned a mixed lifeform. Depending on the size and density of the hardwoods and conifers present, the WHR type could be either montane hardwood or montane hardwood-conifer. Those areas assigned a WHR type of montane hardwood were given a lifeform of hardwood and those areas assigned a WHR type of montane hardwood-conifer were given a lifeform of conifer.

In areas where both a primary and secondary CALVEG label existed, the WHR type also drives what CALVEG type was used in the analysis. Using the example from the previous paragraph, if the primary CALVEG label was Sitka spruce and the secondary CALVEG label was red alder, then, depending on the size and density of each CALVEG type, some of the areas would be assigned a WHR type of montane hardwood and some of the areas would be assigned a WHR

Appendix A

type of montane hardwood-conifer. In those areas assigned a WHR type of montane hardwood, red alder would be the CALVEG type that was reported on and analyzed. Conversely, in those areas assigned a WHR type of montane hardwood-conifer, Sitka spruce would be the CALVEG type that was reported on and analyzed.

Table 1a. Vegetation Data for the Southern Sierra Project Area

Name	Classification	Source	Scale	Extent	% of Project Area
CA Mapping & Monitoring Program Vegetation Data	CALVEG / WHR	1996 TM imagery	2.5 acre mmu	All of project area excluding in and around the Bay Area	100

mmu - minimum mapping unit.

Other Data

Table 2a describes data layers that supplement our monitoring program. These layers are used to stratify change areas, verify causes and correlate change to mortality levels.

Table 2a. Supplemental Data for the Southern Sierra Project Area

Name	Description	Data Type	Scale	Source	Extent
Ownership	Local, state federal, private	Polygon	1:100,000	CaSIL Data Center	Statewide
County	County boundaries	Polygon	1:24,000	CaSIL Data Center	Statewide
Fire Perimeters	Recent and past fires	Regions (polygon)	Varies; 1:24,000 to 1:100,000	Maintained by CDF and FS	Statewide
Harvest / Plantation	Silvicultural practices	Polygon	1:24,000	FS	Forest Service lands
THP Database	Harvest practices on private land	Polygon	1:24,000	CDF	Selected watersheds
NHFEU* Boundaries	Ecological subsection boundaries	Polygon	1:7,500,000	FS	Statewide
Digital Orthophoto Quads	1994	Image	1m ² pixels	FS and CDF	Statewide
Aerial Survey Data	Sketch mapped mortality data	Polygon	Variable	FS	Forest Service lands, National Parks
Aerial Photos	9" x 9"	Print photograph	1:15,840 nominal	FS	Forest Service lands
	Color Infrared	Digital photograph	1:3,000 nominal	FS	Selected sites within project area

*National Hierarchical Framework of Ecological Units.

APPENDIX B – METHODOLOGY

Database Building

Database building includes the preparation of Thematic Mapper (TM) imagery for processing. The early date TM image (time 1) is registered to the later date TM image (time 2). Registration matches the position of ground features (from time 1 and time 2) and is accomplished by creating control points that identify identical features throughout both images (e.g., road intersections). These control points are used in a nearest neighbor resampling technique to assign the early date pixel values to the later date pixel locations. These new pixel locations must be within ½ pixel of the later date pixels to help reduce false change. The images are then radiometrically corrected to account for differences in atmospheric conditions (e.g., haze and water vapor). This process involves the selection of dark and light groups of pixels in each image date followed by the application of a regression-based correction to the pixel brightness values of the early date image to effectively remove differences in atmospheric conditions (Schott et al., 1988).

Change Processing

A TM image contains spectral (or reflectance) information for 7 bands of data, each representing a different range of the electromagnetic spectrum. For instance, band 1 of the Landsat TM measures the reflectance of wavelengths from 0.45µm to 0.52µm, which corresponds to the color blue. The thermal-IR band was not used because its pixel size is 120 meters on each side (all other bands are 30 meters on each side). The spectral information of the 12 bands (six for each date) of the co-registered and radiometrically corrected TM imagery is reduced to three bands in two steps. First, a Kauth-Thomas transformation is applied to each date. For each TM image, the Kauth-Thomas transformation uses the spectral information from six bands with model coefficients to produce new images depicting values of brightness, greenness and wetness (Crist and Cicone, 1984). Brightness identifies variation in reflectance, greenness is related to the amount of green vegetation present in the scene and wetness correlates to canopy and soil moisture. Then the brightness, greenness and wetness values from the first image (time 1) are subtracted from the brightness, greenness and wetness values of the second image (time 2; time 2 – time 1) to produce a new three band image depicting changes in those components on a pixel-by-pixel basis (the delta brightness/greenness/wetness (DBGW) image).

Threshold Mask

A thematic layer was created for each scene processing area which identifies the following classes: urban, water, and agriculture (derived directly from the master vegetation image) and thresholded pixels representing much of the little or no change, large decrease in vegetation, large increase in vegetation and non-vegetation change which were easy to identify. In the thresholding process, ranges of delta brightness, delta greenness and delta wetness for these classes were determined interactively on an 8-bit DBGW image by manipulating the lookup table breakpoints (Maurizi and Longmire, 2002) and then applied in a model to create the threshold mask. This mask reduces the number of pixels that need to be classified and labeled.

Classification

Classification is a multi-step process that converts the DBGW change image into a change map depicting decreases and increases in cover or changes in grass (Figure 5 of main report). The

change image was divided into multiple parts (stratified), with each part (or map subset) corresponding to a different lifeform type (e.g., conifer, hardwood, shrub/chaparral). This was accomplished by overlaying the vegetation layer and threshold mask and selecting those areas in the change image that had the same lifeform and were not already identified with a change class. The result was multiple change images, with each one corresponding to a different lifeform and spatial extent. An unsupervised classification of the 16 bit dBGW image was performed on each individual lifeform change image to create 15 to 30 distinct classes (depending on lifeform and areal extent), with each class containing pixels that had similar levels of brightness, greenness and wetness.

Change Labeling

The pixels were temporarily labeled according to their level of change based on a qualitative gradient from large decreases in vegetation to large increases in vegetation. Image appearance, aerial photos, bispectral plots (e.g., greenness vs. wetness), and vegetation and topographic maps were used to aid in assigning the final quantitative change classes (Table 1b). Each individual lifeform change image was then mosaicked (pieced back together) into one project area change map.

Table 1b. Change Classes and Corresponding Description

CHANGE CLASS	DESCRIPTION
-71 to -100% CC	71 to 100% decrease in cover
-41 to -70% CC	41 to 70% decrease in cover
-16 to -40% CC	16 to 40% decrease in cover
+15 to -15% CC (Little or No Change)	Little or no change in cover
+16 to +40% CC	16 to 40% increase in cover
+41 to +100% CC	41 to 100% increase in cover
Grass/Shrub Decrease > 15%	16 to 100% decrease in grass
Grass/Shrub Increase > 15%	16 to 100% increase grass
Cloud, Cloud Shadow or Smoke	Clouds, cloud shadows or smoke (prevents change assessment)

Once the change image was mosaicked, pixels of similar change classes that were adjacent to each other are temporarily grouped together. All increases in canopy cover and shrub/grass are grouped together, all decreases in canopy cover and shrub/grass are grouped together and non-vegetation change pixels are grouped together. These groups were then filtered to see if they meet the minimum mapping unit (mmu) of 2.5 acres, or 11 pixels. All groups that did not meet the mmu were removed from the change map and assigned the change class matching the majority of the surrounding pixels (usually little or no change). The temporary groupings were then removed, giving the pixels their original value (change class).

The classification system was designed to discriminate between different levels of change in cover (i.e., 16 to 40% CC decrease vs. 71 to 100% CC decrease). The +15 to -15% CC (little or no change) indicates either that change did not occur, that the change area falls below the mmu or that the change was too subtle to be detected. The cloud or cloud shadow class accounts for clouds, cloud shadows and shadows in mountainous areas that obscure ground cover and make it impossible to determine whether the vegetation has changed or remained stable in these areas.

Cause Verification

Once the final change map was complete, an attempt was made to verify cause on all change areas. GIS overlay analysis, fieldwork and photo interpretation are used to determine the causes of change areas. The statewide fire history database was overlaid onto the change map to attribute changes caused by wildfires (Figure 6 of main report). A series of cause identification workshops were conducted and include FS resource managers, CDF personnel and other stakeholders in the project area. FS, CDF and other land managers interpreted change maps by applying local knowledge and fieldwork to identify sources of change on public lands. Similarly, UC Integrated Hardwood Rangeland Management Program (IHRMP) personnel consulted private landowners to identify sources of change in hardwood rangelands. Areas without a causal agent identified through the above processes become the focus of further field efforts and aerial photo interpretation. Despite all of these efforts, complete coverage of cause verification was not always possible due to the large number of change areas, insufficient information and inaccessible lands.

APPENDIX C - DATA ACCURACY

To assess the accuracy of the change map, 492 randomly selected change areas were compared with known reference information of the same areas. All change classes were represented with accuracy assessment sites based on the acreage amount of change (e.g., the little to no change class has the largest acreage thus contains the most sites). Sites were developed randomly selecting 5 to 20 acre polygons from all of the change areas. These areas were interpreted for canopy cover and shrub/chaparral change using color aerial photography at a scale of 1:15,840, digital camera images at a scale of 1:3000, Digital Orthophoto Quadrangles with a 1-meter cell size and field collected data. Essentially, this assessment takes the 492 reference sites with known vegetation change and compares them to the classified change map.

Table 1c. Change Code and Corresponding Change Class

Change Code	CHANGE CLASS
1	-71 to -100% CC
2	-41 to -70% CC
3	-16 to -40% CC
4	+15 to -15% CC (Little or No Change)
5	+16 to +40% CC
6	+41 to +100% CC
7	Grass/Shrub Decrease > 15%
8	Grass/Shrub Increase > 15%
15	Cloud or Cloud Shadow

Table 2c displays the error matrix for the Southern Sierra project area. (See Table 1c for change code descriptions). The overall accuracy of the change map is 85.37%. This means that of the 410 sample sites, 350 were correctly classified (the reference and classified classes are the same; Congalton and Green, 1999). Errors of commission (reference class included in the wrong classified class) and omission (reference class excluded from the correct classified class) were also evident. For example, Table 2c shows that one site was classified as grass increase >15% when the reference class shows it was actually little or no change. Therefore, one area was

Table 2c. Change Map Accuracy Assessment for the Southern Sierra Project Area

		Reference Class								Total
		1	2	3	4	5	6	7	8	
Reference Class	Change Code	1	2	3	4	5	6	7	8	Total
	1	43	4							47
	2	4	45	4	1					54
	3	3	20	39						62
	4		1	4	119	2		2		128
	5				1	24	9			34
	6			1	1	2	33			37
	7							38		38
	8				1				9	10
	Total	50	70	48	123	28	42	40	9	410

omitted from the correct little or no change class and committed to the incorrect shrub/grass increase >15% class. The producer's accuracy of each change class ranged from 53% to 100% and the user's accuracy ranged from 55% to 100% (Table 3c). Producer's accuracy represents how well a particular class is classified. In other words, of all the referenced sites that have a

particular change class, how many times (or in what proportion) did those sites get classified as such? For instance, of the 35 reference sites with a -16 to -40% CC, 27 of those sites were classified correctly. The user's accuracy looks at the matrix from a different approach. Instead of looking at known reference data and calculating how many are correct (producer's accuracy), the user's accuracy looks at the number correctly classified and compares that to the number of sites in that classification. For example, 42 sites are classified into the -16 to -40% CC class, but only 27 of those sites are actually referenced to be in that class. User's accuracy indicates the probability that a given change class actually represents that same change on the ground.

Table 3c. Producer's and User's Accuracy of Each Class

Class	Producer's Accuracy	Users Accuracy
1	86%	91%
2	64%	83%
3	81%	63%
4	97%	93%
5	86%	71%
6	79%	89%
7	95%	100%
8	100%	90%

The accuracy assessment also shows that general vegetation cover decreases and increases were mapped well. Accuracy assessment sites classified as a decrease were never a referenced increase, although a few sites were referenced as little or no change. The same is true for the areas classified as an increase. Additionally, a referenced decrease site was never classified as an increase and a referenced increase site was never classified as a decrease.

APPENDIX D – WHR TYPE DESCRIPTIONS

Species Compositions for major Hardwood, Conifer and Shrub/Chaparral WHR Types;
 Species in bold are dominant and species in non-bold are associates.

MONTANE HARDWOOD	BLUE OAK WOODLAND	Blue Oak/ FOOTHILL PINE
CA black oak pacific madrone tanoak alder interior live oak canyon live oak	blue oak	blue oak foothill pine
Oregon white oak coast live oak California laurel valley oak blue oak foothill pine ponderosa pine	interior live oak coast live oak buckeye juniper canyon live oak valley oak ponderosa pine	coast live oak interior live oak canyon live oak

DOUGLAS FIR	SIERRA MIXED CONIFER	PINYON-JUNIPER
Douglas fir port orford cedar Jeffrey pine sugar pine western hemlock	white fir Douglas fir Ponderosa pine sugar pine incense cedar	singleleaf pine Perry pine western juniper Utah juniper CA juniper
tanoak CA huckleberry poison oak	western redcedar	shrub oak CA scrub oak canyon live oak Mojave yucca ponderosa pine Jeffrey pine

RED FIR	PONDEROSA PINE	LOGEPOLE PINE
red fir	ponderosa pine	Lodgepole pine
	white fir incense cedar Coulter pine Jeffrey pine sugar pine Douglas-fir bigcone Douglas-fir canyon live oak CA black oak Pacific madrone tanoak	aspen mountain hemlock huckleberry mountain heather

Appendix D

SAGEBRUSH	MONTANE CHAPARRAL	MIXED CHAPARRAL
sagebrush rabbitbrush gooseberry	ceanothus manzanita bitter cherry	oaks ceanothus manzanita
		chamise mountain mahogany buckeye sumac buckthorn California fremontia

Source: Mayer and Laudenslayer, 1988.

APPENDIX E – WHR VEGETATION HIERARCHY

Lifeform	WHR Code	WHR Type
Hardwood	ASP	Aspen
	BOP	Blue Oak- Foothill Pine
	COW	Coastal Oak Woodland
	EUC	Eucalyptus
	MHW	Montane Hardwood
	MRI	Montane Riparian
	VOW	Valley Oak Woodland
	VRI	Valley Foothill Riparian
Conifer	JUN	Juniper
	CPC	Closed Cone Pine-Cypress
	DFR	Douglas Fir
	EPN	Eastside Pine
	JPN	Jeffrey Pine
	KMC	Klamath Mixed Conifer
	LPN	Lodgepole Pine
	MHC	Montane Hardwood-Conifer
	PPN	Ponderosa Pine
	RDW	Redwood
	SCN	Subalpine Conifer
	SMC	Sierran Mixed Conifer
	UCN	Undetermined Conifer
	WFR	White Fir
Shrub/ Chaparral	BBR	Bitterbrush
	CRC	Chamise-Redshank Chaparral
	CSC	Coastal Scrub
	DSC	Desert Scrub
	LSG	Low Sagebrush
	MCH	Mixed Chaparral
	MCP	Montane Chaparral
	SGB	Sagebrush
	UND	Undetermined Shrub/Chaparral Type

Source: Mayer and Laudenslayer, 1988.

APPENDIX F – CALVEG CODES

Lifeform	CALVEG Code	CALVEG Description
Hardwood	QC	Canyon Live Oak
	QD	Blue Oak
	QG	Oregon White Oak
	QJ	Cottonwood/Alder
	QK	California Black Oak
	QM	Bigleaf Maple (Dogwood)
	QO	Willow
	QQ	Quaking Aspen
	QR	Red Alder
	QT	Tanoak
	QY	Willow-Alder
	QW	Interior Live Oak
	TA	Mountain Alder
	TC	Tree Chinquapin
Conifer	DF	Pacific Douglas-Fir
	DP	Douglas Fir-Pine
	DT	Douglas Fir-Tanoak
	DW	Douglas Fir-White Fir
	EP	Eastside Pine
	JP	Jeffrey Pine
	KP	Knobcone Pine
	LP	Lodgepole Pine
	MF	Mixed Conifer-Fir
	MP	Mixed Conifer-Pine
	PD	Gray Pine
	PO	Port Oreford Cedar
	PP	Ponderosa Pine
	PW	Ponderosa Pine-White Fir
	RD	Redwood-Douglas Fir
	RF	Red Fir
	SA	Subalpine Conifers
	WB	Whitebark Pine
	WF	White Fir
WJ	Western Juniper	
WW	Western White Pine	
Shrub/Chaparral	BB	Bitterbrush
	BL	Low Sagebrush
	BS	Basin Sagebrush
	CB	Salal-California Huckleberry Shrub
	CC	Ceanothus Chaparral
	CG	Greenleaf Manzanita
	CH	Huckleberry Oak
	CL	Wedgeleaf Ceanothus
	CM	Upper Montane Mixed Shrub
	CN	Pinemat Manzanita
	CQ	Lower Montane Mixed Chaparral
	CS	Scrub Oak
	CW	Whiteleaf Manzanita
CX	Montane Mixed Chaparral	

Source: USDA Forest Service Regional Ecology Group, 1981.

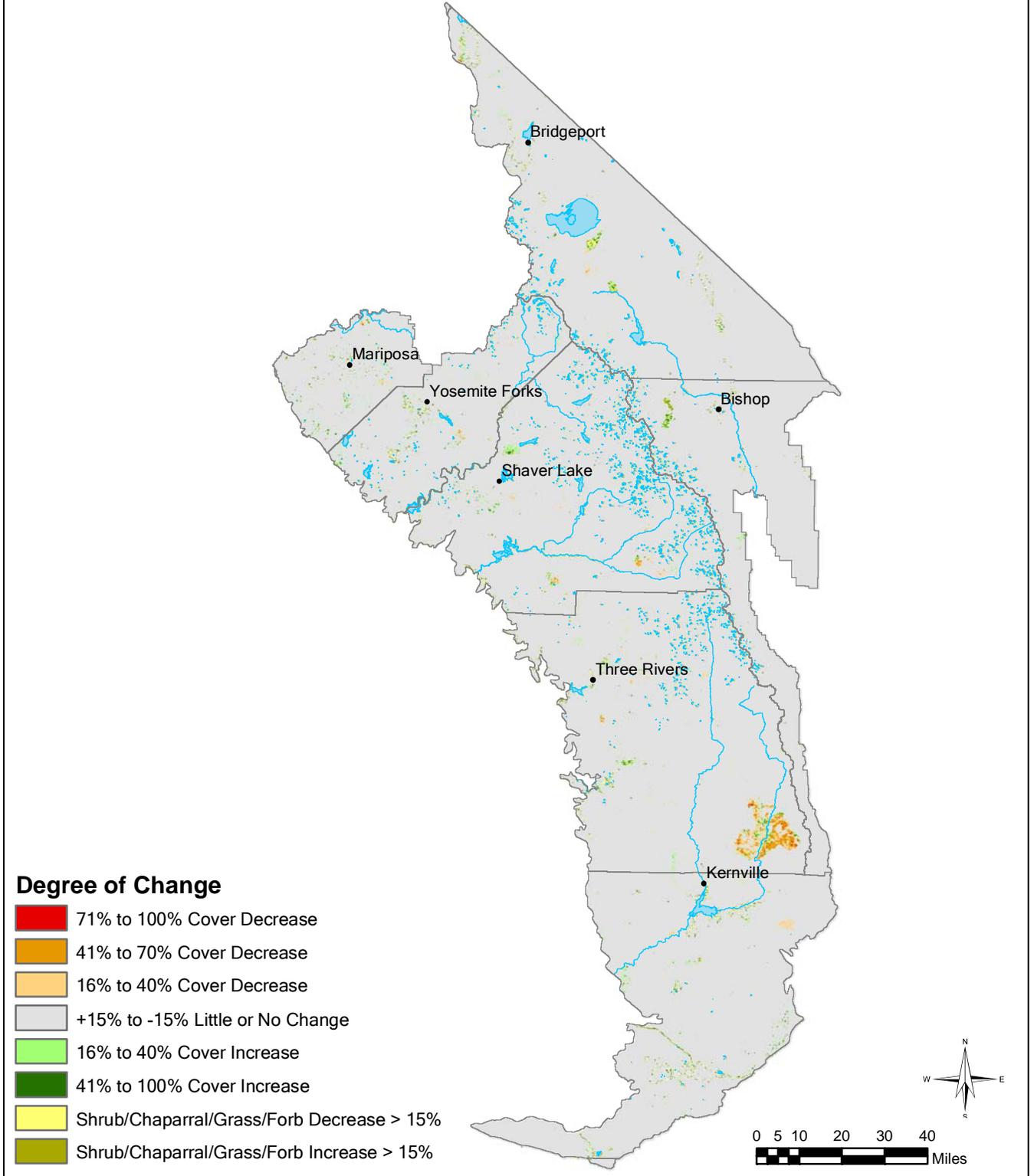
APPENDIX G – DETAILED MAPS AND TABLES

Project Area Maps and Tables

1. Project Area Change Map
2. Acres of Classified change by Lifeform Type
3. Acres of Classified Change by Conifer Cover Type
4. Acres of Classified Change by Hardwood Cover Type
5. Acres of Classified Change by Shrub/Chaparral Types
6. Acres of Classified Change by Grass/Forb Types
7. Acres of Verified Change by Cause for All Lifeform Cover Types and Owner Classes
8. Acres of Classified Change by Lifeform Type and Owner Class
9. Acres of Classified Change by Conifer Type and Owner Class
10. Acres of Classified Change by Hardwood Cover Type and Owner Class
11. Acres of Classified Change by Shrub/Chaparral Types and Owner Class
12. Acres of Classified Change by Grass/Forb Type and Owner Class
13. Acres of Verified Change in All Conifer Cover Types by Cause and Owner Class
14. Acres of Verified Change in All Hardwood Cover Types by Cause and Owner Class
15. Acres of Verified Change in All Shrub/Chaparral Types by Cause and Owner Class
16. Acres of Verified Change in All Grass/Forb Types by Cause and Owner Class

Southern Sierra Project Area

Land Cover Change, 1995/1997 - 2001



Appendix G

Table P-1 Acres of Classified Change by Lifeform

	Conifer		Hardwood		Shrub / Chaparral		Grass / Forb		All Lifeforms	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
-71 to -100% CC	18,496	1	2,721						21,218	
-41 to -70% CC	23,281	1	3,626						26,908	
-16 to -40% CC	17,048	1	6,270						23,319	
+15 to -15% CC (Little or No Change)	3,092,607	98	1,598,340	99	2,596,171	99	1,049,870	100	8,337,285	99
+16 to +40% CC	4,492		755						5,247	
+41 to +100% CC	1,068		281						1,348	
Grass Decrease > 15%					14,996	1	2,511		17,508	
Grass Increase > 15%					2,361		1,399		3,761	
Total	3,156,993	100	1,611,992	100	2,613,529	100	1,053,780	100	8,436,594	100

Table P-2 Acres of Classified Change by Conifer Cover Type

	Closed Cone Pine-Cypress		Douglas Fir		Jeffrey Pine		Juniper		Lodgepole Pine	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
-71 to -100% CC			4		3,337				161	
-41 to -70% CC			2		3,928				265	
-16 to -40% CC			1		3,672				698	
+15 to -15% CC (Little or No Change)	36		76		272,726	9	12,218		206,753	7
+16 to +40% CC					395		1		13	
+41 to +100% CC					54		2		4	
Total	36		83		284,111	9	12,221		207,895	7

	Montane Hardwood-Conifer		Pinyon-Juniper		Ponderosa Pine		Red Fir		Sierran Mixed Conifer	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
-71 to -100% CC	346		7,598		907		643		5,444	
-41 to -70% CC	140		11,883		556		1,340		5,102	
-16 to -40% CC	293		5,460		1,163		2,508		3,079	
+15 to -15% CC (Little or No Change)	75,066	2	669,874	21	214,837	7	500,697	16	676,752	21
+16 to +40% CC	77		100		513		584		2,751	
+41 to +100% CC	54		28		474		57		365	
Total	75,977	2	694,944	22	218,451	7	505,829	16	693,493	22

	Subalpine Conifer		Unknown Conifer Type		White Fir		All Conifer	
	Acres	%	Acres	%	Acres	%	Acres	%
-71 to -100% CC	5		50				18,496	1
-41 to -70% CC	2		63				23,281	1
-16 to -40% CC	72		104				17,048	1
+15 to -15% CC (Little or No Change)	439,103	14	23,608	1	860		3,092,607	98
+16 to +40% CC	56		2				4,492	
+41 to +100% CC	20		9				1,068	
Total	439,259	14	23,835	1	860		3,156,993	100

Appendix G

Table P-3 Acres of Classified Change by Hardwood Cover Type

	Aspen		Blue Oak Woodland		Blue Oak-Foothill Pine		Coastal Oak Woodland		Desert Riparian	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
-71 to -100% CC	33		742		291					
-41 to -70% CC	32		1,628		406					
-16 to -40% CC	34		1,885		1,272					
+15 to -15% CC (Little or No Change)	25,721	2	792,289	49	231,939	14	4,389		4,010	
+16 to +40% CC			336		63		2			
+41 to +100% CC			68		17		2			
Total	25,820	2	796,948	49	233,987	15	4,394		4,010	

	Joshua Tree		Montane Hardwood		Montane Riparian		Valley Foothill Riparian		Valley Oak Woodland	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
-71 to -100% CC			1,622		29				4	
-41 to -70% CC			1,556		2				1	
-16 to -40% CC			3,051		11				17	
+15 to -15% CC (Little or No Change)	2,916		485,649	30	18,723	1	178		32,526	2
+16 to +40% CC			312						42	
+41 to +100% CC			126						67	
Total	2,916		492,317	31	18,765	1	178		32,657	2

	All Hardwood	
	Acres	%
-71 to -100% CC	2,721	
-41 to -70% CC	3,626	
-16 to -40% CC	6,270	
+15 to -15% CC (Little or No Change)	1,598,340	99
+16 to +40% CC	755	
+41 to +100% CC	281	
Total	1,611,992	100

Appendix G

Table P-4 Acres of Classified Change by Shrub/Chaparral Cover Type

	Alkali Scrub		Alpine Dwarf Shrub		Bitterbrush		Chamise-Redshank Chaparral		Coastal Scrub	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
+15 to -15% CC (Little or No Change)	188,855	7	163,813	6	50,230	2	26,702	1	1,585	
Grass Decrease > 15%	173		53		995		815			
Grass Increase > 15%	5		44		625		140		1	
Total	189,033	7	163,910	6	51,849	2	27,657	1	1,586	

	Desert Scrub		Desert Wash		Low Sagebrush		Mixed Chaparral		Montane Chaparral	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
+15 to -15% CC (Little or No Change)	513,289	20	173		7,402		207,784	8	166,434	6
Grass Decrease > 15%	156						1,664		3,216	
Grass Increase > 15%	24						479		333	
Total	513,470	20	173		7,402		209,927	8	169,984	7

	Sagebrush		Unknown Shrub Type		All Shrub/Chaparral	
	Acres	%	Acres	%	Acres	%
+15 to -15% CC (Little or No Change)	1,048,596	40	221,307	8	2,596,171	99
Grass Decrease > 15%	6,482		1,442		14,996	1
Grass Increase > 15%	664		47		2,361	
Total	1,055,742	40	222,796	9	2,613,529	100

Table P-5 Acres of Classified Change by Grass/Forb Cover Type

	Annual Grass		Freshwater Emergen Wetland		Wet Meadow		All Grass/Forb	
	Acres	%	Acres	%	Acres	%	Acres	%
+15 to -15% CC (Little or No Change)	998,251	95	4,730	0	46,888	4	1,049,870	100
Grass Decrease > 15%	2,432	0		0	79		2,511	
Grass Increase > 15%	1,387	0		0	12		1,399	
Total	1,002,071	95	4,730	0	46,979	4	1,053,780	100

Tale P-6 Acres of Verified Change by Cause for All Lifeforms and Owner Classes

	Fire	Harvest	Develop-ment	Pest-related	Regrowth	Other	Unverified	All Causes
-71 to -100% CC	19,125	1,193	135	41		164	560	21,217
-41 to -70% CC	25,383	574	73	59		148	670	26,907
-16 to -40% CC	20,217	1,535	197	103		237	1,027	23,318
+16 to +40% CC					4,269	27	951	5,247
+41 to +100% CC					1,006	8	334	1,348
Grass Decrease > 15%	16,305	121	70	46		606	1,851	19,000
Grass Increase > 15%					2,096	19	1,667	3,781
Total	81,030	3,423	476	249	7,371	1,209	7,060	100,818

Table P-7 Acres of Classified Change by Lifeform and Owner Class

Forest Service												
	Conifer		Hardwood		Shrub/Chaparral		Grass/Forb		Barren		Forest Service Total	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
-71 to -100% CC	11,068		936									12,004
-41 to -70% CC	13,874	1	924									14,799
-16 to -40% CC	10,957		1,557									12,515
-15 to + 15% CC (Little or No Change)	2,267,809	98	325,160	99	1,210,906	99	112,127	99	543,512	100		4,459,514 99
+16 to + 40% CC	3,937		207									4,144
+41 to + 100% CC	875		48									923
Grass Decrease > 15%					8,746	1	936	1	1,405			11,086
Grass Increase > 15%					1,192		15		16			1,222
Total	2,308,521	100	328,832	100	1,220,843	100	113,078	100	544,933	100		4,516,206 100

Other Public												
	Conifer		Hardwood		Shrub/Chaparral		Grass/Forb		Barren		Other Public Total	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
-71 to -100% CC	6,250	1	608									6,858
-41 to -70% CC	8,224	1	974									9,199
-16 to -40% CC	5,608	1	2,754	1								8,362
-15 to + 15% CC (Little or No Change)	621,958	97	206,089	98	923,365	100	82,396	99	386,413	100		2,220,221 99
+16 to + 40% CC	421		38									460
+41 to + 100% CC	16		15									30
Grass Decrease > 15%					3,731		466	1	85			4,281
Grass Increase > 15%					843		22					865
Total	642,478	100	210,478	100	927,938	100	82,883	100	386,498	100		2,250,276 100

Private												
	Conifer		Hardwood		Shrub/Chaparral		Grass/Forb		Barren		Private Total	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
-71 to -100% CC	1,178	1	1,178									2,356
-41 to -70% CC	1,182	1	1,728									2,910
-16 to -40% CC	483		1,958									2,442
-15 to + 15% CC (Little or No Change)	202,840	98	1,066,944	99	460,994	99	854,718	100	125,831	100		2,711,326 99
+16 to + 40% CC	133		510									643
+41 to + 100% CC	177		218									395
Grass Decrease > 15%					2,520	1	1,109		3			3,632
Grass Increase > 15%					327		1,362		5			1,694
Total	205,994	100	1,072,536	100	463,840	100	857,189	100	125,839	100		2,725,398 100

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Table P-8 Acres of Classified Change by Conifer Cover Type and Owner Class

	Forest Service		Other Public		Private		All Owners	
	Acres	%	Acres	%	Acres	%	Acres	%
Unknown Conifer Type								
-71 to -100% CC			21		29		50	
-41 to -70% CC			16		46		63	
-16 to -40% CC			85	1	19		104	
+15 to -15% CC (Little or No Change)	1	100	11,453	99	12,154	99	23,608	99
+16 to +40% CC					2		2	
+41 to +100% CC					9		9	
Total	1	100	11,575	100	12,259	100	23,835	100
Closed Cone Pine-Cypress								
+15 to -15% CC (Little or No Change)			3	100	33	100	36	100
Total			3	100	33	100	36	100
Douglas Fir								
-71 to -100% CC			4	13			4	5
-41 to -70% CC			2	5			2	2
-16 to -40% CC			1	3			1	1
+15 to -15% CC (Little or No Change)			26	80	50	100	76	92
+41 to +100% CC								
Total			33	100	50	100	83	100
Jeffrey Pine								
-71 to -100% CC	3,219	1	62		56		3,337	1
-41 to -70% CC	3,755	2	119		54		3,928	1
-16 to -40% CC	3,286	1	344	1	41		3,672	1
+15 to -15% CC (Little or No Change)	225,434	95	26,631	98	20,662	99	272,726	96
+16 to +40% CC	367		22		6		395	
+41 to +100% CC	44		8		2		54	
Total	236,106	100	27,186	100	20,820	100	284,111	100
Juniper								
+15 to -15% CC (Little or No Change)	5	100	8,081	100	4,133	100	12,218	100
+16 to +40% CC					1		1	
+41 to +100% CC					2		2	
Total	5	100	8,081	100	4,135	100	12,221	100
Lodgepole Pine								
-71 to -100% CC	112		49				161	
-41 to -70% CC	31		235				265	
-16 to -40% CC	62		636	1			698	
+15 to -15% CC (Little or No Change)	118,288	100	86,145	99	2,319	100	206,753	99
+16 to +40% CC	7		6				13	
+41 to +100% CC	2		2				4	
Total	118,503	100	87,072	100	2,319	100	207,895	100
Montane Hardwood-Conifer								
-71 to -100% CC	223		2		122	1	346	
-41 to -70% CC	73		1		66		140	
-16 to -40% CC	234		5	1	54		293	
+15 to -15% CC (Little or No Change)	55,246	99	510	98	19,310	99	75,066	99
+16 to +40% CC	73				4		77	
+41 to +100% CC	20				34		54	
Total	55,868	100	518	100	19,590	100	75,977	100

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Table P-8 Acres of Classified Change by Conifer Cover Type and Owner Class (cont.)

	Forest Service		Other Public		Private		All Owners	
	Acres	%	Acres	%	Acres	%	Acres	%
Pinyon-Juniper								
-71 to -100% CC	4,574	1	2,846	2	178		7,598	1
-41 to -70% CC	7,970	2	3,636	2	277		11,883	2
-16 to -40% CC	4,245	1	1,162	1	52		5,460	1
+15 to -15% CC (Little or No Change)	443,915	96	166,337	96	59,622	99	669,874	96
+16 to +40% CC	47		3		51		100	
+41 to +100% CC	14				14		28	
Total	460,765	100	173,985	100	60,195	100	694,944	100
Ponderosa Pine								
-71 to -100% CC	769		34		104		907	
-41 to -70% CC	485		21		50		556	
-16 to -40% CC	1,017	1	69		77		1,163	1
+15 to -15% CC (Little or No Change)	159,551	98	23,518	99	31,768	99	214,837	98
+16 to +40% CC	499		5		9		513	
+41 to +100% CC	394				80		474	
Total	162,716	100	23,646	100	32,089	100	218,451	100
Red Fir								
-71 to -100% CC	395		248				643	
-41 to -70% CC	309		1,031	1			1,340	
-16 to -40% CC	307		2,201	1			2,508	
+15 to -15% CC (Little or No Change)	328,510	100	169,700	98	2,486	100	500,697	99
+16 to +40% CC	263		321				584	
+41 to +100% CC	52		5				57	
Total	329,836	100	173,506	100	2,486	100	505,829	100
Subalpine Conifer								
-71 to -100% CC	5						5	
-41 to -70% CC	2						2	
-16 to -40% CC	57		15				72	
+15 to -15% CC (Little or No Change)	374,267	100	59,308	100	5,528	99	439,103	100
+16 to +40% CC	3		4		49	1	56	
+41 to +100% CC	1				19		20	
Total	374,335	100	59,328	100	5,596	100	439,259	100
Sierran Mixed Conifer								
-71 to -100% CC	1,770		2,984	4	690	2	5,444	1
-41 to -70% CC	1,249		3,164	4	689	2	5,102	1
-16 to -40% CC	1,749		1,090	1	239	1	3,079	
+15 to -15% CC (Little or No Change)	562,593	99	70,246	91	43,913	96	676,752	98
+16 to +40% CC	2,678		61		12		2,751	
+41 to +100% CC	348		1		17		365	
Total	570,387	100	77,546	100	45,561	100	693,493	100
White Fir								
+15 to -15% CC (Little or No Change)					860	100	860	100
Total					860	100	860	100
All Conifer	2,308,521		642,478		205,994		3,156,993	

Appendix G

Table P-9 Acres of Classified Change by Hardwood Cover Type and Owner Class

	Forest Service		Other Public		Private		All Owners	
	Acres	%	Acres	%	Acres	%	Acres	%
Aspen								
-71 to -100% CC	24		9	1			33	
-41 to -70% CC	20		12	1			32	
-16 to -40% CC	26		8	1			34	
+15 to -15% CC (Little or No Change)	21,916	100	1,589	98	2,069	100	25,574	100
Total	21,986	100	1,618	100	2,069	100	25,673	100
Blue Oak-Foothill Pine								
-71 to -100% CC	4		149		138		291	
-41 to -70% CC	5		281		120		406	
-16 to -40% CC	2		926	2	344		1,272	1
+15 to -15% CC (Little or No Change)	5,043	100	57,712	98	169,184	100	231,939	99
+16 to +40% CC			18		44		63	
+41 to +100% CC			9		8		17	
Total	5,054	100	59,095	100	169,838	100	233,987	100
Blue Oak Woodland								
-71 to -100% CC	99		88		555		742	
-41 to -70% CC	388	1	287	1	953		1,628	
-16 to -40% CC	513	1	367	1	1,005		1,885	
+15 to -15% CC (Little or No Change)	72,363	99	52,720	99	667,206	100	792,289	99
+16 to +40% CC	57		9		269		336	
+41 to +100% CC	2		2		64		68	
Total	73,421	100	53,474	100	670,052	100	796,948	100
Coastal Oak Woodland								
-71 to -100% CC								
+15 to -15% CC (Little or No Change)			18	100	4,371	100	4,389	100
+16 to +40% CC					2		2	
+41 to +100% CC					2		2	
Total			18		4,376	100	4,394	100
Desert Riparian								
+15 to -15% CC (Little or No Change)			3,414	100	596	100	4,010	100
+16 to +40% CC								
Total			3,414	100	596	100	4,010	
Joshua Tree								
+15 to -15% CC (Little or No Change)	832	100	1,869	100	215	100	2,916	100
Total	832	100	1,869	100	215	100	2,916	100
Montane Hardwood								
-71 to -100% CC	781		361		480		1,622	
-41 to -70% CC	509		394		653		1,556	
-16 to -40% CC	1,009		1,451	2	590		3,051	1
+15 to -15% CC (Little or No Change)	220,945	99	77,166	97	187,538	99	485,649	99
+16 to +40% CC	149		11		152		312	
+41 to +100% CC	46		3		77		126	
Total	223,440	100	79,386	100	189,491	100	492,317	100
Montane Riparian								
-71 to -100% CC	27	1			2		29	
-41 to -70% CC	2						2	
-16 to -40% CC	7		2		2		11	
+15 to -15% CC (Little or No Change)	4,061	99	10,764	100	3,897	100	18,723	100
Total	4,098	100	10,766	100	3,901	100	18,765	100

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Table P-9 Acres of Classified Change by Hardwood Cover Type and Owner Class (cont.)

	Forest Service		Other Public		Private		All Owners	
	Acres	%	Acres	%	Acres	%	Acres	%
Valley Oak Woodland								
-71 to -100% CC					4		4	
-41 to -70% CC					1		1	
-16 to -40% CC					17		17	
+15 to -15% CC (Little or No Change)			825	100	31,700	100	32,526	100
+16 to +40% CC					42		42	
+41 to +100% CC					67		67	
Total			825	100	31,831	100	32,657	100
Valley Foothill Riparian								
+15 to -15% CC (Little or No Change)			11	100	167	100	178	100
Total			11	100	167	100	178	100
Total	328,832		210,478		1,072,536		1,611,845	

Table P-10 Acres of Classified Change by shrub/Chaparral Cover Type and Owner Class

	Forest Service		Other Public		Private		All Owners	
	Acres	%	Acres	%	Acres	%	Acres	%
Alpine Dwarf Shrub								
+15 to -15% CC (Little or No Change)	154,629	100	8,908	100	275	100	163,813	100
Grass Decrease > 15%	53						53	
Grass Increase > 15%	44						44	
Total	154,727	100	8,908	100	275	100	163,910	100
Alkali Scrub								
+15 to -15% CC (Little or No Change)	3,608	95	177,409	100	7,838	100	188,855	100
Grass Decrease > 15%	173	5	1				173	
Grass Increase > 15%			5				5	
Total	3,780	100	177,415	100	7,838	100	189,033	100
Bitterbrush								
+15 to -15% CC (Little or No Change)	35,191	98	9,949	93	5,090	100	50,230	97
Grass Decrease > 15%	668	2	326	3			995	2
Grass Increase > 15%	203	1	422	4			625	1
Total	36,062	100	10,698	100	5,090	100	51,849	100
Unknown Shrub Type								
+15 to -15% CC (Little or No Change)	11	100	37,051	98	184,244	100	221,307	99
Grass Decrease > 15%			662	2	780		1,442	1
Grass Increase > 15%			2		44		47	
Total	11	100	37,715	100	185,069	100	222,796	100
Chamise-Redshank Chaparral								
+15 to -15% CC (Little or No Change)	9,713	95	8,635	98	8,354	98	26,702	97
Grass Decrease > 15%	541	5	213	2	61	1	815	3
Grass Increase > 15%					140	2	140	1
Total	10,254	100	8,847	100	8,556	100	27,657	100
Coastal Scrub								
+15 to -15% CC (Little or No Change)	412	100	136	100	1,036	100	1,585	100
Grass Increase > 15%					1		1	
Total	412	100	136	100	1,037	100	1,586	100

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Table P-10 Acres of Classified Change by shrub/Chaparral Cover Type and Owner Class (cont.)

	Forest Service		Other Public		Private		All Owners	
	Acres	%	Acres	%	Acres	%	Acres	%
Desert Scrub								
+15 to -15% CC (Little or No Change)	152,131	100	274,789	100	86,370	100	513,289	100
Grass Decrease > 15%	24		38		95		156	
Grass Increase > 15%	4				20		24	
Total	152,158	100	274,827	100	86,484	100	513,470	100
Desert Wash								
+15 to -15% CC (Little or No Change)			117	100	56	100	173	100
Total			117	100	56	100	173	100
Low Sagebrush								
+15 to -15% CC (Little or No Change)			7,272	100	130	100	7,402	100
Total			7,272	100	130	100	7,402	100
Mixed Chaparral								
+15 to -15% CC (Little or No Change)	117,138	99	18,661	100	71,986	99	207,784	99
Grass Decrease > 15%	1,190	1	62		411	1	1,664	1
Grass Increase > 15%	405		2		72		479	
Total	118,732	100	18,725	100	72,470	100	209,927	100
Montane Chaparral								
+15 to -15% CC (Little or No Change)	149,179	98	12,702	100	4,553	98	166,434	98
Grass Decrease > 15%	3,098	2	59		59	1	3,216	2
Grass Increase > 15%	295				38	1	333	
Total	152,572	100	12,761	100	4,650	100	169,984	100
Sagebrush								
+15 to -15% CC (Little or No Change)	588,894	99	367,735	99	91,060	99	1,047,689	99
Grass Decrease > 15%	2,999	1	2,370	1	1,113	1	6,482	1
Grass Increase > 15%	241		412		10		664	
Total	592,134	100	370,517	100	92,184	100	1,054,834	100
All Shrub/Chaparral	1,220,843		927,938		463,840		2,612,621	

Table P-11 Acres of Classified Change by Grass/Forb Cover Type and Owner Class

	Forest Service		Other Public		Private		All Owners	
	Acres	%	Acres	%	Acres	%	Acres	%
Annual Grass								
+15 to -15% CC (Little or No Change)	81,644	99	70,071	99	846,537	100	998,251	100
Grass Decrease > 15%	862	1	465	1	1,106		2,432	
Grass Increase > 15%	6		22		1,360		1,387	
Total	82,512	100	70,557	100	849,002	100	1,002,071	100
Freshwater Emergen Wetland								
+15 to -15% CC (Little or No Change)			4,383	100	347	100	4,730	100
Total			4,383	100	347	100	4,730	100
Wet Meadow								
+15 to -15% CC (Little or No Change)	30,482	100	7,942	100	7,834	100	46,258	100
Grass Decrease > 15%	74		2		3		79	
Grass Increase > 15%	9				3		12	
Total	30,566	100	7,944	100	7,840	100	46,349	100
All Grass/Forb	113,078		82,883		857,189		1,053,150	

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Table P-12 Acres of Verified Change in All Conifer Cover Types by Cause and Owner Class

	Fire	Harvest	Develop- ment	Pest- related	Regrowth	Other	Unverified	All Causes
Forest Service								
-71 to -100% CC	9,962	957		21		40	87	11,068
-41 to -70% CC	13,306	436		41		14	78	13,874
-16 to -40% CC	9,254	1,381	2	75		17	227	10,957
+16 to +40% CC					3,499	26	411	3,937
+41 to +100% CC					762	8	105	875
Total	32,522	2,774	2	138	4,261	106	909	40,712
Other Public								
-71 to -100% CC	6,214			9		8	20	6,250
-41 to -70% CC	8,128			10		33	53	8,224
-16 to -40% CC	5,275			23		136	174	5,608
+16 to +40% CC					406		15	421
+41 to +100% CC					12		4	16
Total	19,617	0	0	42	418	177	266	20,519
Private								
-71 to -100% CC	903	128	60	8		14	65	1,178
-41 to -70% CC	1,040	23	40			9	71	1,182
-16 to -40% CC	271	54	52	3		6	98	483
+16 to +40% CC					22	0	110	133
+41 to +100% CC					104		73	177
Total	2,214	205	151	11	126	30	417	3,154
All owners	54,353	2,979	154	191	4,806	312	1,592	64,385

Table P-13 Acres of Verified Change in All Hardwood Cover Types by Cause and Owner Class

	Fire	Harvest	Develop- ment	Pest- related	Regrowth	Other	Unverified	All Causes
Forest Service								
-71 to -100% CC	793	77		0		48	18	936
-41 to -70% CC	699	97		5		87	36	924
-16 to -40% CC	1,360	77		0		68	52	1,557
+16 to +40% CC					123		84	207
+41 to +100% CC					30		18	48
Total	2,852	250	0	6	153	203	208	3,672
Other Public								
-71 to -100% CC	592			2		0	13	608
-41 to -70% CC	963			2		0	9	974
-16 to -40% CC	2,658			2		3	91	2,754
+16 to +40% CC					4		34	38
+41 to +100% CC							15	15
Total	4,213	0	0	6	4	4	162	4,389
Private								
-71 to -100% CC	661	31	75	0		54	357	1,178
-41 to -70% CC	1,246	18	34			6	423	1,728
-16 to -40% CC	1,399	23	143			7	385	1,958
+16 to +40% CC					214		296	510
+41 to +100% CC					99		119	218
Total	3,307	73	252	0	313	66	1,581	5,592
All owners	10,373	323	252	12	470	273	1,950	13,652

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Table P-14 Acres of Verified Change in All Shrub/Chaparral Cover Types by Cause and Owner Class

	Fire	Harvest	Develop- ment	Pest- related	Regrowth	Other	Unverified	All Causes
Forest Service								
Grass Decrease > 15%	8,053	50		37		366	239	8,746
Grass Increase > 15%					1,008	5	179	1,192
Total	8,053	50	0	37	1,008	371	418	9,937
Other Public								
Grass Decrease > 15%	3,670			10		4	47	3,731
Grass Increase > 15%					830		13	843
Total	3,670	0	0	10	830	4	60	4,574
Private								
Grass Decrease > 15%	1,957	69	42			132	319	2,520
Grass Increase > 15%					195		131	327
Total	1,957	69	42	0	195	132	451	2,847
All owners	13,679	120	42	46	2,033	508	929	17,357

Table P-15 Acres of Verified Change in All Grass/Forb Cover Types by Cause and Owner Class

	Fire	Harvest	Develop- ment	Pest- related	Regrowth	Other	Unverified	All Causes
Forest Service								
Grass Decrease > 15%	839	1	2			2	92	936
Grass Increase > 15%					3		12	15
Total	839	1	2	0	3	2	104	951
Other Public								
Grass Decrease > 15%	445		12			3	6	466
Grass Increase > 15%					1		21	22
Total	445	0	12	0	1	3	27	488
Private								
Grass Decrease > 15%	95		14			91	908	1,109
Grass Increase > 15%					47	14	1,302	1,362
Total	95	0	14	0	47	105	2,210	2,472
All owners	1,379	1	28	0	50	110	2,341	3,910

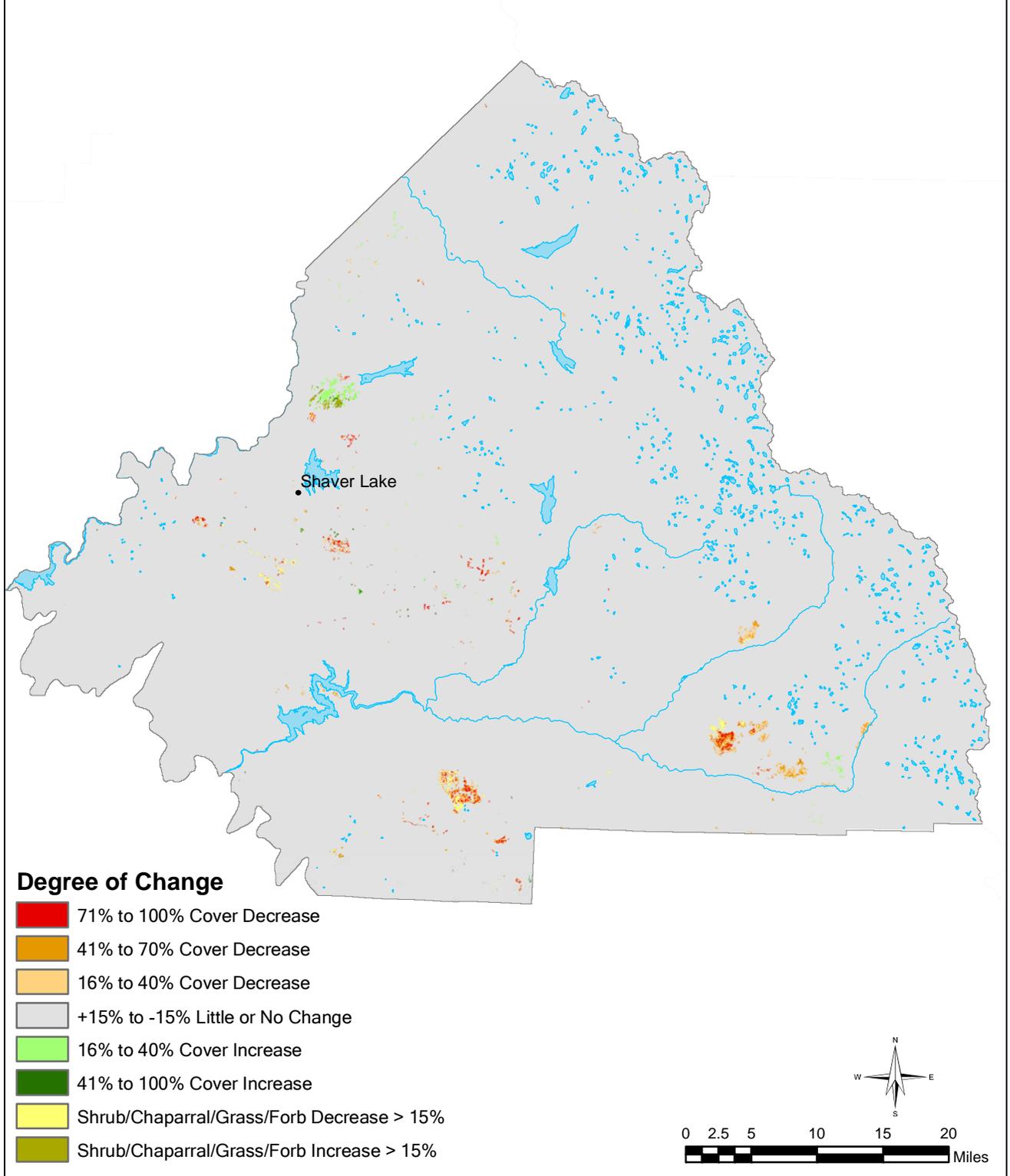
County Maps and Tables

For each county (if relevant), the following will be present:

1. Change Map
2. Table of Change by Ownership and Lifeform
3. Table of Verified Change by Cause and Lifeform
4. Table of Change by Conifer Type
5. Table of Change by Harwood Type
6. Table of Change by Shrub/Chaparral Type
7. Table of Change by Grass/Forb Type
8. Table of Conifer Change by Cause
9. Table of Hardwood Change by Cause
10. Table of Shrub/Chaparral Change by Cause
11. Table of Grass/Forb Change by Cause

Fresno County

Land Cover Change, 1995/1997 - 2001



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Table C-1 Acres of Classified Change in Fresno County by Lifeform and Owner Class

	Forest Service												
	Conifer		Hardwood		Shrub /Chaparral		Grass /Forb		Barren		Forest Service Total		
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	
-71 to -100% CC	1,277		351									1,628	
-41 to -70% CC	1,059		272									1,330	
-16 to -40% CC	1,446		461									1,907	
+15 to -15% CC (Little or No Change)	622,481	99	107,521	99	77,545	98	15,381	100	138,644	100		961,572	99
+16 to +40% CC	1,519		120									1,639	
+41 to +100% CC	243		7									250	
Grass Decrease > 15%					1,009	1	2		92			1,103	
Grass Increase > 15%					442	1	1		11			454	
Total	628,023	100	108,733	100	78,997	100	15,384	100	138,746	100		969,883	100

	Other Public												
	Conifer		Hardwood		Shrub /Chaparral		Grass/Forb		Barren		Other Public Total		
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	
-71 to -100% CC	168											168	
-41 to -70% CC	811	1										811	
-16 to -40% CC	1,628	1										1,628	
+15 to -15% CC (Little or No Change)	147,497	98	7,291	100	15,359	100	2,680	100	180,233	100		353,062	99
+16 to +40% CC	321											321	
+41 to +100% CC	5		1									6	
Grass Decrease > 15%					58				47			105	
Total	150,430	100	7,292	100	15,417	100	2,680	100	180,280	100		356,100	100

	Private												
	Conifer		Hardwood		Shrub /Chaparral		Grass/Forb		Barren		Private Total		
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	
-71 to -100% CC	139		255									393	
-41 to -70% CC	57		283									340	
-16 to -40% CC	72		204									277	
+15 to -15% CC (Little or No Change)	36,566	99	178,368	100	13,977	98	122,245	100	823	100		351,978	100
+16 to +40% CC	2		26									29	
+41 to +100% CC	22		11									33	
Grass Decrease > 15%					292	2	80					372	
Grass Increase > 15%					10		1					11	
Total	36,859	100	179,147	100	14,280	100	122,325	100	823	100		353,434	100

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Table C-2 Acres of Verified Change in Fresno County by Cause and Lifeform

	Fire	Harvest	Pest - related	Regrowth	Develop- ment	Other	Unverified	All Causes
Conifer								
-71 to -100% CC	908	550	18			20	87	1,583
-41 to -70% CC	1,580	196	17		28	44	62	1,927
-16 to -40% CC	2,341	441	3		16	138	207	3,146
+16 to +40% CC				1,719			123	1,842
+41 to +100% CC				238			32	270
Total	4,829	1,186	38	1,957	44	202	512	8,768
Hardwood								
-71 to -100% CC	394	40			5	92	75	606
-41 to -70% CC	396	27	5		1	44	82	554
-16 to -40% CC	522	19			6	55	63	665
+16 to +40% CC				118			28	147
+41 to +100% CC				7			13	19
Total	1,312	86	5	125	12	192	261	1,992
Shrub/Chaparral								
Grass Decrease > 15%	856	17			1	347	138	1,359
Grass Increase > 15%				424			28	453
Total	856	17		424	1	347	166	1,812
Grass/Forb								
Grass Decrease > 15%	2					16	64	82
Grass Increase > 15%				1			1	2
Total	2			1		16	64	83
Barren								
Grass Decrease > 15%	134					2	3	139
Grass Increase > 15%				11				11
Total	134			11		2	3	150
All Lifeform	7,134	1,289	43	2,518	57	758	1,005	12,805

Table C-3 Acres of Classified Change in Fresno County by Conifer Cover Type and Owner Class

	Forest Service		Other Public		Private		All Owners	
	Acres	%	Acres	%	Acres	%	Acres	%
Unknown Conifer Type								
+15 to -15% CC (Little or No Change)					2	100	2	100
Total					2	100	2	100
Jeffrey Pine								
-71 to -100% CC		5						5
-41 to -70% CC		5						5
-16 to -40% CC		28						28
+15 to -15% CC (Little or No Change)	35,171	100	156	100	506	100	35,833	100
Total	35,209	100	156	100	506	100	35,871	100
Lodgepole Pine								
-71 to -100% CC		13						13
-41 to -70% CC		4						4
-16 to -40% CC		10						10
+15 to -15% CC (Little or No Change)	14,989	100	21,243	100	134	100	36,367	100
Total		15,016	100	21,243	100	134	100	36,394

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Table C-3 Acres of Classified Change in Fresno County by Conifer Cover Type and Owner Class (cont.)

	Forest Service		Other Public		Private		All Owners	
	Acres	%	Acres	%	Acres	%	Acres	%
Montane Hardwood-Conifer								
-71 to -100% CC	74	1	1	3	46	2	121	1
-41 to -70% CC	31			1	6		37	
-16 to -40% CC	77	1	3	9	13		94	1
+15 to -15% CC (Little or No Change)	12,743	98	28	87	2,938	98	15,709	98
+16 to +40% CC	8				1		9	
+41 to +100% CC	6				4		10	
Total	12,939	100	33	100	3,008	100	15,980	100
Pinyon-Juniper								
+15 to -15% CC (Little or No Change)			1,668	100			1,668	100
Total			1,668	100			1,668	100
Ponderosa Pine								
-71 to -100% CC	435	1	2		20		457	1
-41 to -70% CC	374	1	2		15		391	1
-16 to -40% CC	420	1	10		11		441	1
+15 to -15% CC (Little or No Change)	57,988	97	3,923	100	9,970	99	71,881	98
+16 to +40% CC	378	1					378	1
+41 to +100% CC	156				10		166	
Total	59,751	100	3,938	100	10,026	100	73,715	100
Red Fir								
-71 to -100% CC	154		165				319	
-41 to -70% CC	147		808	1			955	
-16 to -40% CC	137		1,615	1			1,752	1
+15 to -15% CC (Little or No Change)	107,433	99	105,096	97	586	100	213,116	98
+16 to +40% CC	116		321				436	
+41 to +100% CC			5				5	
Total	107,987	100	108,010	100	586	100	216,583	100
Subalpine Conifer								
-71 to -100% CC	5						5	
-41 to -70% CC								
-16 to -40% CC	2						2	
+15 to -15% CC (Little or No Change)	205,090	100	8,484	100	82	100	213,656	100
Total	205,097	100	8,484	100	82	100	213,663	100
Sierran Mixed Conifer								
-71 to -100% CC	591				73		664	
-41 to -70% CC	498				36		534	
-16 to -40% CC	771				48		819	
+15 to -15% CC (Little or No Change)	189,067	98	6,898	100	22,347	99	218,312	99
+16 to +40% CC	1,017	1			1		1,018	
+41 to +100% CC	81				8		89	
Total	192,024	100	6,898	100	22,514	100	221,437	100
All Conifer	628,023		150,430		36,859		815,313	

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Table C-4 Acres of Classified Change in Fresno County by Hardwood Cover Type and Owner Class

	Forest Service		Other Public		Private		All Owners	
	Acres	%	Acres	%	Acres	%	Acres	%
Blue Oak-Foothill Pine								
-71 to -100% CC	4						4	
-41 to -70% CC	5				4		9	
-16 to -40% CC	2						2	
+15 to -15% CC (Little or No Change)	3,746	100	2,288	100	23,534	100	29,568	100
+16 to +40% CC					3		3	
+41 to +100% CC			1		3		4	
Total	3,758	100	2,289	100	23,543	100	29,590	100
Blue Oak Woodland								
-71 to -100% CC	38				138		176	
-41 to -70% CC	20				219		238	
-16 to -40% CC	16				104		120	
+15 to -15% CC (Little or No Change)	33,126	100	2,883	100	132,970	100	168,978	100
+16 to +40% CC	6				17		23	
+41 to +100% CC					7		7	
Total	33,206	100	2,883	100	133,454	100	169,543	100
Montane Hardwood								
-71 to -100% CC	305				117	1	422	
-41 to -70% CC	247				60		307	
-16 to -40% CC	441	1			100		541	1
+15 to -15% CC (Little or No Change)	69,735	98	2,042	100	21,823	99	93,601	99
+16 to +40% CC	114				7		121	
+41 to +100% CC	7				2		9	
Total	70,851	100	2,042	100	22,109	100	95,001	100
Montane Riparian								
-71 to -100% CC	3						3	
-16 to -40% CC	2						2	
+15 to -15% CC (Little or No Change)	914	100	72	100			986	100
Total	919	100	72	100			990	100
Valley Oak Woodland								
+15 to -15% CC (Little or No Change)					19	100	19	100
Total					19	100	19	100
Valley Foothill Riparian								
+15 to -15% CC (Little or No Change)			7	100	22	100	28	100
Total			7	100	22	100	28	100
All Hardwood	108,733		7,292		179,147		295,172	

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Table C-5 Acres of Classified Change in Fresno County by Shrub/Chaparral Cover Type and Owner Class

	Forest Service		Other Public		Private		All Owners	
	Acres	%	Acres	%	Acres	%	Acres	%
Alpine Dwarf Shrub								
+15 to -15% CC (Little or No Change)	887	100	8,765	100			9,652	100
Total	887	100	8,765	100			9,652	100
Unknown Shrub Type								
+15 to -15% CC (Little or No Change)			400	100	8,931	99	9,331	100
Grass Decrease > 15%					45	1	45	
Total			400	100	8,976	100	9,376	100
Chamise-Redshank Chaparral								
+15 to -15% CC (Little or No Change)			2	100	41	100	43	100
Total			2	100	41	100	43	100
Mixed Chaparral								
+15 to -15% CC (Little or No Change)	42,625	98	191	100	4,320	95	47,136	97
Grass Decrease > 15%	729	2			235	5	964	2
Grass Increase > 15%	320	1					320	1
Total	43,673	100	191	100	4,555	100	48,419	100
Montane Chaparral								
+15 to -15% CC (Little or No Change)	33,991	99	6,002	99	685	97	40,678	99
Grass Decrease > 15%	280	1	58	1	12	2	350	1
Grass Increase > 15%	122				10	1	133	
Total	34,394	100	6,059	100	708	100	41,160	100
Sagebrush								
+15 to -15% CC (Little or No Change)	43	100					43	100
Total	43	100					43	100
All Shrub/Chaparral	78,997		15,417		14,280		108,693	

Table C-6 Acres of Classified Change in Fresno County by Grass/Forb Cover Type and Owner Class

	Forest Service		Other Public		Private		All Owners	
	Acres	%	Acres	%	Acres	%	Acres	%
Alpine Dwarf Shrub								
+15 to -15% CC (Little or No Change)	6,377	100	1,779	100	121,687	100	129,843	100
Grass Decrease > 15%					80		80	
Grass Increase > 15%	1				1		1	
Total	6,378	100	1,779	100	121,767	100	129,924	100
Wet Meadow								
+15 to -15% CC (Little or No Change)	9,004	100	902	100	558	100	10,463	100
Grass Decrease > 15%	2						2	
Grass Increase > 15%								
Total	9,006	100	902	100	558	100	10,465	100
All Grass/Forb	15,384		2,680		122,325		140,390	

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Table C-7 Acres of Verified Change in Fresno County by Cause and Conifer Cover Type

	Fire	Harvest	Develop- ment	Pest- related	Regrowth	Other	unverified	All Causes
Jeffrey Pine								
-71 to -100% CC	1						4	5
-41 to -70% CC	2						3	5
-16 to -40% CC	12						15	28
Total	15						22	38
Lodgepole Pine								
-71 to -100% CC		7		6				13
-41 to -70% CC		2		1				4
-16 to -40% CC	2	7		1			1	10
Total	2	16		8			1	27
Montane Hardwood-Conifer								
-71 to -100% CC	22	89					10	121
-41 to -70% CC	4	21		6		4	2	37
-16 to -40% CC	28	52					14	94
+16 to +40% CC					9			9
+41 to +100% CC					9		1	10
Total	54	162		6	18	4	28	271
Ponderosa Pine								
-71 to -100% CC	315	111		8		6	17	457
-41 to -70% CC	317	58		2		8	7	391
-16 to -40% CC	291	125		3		1	22	441
+16 to +40% CC					373		6	378
+41 to +100% CC					140		26	166
Total	924	293		13	512	14	78	1,834
Red Fir								
-71 to -100% CC	284	10		3		8	14	319
-41 to -70% CC	873	6		2		33	40	955
-16 to -40% CC	1,505	17				136	94	1,752
+16 to +40% CC					372		64	436
+41 to +100% CC					3		2	5
Total	2,663	34		5	375	177	214	3,468
Subalpine Conifer								
-71 to -100% CC							5	5
-41 to -70% CC								
-16 to -40% CC							2	2
Total							7	7
Sierran Mixed Conifer								
-71 to -100% CC	287	332		1		6	38	664
-41 to -70% CC	383	108	28	6			10	534
-16 to -40% CC	502	240	16			1	59	819
+16 to +40% CC					965		53	1,018
+41 to +100% CC					86		3	89
Total	1,172	681	44	7	1,051	8	163	3,125
All Conifer	4,829	1,186	44	38	1,957	202	512	8,768

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Table C-8 Acres of Verified Change in Fresno County by Cause and Hardwood Cover Type

	Fire	Harvest	Develop- ment	Pest- related	Regrowth	Other	unverified	All Causes
Blue Oak-Foothill Pine								
-71 to -100% CC	4							4
-41 to -70% CC	4					5		9
-16 to -40% CC	1					1		2
+16 to +40% CC							3	3
+41 to +100% CC							4	4
Total	9					6	7	22
Blue Oak Woodland								
-71 to -100% CC	49	12	5			47	63	176
-41 to -70% CC	158	6	1			1	72	238
-16 to -40% CC	44	12	6			6	53	120
+16 to +40% CC							23	23
+41 to +100% CC							7	7
Total	251	30	12			54	218	565
Montane Hardwood								
-71 to -100% CC	341	28				42	12	422
-41 to -70% CC	233	21		5		38	10	307
-16 to -40% CC	478	7				46	10	541
+16 to +40% CC					118		2	121
+41 to +100% CC					7		2	9
Total	1,052	56		5	125	126	36	1,400
Montane Riparian								
-71 to -100% CC						3		3
-16 to -40% CC						2		2
Total						4		4
All Hardwood	1,312	86	12	5	125	192	261	1,992

Table C-9 Acres of Verified Change in Fresno County by Cause and Shrub/Chaparral Cover Type

	Fire	Harvest	Develop- ment	Regrowth	Other	unverified	All Causes
Unknown Shrub Type							
Grass Decrease > 15%	26		1			17	45
Total	26		1			17	45
Mixed Chaparral							
Grass Decrease > 15%	538	7			345	74	964
Grass Increase > 15%				306		14	320
Total	538	7		306	345	88	1,283
Montane Chaparral							
Grass Decrease > 15%	291	10			2	46	350
Grass Increase > 15%				118		14	133
Total	291	10		118	2	61	483
All Shrub/Chaparral	856	17	1	424	347	166	1,812

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Table C-10 Acres of Verified Change in Fresno County by Cause and Grass/Forb Cover Type

	Fire	Regrowth	Other	unverified	All Causes
Annual Grass					
Grass Decrease > 15%	2		14	63	80
Grass Increase > 15%		1		1	1
Total	2	1	14	64	81
Wet Meadow					
Grass Decrease > 15%			2		2
Grass Increase > 15%					
Total			2		2
All Grass/Forb	2	1	16	64	83

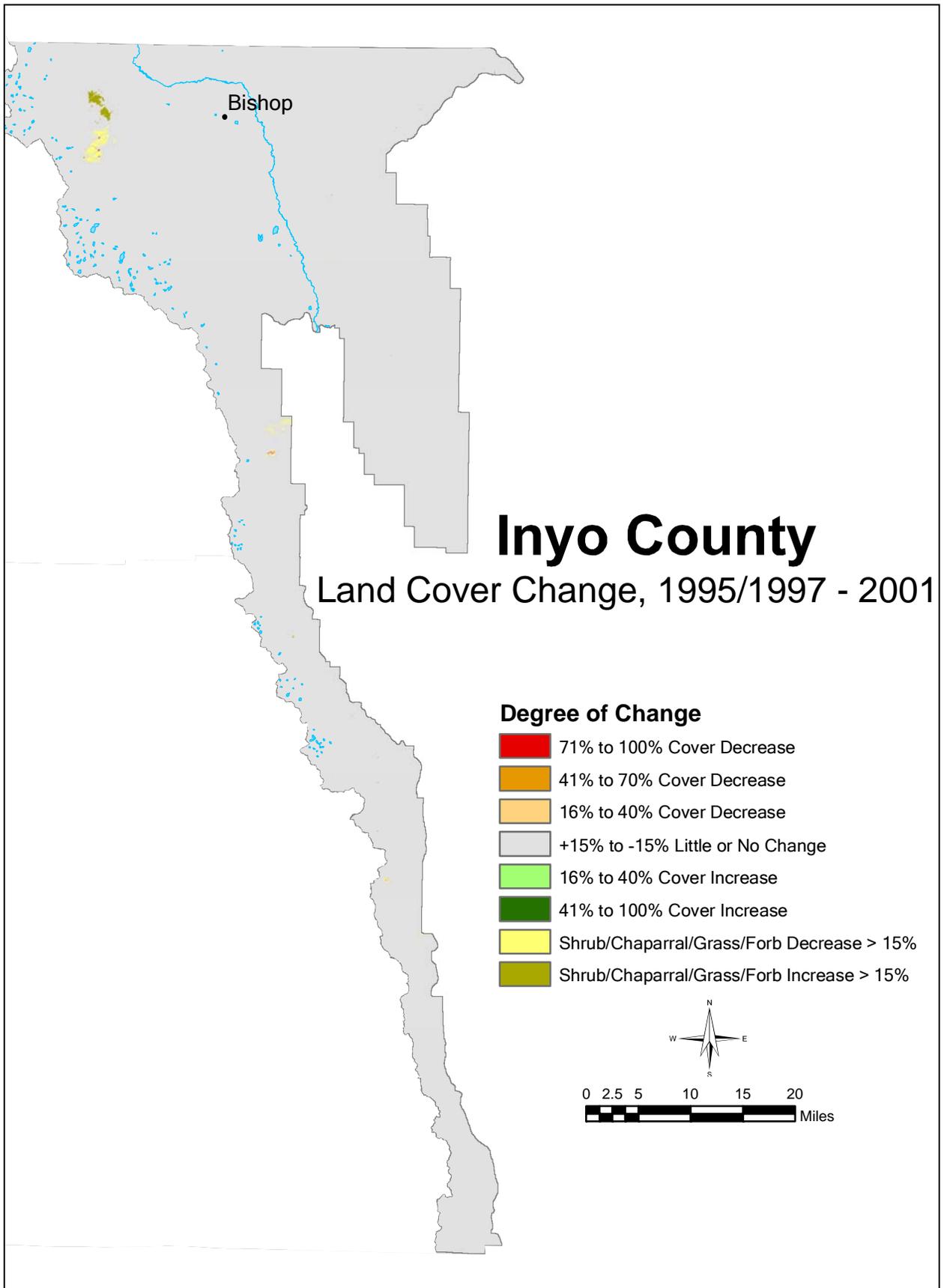


Table C-11 Acres of Classified Change in Inyo County by Lifeform and Owner Class

	Forest Service											
	Conifer		Hardwood		Shrub /Chaparral		Grass /Forb		Barren		Forest Service Total	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
-71 to -100% CC	27											27
-41 to -70% CC	39		12									52
-16 to -40% CC	90		20									110
+15 to -15% CC (Little or No Change)	202,327	100	8,834	100	444,584	99	2,124	100	128,685	100		786,555
+16 to +40% CC	5											5
+41 to +100% CC												
Grass Decrease > 15%					1,938				5			1,943
Grass Increase > 15%					435		3					438
Total	202,488	100	8,867	100	446,958	100	2,127	100	128,690	100		789,130

	Other Public											
	Conifer		Hardwood		Shrub /Chaparral		Grass /Forb		Barren		Other Public Total	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
-71 to -100% CC			9									9
-41 to -70% CC			12									12
-16 to -40% CC			8									8
+15 to -15% CC (Little or No Change)	16,851	100	6,924	100	220,779	100	4,071	100	3,658	100		252,283
Grass Decrease > 15%					176							176
Grass Increase > 15%					835							835
Total	16,851	100	6,954	100	221,790	100	4,071	100	3,658	100		253,324

	Private											
	Conifer		Hardwood		Shrub /Chaparral		Grass /Forb		Barren		Private Total	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
+15 to -15% CC (Little or No Change)	2,838	100	835	100	8,413	100	526	100	698	100		13,309
+16 to +40% CC	5											6
+41 to +100% CC												
Grass Decrease > 15%					16							16
Total	2,843	100	835	100	8,429	100	526	100	698	100		13,330

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Table C-12 Acres of Verified Change in Inyo County by Cause and Lifeform

	Fire	Harvest	Pest - related	Regrowth	Unverified	All Causes
Conifer						
-71 to -100% CC	26		1			27
-41 to -70% CC	30		8		1	39
-16 to -40% CC	35		37		18	90
+16 to +40% CC					10	10
+41 to +100% CC						
Total	91		46		29	167
Hardwood						
-71 to -100% CC	9					9
-41 to -70% CC	24					24
-16 to -40% CC	26				3	29
+16 to +40% CC						
Total	60				3	62
Shrub/Chaparral						
Grass Decrease > 15%	2,044		37		49	2,130
Grass Increase > 15%				1,223	47	1,270
Total	2,044		37	1,223	96	3,400
Grass/Forb						
Grass Increase > 15%					3	3
Total					3	3
Barren						
BAR Grass Decrease > 15%	5					5
Total	5					5
All Lifeform	2,200		82	1,223	131	3,637

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Table C-13 Acres of Classified Change in Inyo County by Conifer Cover Type and Owner Class

	Forest Service		Other Public		Private		All Owners	
	Acres	%	Acres	%	Acres	%	Acres	%
Jeffrey Pine								
-16 to -40% CC	5						5	
+15 to -15% CC (Little or No Change)	4,037	100	13	100	10	100	4,059	100
Total	4,042	100	13	100	10	100	4,065	100
Lodgepole Pine								
-41 to -70% CC	1						1	
-16 to -40% CC	9						9	
+15 to -15% CC (Little or No Change)	10,652	100	25	100	227	100	10,904	100
Total	10,662	100	25	100	227	100	10,914	100
Pinyon-Juniper								
-71 to -100% CC	23						23	
-41 to -70% CC	33						33	
-16 to -40% CC	69						69	
+15 to -15% CC (Little or No Change)	141,954	100	16,737	100	903	99	159,593	100
+16 to +40% CC	5				5	1	10	
+41 to +100% CC								
Total	142,083	100	16,737	100	908	100	159,728	100
Red Fir								
-71 to -100% CC	3						3	
-41 to -70% CC	5						5	
-16 to -40% CC	3						3	
+15 to -15% CC (Little or No Change)	1,658	99			11	100	1,669	99
Total	1,669	100			11	100	1,680	100
Subalpine Conifer								
-41 to -70% CC								
-16 to -40% CC	4						4	
+15 to -15% CC (Little or No Change)	43,929	100	76	100	1,684	100	45,689	100
Total	43,934	100	76	100	1,684	100	45,694	100
Sierran Mixed Conifer								
+15 to -15% CC (Little or No Change)	98	100			4	100	102	100
Total	98	100			4	100	102	100
All Conifer	202,488		16,851		2,843		222,182	

Table C-14 Acres of Classified Change in Inyo County by Hardwood Cover Type and Owner Class

	Forest Service		Other Public		Private		All Owners	
	Acres	%	Acres	%	Acres	%	Acres	%
Aspen								
-71 to -100% CC			9	1			9	
-41 to -70% CC	12		12	2			24	
-16 to -40% CC	20		8	1			29	
+15 to -15% CC (Little or No Change)	7,963	100	614	95	489	100	9,066	99
Total	7,995	100	644	100	489	100	9,128	100
Desert Riparian								
+15 to -15% CC (Little or No Change)			1,679	100	150	100	1,829	100
+16 to +40% CC								
Total			1,679	100	150	100	1,829	100
Montane Riparian								
+15 to -15% CC (Little or No Change)	871	100	4,631	100	196	100	5,699	100
Total	871	100	4,631	100	196	100	5,699	100
All Hardwood	8,867		6,954		835		16,656	

Table C-15 Acres of Classified Change in Inyo County by Shrub/Chaparral Cover Type and Owner Class

	Forest Service		Other Public		Private		All Owners	
	Acres	%	Acres	%	Acres	%	Acres	%
Alpine Dwarf Shrub								
+15 to -15% CC (Little or No Change)	56,120	100	71	100	184	100	56,375	100
Grass Decrease > 15%	51						51	
Grass Increase > 15%	6						6	
Total	56,176	100	71	100	184	100	56,431	100
Alkali Scrub								
+15 to -15% CC (Little or No Change)	3,367	95	78,558	100	1,605	100	83,530	100
Grass Decrease > 15%	173	5	1				173	
Grass Increase > 15%			5				5	
Total	3,540	100	78,564	100	1,605	100	83,708	100
Bitterbrush								
+15 to -15% CC (Little or No Change)	24,236	97	2,711	86	528	100	27,474	96
Grass Decrease > 15%	628	3	32	1			659	2
Grass Increase > 15%	203	1	422	13			624	2
Total	25,066	100	3,164	100	528	100	28,758	100
Desert Scrub								
+15 to -15% CC (Little or No Change)	121,149	100	94,932	100	2,137	99	218,218	100
Grass Decrease > 15%	12		4		13	1	29	
Grass Increase > 15%	4						4	
Total	121,164	100	94,936	100	2,151	100	218,251	100
Low Sagebrush								
+15 to -15% CC (Little or No Change)			4,849	100			4,849	100
Total			4,849	100			4,849	100
Montane Chaparral								
+15 to -15% CC (Little or No Change)	3,543	99			14	100	3,557	99
Grass Decrease > 15%	23	1					23	1
Grass Increase > 15%	10						10	
Total	3,577	100			14	100	3,591	100

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Table C-15 Acres of Classified Change in Inyo County by Shrub/Chaparral Cover Type and Owner Class (cont.)

	Forest Service		Other Public		Private		All Owners	
	Acres	%	Acres	%	Acres	%	Acres	%
Sagebrush								
+15 to -15% CC (Little or No Change)	236,170	99	39,659	99	3,945	100	279,774	99
Grass Decrease > 15%	1,052		139		2		1,194	
Grass Increase > 15%	213		408	1			621	
Total	237,435	100	40,206	100	3,948	100	281,589	100
All Shrub/Chaparral	446,958	600	221,790	600	8,429	600	677,177	700

Table C-6 Acres of Classified Change in Inyo County by Grass/Forb Cover Type and Owner Class

	Forest Service		Other Public		Private		All Owners	
	Acres	%	Acres	%	Acres	%	Acres	%
Annual Grass								
+15 to -15% CC (Little or No Change)	12	100					12	100
Total	12	100					12	100
Freshwater Emergen Wetland								
+15 to -15% CC (Little or No Change)			3,353	100	347	100	3,701	100
Total			3,353	100	347	100	3,701	100
Wet Meadow								
+15 to -15% CC (Little or No Change)	2,112	100	717	100	179	100	3,008	100
Grass Increase > 15%	3						3	
Total	2,115	100	717	100	179	100	3,011	100
All Grass/Forb	2,127	200	4,071	200	526	200	6,724	300

Table C-17 Acres of Verified Change in Inyo County by Cause and Conifer Cover Type

	Fire	Pest-related	unverified	All Causes
Jeffrey Pine				
-16 to -40% CC	5			5
Total	5			5
Lodgepole Pine				
-41 to -70% CC		1		1
-16 to -40% CC		9		9
Total		10		10
Pinyon-Juniper				
-71 to -100% CC	22	1		23
-41 to -70% CC	25	7		33
-16 to -40% CC	27	28	14	69
+16 to +40% CC			10	10
+41 to +100% CC				
Total	75	36	25	135
Red Fir				
-71 to -100% CC	3			3
-41 to -70% CC	5			5
-16 to -40% CC	3			3
Total	12			12
Subalpine Conifer				
-41 to -70% CC				
-16 to -40% CC			4	4
Total			4	4
All Conifer	91	46	29	167

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Table C-18 Acres of Verified Change in Inyo County by Cause and Hardwood Cover Type

	Fire	unverified	All Causes
Aspen			
-71 to -100% CC	9		9
-41 to -70% CC	24		24
-16 to -40% CC	26	3	29
Total	60	3	62
Desert Riparian			
+16 to +40% CC			
Total			
All Hardwood	60	3	62

Table C-19 Acres of Verified Change in Inyo County by Cause and Shrub/Chaparral Cover Type

	Fire	Pest-related	Regrowth	unverified	All Causes
Alpine Dwarf Shrub					
Grass Decrease > 15%	51				51
Grass Increase > 15%				6	6
Total	51			6	56
Alkali Scrub					
Grass Decrease > 15%	173				173
Grass Increase > 15%				5	5
Total	173			5	178
Bitterbrush					
Grass Decrease > 15%	658			1	659
Grass Increase > 15%			624		624
Total	658		624	1	1,284
Desert Scrub					
Grass Decrease > 15%	27			3	29
Grass Increase > 15%				4	4
Total	27			6	33
Montane Chaparral					
Grass Decrease > 15%		23			23
Grass Increase > 15%				10	10
Total		23		10	34
Sagebrush					
Grass Decrease > 15%	1,135	13		45	1,194
Grass Increase > 15%			599	23	621
Total	1,135	13	599	68	1,815
All Shrub/Chaparral	2,044	37	1,223	96	3,400

Table C-20 Acres of Verified Change in Inyo County by Cause and Grass/Forb Cover Type

	unverified	All Causes
Wet Meadow		
Grass Increase > 15%	3	3
Total	3	3
All Grass/Forb	3	3

Kern County

Land Cover Change, 1995/1997 - 2001

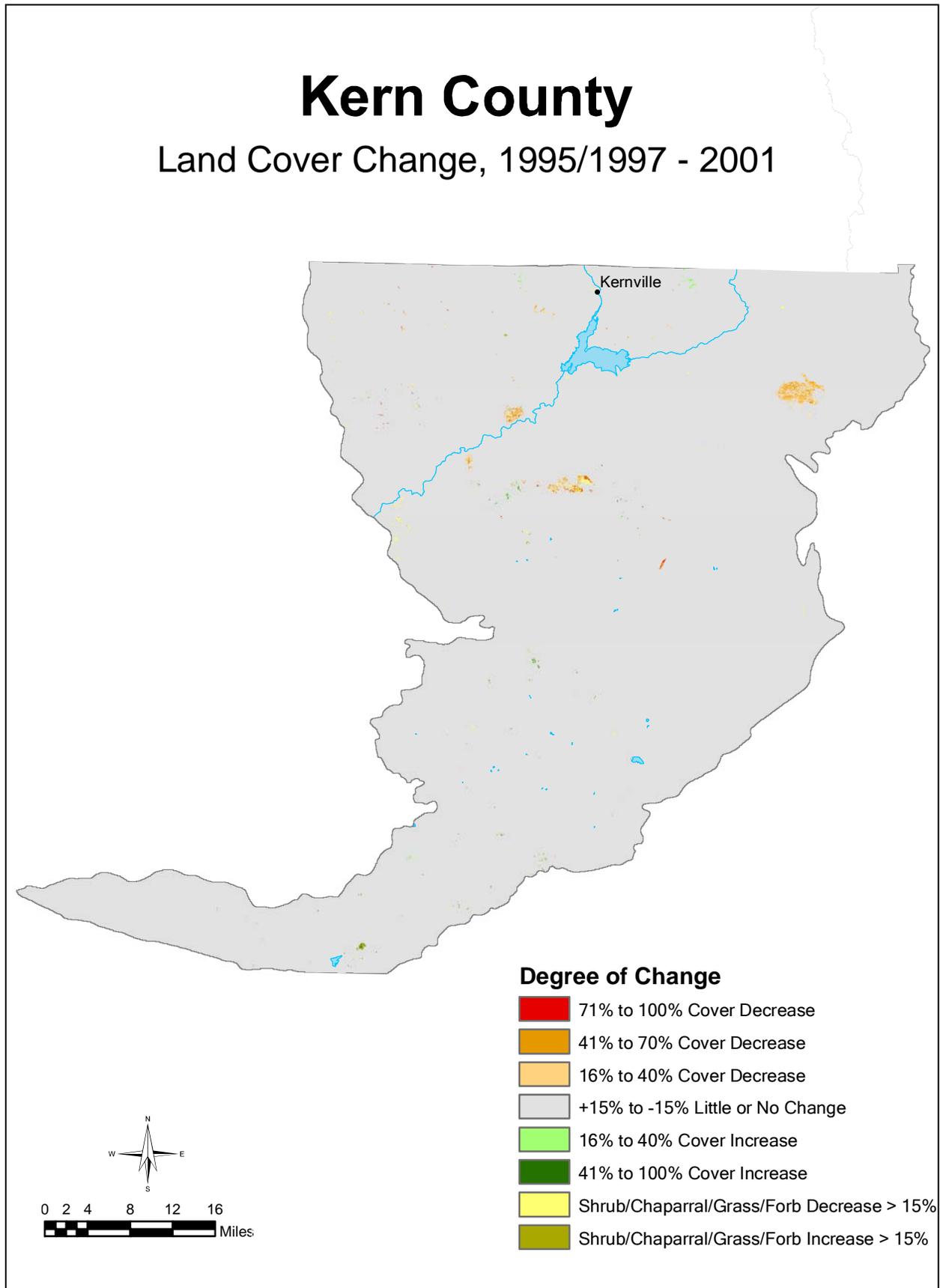


Table C-21 Acres of Classified Change in Kern County by Lifeform and Owner Class

	Forest Service											
	Conifer		Hardwood		Shrub /Chaparral		Grass/Forb		Barren		Forest Service Total	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
-71 to -100% CC	47		43									90
-41 to -70% CC	1,038	1	420	1								1,458
-16 to -40% CC	2,299	1	638	1								2,937
+15 to -15% CC (Little or No Change)	167,749	98	54,947	98	62,178	100	44,670	100	9,036	99		338,580
+16 to +40% CC	385		21									406
+41 to +100% CC	76		14									89
Grass Decrease > 15%					222		79		104	1		405
Grass Increase > 15%					26				2			28
Total	171,593	100	56,083	100	62,425	100	44,749	100	9,142	100		343,993

	Other Public											
	Conifer		Hardwood		Shrub /Chaparral		Grass/Forb		Barren		Other Public Total	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
-71 to -100% CC	13		21									34
-41 to -70% CC	7		171									178
-16 to -40% CC	9		199	1								208
+15 to -15% CC (Little or No Change)	43,084	100	39,291	99	215,632	100	27,992	100	279	100		326,277
+16 to +40% CC			4									4
+41 to +100% CC			3									3
Grass Decrease > 15%					228		14					242
Grass Increase > 15%					2							2
Total	43,112	100	39,688	100	215,863	100	28,006	100	279	100		326,947

	Private											
	Conifer		Hardwood		Shrub /Chaparral		Grass/Forb		Barren		Private Total	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
-71 to -100% CC	84		109									193
-41 to -70% CC	95		255									350
-16 to -40% CC	51		260									311
+15 to -15% CC (Little or No Change)	71,880	100	277,880	100	287,364	100	302,958	100	532	100		940,614
+16 to +40% CC	54		119									173
+41 to +100% CC	16		172									188
Grass Decrease > 15%					312		670					981
Grass Increase > 15%					241		54		2			297
Total	72,179	100	278,795	100	287,917	100	303,682	100	534	100		943,107

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Table C-22 Acres of Verified Change in Kern County by Cause and Lifeform

	Fire	Harvest	Regrowth	Develop- ment	Other	Unverified	All Causes
Conifer							
-71 to -100% CC	118	7		3		15	143
-41 to -70% CC	1,100	4				36	1,140
-16 to -40% CC	2,307	4		9		40	2,359
+16 to +40% CC			332			107	439
+41 to +100% CC			47			44	92
Total	3,525	15	379	12		241	4,172
Hardwood							
-71 to -100% CC	69			3	1	100	173
-41 to -70% CC	753			1		92	846
-16 to -40% CC	952			17		127	1,096
+16 to +40% CC			17			126	143
+41 to +100% CC			84			104	188
Total	1,774		101	21	2	549	2,447
Shrub/Chaparral							
Grass Decrease > 15%	563			16	55	128	762
Grass Increase > 15%			154			115	269
Total	563		154	16	55	243	1,031
Grass/Forb							
Grass Decrease > 15%	2			28	77	655	762
Grass Increase > 15%			1		14	40	54
Total	2		1	28	91	695	817
Barren							
Grass Decrease > 15%	17					87	104
Grass Increase > 15%			2			2	4
Total	17		2			89	108
All Lifeform	5,881	15	636	77	147	1,818	8,575

Table C-23 Acres of Classified Change in Kern County by Conifer Cover Type and Owner Class

	Forest Service		Other Public		Private		All Owners	
	Acres	%	Acres	%	Acres	%	Acres	%
Unknown Conifer Type								
-71 to -100% CC			10	6	10		20	
-41 to -70% CC			3	2	4		6	
-16 to -40% CC			3	2	2		5	
+15 to -15% CC (Little or No Change)			138	90	6,068	100	6,207	99
+16 to +40% CC					1		1	
+41 to +100% CC								
Total			154	100	6,085	100	6,240	100
Jeffrey Pine								
-71 to -100% CC	32		3		50		86	
-41 to -70% CC	203		4		54		260	
-16 to -40% CC	325	1	3		41		370	1
+15 to -15% CC (Little or No Change)	45,574	98	5,847	100	17,378	99	68,799	99
+16 to +40% CC	203				1		204	
+41 to +100% CC	15						15	
Total	46,352	100	5,858	100	17,524	100	69,734	100

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Table C-23 Acres of Classified Change in Kern County by Conifer Cover Type and Owner Class (cont.)

	Forest Service		Other Public		Private		All Owners	
	Acres	%	Acres	%	Acres	%	Acres	%
Juniper								
+15 to -15% CC (Little or No Change)	2	100	1,131	100	3,348	100	4,480	100
+16 to +40% CC					1		1	
+41 to +100% CC					2		2	
Total	2	100	1,131	100	3,350	100	4,483	100
Lodgepole Pine								
+15 to -15% CC (Little or No Change)	3	100					3	100
Total	3	100					3	100
Montane Hardwood-Conifer								
-71 to -100% CC							1	
-41 to -70% CC	1						1	
-16 to -40% CC								
+15 to -15% CC (Little or No Change)	5,399	100	2	100	766	100	6,167	100
+16 to +40% CC	4						4	
+41 to +100% CC	1						1	
Total	5,405	100	2	100	767	100	6,174	100
Pinyon-Juniper								
-71 to -100% CC	4				22		27	
-41 to -70% CC	823	1			36		859	1
-16 to -40% CC	1,963	3	3		8		1,974	1
+15 to -15% CC (Little or No Change)	70,467	96	35,206	100	39,044	100	144,717	98
+16 to +40% CC					45		45	
+41 to +100% CC					14		14	
Total	73,257	100	35,209	100	39,170	100	147,636	100
Ponderosa Pine								
-71 to -100% CC	3						3	
-41 to -70% CC	6						6	
-16 to -40% CC	1						1	
+15 to -15% CC (Little or No Change)	10,741	100	671	100	2,532	100	13,944	100
+16 to +40% CC	36				2		38	
+41 to +100% CC	5						5	
Total	10,792	100	671	100	2,535	100	13,998	100
Red Fir								
+15 to -15% CC (Little or No Change)	610	100					610	100
Total	610	100					610	100
Sierran Mixed Conifer								
-71 to -100% CC	8						8	
-41 to -70% CC	6				1		6	
-16 to -40% CC	8						8	
+15 to -15% CC (Little or No Change)	34,952	99	88	100	1,883	100	36,923	99
+16 to +40% CC	142				4		146	
+41 to +100% CC	55						55	
Total	35,171	100	88	100	1,888	100	37,147	100
White Fir								
+15 to -15% CC (Little or No Change)					860	100	860	100
Total					860	100	860	100
All Conifer	171,593		43,112		72,179		286,884	

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Table C-24 Acres of Classified Change in Kern County by Hardwood Cover Type and Owner Class

	Forest Service		Other Public		Private		All Owners	
	Acres	%	Acres	%	Acres	%	Acres	%
Blue Oak-Foothill Pine								
-71 to -100% CC			3		1		5	
-41 to -70% CC			4				4	
-16 to -40% CC			23		40		63	
+15 to -15% CC (Little or No Change)	9	100	8,228	100	37,831	100	46,068	100
+16 to +40% CC					2		2	
+41 to +100% CC					5		5	
Total	9	100	8,259	100	37,879	100	46,146	100
Blue Oak Woodland								
-71 to -100% CC	40		8		101		149	
-41 to -70% CC	353	1	117	1	242		712	
-16 to -40% CC	492	2	109	1	181		782	
+15 to -15% CC (Little or No Change)	23,079	96	21,254	99	175,986	100	220,319	99
+16 to +40% CC	3				45		48	
+41 to +100% CC					40		40	
Total	23,967	100	21,488	100	176,595	100	222,051	100
Coastal Oak Woodland								
-71 to -100% CC								
+15 to -15% CC (Little or No Change)			18	100	4,370	100	4,389	100
+16 to +40% CC					2		2	
+41 to +100% CC					2		2	
Total			18	100	4,375	100	4,393	100
Desert Riparian								
+15 to -15% CC (Little or No Change)			1,735	100	446	100	2,181	100
Total			1,735	100	446	100	2,181	100
Joshua Tree								
+15 to -15% CC (Little or No Change)	832	100	1,869	100	215	100	2,916	100
Total	832	100	1,869	100	215	100	2,916	100
Montane Hardwood								
-71 to -100% CC	2		9		2		13	
-41 to -70% CC	66		50	1	12		127	
-16 to -40% CC	140		65	1	21		226	
+15 to -15% CC (Little or No Change)	30,555	99	4,755	97	25,794	100	61,104	99
+16 to +40% CC	18		4		28		50	
+41 to +100% CC	14		3		58		74	
Total	30,794	100	4,885	100	25,915	100	61,594	100
Montane Riparian								
-71 to -100% CC	1				2		2	
-41 to -70% CC	2						2	
-16 to -40% CC	6	1	2		1		9	
+15 to -15% CC (Little or No Change)	472	98	603	100	1,514	100	2,589	100
Total	480	100	605	100	1,516	100	2,601	100
Valley Oak Woodland								
-71 to -100% CC					4		4	
-41 to -70% CC					1		1	
-16 to -40% CC					17		17	
+15 to -15% CC (Little or No Change)			825	100	31,579	100	32,404	100
+16 to +40% CC					42		42	
+41 to +100% CC					67		67	
Total			825	100	31,709	100	32,534	100

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Table C-24 Acres of Classified Change in Kern County by Hardwood Cover Type and Owner Class (cont.)

	Forest Service		Other Public		Private		All Owners	
	Acres	%	Acres	%	Acres	%	Acres	%
Valley Foothill Riparian								
+15 to -15% CC (Little or No Change)			4	100	145	100	149	100
Total			4	100	145	100	149	100
All Hardwood	56,083		39,688		278,795		374,565	

Table C-25 Acres of Classified Change in Kern County by Shrub/Chaparral Cover Type and Owner Class

	Forest Service		Other Public		Private		All Owners	
	Acres	%	Acres	%	Acres	%	Acres	%
Bitterbrush								
+15 to -15% CC (Little or No Change)	351	100	567	100	2,062	100	2,980	100
Total	351	100	567	100	2,062	100	2,980	100
Unknown Shrub Type								
+15 to -15% CC (Little or No Change)	11	100	19,809	99	109,531	100	129,352	100
Grass Decrease > 15%			184	1	102		287	
Grass Increase > 15%					34		34	
Total	11	100	19,994	100	109,668	100	129,672	100
Chamise-Redshank Chaparral								
+15 to -15% CC (Little or No Change)	1	100	276	100	3,741	97	4,018	97
Grass Decrease > 15%					4		4	
Grass Increase > 15%					126	3	126	3
Total	1	100	276	100	3,871	100	4,147	100
Coastal Scrub								
+15 to -15% CC (Little or No Change)	412	100	136	100	931	100	1,479	100
Grass Increase > 15%					1		1	
Total	412	100	136	100	931	100	1,480	100
Desert Scrub								
+15 to -15% CC (Little or No Change)	521	100	143,163	100	79,749	100	223,433	100
Grass Decrease > 15%			33		81		115	
Grass Increase > 15%					20		20	
Total	521	100	143,197	100	79,850	100	223,568	100
Desert Wash								
+15 to -15% CC (Little or No Change)			117	100	56	100	173	100
Total			117	100	56	100	173	100
Mixed Chaparral								
+15 to -15% CC (Little or No Change)	34,437	100	13,928	100	61,135	100	109,500	100
Grass Decrease > 15%	55		9		45		109	
Grass Increase > 15%	9		2		34		45	
Total	34,500	100	13,940	100	61,215	100	109,655	100
Montane Chaparral								
+15 to -15% CC (Little or No Change)	20,531	99	217	99	1,275	97	22,024	99
Grass Decrease > 15%	167	1	2	1	28	2	197	1
Grass Increase > 15%	17				17	1	34	
Total	20,716	100	219	100	1,320	100	22,255	100
Sagebrush								
+15 to -15% CC (Little or No Change)	5,914	100	37,418	100	28,883	100	72,214	100
Grass Decrease > 15%					50		50	
Grass Increase > 15%					10		10	
Total	5,914	100	37,418	100	28,943	100	72,275	100
All Shrub/Chaparral	62,425		215,863		287,917		566,205	

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Table C-26 Acres of Classified Change in Kern County by Grass/Forb Cover Type and Owner Class

	Forest Service		Other Public		Private		All Owners	
	Acres	%	Acres	%	Acres	%	Acres	%
Alpine Dwarf Shrub								
+15 to -15% CC (Little or No Change)	43,133	100	27,987	100	302,223	100	373,343	100
Grass Decrease > 15%	79		14		670		762	
Grass Increase > 15%					54		54	
Total	43,212	100	28,001	100	302,947	100	374,160	100
Wet Meadow								
+15 to -15% CC (Little or No Change)	1,537	100	5	100	735	100	2,277	
Total	100	100	100	100	100	100	100	100
All Grass/Forb	43,312		28,101		303,047		374,260	

Table C-27 Acres of Verified Change in Kern County by Cause and Conifer Cover Type

	Fire	Harvest	Develop- ment	Regrowth	unverified	All Causes
Unknown Conifer Type						
-71 to -100% CC	20					20
-41 to -70% CC	6				1	6
-16 to -40% CC	5					5
+16 to +40% CC				1		1
+41 to +100% CC						
Total	30			2	1	33
Jeffrey Pine						
-71 to -100% CC	76		3		6	86
-41 to -70% CC	243				17	260
-16 to -40% CC	334		9		27	370
+16 to +40% CC				202	2	204
+41 to +100% CC				12	3	15
Total	653		12	214	55	934
Juniper						
+16 to +40% CC					1	1
+41 to +100% CC					2	2
Total					2	2
Montane Hardwood-Conifer						
-71 to -100% CC	1					1
-41 to -70% CC	1					1
-16 to -40% CC						
+16 to +40% CC				2	2	4
+41 to +100% CC					1	1
Total	2			2	3	7
Pinyon-Juniper						
-71 to -100% CC	20				7	27
-41 to -70% CC	849				11	859
-16 to -40% CC	1,964				9	1,974
+16 to +40% CC					45	45
+41 to +100% CC					14	14
Total	2,833				86	2,919

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Table C-27 Acres of Verified Change in Kern County by Cause and Conifer Cover Type (cont.)

	Fire	Harvest	Develop- ment	Regrowth	unverified	All Causes
Ponderosa Pine						
-71 to -100% CC		1			2	3
-41 to -70% CC		1			5	6
-16 to -40% CC					1	1
+16 to +40% CC				34	4	38
+41 to +100% CC				4	1	5
Total		3		38	13	53
Sierran Mixed Conifer						
-71 to -100% CC	2	6				8
-41 to -70% CC	2	3			2	6
-16 to -40% CC	3	4			2	8
+16 to +40% CC				93	53	146
+41 to +100% CC				30	24	55
Total	6	12		124	82	224
All Conifer	3,525	15	12	379	241	4,172

Table C-28 Acres of Verified Change in Kern County by Cause and Hardwood Cover Type

	Fire	Develop- ment	Regrowth	Other	unverified	All Causes
Blue Oak-Foothill Pine						
-71 to -100% CC				1	3	5
-41 to -70% CC	4					4
-16 to -40% CC	14	16			32	63
+16 to +40% CC					2	2
+41 to +100% CC					5	5
Total	19	16		2	42	78
Blue Oak Woodland						
-71 to -100% CC	60				89	149
-41 to -70% CC	624				88	712
-16 to -40% CC	747				35	782
+16 to +40% CC			4		44	48
+41 to +100% CC			14		26	40
Total	1,431		18		283	1,731
Coastal Oak Woodland						
-71 to -100% CC						
+16 to +40% CC					2	2
+41 to +100% CC					2	2
Total					5	5
Montane Hardwood						
-71 to -100% CC	8				5	13
-41 to -70% CC	124				3	127
-16 to -40% CC	185				41	226
+16 to +40% CC			8		42	50
+41 to +100% CC			21		53	74
Total	317		29		143	490
Montane Riparian						
-71 to -100% CC	1				2	2
-41 to -70% CC	2					2
-16 to -40% CC	6				3	9
Total	8				5	13

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Table C-28 Acres of Verified Change in Kern County by Cause and Hardwood Cover Type (cont.)

	Fire	Develop-ment	Regrowth	Other	unverified	All Causes
Blue Oak-Foothill Pine						
Valley Oak Woodland						
-71 to -100% CC		3				4
-41 to -70% CC		1			1	1
-16 to -40% CC					16	17
+16 to +40% CC			5		36	42
+41 to +100% CC			49		18	67
Total		4	54		72	130
All Hardwood	1,774	21	101	2	549	2,447

Table C-29 Acres of Verified Change in Kern County by Cause and Shrub/Chaparral Cover Type

	Fire	Develop-ment	Regrowth	Other	unverified	All Causes
Unknown Shrub Type						
Grass Decrease > 15%	267			1	19	287
Grass Increase > 15%			7		27	34
Total	267		7	1	46	321
Chamise-Redshank Chaparral						
Grass Decrease > 15%					4	4
Grass Increase > 15%			126			126
Total			126		4	129
Coastal Scrub						
Grass Increase > 15%					1	1
Total					1	1
Desert Scrub						
Grass Decrease > 15%				21	94	115
Grass Increase > 15%					20	20
Total				21	114	134
Mixed Chaparral						
Grass Decrease > 15%	100				9	109
Grass Increase > 15%			14		31	45
Total	100		14		40	154
Montane Chaparral						
Grass Decrease > 15%	196				1	197
Grass Increase > 15%			7		26	34
Total	196		7		28	231
Sagebrush						
Grass Decrease > 15%		16		33	1	50
Grass Increase > 15%					10	10
Total		16		33	11	60
All Shrub/Chaparral	563	16	154	55	243	1,031

Table C-30 Acres of Verified Change in Kern County by Cause and Grass/Forb Cover Type

	Fire	Develop-ment	Regrowth	Other	unverified	All Causes
Annual Grass						
Grass Decrease > 15%	2	28		77	655	762
Grass Increase > 15%			1	14	40	54
Total	2	28	1	91	695	817
All Grass/Forb	2	28	1	91	695	817

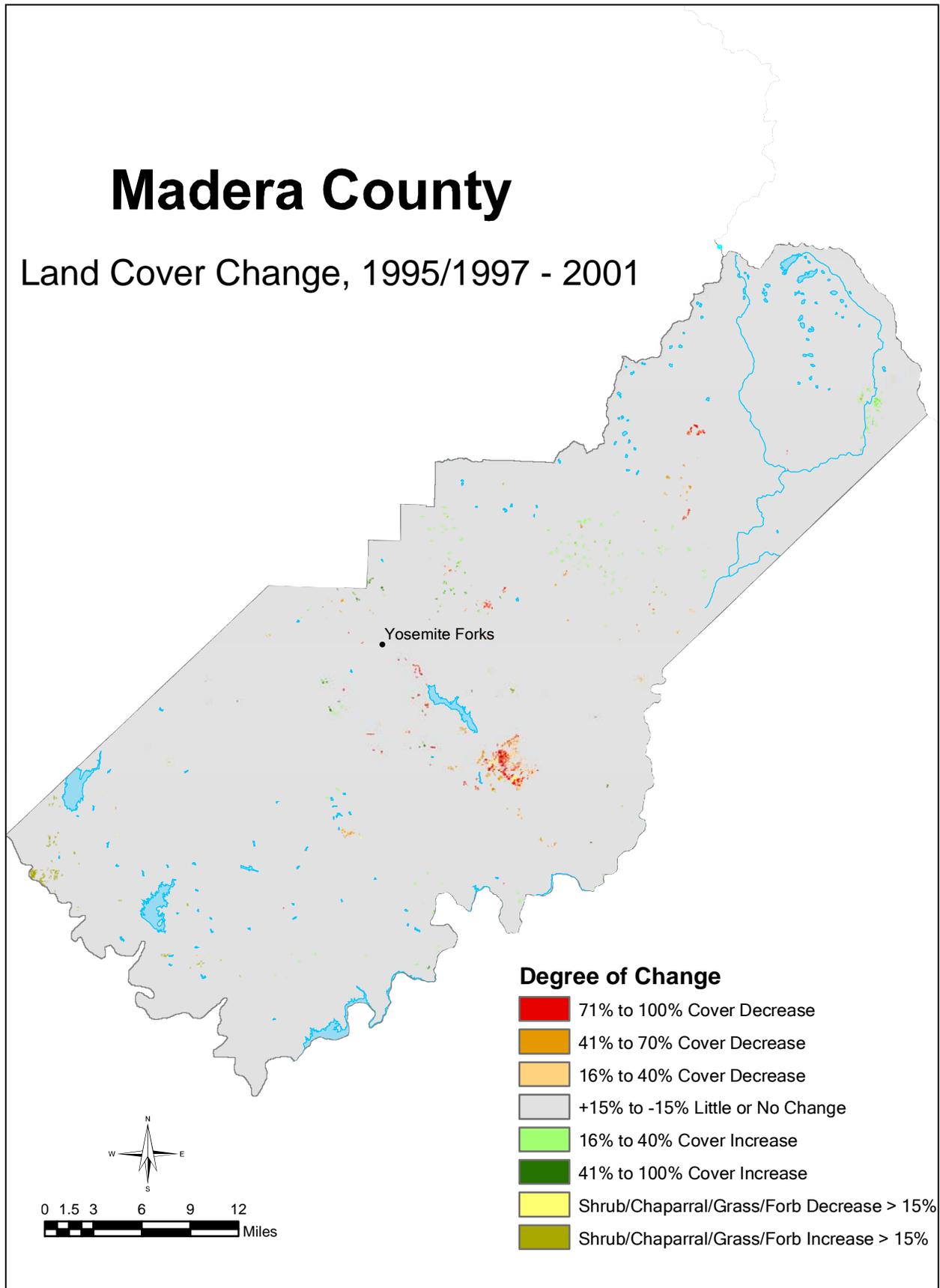


Table C-31 Acres of Classified Change in Madera County by Lifeform and Owner Class

	Forest Service											
	Conifer		Hardwood		Shrub /Chaparral		Grass /Forb		Barren		Forest Service Total	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
-71 to -100% CC	540		299	1								839
-41 to -70% CC	182		102									283
-16 to -40% CC	815		321	1								1,136
+15 to -15% CC (Little or No Change)	283,552	99	44,969	98	19,488	99	3,925	100	54,689	100		406,623
+16 to +40% CC	998		56									1,054
+41 to +100% CC	132		9									141
Grass Decrease > 15%					68				2			70
Grass Increase > 15%					94							95
Total	286,219	100	45,756	100	19,651	100	3,926	100	54,691	100		410,242

	Other Public											
	Conifer		Hardwood		Shrub /Chaparral		Grass /Forb		Barren		Other Public Total	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
-71 to -100% CC	1											1
-41 to -70% CC	2											2
-16 to -40% CC	3		5									8
+15 to -15% CC (Little or No Change)	1,284	97	6,140	100	932	100	5,986	100	102	100		14,443
+16 to +40% CC	28	2	11									38
+41 to +100% CC			7									8
Grass Decrease > 15%					2							2
Grass Increase > 15%							5					5
Total	1,318	100	6,163	100	934	100	5,991	100	102	100		14,508

	Private											
	Conifer		Hardwood		Shrub/ Chaparral		Grass /Forb		Barren		Private Total	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
-71 to -100% CC	67		109									176
-41 to -70% CC	37		96									133
-16 to -40% CC	46		131									177
+15 to -15% CC (Little or No Change)	19,129	99	175,794	100	23,792	100	119,537	100	432	100		338,685
+16 to +40% CC	2		163									165
+41 to +100% CC	16		16									31
Grass Decrease > 15%					71		36					107
Grass Increase > 15%					13		419					431
Total	19,297	100	176,308	100	23,876	100	119,992	100	432	100		339,905

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Table C-32 Acres of Verified Change in Madera County by Cause and Lifeform

	Fire	Harvest	Regrowth	Development	Other	Unverified	All Causes
Conifer							
-71 to -100% CC	279	253		11	35	29	608
-41 to -70% CC	10	146			3	61	221
-16 to -40% CC	602	227		2	8	25	863
+16 to +40% CC			1,027			1	1,028
+41 to +100% CC			137			11	148
Total	891	626	1,164	13	46	127	2,868
Hardwood							
-71 to -100% CC	330	10		12	6	49	408
-41 to -70% CC	5	27		31	46	88	198
-16 to -40% CC	304	25		60	20	49	457
+16 to +40% CC			78			151	230
+41 to +100% CC			19			13	32
Total	639	62	98	103	72	350	1,324
Shrub/Chaparral							
Grass Decrease > 15%	97	7		9	4	25	141
Grass Increase > 15%			106			1	107
Total	97	7	106	9	4	26	249
Grass/Forb							
Grass Decrease > 15%						36	36
Grass Increase > 15%						424	424
Total						460	461
Barren							
Grass Decrease > 15%					2		2
Total					2		2
All Lifeform	1,627	695	1,368	125	124	964	4,903

Table C-33 Acres of Classified Change in Madera County by Conifer Cover Type and Owner Class

	Forest Service		Other Public		Private		All Owners	
	Acres	%	Acres	%	Acres	%	Acres	%
Unknown Conifer Type								
+15 to -15% CC (Little or No Change)			66	100	983	99	1,048	99
+16 to +40% CC								
+41 to +100% CC					9	1	9	1
Total			66	100	992	100	1,057	100
Jeffrey Pine								
+15 to -15% CC (Little or No Change)	110	100					110	100
Total	110	100					110	100
Lodgepole Pine								
-71 to -100% CC	13						13	
-41 to -70% CC	7						7	
-16 to -40% CC	4						4	
+15 to -15% CC (Little or No Change)	2,899	99			453	100	3,353	99
+16 to +40% CC	1						1	
Total	2,925	100			453	100	3,379	100

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Table C-33 Acres of Classified Change in Madera County by Conifer Cover Type and Owner Class (cont.)

	Forest Service		Other Public		Private		All Owners	
	Acres	%	Acres	%	Acres	%	Acres	%
Montane Hardwood-Conifer								
-71 to -100% CC	93		1		49	1	143	
-41 to -70% CC	32		1		30		63	
-16 to -40% CC	133		2	1	30		165	
+15 to -15% CC (Little or No Change)	26,435	99	241	98	7,590	98	34,266	99
+16 to +40% CC	60				1		61	
+41 to +100% CC	8				6		14	
Total	26,760	100	245	100	7,708	100	34,712	100
Ponderosa Pine								
-71 to -100% CC	225	1			16		242	1
-41 to -70% CC	36		1	1	6		43	
-16 to -40% CC	361	1	1	1	7		369	1
+15 to -15% CC (Little or No Change)	34,496	98	131	98	4,680	99	39,308	98
+16 to +40% CC	70						70	
+41 to +100% CC	77						78	
Total	35,266	100	134	100	4,710	100	40,109	100
Red Fir								
-71 to -100% CC	103						103	
-41 to -70% CC	76						76	
-16 to -40% CC	70						70	
+15 to -15% CC (Little or No Change)	80,657	100	124	100	1,496	100	82,277	100
+16 to +40% CC	32						32	
+41 to +100% CC	3						3	
Total	80,941	100	124	100	1,496	100	82,562	100
Subalpine Conifer								
-16 to -40% CC	5						5	
+15 to -15% CC (Little or No Change)	28,941	100	4	100	27	100	28,973	100
Total	28,946	100	4	100	27	100	28,978	100
Sierran Mixed Conifer								
-71 to -100% CC	105				1		106	
-41 to -70% CC	32						32	
-16 to -40% CC	241				9		250	
+15 to -15% CC (Little or No Change)	110,013	99	718	96	3,900	100	114,631	99
+16 to +40% CC	835	1	28	4	1		863	1
+41 to +100% CC	44						44	
Total	111,270	100	746	100	3,910	100	115,927	100
All Conifer	286,219		1,318		19,297		306,834	

Table C-34 Acres of Classified Change in Madera County by Hardwood Cover Type and Owner Class

	Forest Service		Other Public		Private		All Owners	
	Acres	%	Acres	%	Acres	%	Acres	%
Blue Oak-Foothill Pine								
-71 to -100% CC					11		11	
-41 to -70% CC					33		33	
-16 to -40% CC					59		59	
+15 to -15% CC (Little or No Change)	940	100	3,098	99	57,223	100	61,261	100
+16 to +40% CC			11		28		39	
+41 to +100% CC			7				7	
Total	940	100	3,116	100	57,355	100	61,411	100

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Table C-34 Acres of Classified Change in Madera County by Hardwood Cover Type and Owner Class (cont.)

	Forest Service		Other Public		Private		All Owners	
	Acres	%	Acres	%	Acres	%	Acres	%
Blue Oak Woodland								
-71 to -100% CC					15		15	
-41 to -70% CC	2				6		8	
-16 to -40% CC					6		6	
+15 to -15% CC (Little or No Change)	13,143	100	1,684	100	75,072	100	89,900	100
+16 to +40% CC	48				84		132	
+41 to +100% CC	2				12		13	
Total	13,195	100	1,684	100	75,196	100	90,074	100
Montane Hardwood								
-71 to -100% CC	299	1			83		382	1
-41 to -70% CC	100				57		157	
-16 to -40% CC	321	1	5		65		391	1
+15 to -15% CC (Little or No Change)	30,270	98	1,358	100	43,499	99	75,127	99
+16 to +40% CC	8				50		59	
+41 to +100% CC	8				4		12	
Total	31,006	100	1,363	100	43,758	100	76,127	100
Montane Riparian								
+15 to -15% CC (Little or No Change)	615	100					615	100
Total	615	100					615	100
All Hardwood	45,756		6,163		176,308		228,227	

Table C-35 Acres of Classified Change in Madera County by Shrub/Chaparral Cover Type and Owner Class

	Forest Service		Other Public		Private		All Owners	
	Acres	%	Acres	%	Acres	%	Acres	%
Alpine Dwarf Shrub								
+15 to -15% CC (Little or No Change)	2,228	100					2,228	100
Total	2,228	100					2,228	100
Unknown Shrub Type								
+15 to -15% CC (Little or No Change)			762	100	20,723	100	21,485	100
Grass Decrease > 15%			2		20		22	
Grass Increase > 15%					9		9	
Total			765	100	20,752	100	21,517	100
Chamise-Redshank Chaparral								
+15 to -15% CC (Little or No Change)			29	100	615	100	644	100
Total			29	100	615	100	644	100
Mixed Chaparral								
+15 to -15% CC (Little or No Change)	5,322	99	120	100	2,104	97	7,546	98
Grass Decrease > 15%	65	1			51	2	116	2
Grass Increase > 15%	10				4		13	
Total	5,396	100	120	100	2,159	100	7,675	100
Montane Chaparral								
+15 to -15% CC (Little or No Change)	11,938	99	20	100	350	100	12,309	99
Grass Decrease > 15%	3						3	
Grass Increase > 15%	85	1					85	1
Total	12,026	100	20	100	350	100	12,397	100
All Shrub/Chaparral	19,651		934		23,876		44,460	

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Table C-36 Acres of Classified Change in Madera County by Grass/Forb Cover Type and Owner Class

	Forest Service		Other Public		Private		All Owners	
	Acres	%	Acres	%	Acres	%	Acres	%
Annual Grass								
+15 to -15% CC (Little or No Change)	1,187	100	5,968	100	119,279	100	126,434	100
Grass Decrease > 15%					36		36	
Grass Increase > 15%			5		419		424	
Total	1,187	100	5,973	100	119,734	100	126,894	100
Wet Meadow								
+15 to -15% CC (Little or No Change)	2,738	100	18	100	258	100	3,014	100
Grass Decrease > 15%								
Grass Increase > 15%								
Total	2,739	100	18	100	258	100	3,015	100
All Grass/Forb	3,926		5,991		119,992		129,909	

Table C-37 Acres of Verified Change in Madera County by Cause and Conifer Cover Type

	Fire	Harvest	Develop-ment	Regrowth	Other	unverified	All Causes
Unknown Conifer Type							
+16 to +40% CC							
+41 to +100% CC				9			9
Total				9			9
Lodgepole Pine							
-71 to -100% CC		13					13
-41 to -70% CC		7					7
-16 to -40% CC		4					4
+16 to +40% CC				1			1
Total		25		1			26
Montane Hardwood-Conifer							
-71 to -100% CC	84	25	11		12	11	143
-41 to -70% CC	5	18			2	38	63
-16 to -40% CC	116	37	2		3	8	165
+16 to +40% CC				61			61
+41 to +100% CC				9		6	14
Total	204	80	13	70	17	62	446
Ponderosa Pine							
-71 to -100% CC	164	48			23	8	242
-41 to -70% CC	1	29			1	11	43
-16 to -40% CC	320	36			5	8	369
+16 to +40% CC				70			70
+41 to +100% CC				75		3	78
Total	486	112		145	29	30	801
Red Fir							
-71 to -100% CC		101				3	103
-41 to -70% CC		66				10	76
-16 to -40% CC	11	56				4	70
+16 to +40% CC				32			32
+41 to +100% CC				3			3
Total	11	223		35		16	285

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Table C-37 Acres of Verified Change in Madera County by Cause and Conifer Cover Type (cont.)

	Fire	Harvest	Develop- ment	Regrowth	Other	unverified	All Causes
Subalpine Conifer							
-16 to -40% CC	5						5
Total	5						5
Sierran Mixed Conifer							
-71 to -100% CC	31	67				8	106
-41 to -70% CC	4	25				2	32
-16 to -40% CC	151	94				5	250
+16 to +40% CC				862		1	863
+41 to +100% CC				42		2	44
Total	186	186		904		19	1,296
All Conifer	891	626	13	1,164	46	127	2,868

Table C-38 Acres of Verified Change in Madera County by Cause and Hardwood Cover Type

	Fire	Harvest	Develop- ment	Regrowth	Other	unverified	All Causes
Blue Oak-Foothill Pine							
-71 to -100% CC			7			4	11
-41 to -70% CC			28			5	33
-16 to -40% CC			58			1	59
+16 to +40% CC						39	39
+41 to +100% CC						7	7
Total			93			57	150
Blue Oak Woodland							
-71 to -100% CC						15	15
-41 to -70% CC		2	3			3	8
-16 to -40% CC		2	1			3	6
+16 to +40% CC				55		77	132
+41 to +100% CC				12		2	13
Total		4	4	66		100	174
Montane Hardwood							
-71 to -100% CC	330	10	6		6	30	382
-41 to -70% CC	5	25			46	80	157
-16 to -40% CC	304	23			20	45	391
+16 to +40% CC				24		35	59
+41 to +100% CC				7		4	12
Total	639	58	6	31	72	193	1,000
All Hardwood	639	62	103	98	72	350	1,324

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Table C-39 Acres of Verified Change in Madera County by Cause and Shrub/Chaparral Cover Type

	Fire	Harvest	Develop- ment	Regrowth	Other	unverified	All Causes
Unknown Shrub Type							
Grass Decrease > 15%			9			13	22
Grass Increase > 15%				8		1	9
Total			9	8		14	31
Mixed Chaparral							
Grass Decrease > 15%	96	4			4	12	116
Grass Increase > 15%				13			13
Total	96	4		13	4	12	129
Montane Chaparral							
Grass Decrease > 15%		3					3
Grass Increase > 15%				85			85
Total		3		85			88
All Shrub/Chaparral	97	7	9	106	4	26	249

Table C-40 Acres of Verified Change in Madera County by Cause and Grass/Forb Cover Type

	unverified	All Causes
Annual Grass		
Grass Decrease > 15%	36	36
Grass Increase > 15%	424	424
Total	460	460
Wet Meadow		
Grass Decrease > 15%		
Grass Increase > 15%		
Total		
All Grass/Forb	460	461

Mariposa County

Land Cover Change, 1995/1997 - 2001

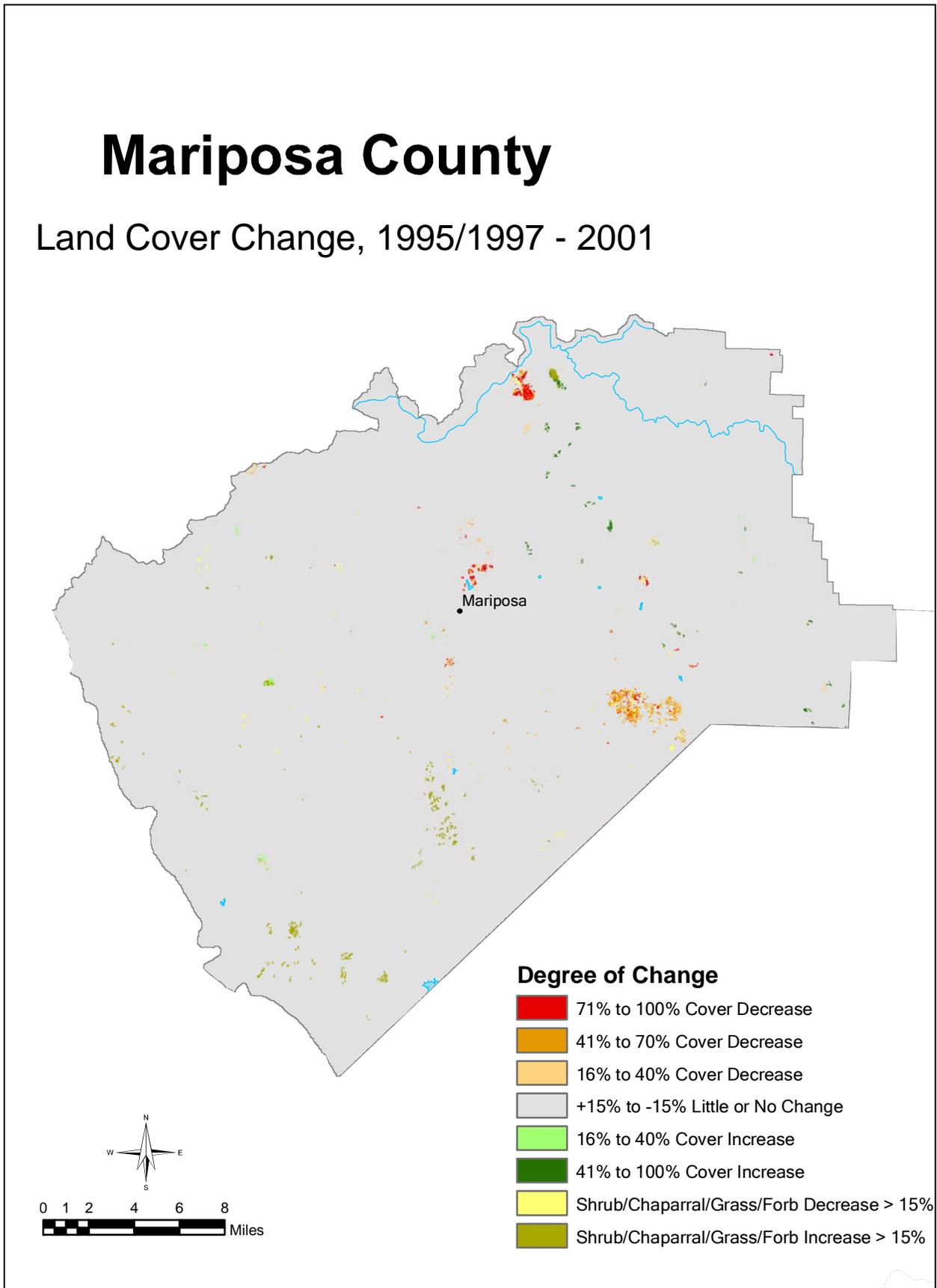


Table C-41 Acres of Classified Change in Mariposa County by Lifeform and Owner Class

	Forest Service											
	Conifer		Hardwood		Shrub /Chaparral		Grass /Forb		Barren		Forest Service Total	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
-71 to -100% CC	92		126									219
-41 to -70% CC	5		22									27
-16 to -40% CC	79		28									107
+15 to -15% CC (Little or No Change)	42,394	99	33,513	99	9,835	99	890	100	59	100		86,691 99
+16 to +40% CC	31		5									36
+41 to +100% CC	171		9									180
Grass Decrease > 15%					36							36
Grass Increase > 15%					67	1						67
Total	42,772	100	33,703	100	9,938	100	890	100	59	100		87,362 100

	Other Public											
	Conifer		Hardwood		Shrub Chaparral		Grass /Forb		Barren		Other Public Total	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
-71 to -100% CC	5		20									25
-41 to -70% CC	2		8									9
-16 to -40% CC	1		7									8
+15 to -15% CC (Little or No Change)	2,790	100	8,119	100	7,201	100	1,345	99	2	100		19,457 100
+16 to +40% CC			3									3
Grass Decrease > 15%					21							21
Grass Increase > 15%							7	1				7
Total	2,797	100	8,156	100	7,222	100	1,352	100	2	100		19,529 100

	Private											
	Conifer		Hardwood		Shrub /Chaparral		Grass /Forb		Barren		Private Total	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
-71 to -100% CC	108		218									325
-41 to -70% CC	92		587									680
-16 to -40% CC	88		409									498
+15 to -15% CC (Little or No Change)	28,148	99	159,515	99	30,742	99	108,588	99	60	100		327,052 99
+16 to +40% CC	5		155									160
+41 to +100% CC	100		10									110
Grass Decrease > 15%					287	1	176					463
Grass Increase > 15%					48		864	1				912
Total	28,542	100	160,894	100	31,076	100	109,628	100	60	100		330,200 100

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Table C-42 Acres of Verified Change in Mariposa County by Cause and Lifeform

	Fire	Harvest	Regrowth	Development	Other	Unverified	All Causes
Conifer							
-71 to -100% CC	109	28		46		22	205
-41 to -70% CC	69	12		12		7	99
-16 to -40% CC	56	55		13		44	168
+16 to +40% CC			36				36
+41 to +100% CC			250			21	271
Total	233	95	286	70		95	779
Hardwood							
-71 to -100% CC	244	2		54		64	364
-41 to -70% CC	522	2		1		91	617
-16 to -40% CC	286	7		61		90	444
+16 to +40% CC			115			48	163
+41 to +100% CC			9			10	19
Total	1,052	11	124	116		303	1,606
Shrub/Chaparral							
Grass Decrease > 15%	184	36		16		107	344
Grass Increase > 15%			92			23	115
Total	184	36	92	16		130	458
Grass/Forb							
Grass Decrease > 15%						176	176
Grass Increase > 15%			42			829	871
Total			42			1,005	1,047
Barren							
Grass Decrease > 15%							
Total							
All Lifeform	1,470	142	544	203		1,533	3,892

Table C-43 Acres of Classified Change in Mariposa County by Conifer Cover Type and Owner Class

	Forest Service		Other Public		Private		All Owners	
	Acres	%	Acres	%	Acres	%	Acres	%
Unknown Conifer Type								
-71 to -100% CC					18		18	
-41 to -70% CC					40	1	40	1
-16 to -40% CC					13		13	
+15 to -15% CC (Little or No Change)			1,703	100	4,108	98	5,811	99
Total			1,703	100	4,179	100	5,882	100
Closed Cone Pine-Cypress								
+15 to -15% CC (Little or No Change)			3	100	33	100	36	100
Total			3	100	33	100	36	100
Douglas Fir								
-71 to -100% CC			4	13			4	5
-41 to -70% CC			2	5			2	2
-16 to -40% CC			1	3			1	1
+15 to -15% CC (Little or No Change)			26	80	50	100	76	92
+41 to +100% CC								
Total			33	100	50	100	83	100

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Table C-43 Acres of Classified Change in Mariposa County by Conifer Cover Type and Owner Class (cont.)

	Forest Service		Other Public		Private		All Owners	
	Acres	%	Acres	%	Acres	%	Acres	%
Montane Hardwood-Conifer								
-71 to -100% CC	46	1			26		73	
-41 to -70% CC	1				29		30	
-16 to -40% CC	21				11		32	
+15 to -15% CC (Little or No Change)	7,045	99	158	100	7,905	99	15,108	99
+16 to +40% CC							1	
+41 to +100% CC	5				24		29	
Total	7,120	100	158	100	7,995	100	15,273	100
Ponderosa Pine								
-71 to -100% CC	46				63	1	110	
-41 to -70% CC	4				24		27	
-16 to -40% CC	58				55		113	
+15 to -15% CC (Little or No Change)	22,764	99	864	100	11,602	98	35,230	99
+16 to +40% CC	11				5		15	
+41 to +100% CC	155	1			68	1	223	1
Total	23,037	100	864	100	11,817	100	35,718	100
Sierran Mixed Conifer								
-16 to -40% CC					10		10	
+15 to -15% CC (Little or No Change)	12,584	100	35	100	4,451	100	17,071	100
+16 to +40% CC	20						20	
+41 to +100% CC	11				8		19	
Total	12,615	100	35	100	4,460	100	17,109	100
All Conifer	42,772		2,797		28,533		74,102	

Table C-44 Acres of Classified Change in Mariposa County by Hardwood Cover Type and Owner Class

	Forest Service		Other Public		Private		All Owners	
	Acres	%	Acres	%	Acres	%	Acres	%
Blue Oak-Foothill Pine								
-71 to -100% CC					8		8	
-41 to -70% CC					31		31	
-16 to -40% CC					33		33	
+15 to -15% CC (Little or No Change)	348	100	1,019	100	16,518	100	17,885	100
+16 to +40% CC					7		7	
Total	348	100	1,019	100	16,598	100	17,965	100
Blue Oak Woodland								
-71 to -100% CC	18	1	8		22		49	
-41 to -70% CC	4		1		63		68	
-16 to -40% CC	1		2		49		52	
+15 to -15% CC (Little or No Change)	1,661	99	2,050	99	73,047	100	76,759	100
+16 to +40% CC					109		109	
+41 to +100% CC					2		2	
Total	1,684	100	2,062	100	73,293	100	77,039	100
Montane Hardwood								
-71 to -100% CC	108		12		187		306	
-41 to -70% CC	18		7		493	1	518	
-16 to -40% CC	27		5		327		359	
+15 to -15% CC (Little or No Change)	31,504	99	5,050	99	69,947	99	106,501	99
+16 to +40% CC	5		3		39		46	
+41 to +100% CC	9				8		17	
Total	31,671	100	5,076	100	71,000	100	107,747	100

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Table C-44 Acres of Classified Change in Mariposa County by Hardwood Cover Type and Owner Class (cont.)

	Forest Service		Other Public		Private		All Owners	
	Acres	%	Acres	%	Acres	%	Acres	%
Valley Oak Woodland								
+15 to -15% CC (Little or No Change)					3	100	3	100
Total					3	100	3	100
All Hardwood	33,703		8,156		160,894		202,754	

Table C-45 Acres of Classified Change in Mariposa County by Shrub/Chaparral Cover Type and Owner Class

	Forest Service		Other Public		Private		All Owners	
	Acres	%	Acres	%	Acres	%	Acres	%
Unknown Shrub Type								
+15 to -15% CC (Little or No Change)			1,065	100	25,476	99	26,541	99
Grass Decrease > 15%					209	1	209	1
Grass Increase > 15%					1		1	
Total			1,065	100	25,687	100	26,751	100
Chamise-Redshank Chaparral								
+15 to -15% CC (Little or No Change)	2,831	99	4,316	100	3,288	99	10,435	99
Grass Decrease > 15%	17	1	21		29	1	68	1
Grass Increase > 15%					15		15	
Total	2,848	100	4,338	100	3,332	100	10,518	100
Mixed Chaparral								
+15 to -15% CC (Little or No Change)	6,251	99	1,819	100	1,800	96	9,871	98
Grass Decrease > 15%	18				44	2	63	1
Grass Increase > 15%	67	1			32	2	98	1
Total	6,336	100	1,819	100	1,876	100	10,032	100
Montane Chaparral								
+15 to -15% CC (Little or No Change)	753	100			178	98	931	100
Grass Decrease > 15%					4	2	4	
Grass Increase > 15%								
Total	754	100			182	100	935	100
All Shrub/Chaparral	9,938		7,222		31,076		48,236	

Table C-46 Acres of Classified Change in Mariposa County by Grass/Forb Cover Type and Owner Class

	Forest Service		Other Public		Private		All Owners	
	Acres	%	Acres	%	Acres	%	Acres	%
Annual Grass								
+15 to -15% CC (Little or No Change)	850	100	1,345	99	107,966	99	110,161	99
Grass Decrease > 15%					176		176	
Grass Increase > 15%			7	1	864	1	871	1
Total	850	100	1,352	100	109,007	100	111,209	100
Wet Meadow								
+15 to -15% CC (Little or No Change)	39	100			622	100	661	100
Total	39	100			622	100	661	100
All Grass/Forb	890		1,352		109,628		111,870	

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Table C-47 Acres of Verified Change in Mariposa County by Cause and Conifer Cover Type

	Fire	Harvest	Develop- ment	Regrowth	unverified	All Causes
Unknown Conifer Type						
-71 to -100% CC	12		3		3	18
-41 to -70% CC	35				5	40
-16 to -40% CC	7		1		5	13
Total	54		4		13	71
Douglas Fir						
-71 to -100% CC	4					4
-41 to -70% CC	2					2
-16 to -40% CC	1					1
+41 to +100% CC						
Total	7					7
Montane Hardwood-Conifer						
-71 to -100% CC	47	17			9	73
-41 to -70% CC	24	5			1	30
-16 to -40% CC	25	1			6	32
+16 to +40% CC				1		1
+41 to +100% CC				17	12	29
Total	95	24		18	28	165
Ponderosa Pine						
-71 to -100% CC	46	11	43		10	110
-41 to -70% CC	8	6	11		1	27
-16 to -40% CC	23	44	12		34	113
+16 to +40% CC				15		15
+41 to +100% CC				217	7	223
Total	77	62	66	232	51	488
Sierran Mixed Conifer						
-16 to -40% CC		10				10
+16 to +40% CC				20		20
+41 to +100% CC				16	2	19
Total		10		36	2	48
All Conifer	233	95	70	286	95	779

Table C-48 Acres of Verified Change in Mariposa County by Cause and Hardwood Cover Type

	Fire	Harvest	Develop- ment	Regrowth	unverified	All Causes
Blue Oak-Foothill Pine						
-71 to -100% CC					8	8
-41 to -70% CC	21				10	31
-16 to -40% CC	30				3	33
+16 to +40% CC					7	7
Total	52				28	80
Blue Oak Woodland						
-71 to -100% CC	27		1		21	49
-41 to -70% CC	25				43	68
-16 to -40% CC	26				25	52
+16 to +40% CC				92	17	109
+41 to +100% CC					2	2
Total	78		2	92	108	280

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Table C-48 Acres of Verified Change in Mariposa County by Cause and Hardwood Cover Type (cont.)

	Fire	Harvest	Develop- ment	Regrowth	unverified	All Causes
Montane Hardwood						
-71 to -100% CC	217	2	53		34	306
-41 to -70% CC	476	2	1		38	518
-16 to -40% CC	229	7	60		62	359
+16 to +40% CC				22	24	46
+41 to +100% CC				9	8	17
Total	923	11	114	32	166	1,246
All Hardwood	1,052	11	116	124	303	1,606

Table C-49 Acres of Verified Change in Mariposa County by Cause and Shrub/Chaparral Cover Type

	Fire	Harvest	Develop- ment	Regrowth	unverified	All Causes
Unknown Shrub Type						
Grass Decrease > 15%	127		1		81	209
Grass Increase > 15%					1	1
Total	127		1		83	211
Chamise-Redshank Chaparral						
Grass Decrease > 15%	39		15		14	68
Grass Increase > 15%					15	15
Total	39		15		29	82
Mixed Chaparral						
Grass Decrease > 15%	18	36			8	63
Grass Increase > 15%				92	6	98
Total	18	36		92	14	161
Montane Chaparral						
Grass Decrease > 15%					4	4
Grass Increase > 15%						
Total					4	4
All Shrub/Chaparral	184	36	16	92	130	458

Table C-50 Acres of Verified Change in Mariposa County by Cause and Grass/Forb Cover Type

	Regrowth	unverified	All Causes
Annual Grass			
Grass Decrease > 15%		176	176
Grass Increase > 15%	42	829	871
Total	42	1,005	1,047
All Grass/Forb	42	1,005	1,047

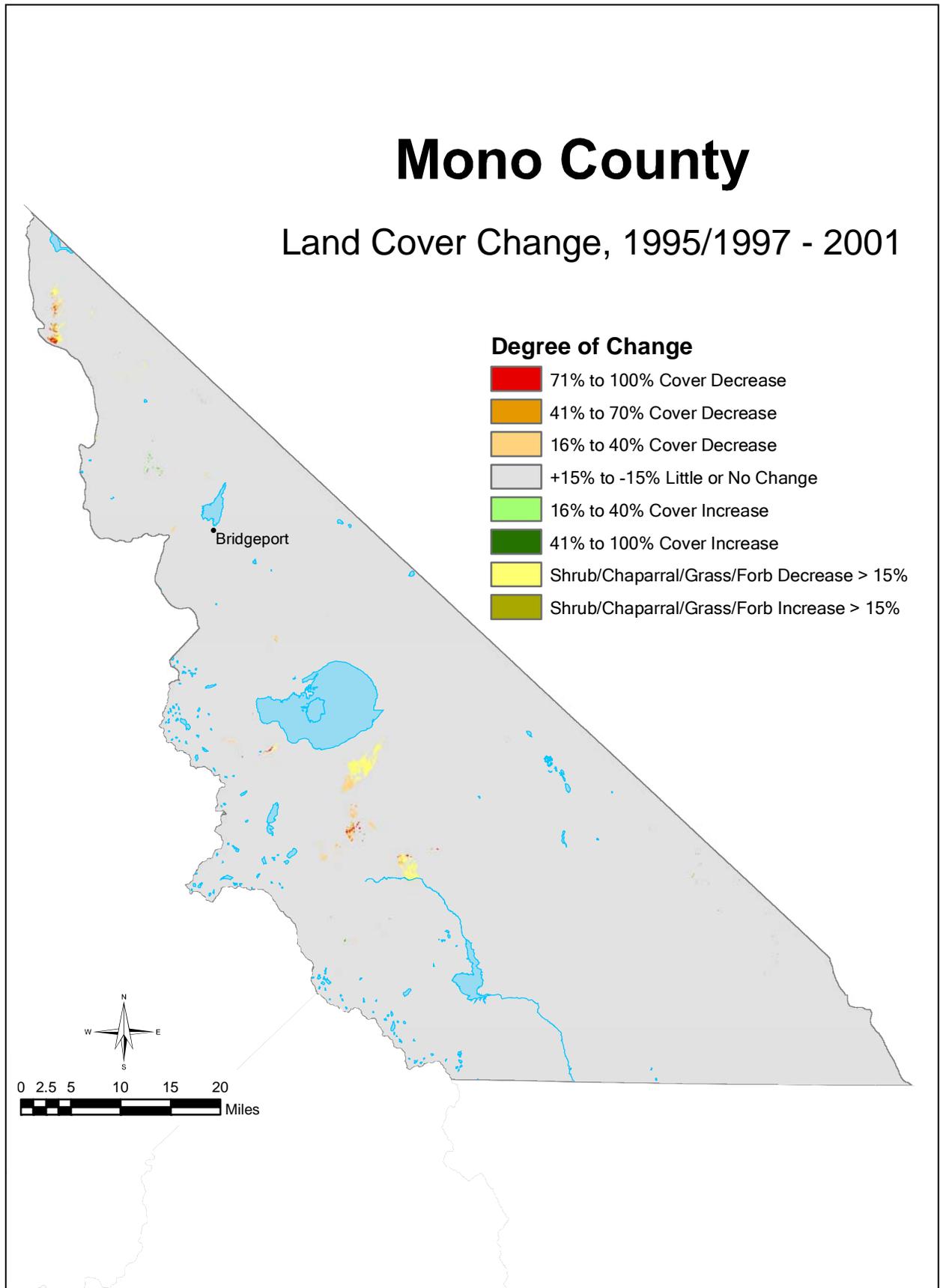


Table C-51 Acres of Classified Change in Mono County by Lifeform and Owner Class

	Forest Service											
	Conifer		Hardwood		Shrub /Chaparral		Grass /Forb		Barren		Forest Service Total	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
-71 to -100% CC	255		24									279
-41 to -70% CC	395		8									402
-16 to -40% CC	2,195	1	6									2,201
+15 to -15% CC (Little or No Change)	348,493	99	14,021	100	480,966	100	14,556	100	135,289	100	993,325	99
+16 to +40% CC	167											167
+41 to +100% CC	57											57
Grass Decrease > 15%					1,991		24		148		2,163	
Grass Increase > 15%					62		2		3		66	
Total	351,562	100	14,058	100	483,019	100	14,581	100	135,439	100	998,659	100

	Other Public											
	Conifer		Hardwood		Shrub /Chaparral		Grass /Forb		Barren		Other Public Total	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
-71 to -100% CC	174											174
-41 to -70% CC	233											233
-16 to -40% CC	267											267
+15 to -15% CC (Little or No Change)	72,177	99	3,971	100	430,819	100	32,063	99	23,176	100	562,207	99
+16 to +40% CC	3											3
Grass Decrease > 15%					1,982		380	1	13		2,375	
Grass Increase > 15%					4						4	
Total	72,853	100	3,971	100	432,806	100	32,443	100	23,189	100	565,262	100

	Private											
	Conifer		Hardwood		Shrub/Chaparral		Grass/Forb		Barren		Private Total	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
-71 to -100% CC	5											5
-16 to -40% CC	30		1									31
+15 to -15% CC (Little or No Change)	22,794	100	3,742	100	68,488	99	9,168	100	9,102	100	113,293	99
+16 to +40% CC	54											54
+41 to +100% CC	21											21
Grass Decrease > 15%					634	1	33		2		669	1
Grass Increase > 15%									3		4	
Total	22,904	100	3,744	100	69,122	100	9,201	100	9,107	100	114,077	100

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Table C-52 Acres of Verified Change in Mono County by Cause and Lifeform

	Fire	Harvest	Pest - related	Regrowth	Development	Other	Unverified	All Causes
Conifer								
-71 to -100% CC	428					5	1	433
-41 to -70% CC	602	19	5					628
-16 to -40% CC	1,982	455	12		14	9	20	2,492
+16 to +40% CC				52		27	145	224
+41 to +100% CC				13		8	56	77
Total	3,012	474	17	65	14	49	223	3,855
Hardwood								
-71 to -100% CC	24							24
-41 to -70% CC	8							8
-16 to -40% CC	7							7
Total	38							38
Shrub/Chaparral								
Grass Decrease > 15%	4,483		10			90	24	4,607
Grass Increase > 15%				1		5	60	67
Total	4,483		10	1		95	84	4,674
Grass/Forb								
Grass Decrease > 15%	435						2	437
Grass Increase > 15%				2				2
Total	435			2			2	438
Barren								
Grass Decrease > 15%	23					4	136	163
Grass Increase > 15%							6	6
Total	23					4	142	169
All Lifeform	7,991	474	26	68	14	148	451	9,174

Table C-53 Acres of Classified Change in Mono County by Conifer Cover Type and Owner Class

	Forest Service		Other Public		Private		All Owners	
	Acres	%	Acres	%	Acres	%	Acres	%
Jeffrey Pine								
-71 to -100% CC	126		29	1	5		160	
-41 to -70% CC	221		4				225	
-16 to -40% CC	1,844	2					1,844	2
+15 to -15% CC (Little or No Change)	92,563	98	2,177	99	2,152	99	96,892	98
+16 to +40% CC	100				5		105	
+41 to +100% CC	26				2		28	
Total	94,881	100	2,209	100	2,164	100	99,254	100
Juniper								
+15 to -15% CC (Little or No Change)	3	100	2,457	100	721	100	3,180	100
Total	3	100	2,457	100	721	100	3,180	100
Lodgepole Pine								
-71 to -100% CC	62						62	
-41 to -70% CC	5						5	
-16 to -40% CC	17						17	
+15 to -15% CC (Little or No Change)	31,928	100	297	100	554	100	32,779	100
+16 to +40% CC								
+41 to +100% CC	2						2	
Total	32,014	100	297	100	554	100	32,865	100

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Table C-53 Acres of Classified Change in Mono County by Conifer Cover Type and Owner Class (cont.)

	Forest Service		Other Public		Private		All Owners	
	Acres	%	Acres	%	Acres	%	Acres	%
Pinyon-Juniper								
-71 to -100% CC	42		29				71	
-41 to -70% CC	114		120				235	
-16 to -40% CC	229		247		2		479	
+15 to -15% CC (Little or No Change)	147,849	100	64,633	99	11,953	100	224,435	100
+16 to +40% CC	42		3				45	
+41 to +100% CC	12						12	
Total	148,288	100	65,033	100	11,955	100	225,276	100
Red Fir								
+15 to -15% CC (Little or No Change)	10,325	100			2	100	10,328	100
Total	10,325	100			2	100	10,328	100
Subalpine Conifer								
-71 to -100% CC								
-16 to -40% CC	31						31	
+15 to -15% CC (Little or No Change)	38,992	100	678	100	3,699	98	43,369	100
+16 to +40% CC	3				49	1	52	
+41 to +100% CC	1				19	1	20	
Total	39,027	100	678	100	3,767	100	43,472	100
Sierran Mixed Conifer								
-71 to -100% CC	24		116	5			140	
-41 to -70% CC	54		109	5			163	
-16 to -40% CC	74		19	1	28	1	121	
+15 to -15% CC (Little or No Change)	26,834	99	1,935	89	3,713	99	32,482	99
+16 to +40% CC	22						22	
+41 to +100% CC	16						16	
Total	27,024	100	2,179	100	3,741	100	32,944	100
All Conifer	351,562		72,853		22,904		447,319	

Table C-54 Acres of Classified Change in Mono County by Hardwood Cover Type and Owner Class

	Forest Service		Other Public		Private		All Owners	
	Acres	%	Acres	%	Acres	%	Acres	%
Aspen								
-71 to -100% CC	24						24	
-41 to -70% CC	8						8	
-16 to -40% CC	6						6	
+15 to -15% CC (Little or No Change)	13,953	100	973	100	1,580	100	16,506	100
Total	13,990	100	973	100	1,580	100	16,543	100
Montane Riparian								
-16 to -40% CC					1		1	
+15 to -15% CC (Little or No Change)	68	100	2,999	100	2,162	100	5,229	100
Total	68	100	2,999	100	2,163	100	5,230	100
All Hardwood	14,058		3,971		3,744		21,773	

Appendix G

Table C-55 Acres of Classified Change in Mono County by Shrub/Chaparral Cover Type and Owner Class

	Forest Service		Other Public		Private		All Owners	
	Acres	%	Acres	%	Acres	%	Acres	%
Alpine Dwarf Shrub								
+15 to -15% CC (Little or No Change)	94,264	100	22	100	91	100	94,378	100
Grass Decrease > 15%	2						2	
Grass Increase > 15%	38						38	
Total	94,305	100	22	100	91	100	94,419	100
Alkali Scrub								
+15 to -15% CC (Little or No Change)	241	100	98,851	100	6,234	100	105,325	100
Total	241	100	98,851	100	6,234	100	105,325	100
Bitterbrush								
+15 to -15% CC (Little or No Change)	10,604	100	6,672	96	2,499	100	19,775	98
Grass Decrease > 15%	40		295	4			335	2
Grass Increase > 15%								
Total	10,645	100	6,966	100	2,499	100	20,111	100
Desert Scrub								
+15 to -15% CC (Little or No Change)	30,461	100	36,694	100	4,390	100	71,545	100
Grass Decrease > 15%	12		1				12	
Total	30,472	100	36,694	100	4,391	100	71,557	100
Low Sagebrush								
+15 to -15% CC (Little or No Change)			2,423	100	130	100	2,553	100
Total			2,423	100	130	100	2,553	100
Montane Chaparral								
+15 to -15% CC (Little or No Change)	7,132	100	323	100	916	100	8,372	100
Grass Decrease > 15%	2						2	
Total	7,135	100	323	100	916	100	8,374	100
Sagebrush								
+15 to -15% CC (Little or No Change)	338,264	99	285,834	99	54,227	99	678,325	99
Grass Decrease > 15%	1,934	1	1,687	1	633	1	4,255	1
Grass Increase > 15%	23		4				28	
Total	340,221	100	287,525	100	54,860	100	682,607	100
All Shrub/Chaparral	483,019		432,806		69,122		984,947	

Table C-56 Acres of Classified Change in Mono County by Grass/Forb Cover Type and Owner Class

	Forest Service		Other Public		Private		All Owners	
	Acres	%	Acres	%	Acres	%	Acres	%
Annual Grass								
+15 to -15% CC (Little or No Change)	12,066	100	25,951	99	5,928	99	43,944	99
Grass Decrease > 15%	16		378	1	30	1	424	1
Total	12,082	100	26,329	100	5,957	100	44,368	100
Freshwater Emergen Wetland								
+15 to -15% CC (Little or No Change)			1,029	100			1,029	100
Total			1,029	100			1,029	100
Wet Meadow								
+15 to -15% CC (Little or No Change)	2,490	100	5,083	100	3,240	100	10,813	100
Grass Decrease > 15%	8		2		3		13	
Grass Increase > 15%	2						2	
Total	2,500	100	5,084	100	3,243	100	10,827	100
All Grass/Forb	14,581		32,443		9,201		56,225	

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Table C-57 Acres of Verified Change in Mono County by Cause and Conifer Cover Type

	Fire	Harvest	Develop- ment	Pest- related	Regrowth	Other	unverified	All Causes
Jeffrey Pine								
-71 to -100% CC	156					4		160
-41 to -70% CC	211	14						225
-16 to -40% CC	1,404	423		7		5	4	1,844
+16 to +40% CC					32		74	105
+41 to +100% CC							28	28
Total	1,771	437		7	32	9	105	2,362
Lodgepole Pine								
-71 to -100% CC	62							62
-41 to -70% CC		5						5
-16 to -40% CC	1	16						17
+16 to +40% CC								
+41 to +100% CC							2	2
Total	62	22					2	86
Pinyon-Juniper								
-71 to -100% CC	69					1	1	71
-41 to -70% CC	230			3				235
-16 to -40% CC	459					4	16	479
+16 to +40% CC						27	18	45
+41 to +100% CC						8	3	12
Total	758			3		40	39	841
Subalpine Conifer								
-71 to -100% CC								
-16 to -40% CC	31							31
+16 to +40% CC							52	52
+41 to +100% CC							20	20
Total	32						72	104
Sierran Mixed Conifer								
-71 to -100% CC	140							140
-41 to -70% CC	161			2				163
-16 to -40% CC	87	16	14	4				121
+16 to +40% CC					20		2	22
+41 to +100% CC					13		3	16
Total	389	16	14	6	33		5	462
All Conifer	3,012	474	14	17	65	49	223	3,855

Table C-58 Acres of Verified Change in Mono County by Cause and Hardwood Cover Type

	Fire	All Causes
Aspen		
-71 to -100% CC	24	24
-41 to -70% CC	8	8
-16 to -40% CC	6	6
Total	37	37
Montane Riparian		
-16 to -40% CC	1	1
Total	1	1
All Hardwood	38	38

Table C-59 Acres of Verified Change in Mono County by Cause and Shrub/Chaparral Cover Type

	Fire	Pest-related	Regrowth	Other	unverified	All Causes
Alpine Dwarf Shrub						
Grass Decrease > 15%					2	2
Grass Increase > 15%			1		37	38
Total			1		39	41
Bitterbrush						
Grass Decrease > 15%	335					335
Grass Increase > 15%						
Total	335					336
Desert Scrub						
Grass Decrease > 15%				12	1	12
Total				12	1	12
Montane Chaparral						
Grass Decrease > 15%	2					2
Total	2					2
Sagebrush						
Grass Decrease > 15%	4,145	10		78	21	4,255
Grass Increase > 15%				5	22	28
Total	4,145	10		84	44	4,282
All Shrub/Chaparral	4,483	10	1	95	84	4,674

Table C-60 Acres of Verified Change in Mono County by Cause and Grass/Forb Cover Type

	Fire	Regrowth	Other	unverified	All Causes
Annual Grass					
Grass Decrease > 15%	424				424
Grass Decrease > 15%	11			2	13
Grass Increase > 15%		2			2
Total	435	2		2	438
Barren					
Grass Decrease > 15%	23		4	136	163
Grass Increase > 15%				6	6
Total	23		4	142	169
All Grass/Forb	458	2	4	144	607

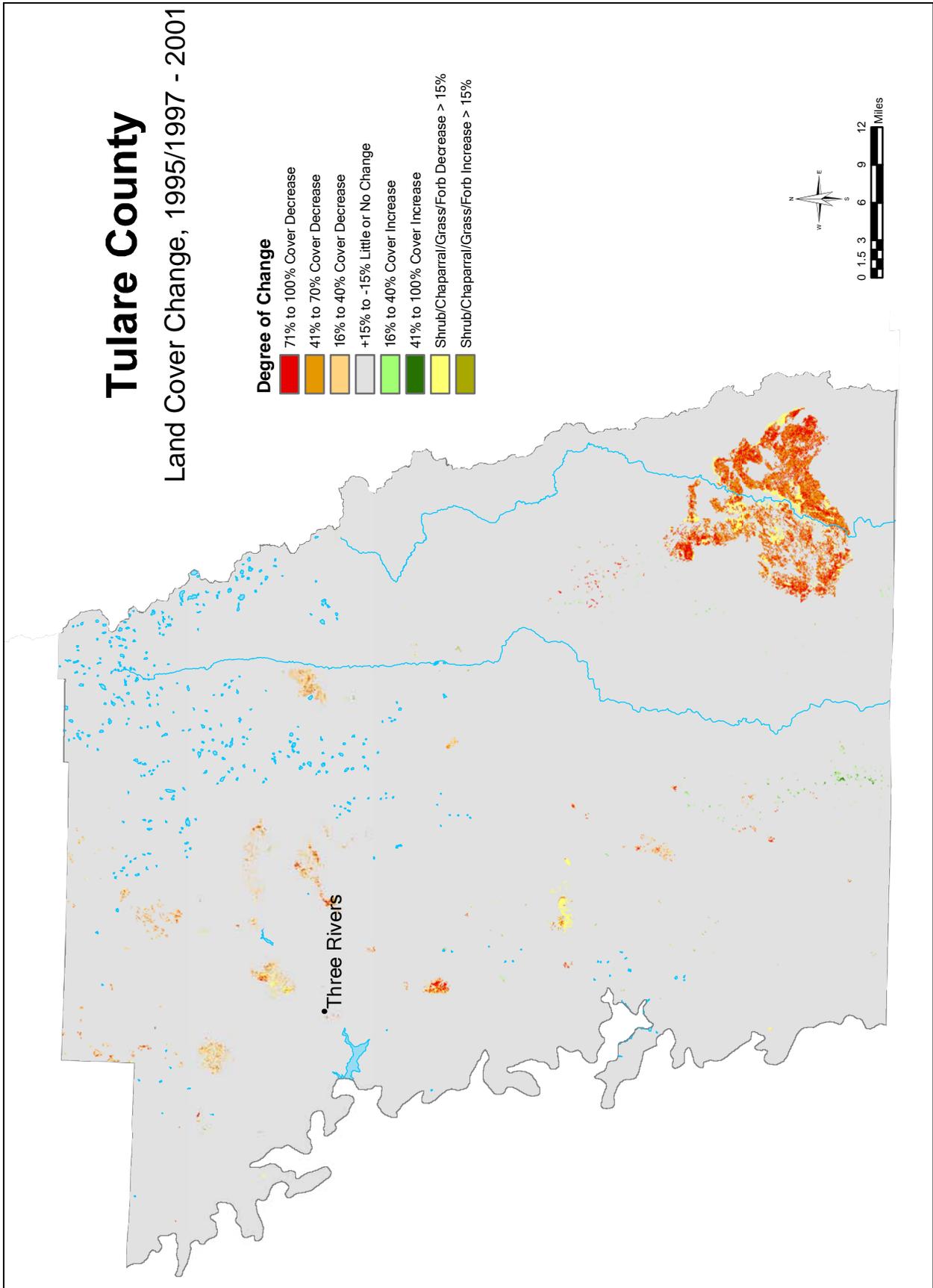


Table C-61 Acres of Classified Change in Tulare County by Lifeform and Owner Class

	Forest Service											
	Conifer		Hardwood		Shrub /Chaparral		Grass /Forb		Barren		Forest Service Total	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
-71 to -100% CC	8,831	1	92								8,923	1
-41 to -70% CC	11,157	2	89								11,245	1
-16 to -40% CC	4,034	1	83								4,117	
+15 to -15% CC (Little or No Change)	600,589	96	61,355	100	115,405	97	30,581	97	39,882	97	847,811	96
+16 to +40% CC	833		4								838	
+41 to +100% CC	197		9								206	
Grass Decrease > 15%					3,482	3	831	3	1,055	3	5,367	1
Grass Increase > 15%					64		9				74	
Total	625,641	100	61,632	100	118,951	100	31,421	100	40,937	100	878,581	100

	Other Public											
	Conifer		Hardwood		Shrub /Chaparral		Grass /Forb		Barren		Other Public Total	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
-71 to -100% CC	5,890	2	558								6,447	1
-41 to -70% CC	7,170	2	784	1							7,954	1
-16 to -40% CC	3,700	1	2,535	2							6,235	1
+15 to -15% CC (Little or No Change)	338,195	95	134,350	97	32,621	96	8,212	99	145,679	100	659,057	97
+16 to +40% CC	70		21								91	
+41 to +100% CC	10		4								14	
Grass Decrease > 15%					1,262	4	73	1	24		1,360	
Grass Increase > 15%					2		9				12	
Total	355,036	100	138,251	100	33,885	100	8,294	100	145,703	100	681,171	100

	Private											
	Conifer		Hardwood		Shrub /Chaparral		Grass /Forb		Barren		Private Total	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
-71 to -100% CC	776	3	487								1,263	1
-41 to -70% CC	901	4	506								1,407	1
-16 to -40% CC	196	1	954								1,149	1
+15 to -15% CC (Little or No Change)	21,297	92	269,859	99	27,620	97	186,302	100	1,771	100	506,847	239
+16 to +40% CC	10		45								55	
+41 to +100% CC	2		6								8	
Grass Decrease > 15%					909	3	115				1,024	
Grass Increase > 15%					11		18				29	
Total	23,181	100	271,857	100	28,540	100	186,435	100	1,771	100	511,783	242

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Table C-62 Acres of Verified Change in Tulare County by Cause and Lifeform

	Fire	Harvest	Pest - related	Regrowth	Other	Unverified	All Causes
Conifer							
-71 to -100% CC	15,211	247	19		3	18	15,497
-41 to -70% CC	19,083	82	21		7	35	19,228
-16 to -40% CC	7,477	254	49		5	144	7,929
+16 to +40% CC				763		151	913
+41 to +100% CC				193		17	209
Total	41,770	583	90	955	15	364	43,777
Hardwood							
-71 to -100% CC	977	56	2		1	101	1,137
-41 to -70% CC	1,200	59	2		3	115	1,379
-16 to -40% CC	3,320	49	3		3	196	3,572
+16 to +40% CC				12		58	70
+41 to +100% CC				10		9	19
Total	5,497	164	7	22	7	480	6,177
Shrub/Chaparral							
Grass Decrease > 15%	5,452	59			8	134	5,653
Grass Increase > 15%				32		45	78
Total	5,452	59		32	8	179	5,731
Grass/Forb							
Grass Decrease > 15%	940	1			3	74	1,018
Grass Increase > 15%				4		33	37
Total	940	1		4	3	107	1,055
Barren							
Grass Decrease > 15%	1,067					12	1,079
Total	1,067					12	1,079
All Lifeform	54,726	807	97	1,014	33	1,143	57,819

Table C-63 Acres of Classified Change in Tulare County by Conifer Cover Type and Owner Class

	Forest Service		Other Public		Private		All Owners	
	Acres	%	Acres	%	Acres	%	Acres	%
Unknown Conifer Type								
-71 to -100% CC			12		1		12	
-41 to -70% CC			13		3		16	
-16 to -40% CC			82	1	4		85	1
+15 to -15% CC (Little or No Change)	1	100	9,545	99	994	99	10,540	99
Total	1	100	9,652	100	1,001	100	10,654	100
Jeffrey Pine								
-71 to -100% CC	3,056	6	30				3,086	4
-41 to -70% CC	3,326	6	112	1			3,438	5
-16 to -40% CC	1,085	2	341	2			1,425	2
+15 to -15% CC (Little or No Change)	47,967	86	18,437	97	616	100	67,020	89
+16 to +40% CC	64		22				86	
+41 to +100% CC	3		8				11	
Total	55,501	100	18,949	100	616	100	75,066	100
Juniper								
+15 to -15% CC (Little or No Change)			4,480	100			4,480	100
Total			4,480	100			4,480	100

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Table C-63 Acres of Classified Change in Tulare County by Conifer Cover Type and Owner Class (cont.)

	Forest Service		Other Public		Private		All Owners	
	Acres	%	Acres	%	Acres	%	Acres	%
Lodgepole Pine								
-71 to -100% CC	25		49				74	
-41 to -70% CC	13		235				248	
-16 to -40% CC	21		636	1			657	1
+15 to -15% CC (Little or No Change)	57,817	100	64,571	99	951	100	123,339	99
+16 to +40% CC	6		6				12	
+41 to +100% CC			2				2	
Total	57,883	100	65,498	100	951	100	124,332	100
Montane Hardwood-Conifer								
-71 to -100% CC	9						9	
-41 to -70% CC	8						8	
-16 to -40% CC	2						2	
+15 to -15% CC (Little or No Change)	3,623	99	81	100	104	99	3,808	99
+16 to +40% CC	1				1	1	2	
+41 to +100% CC								
Total	3,644	100	81	100	106	100	3,830	100
Pinyon-Juniper								
-71 to -100% CC	4,504	5	2,817	5	156	2	7,477	5
-41 to -70% CC	7,000	7	3,516	6	241	3	10,756	7
-16 to -40% CC	1,984	2	912	2	43	1	2,939	2
+15 to -15% CC (Little or No Change)	83,646	86	48,066	87	7,710	95	139,422	87
+16 to +40% CC								
+41 to +100% CC	2						2	
Total	97,136	100	55,311	100	8,150	100	160,597	100
Ponderosa Pine								
-71 to -100% CC	60		31		4		95	
-41 to -70% CC	66		17		5		89	
-16 to -40% CC	176	1	58		4		239	
+15 to -15% CC (Little or No Change)	33,562	99	17,929	99	2,984	99	54,474	99
+16 to +40% CC	4		5		2		11	
+41 to +100% CC	1				2		3	
Total	33,869	100	18,040	100	3,002	100	54,911	100
Red Fir								
-71 to -100% CC	134		83				217	
-41 to -70% CC	81		223				304	
-16 to -40% CC	96		586	1			682	
+15 to -15% CC (Little or No Change)	127,827	100	64,480	99	391	100	192,697	99
+16 to +40% CC	115						115	
+41 to +100% CC	49						49	
Total	128,303	100	65,372	100	391	100	194,065	100
Subalpine Conifer								
-41 to -70% CC	2						2	
-16 to -40% CC	14		15				30	
+15 to -15% CC (Little or No Change)	57,291	100	50,062	100	36	100	107,389	100
+16 to +40% CC			4				4	
+41 to +100% CC								
Total	57,307	100	50,082	100	36	100	107,425	100

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Table C-63 Acres of Classified Change in Tulare County by Conifer Cover Type and Owner Class (cont.)

	Forest Service		Other Public		Private		All Owners	
	Acres	%	Acres	%	Acres	%	Acres	%
Sierran Mixed Conifer								
-71 to -100% CC	1,042	1	2,868	4	616	7	4,526	2
-41 to -70% CC	660		3,054	5	652	7	4,366	2
-16 to -40% CC	654		1,071	2	145	2	1,870	1
+15 to -15% CC (Little or No Change)	188,856	98	60,545	90	7,510	84	256,911	96
+16 to +40% CC	642		34		6		682	
+41 to +100% CC	141						142	
Total	191,996	100	67,572	100	8,929	100	268,497	100
All Conifer	625,641		355,036		23,181		1,003,858	

Table C-64 Acres of Classified Change in Tulare County by Hardwood Cover Type and Owner Class

	Forest Service		Other Public		Private		All Owners	
	Acres	%	Acres	%	Acres	%	Acres	%
Blue Oak-Foothill Pine								
-71 to -100% CC			146		117		263	
-41 to -70% CC			276	1	52		328	
-16 to -40% CC			903	2	211	1	1,114	1
+15 to -15% CC (Little or No Change)			43,078	97	34,079	99	77,157	98
+16 to +40% CC			7		4		12	
+41 to +100% CC			1				2	
Total			44,412	100	34,463	100	78,875	100
Blue Oak Woodland								
-71 to -100% CC	2		72		278		352	
-41 to -70% CC	10	1	169	1	423		602	
-16 to -40% CC	4		256	1	664		924	
+15 to -15% CC (Little or No Change)	1,353	99	24,849	98	209,855	99	236,057	99
+16 to +40% CC			9		15		24	
+41 to +100% CC			2		3		6	
Total	1,369	100	25,358	100	211,239	100	237,966	100
Montane Hardwood								
-71 to -100% CC	67		340	1	91		498	
-41 to -70% CC	78		338	1	32		447	
-16 to -40% CC	79		1,377	2	78		1,533	1
+15 to -15% CC (Little or No Change)	58,881	100	63,962	97	25,800	99	148,643	98
+16 to +40% CC	4		4		26		35	
+41 to +100% CC	9				3		12	
Total	59,118	100	66,021	100	26,030	100	151,169	100
Montane Riparian								
-71 to -100% CC	23	2					23	1
-41 to -70% CC	1						1	
+15 to -15% CC (Little or No Change)	1,121	98	2,460	100	25	100	3,606	99
Total	1,145	100	2,460	100	25	100	3,630	100
Valley Oak Woodland								
-71 to -100% CC								
-16 to -40% CC								
+15 to -15% CC (Little or No Change)			1	100	99	99	100	99
Total			1	100	100	100	101	100
All Hardwood	61,632	300	138,251	500	271,857	500	471,741	500

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Table C-65 Acres of Classified Change in Tulare County by Shrub/Chaparral Cover Type and Owner Class

	Forest Service		Other Public		Private		All Owners	
	Acres	%	Acres	%	Acres	%	Acres	%
Alpine Dwarf Shrub								
+15 to -15% CC (Little or No Change)	1,130	100	29	100			1,160	100
Total	1,130	100	29	100			1,160	100
Unknown Shrub Type								
+15 to -15% CC (Little or No Change)		100	15,015	97	19,548	98	34,563	98
Grass Decrease > 15%			475	3	403	2	878	2
Grass Increase > 15%			2				2	
Total		100	15,492	100	19,951	100	35,444	100
Chamise-Redshank Chaparral								
+15 to -15% CC (Little or No Change)	6,882	93	4,012	95	670	96	11,563	94
Grass Decrease > 15%	524	7	191	5	28	4	743	6
Total	7,405	100	4,203	100	698	100	12,306	100
Mixed Chaparral								
+15 to -15% CC (Little or No Change)	28,504	99	2,601	98	2,274	98	33,379	99
Grass Decrease > 15%	323	1	53	2	36	2	412	1
Total	28,827	100	2,654	100	2,309	100	33,790	100
Montane Chaparral								
+15 to -15% CC (Little or No Change)	70,661	96	6,139	100	1,136	98	77,936	97
Grass Decrease > 15%	2,622	4			14	1	2,637	3
Grass Increase > 15%	60				11	1	71	
Total	73,343	100	6,139	100	1,161	100	80,644	100
Sagebrush								
+15 to -15% CC (Little or No Change)	8,228	100	4,824	90	3,993	90	17,044	95
Grass Decrease > 15%	13		543	10	427	10	983	5
Grass Increase > 15%	5						5	
Total	8,245	100	5,367	100	4,420	100	18,032	100
All Shrub/Chaparral	118,951		33,885		28,540		181,376	

Table C-66 Acres of Classified Change in Tulare County by Grass/Forb Cover Type and Owner Class

	Forest Service		Other Public		Private		All Owners	
	Acres	%	Acres	%	Acres	%	Acres	%
Annual Grass								
+15 to -15% CC (Little or No Change)	18,019	96	7,008	99	184,059	100	209,086	100
Grass Decrease > 15%	767	4	73	1	115		954	
Grass Increase > 15%	5		9		16		30	
Total	18,791	100	7,090	100	184,189	100	210,070	100
Wet Meadow								
+15 to -15% CC (Little or No Change)	12,562	99	1,205	100	2,243	100	16,009	100
Grass Decrease > 15%	64	1					64	
Grass Increase > 15%	4				3		7	
Total	12,630	100	1,205	100	2,245	100	16,080	100
All Grass/Forb	31,421		8,294		186,435		226,150	

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Table C-67 Acres of Verified Change in Tulare County by Cause and Conifer Cover Type

	Fire	Harvest	Pest-related	Regrowth	Other	unverified	All Causes
Unknown Conifer Type							
-71 to -100% CC	12						12
-41 to -70% CC	15					1	16
-16 to -40% CC	80					6	85
Total	107					6	114
Jeffrey Pine							
-71 to -100% CC	3,082	2				2	3,086
-41 to -70% CC	3,434	1				4	3,438
-16 to -40% CC	1,418	1				6	1,425
+16 to +40% CC				73		13	86
+41 to +100% CC				10		1	11
Total	7,934	4		83		25	8,046
Lodgepole Pine							
-71 to -100% CC	55	18					74
-41 to -70% CC	244	4					248
-16 to -40% CC	634	15				8	657
+16 to +40% CC				1		11	12
+41 to +100% CC						2	2
Total	933	38		1		22	993
Montane Hardwood-Conifer							
-71 to -100% CC	9						9
-41 to -70% CC	8						8
-16 to -40% CC	2						2
+16 to +40% CC				2			2
+41 to +100% CC							
Total	19			2			22
Pinyon-Juniper							
-71 to -100% CC	7,476	1					7,477
-41 to -70% CC	10,756						10,756
-16 to -40% CC	2,936					3	2,939
+41 to +100% CC						2	2
Total	21,169	1				5	21,175
Ponderosa Pine							
-71 to -100% CC	68	18	9				95
-41 to -70% CC	52	28	8				89
-16 to -40% CC	189	25	22			2	239
+16 to +40% CC				8		3	11
+41 to +100% CC				1		2	3
Total	310	71	39	9		7	436
Red Fir							
-71 to -100% CC	157	51				9	217
-41 to -70% CC	279	8				17	304
-16 to -40% CC	586	39				58	682
+16 to +40% CC				110		6	115
+41 to +100% CC				49			49
Total	1,022	98		158		90	1,368
Subalpine Conifer							
-41 to -70% CC	2						2
-16 to -40% CC	30						30
+16 to +40% CC				4			4
Total	31			4			36

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Table C-67 Acres of Verified Change in Tulare County by Cause and Conifer Cover Type (cont.)

	Fire	Harvest	Pest-related	Regrowth	Other	unverified	All Causes
Sierran Mixed Conifer							
-71 to -100% CC	4,350	155	11		3	8	4,526
-41 to -70% CC	4,292	41	13		7	13	4,366
-16 to -40% CC	1,603	174	27		5	61	1,870
+16 to +40% CC				565		117	682
+41 to +100% CC				132		10	142
Total	10,245	370	51	697	15	209	11,587
All Conifer	41,770	583	90	955	15	364	43,777

Table C-68 Acres of Verified Change in Tulare County by Cause and Hardwood Cover Type

	Fire	Harvest	Pest-related	Regrowth	Other	unverified	All Causes
Blue Oak-Foothill Pine							
-71 to -100% CC	236					26	263
-41 to -70% CC	304					24	328
-16 to -40% CC	1,066					48	1,114
+16 to +40% CC				4		7	12
+41 to +100% CC						1	2
Total	1,606			4		107	1,717
Blue Oak Woodland							
-71 to -100% CC	285	7			1	58	352
-41 to -70% CC	517	4			2	80	602
-16 to -40% CC	826				3	95	924
+16 to +40% CC						24	24
+41 to +100% CC						6	6
Total	1,628	11			6	263	1,909
Montane Hardwood							
-71 to -100% CC	432	49	2			16	498
-41 to -70% CC	378	55	2		1	12	447
-16 to -40% CC	1,429	49	3			53	1,533
+16 to +40% CC				8		27	35
+41 to +100% CC				10		2	12
Total	2,239	153	7	18	1	109	2,526
Montane Riparian							
-71 to -100% CC	23						23
-41 to -70% CC	1						1
Total	24						24
Valley Oak Woodland							
-71 to -100% CC							
-16 to -40% CC							
Total						1	1
All Hardwood	5,497	164	7	22	7	480	6,177

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Table C-69 Acres of Verified Change in Tulare County by Cause and Shrub/Chaparral Cover Type

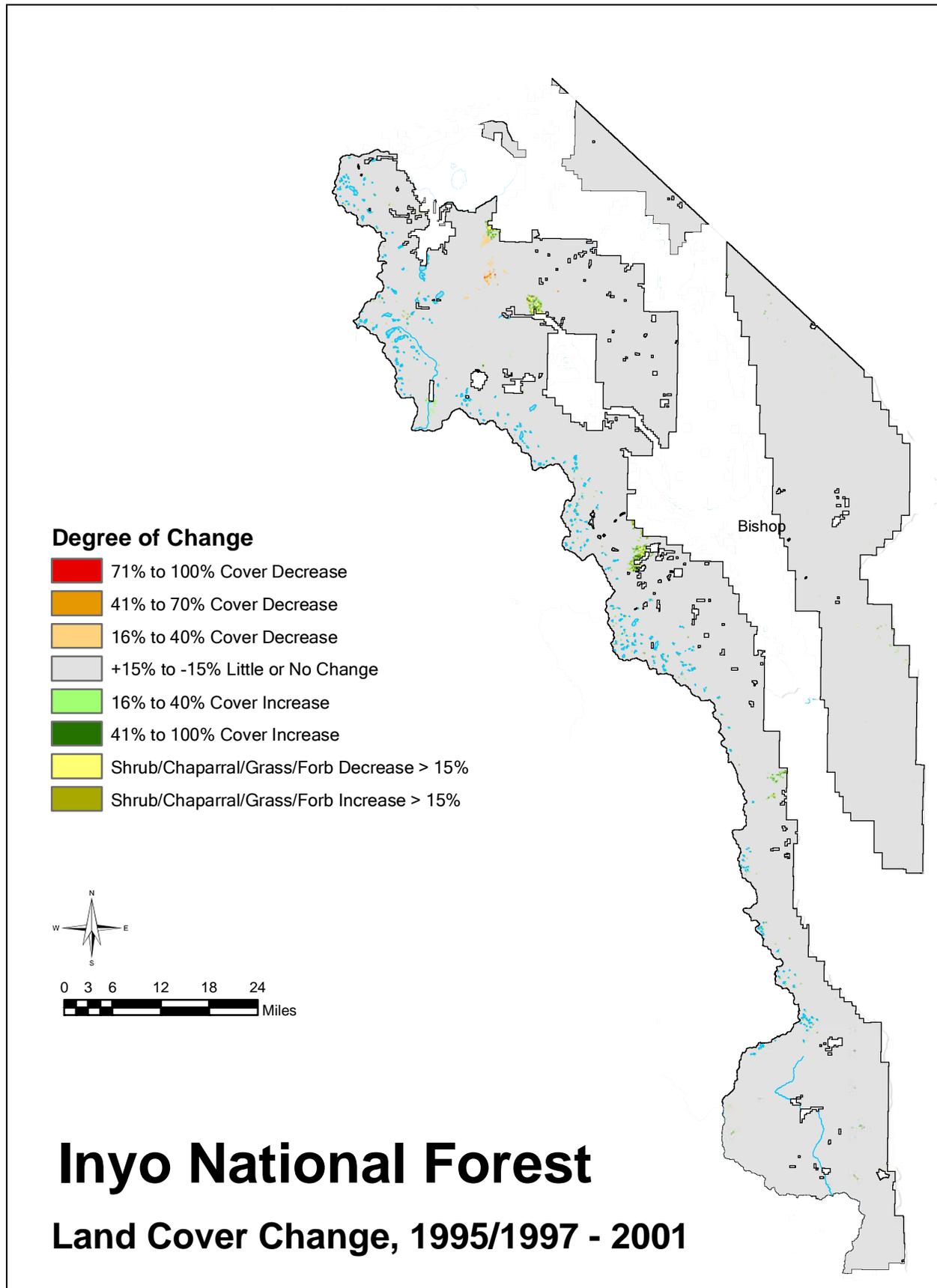
	Fire	Harvest	Regrowth	Other	unverified	All Causes
Unknown Shrub Type						
Grass Decrease > 15%	807	16		8	47	878
Grass Increase > 15%					2	2
Total	807	16		8	50	881
Chamise-Redshank Chaparral						
Grass Decrease > 15%	675				68	743
Total	675				68	743
Mixed Chaparral						
Grass Decrease > 15%	352	43			16	412
Total	352	43			16	412
Montane Chaparral						
Grass Decrease > 15%	2,635				2	2,637
Grass Increase > 15%			32		38	71
Total	2,635		32		40	2,708
Sagebrush						
Grass Decrease > 15%	983					983
Grass Increase > 15%					5	5
Total	983				5	988
All Shrub/Chaparral	5,452	59	32	8	179	5,731

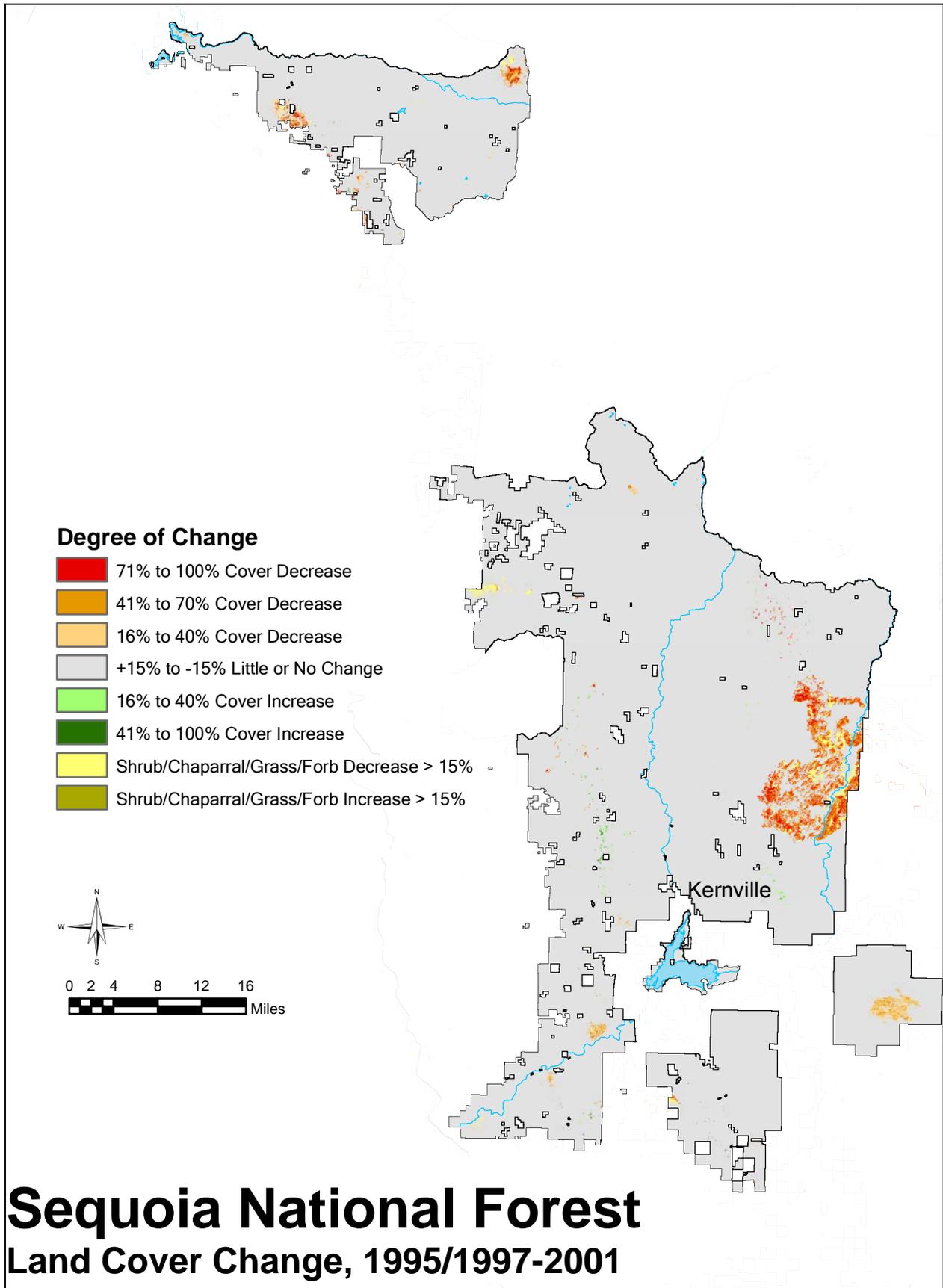
Table C-70 Acres of Verified Change in Tulare County by Cause and Grass/Forb Cover Type

	Fire	Harvest	Regrowth	Other	unverified	All Causes
Annual Grass						
Grass Decrease > 15%	883	1		3	67	954
Grass Increase > 15%			4		26	30
Total	883	1	4	3	93	985
Valley Oak Woodland						
Grass Decrease > 15%	57				7	64
Grass Increase > 15%					7	7
Total	57				14	71
All Grass/Forb	940	1	4	3	107	1,055

National Forest Maps and Tables

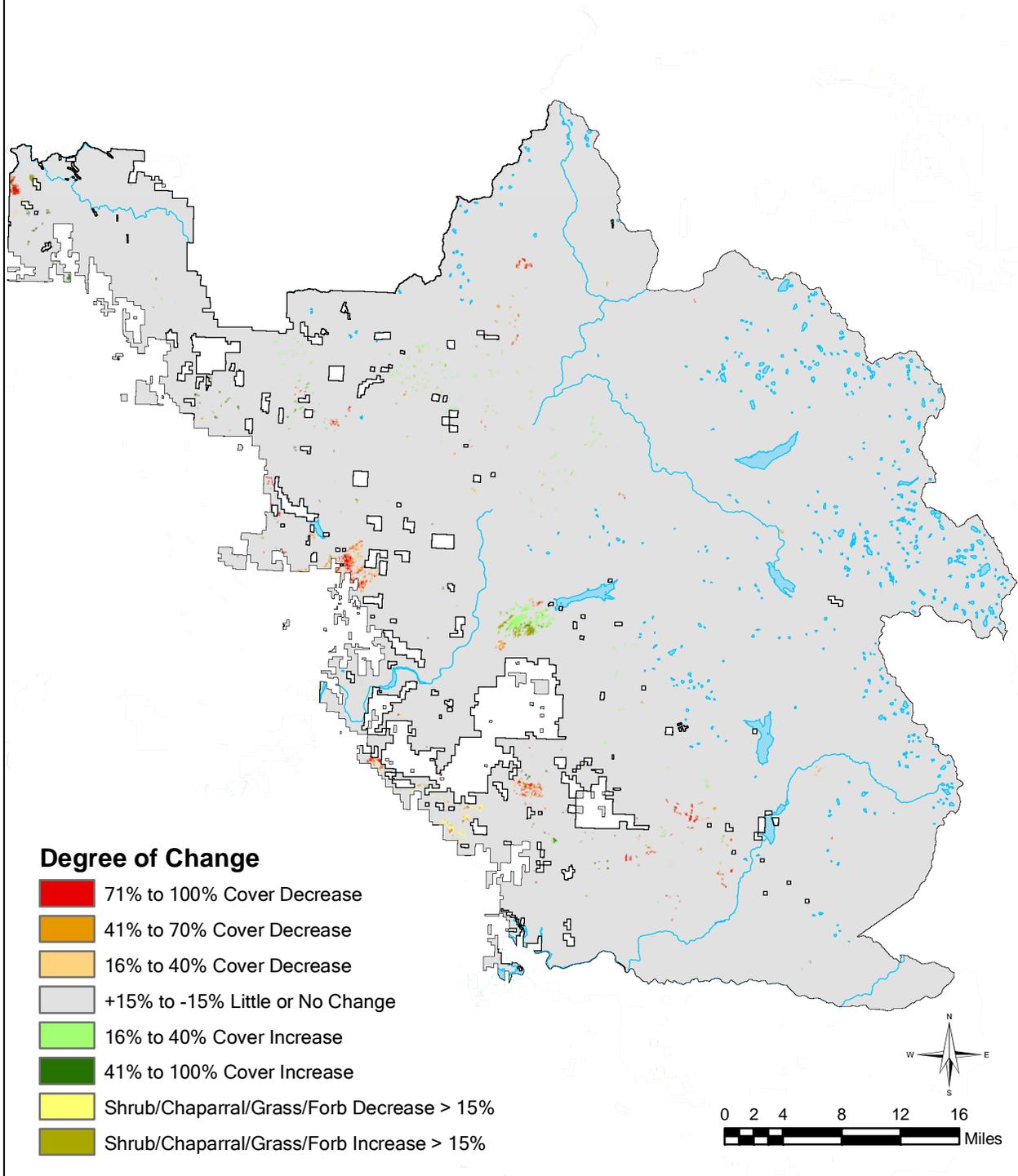
1. Forest Change Maps
2. Acres of Classified Change by Lifeform and National Forest
3. Acres of Classified Change by Cause and Lifeform
4. Acres of Classified Conifer Change by CALVEG Type and National Forest
5. Acres of Classified Hardwood Change by CALVEG Type and National Forest
6. Acres of Classified Shrub/Chaparral Change by CALVEG Type and National Forest
7. Acres of Classified Grass/Forb Change by CALVEG Type and National Forest
8. Acres of Verified Change by Cause and Conifer CALVEG Type
9. Acres of Verified Change by Cause and Hardwood CALVEG Type
10. Acres of Verified Change by Cause and Shrub/Chaparral CALVEG Type
11. Acres of Verified Change by Cause and Grass/Forb CALVEG Type

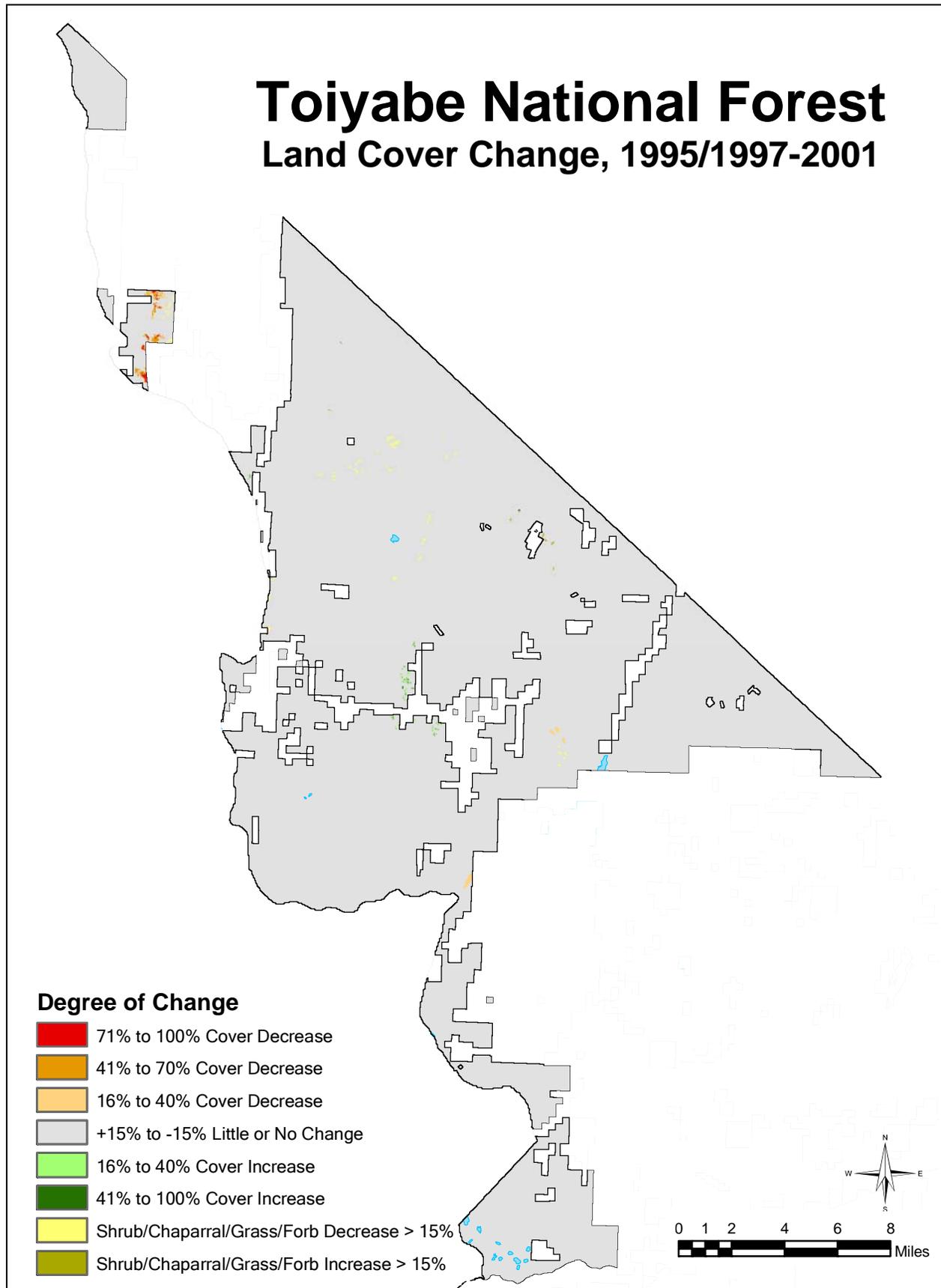




Sierra National Forest

Land Cover Change, 1995/1997-2001





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Table F-1 Acres of Classified Change by Lifeform and National Forest

	Inyo		Sequoia		Sierra		Toiyabe		All Forests	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
Conifer										
-71 to -100% CC	222		9,542	1	1,321		59		11,144	
-41 to -70% CC	289		12,999	2	468		154		13,911	1
-16 to -40% CC	2,152		7,198	1	1,480		193		11,023	
+15 to -15% CC (Little or No Change)	668,985	100	644,411	95	886,034	99	60,748	99	2,260,177	98
+16 to +40% CC	377		1,220		2,268		78		3,944	
+41 to +100% CC	32		287		530		34		884	
Total	672,058	100	675,658	100	892,101	100	61,266	100	2,301,082	100
Hardwood										
-71 to -100% CC	24		340		494				859	
-41 to -70% CC	20		674		193				888	
-16 to -40% CC	26		1,059	1	407				1,492	1
+15 to -15% CC (Little or No Change)	22,421	100	145,274	99	118,401	99	1,710	100	287,806	97
+16 to +40% CC			26		161				187	
+41 to +100% CC			23		15				38	
Total	22,491	100	147,396	100	119,672	100	1,710	100	291,270	98
Shrub/Chaparral										
+15 to -15% CC (Little or No Change)	860,338	99	181,476	98	79,419	99	76,841	100	1,198,074	99
Grass Decrease > 15%	3,861		4,239	2	564	1	81		8,746	1
Grass Increase > 15%	519		70		583	1	18		1,192	
Total	864,718	100	185,786	100	80,567	100	76,940	100	1,208,011	100
Grass/Forb										
+15 to -15% CC (Little or No Change)	23,526	100	66,628	99	17,082	100	1,763	100	108,998	99
Grass Decrease > 15%	28		900	1	2		3		933	1
Grass Increase > 15%	5		9		1				15	
Total	23,558	100	67,536	100	17,086	100	1,766	100	109,946	100
Barren										
+15 to -15% CC (Little or No Change)	236,986	100	44,444	97	177,348	100	45,777	100	504,555	100
Grass Decrease > 15%	20		1,244	3	4		137		1,405	
Grass Increase > 15%			2		11		2		16	
Total	237,007	100	45,691	100	177,362	100	45,916	100	505,976	100
All Lifeform	1,819,832		1,122,066		1,286,788		187,599		4,416,285	

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Table F-2 Acres of Verified Change in the Inyo National Forest by Cause and Lifeform

	Fire	Harvest	Develop- ment	Pest- related	Other	Regrowth	Unverified	All Causes
Conifer								
-71 to -100% CC	221			1	1			222
-41 to -70% CC	255	19		14			1	289
-16 to -40% CC	1,613	455	2	48	8		25	2,152
+16 to +40% CC					26	334	17	377
+41 to +100% CC					8	22	1	32
Total	2,089	474	2	63	44	356	44	3,073
Hardwood								
-71 to -100% CC	24							24
-41 to -70% CC	20							20
-16 to -40% CC	26							26
Total	70							70
Shrub/Chaparral								
Grass Decrease > 15%	3,763			37	11		50	3,861
Grass Increase > 15%					5	414	100	519
Total	3,763			37	16	414	150	4,380
Grass/Forb								
Grass Decrease > 15%	21						7	28
Grass Increase > 15%						2	4	5
Total	21							
Barren								
Grass Decrease > 15%	18				2			20
Grass Increase > 15%								
Total	18				2			20
All Lifeforms	5,961	474	2	99	62	770	195	7,544

Table F-3 Acres of Verified Change in the Sequoia National Forest by Cause and Lifeform

	Fire	Harvest	Develop- ment	Pest- related	Other	Regrowth	Unverified	All Causes
Conifer								
-71 to -100% CC	9,241	268		11			22	9,542
-41 to -70% CC	12,858	93		11			38	12,999
-16 to -40% CC	6,797	273		26			102	7,198
+16 to +40% CC						1,025	195	1,220
+41 to +100% CC						246	42	287
Total	28,896	633		48		1,271	398	31,246
Hardwood								
-71 to -100% CC	271	62					7	340
-41 to -70% CC	615	54					5	674
-16 to -40% CC	969	45					44	1,059
+16 to +40% CC						6	20	26
+41 to +100% CC						10	13	23
Total	1,855	161		1		16	89	2,122
Shrub/Chaparral								
Grass Decrease > 15%	4,081	42					116	4,239
Grass Increase > 15%						39	31	70
Total	4,081	42				39	147	4,310

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Table F-3 Acres of Verified Change in the Sequoia National Forest by Cause and Lifeform (cont.)

	Fire	Harvest	Develop- ment	Pest- related	Other	Regrowth	Unverified	All Causes
Grass/Forb								
Grass Decrease > 15%	815	1	2				81	900
Grass Increase > 15%							9	9
Total	815	1	2				90	909
Barren								
Grass Decrease > 15%	1,148						96	1,244
Grass Increase > 15%							2	2
Total	1,148						98	1,247
All Lifeforms	36,796	837	2	49		1,327	823	39,833

Table F-4 Acres of Verified Change in the Sierra National Forest by Cause and Lifeform

	Fire	Harvest	Pest- related	Other	Regrowth	Unverified	All Causes
Conifer							
-71 to -100% CC	499	703	10	40		69	1,321
-41 to -70% CC	43	347	17	21		40	468
-16 to -40% CC	692	674	1	14		100	1,480
+16 to +40% CC					2,146	122	2,268
+41 to +100% CC					503	27	530
Total	1,234	1,723	27	75	2,649	359	6,067
Hardwood							
-71 to -100% CC	440	1		46		6	494
-41 to -70% CC	59	20	5	79		31	193
-16 to -40% CC	325	12		64		7	407
+16 to +40% CC					111	50	161
+41 to +100% CC					10	5	15
Total	825	32	5	189	121	99	1,271
Shrub/Chaparral							
Grass Decrease > 15%	140	9		343		73	564
Grass Increase > 15%					555	29	583
Total	140	9		343	555	101	1,148
Grass/Forb							
Grass Decrease > 15%				2			2
Grass Increase > 15%					1		1
Total				2	1		3
Barren							
Grass Decrease > 15%				2		2	4
Grass Increase > 15%					11		11
Total				2	11	2	14
All Lifeforms	2,199	1,765	32	610	3,337	561	8,503

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Table F-5 Acres of Verified Change in the Toiyabe National Forest by Cause and Lifeform

	Fire	Other	Unverified	All Causes
Conifer				
-71 to -100% CC	58			59
-41 to -70% CC	154			154
-16 to -40% CC	193			193
+16 to +40% CC			78	78
+41 to +100% CC			34	34
Total	406		112	519
Shrub/Chaparral				
Grass Decrease > 15%	69	12		81
Grass Increase > 15%			18	18
Total	69	12	19	99
Grass/Forb				
Grass Decrease > 15%	3			3
Total	3			3
Barren				
Grass Decrease > 15%			136	137
Grass Increase > 15%			2	2
Total			139	139
All Lifeforms	478	12	270	760

Table F-6 Acres of Classified Conifer Change by CALVEG Type and National Forest

	Inyo		Sequoia		Sierra		Toiyabe		All Forests	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
Bristlecone Pine										
+15 to -15% CC (Little or No Change)	14,072	100							14,072	100
Total	14,072	100							14,072	100
Big Tree										
+15 to -15% CC (Little or No Change)			937	100	1,469	100			2,405	100
+16 to +40% CC			3						3	
+41 to +100% CC										
Total			940	100	1,469	100			2,409	100
Foxtail Pine										
-41 to -70% CC	1								1	
-16 to -40% CC	14								14	
+15 to -15% CC (Little or No Change)	12,287	100	2	100					12,289	100
Total	12,303	100	2	100					12,305	100
Jeffrey Pine										
-71 to -100% CC	123		3,088	3	5		3		3,219	1
-41 to -70% CC	216		3,529	4	5		5		3,755	2
-16 to -40% CC	1,846	2	1,410	1	28		3		3,286	1
+15 to -15% CC (Little or No Change)	94,164	98	91,558	92	35,171	100	2,557	96	223,451	95
+16 to +40% CC	32		267				69	3	367	
+41 to +100% CC			18				26	1	44	
Total	96,380	100	99,871	100	35,209	100	2,663	100	234,123	100
Lodgepole Pine										
-71 to -100% CC	62		25		26				112	
-41 to -70% CC	8		12		11				31	
-16 to -40% CC	30		20		13				62	
+15 to -15% CC (Little or No Change)	82,431	100	12,348	100	17,283	100	4,721	100	116,782	100
+16 to +40% CC	2		4		1				7	
+41 to +100% CC							2		2	
Total	82,532	100	12,408	100	17,334	100	4,723	100	116,997	100

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**Table F-6 Acres of Classified Conifer Change by CALVEG Type and National Forest
(cont.)**

	Inyo		Sequoia		Sierra		Toiyabe		All Forests	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
Mixed Conifer - Giant Sequoia										
+15 to -15% CC (Little or No Change)			15,272	100	57	100			15,329	100
+16 to +40% CC			5						5	
+41 to +100% CC			1						1	
Total			15,277	100	57	100			15,334	100
Mixed Conifer - Fir										
-71 to -100% CC	4		1,243	1	267		21	1	1,535	
-41 to -70% CC	12		963	1	117		42	1	1,134	
-16 to -40% CC	71		867		203		17		1,158	
+15 to -15% CC (Little or No Change)	30,947	99	170,555	98	162,942	99	3,616	98	368,061	99
+16 to +40% CC	289	1	676		558		2		1,525	
+41 to +100% CC	22		165		10		3		200	
Total	31,345	100	174,470	100	164,097	100	3,701	100	373,612	100
Mixed Conifer - Pine										
-71 to -100% CC			92		167				259	
-41 to -70% CC			93		35				128	
-16 to -40% CC			298		339				637	
+15 to -15% CC (Little or No Change)	75	100	73,649	99	133,597	99			207,322	99
+16 to +40% CC			108		1,109	1			1,217	1
+41 to +100% CC			43		106				150	
Total	75	100	74,283	100	135,354	100			209,712	100
Gray Pine										
-71 to -100% CC					4				4	
-41 to -70% CC					5				5	
-16 to -40% CC					2				2	
+15 to -15% CC (Little or No Change)			19	100	5,016	100			5,034	100
Total			19	100	5,027	100			5,046	100
Singleleaf Pinyon Pine										
-71 to -100% CC	30		4,508	5			35		4,573	1
-41 to -70% CC	46		7,817	8			107		7,970	2
-16 to -40% CC	168		3,936	4			141		4,245	1
+15 to -15% CC (Little or No Change)	298,402	100	78,063	83			41,806	99	418,271	96
+16 to +40% CC	41						5		47	
+41 to +100% CC	10		2				2		14	
Total	298,698	100	94,325	100			42,097	100	435,119	100
Ponderosa Pine										
-71 to -100% CC			310		730	1			1,041	1
-41 to -70% CC			363	1	213				576	
-16 to -40% CC			446	1	822	1			1,268	1
+15 to -15% CC (Little or No Change)			65,791	98	136,305	98			202,096	98
+16 to +40% CC			42		465				508	
+41 to +100% CC			9		411				420	
Total			66,961	100	138,947	100			205,908	100
Red Fir										
-71 to -100% CC	3		276		115				395	
-41 to -70% CC	5		222		82				309	
-16 to -40% CC	14		221		72				307	
+15 to -15% CC (Little or No Change)	23,061	100	136,070	99	169,435	100			328,567	100
+16 to +40% CC	13		115		135				263	
+41 to +100% CC			49		3				52	
Total	23,096	100	136,954	100	169,842	100			329,893	100

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Table F-6 Acres of Classified Conifer Change by CALVEG Type and National Forest (cont.)

	Inyo		Sequoia		Sierra		Toiyabe		All Forests	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
Subalpine Conifers										
-71 to -100% CC					5				5	
-41 to -70% CC	1								1	
-16 to -40% CC	9				2		31		42	
+15 to -15% CC (Little or No Change)	113,545	100	147	100	224,759	100	8,048	100	346,499	100
+16 to +40% CC							3		3	
+41 to +100% CC							1		1	
Total	113,555	100	147	100	224,766	100	8,083	100	346,551	100
All Conifer	672,058		675,658		892,101		61,266		2,301,082	

Table F-7 Acres of Classified Hardwood Change by CALVEG Type and National Forest

	Inyo		Sequoia		Sierra		Toiyabe		All Forests	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
Canyon Live Oak										
-71 to -100% CC			274		405	1			679	
-41 to -70% CC			285		146				431	
-16 to -40% CC			542	1	361	1			903	1
+15 to -15% CC (Little or No Change)	7	100	102,838	99	61,926	98			164,771	99
+16 to +40% CC			22		118				140	
+41 to +100% CC			22		14				35	
Total	7	100	103,982	100	62,970	100			166,959	100
Blue Oak										
-71 to -100% CC			42		57				99	
-41 to -70% CC			373	1	15				388	1
-16 to -40% CC			500	2	13				513	1
+15 to -15% CC (Little or No Change)			28,830	97	38,741	100			67,571	98
+16 to +40% CC			3		43				46	
+41 to +100% CC					2				2	
Total			29,748	100	38,871	100			68,618	100
White Alder										
+15 to -15% CC (Little or No Change)	16	100							16	100
Total	16	100							16	100
Fremont Cottonwood										
+15 to -15% CC (Little or No Change)			236	100					236	100
Total			236	100					236	100
California Black Oak										
-71 to -100% CC										
-41 to -70% CC			13						13	
-16 to -40% CC			11		1				12	
+15 to -15% CC (Little or No Change)	26	100	4,489	99	3,834	100			8,349	100
+16 to +40% CC			2						2	
+41 to +100% CC			1						1	
Total	26	100	4,516	100	3,835	100			8,377	100
Willow										
-71 to -100% CC			24	4	3				27	1
-41 to -70% CC			2						2	
-16 to -40% CC			6	1	2				7	
+15 to -15% CC (Little or No Change)	2,335	100	508	94	967	100			3,810	99
Total	2,335	100	540	100	971	100			3,846	100

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Table F-7 Acres of Classified Hardwood Change by CALVEG Type and National Forest (cont.)

	Inyo		Sequoia		Sierra		Toiyabe		All Forests	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
Quaking Aspen										
-71 to -100% CC	24								24	
-41 to -70% CC	20								20	
-16 to -40% CC	26								26	
+15 to -15% CC (Little or No Change)	20,038	100					1,710	100	21,748	100
Total	20,108	100					1,710	100	21,818	100
Interior Live Oak										
-71 to -100% CC					29				29	
-41 to -70% CC					32				32	
-16 to -40% CC					31				31	
+15 to -15% CC (Little or No Change)			8,374	100	12,933	99			21,307	100
Total			8,374	100	13,025	100			21,399	100
All Hardwood	22,491		147,396		119,672		1,710		291,270	

Table F-8 Acres of Classified Shrub/Chaparral Change by CALVEG Type and National Forest

	Inyo		Sequoia		Sierra		Toiyabe		All Forests	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
Mixed Alpine Scrub										
+15 to -15% CC (Little or No Change)	146,500	100			887	100	3,495	100	150,881	100
Grass Decrease > 15%	53								53	
Grass Increase > 15%	44								44	
Total	146,597	100			887	100	3,495	100	150,979	100
Bitterbrush										
+15 to -15% CC (Little or No Change)	28,333	97					6,075	99	34,408	98
Grass Decrease > 15%	628	2					40	1	668	2
Grass Increase > 15%	203	1							203	1
Total	29,164	100					6,116	100	35,279	100
Saltbush										
+15 to -15% CC (Little or No Change)	3,367	95							3,367	95
Grass Decrease > 15%	173	5							173	5
Total	3,540	100							3,540	100
Curlleaf Mountain Mahogany										
+15 to -15% CC (Little or No Change)	87,461	99					35	100	87,496	99
Grass Decrease > 15%	482	1							482	1
Grass Increase > 15%	21								21	
Total	87,965	100					35	100	87,999	100
Rabbitbrush										
+15 to -15% CC (Little or No Change)			351	100					351	100
Total			351	100					351	100
Basin Sagebrush										
+15 to -15% CC (Little or No Change)	430,924	99	7,033	100	43	100	59,825	100	497,826	99
Grass Decrease > 15%	2,472	1	7				38		2,517	1
Grass Increase > 15%	202						18		220	
Total	433,598	100	7,040	100	43	100	59,881	100	500,563	100
Chamise										
+15 to -15% CC (Little or No Change)			6,882	93	2,518	99			9,400	95
Grass Decrease > 15%			524	7	17	1			541	5
Total			7,405	100	2,536	100			9,941	100

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Table F-8 Acres of Classified Shrub/Chaparral Change by CALVEG Type and National Forest (cont.)

	Inyo		Sequoia		Sierra		Toiyabe		All Forests	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
Ceanothus Mixed Chaparral										
+15 to -15% CC (Little or No Change)			75,589	99	38,533	98			114,122	99
Grass Decrease > 15%			666	1	524	1			1,190	1
Grass Increase > 15%			10		395	1			405	
Total			76,265	100	39,452	100			115,716	100
Huckleberry Oak										
+15 to -15% CC (Little or No Change)			3,651	100					3,651	100
Grass Increase > 15%			4						4	
Total			3,656	100					3,656	100
Upper Montane Mixed Shrub										
+15 to -15% CC (Little or No Change)	11	100	1	100	25,826	100	218	100	26,056	18
Grass Decrease > 15%					14				14	
Grass Increase > 15%					20				20	
+15 to -15% CC (Little or No Change)	12,131	99	87,969	97	11,612	98	6,933	100	118,645	80
Grass Decrease > 15%	30		3,043	3	9		2		3,085	2
Grass Increase > 15%	46		56		169	1			271	
Total	12,218	200	91,069	200	37,650	200	7,153	200	148,091	100
Semi-Desert Chaparral										
+15 to -15% CC (Little or No Change)							261	100	261	100
Total							261	100	261	100
Mixed Desert Shrub										
+15 to -15% CC (Little or No Change)	151,609	100							151,609	100
Grass Decrease > 15%	24								24	
Grass Increase > 15%	4								4	
Total	151,637	100							151,637	100
All Shrub/Chaparral	864,718		185,786		80,567		76,940		1,208,011	

Table F-9 Acres of Classified Grass/Forb Change by CALVEG Type and National Forest

	Inyo		Sequoia		Sierra		Toiyabe		All Forests	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
Unknown Grass (obsolete)										
+15 to -15% CC (Little or No Change)	9,897	100					1,762	100	11,659	100
Grass Decrease > 15%	13						3		16	
Total	9,910	100					1,765	100	11,675	100
Annual Grass/Forb										
+15 to -15% CC (Little or No Change)			60,064	99	6,794	100			66,858	99
Grass Decrease > 15%			843	1					843	1
Grass Increase > 15%			5		1				6	
Total			60,912	100	6,794	100			67,706	100
Wet Meadows (Grass/Sedge/Rush)										
+15 to -15% CC (Little or No Change)	13,628	100	6,563	99	10,289	100	1	100	30,481	100
Grass Decrease > 15%	15		57	1	2				74	
Grass Increase > 15%	5		4						9	
Total	13,648	100	6,624	100	10,291	100	1	100	30,565	100
All Grass/Forb	23,558		67,536		17,086		1,766		109,946	

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Table F-10 Acres of Verified Change in the Inyo National Forest by Cause and Conifer CALVEG Type

	Fire	Harvest	Develop- ment	Pest- related	Regrowth	Other	Unverified	All Causes
Foxtail Pine								
-41 to -70% CC	1							1
-16 to -40% CC	12						3	14
Total	13						3	16
Jeffrey Pine								
-71 to -100% CC	123							123
-41 to -70% CC	202	14						216
-16 to -40% CC	1,406	423		7		5	4	1,846
+16 to +40% CC					32			32
Total	1,731	437		7	32	5	4	2,217
Lodgepole Pine								
-71 to -100% CC	62							62
-41 to -70% CC	2	5		1				8
-16 to -40% CC	4	16		9				30
+16 to +40% CC							2	2
Total	68	22		10			3	102
Mixed Conifer - Fir								
-71 to -100% CC	4							4
-41 to -70% CC	10			2				12
-16 to -40% CC	48	16	2	4				71
+16 to +40% CC					289			289
+41 to +100% CC					22			22
Total	62	16	2	6	311			397
Singleleaf Pinyon Pine								
-71 to -100% CC	28			1		1		30
-41 to -70% CC	35			10			1	46
-16 to -40% CC	121			28		3	16	168
+16 to +40% CC						26	15	41
+41 to +100% CC						8	1	10
Total	185			39		39	33	296
Red Fir								
-71 to -100% CC	3							3
-41 to -70% CC	5							5
-16 to -40% CC	14							14
+16 to +40% CC					13			13
Total	22				13			35
Subalpine Conifers								
-41 to -70% CC								1
-16 to -40% CC	8						1	9
Total	9						2	10
All Conifer	2,089	474	2	63	356	44	44	3,073

Table F-11 Acres of Verified Change in the Inyo National Forest by Cause and Hardwood CALVEG Type

	Fire	All Causes
Quaking Aspen		
-71 to -100% CC	24	24
-41 to -70% CC	20	20
-16 to -40% CC	26	26
Total	70	70
All Hardwood	70	70

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Table F-12 Acres of Verified Change in the Inyo National Forest by Cause and Shrub/Chaparral CALVEG Type

	Fire	Pest-related	Regrowth	Other	Unverified	All Causes
Mixed Alpine Scrub						
Grass Decrease > 15%	51				2	53
Grass Increase > 15%			1		43	44
Total	51		1		45	97
Bitterbrush						
Grass Decrease > 15%	627				1	628
Grass Increase > 15%			203			203
Total	627		203		1	830
Saltbush						
Grass Decrease > 15%	173					173
Total	173					173
Curleaf Mountain Mahogany						
Grass Decrease > 15%	482					482
Grass Increase > 15%			1	3	17	21
Total	482		1	3	17	503
Basin Sagebrush						
Grass Decrease > 15%	2,412	13			46	2,472
Grass Increase > 15%			190	2	10	202
Total	2,412	13	190	2	57	2,674
Upper Montane Mixed Chaparral						
Grass Decrease > 15%	7	23				30
Grass Increase > 15%			19		27	46
Total	7	23	19		27	76
Mixed Desert Shrub						
Grass Decrease > 15%	12			11	1	24
Grass Increase > 15%					4	4
Total	12			11	4	27
All Shrub/Chaparral	3,763	37	414	16	150	4,380

Table F-13 Acres of Verified Change in the Inyo National Forest by Cause and Grass/Forb CALVEG Type

	Fire	Regrowth	Unverified	All Causes
Unknown Grass (obsolete)				
Grass Decrease > 15%	13			13
Total	13			13
Grass Decrease > 15%	8		7	15
Grass Increase > 15%		2	4	5
Total	8	2	10	20
All Grass/Forb	21	2	10	33

Table F-14 Acres of Verified Change in the Sequoia National Forest by Cause and Conifer CALVEG Type

	Fire	Harvest	Pest-related	Regrowth	Unverified	All Causes
Jeffrey Pine						
-71 to -100% CC	3,083	2			3	3,088
-41 to -70% CC	3,526	1			2	3,529
-16 to -40% CC	1,404	1			5	1,410
+16 to +40% CC				254	12	267
+41 to +100% CC				15	4	18
Total	8,012	4		269	26	8,312

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Table F-14 Acres of Verified Change in the Sequoia National Forest by Cause and Conifer CALVEG Type (cont.)

	Fire	Harvest	Pest-related	Regrowth	Unverified	All Causes
Lodgepole Pine						
-71 to -100% CC	6	18				25
-41 to -70% CC	8	4				12
-16 to -40% CC	5	15				20
+16 to +40% CC				1	3	4
+41 to +100% CC						
Total	18	38		1	4	60
Mixed Conifer - Giant Sequoia						
+16 to +40% CC				1	4	5
+41 to +100% CC						1
Total				1	4	5
Mixed Conifer - Fir						
-71 to -100% CC	1,081	155	3		5	1,243
-41 to -70% CC	908	34	9		13	963
-16 to -40% CC	642	154	14		56	867
+16 to +40% CC				538	138	676
+41 to +100% CC				137	28	165
Total	2,631	342	26	675	241	3,915
Mixed Conifer - Pine						
-71 to -100% CC	65	17	8		2	92
-41 to -70% CC	74	17	2			93
-16 to -40% CC	254	30	8		6	298
+16 to +40% CC				84	24	108
+41 to +100% CC				37	6	43
Total	393	64	17	121	38	634
Singleleaf Pinyon Pine						
-71 to -100% CC	4,507	1				4,508
-41 to -70% CC	7,817					7,817
-16 to -40% CC	3,936					3,936
+16 to +40% CC						
+41 to +100% CC					2	2
Total	16,259	1			2	16,262
Ponderosa Pine						
-71 to -100% CC	287	21			2	310
-41 to -70% CC	331	27			6	363
-16 to -40% CC	409	29	4		5	446
+16 to +40% CC				38	4	42
+41 to +100% CC				8	1	9
Total	1,026	77	4	46	17	1,170
Red Fir						
-71 to -100% CC	213	53			10	276
-41 to -70% CC	196	10			16	222
-16 to -40% CC	148	44			30	221
+16 to +40% CC				110	6	115
+41 to +100% CC				49		49
Total	556	107		158	63	884
Subalpine Conifers						
-41 to -70% CC						
Total						
All Conifer	28,896	633	48	1,271	395	31,243

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Table F-15 Acres of Verified Change in the Sequoia National Forest by Cause and Hardwood CALVEG Type

	Fire	Harvest	Pest-related	Regrowth	Unverified	All Causes
Canyon Live Oak						
-71 to -100% CC	205	62			6	274
-41 to -70% CC	227	54			4	285
-16 to -40% CC	462	45			34	542
+16 to +40% CC				6	15	22
+41 to +100% CC				10	12	22
Total	895	161	1	16	71	1,144
Blue Oak						
-71 to -100% CC	42				1	42
-41 to -70% CC	372				1	373
-16 to -40% CC	490				10	500
+16 to +40% CC					3	3
Total	903				14	918
California Black Oak						
-71 to -100% CC						
-41 to -70% CC	13					13
-16 to -40% CC	11					11
+16 to +40% CC					2	2
+41 to +100% CC					1	1
Total	25				3	28
Willow						
-71 to -100% CC	24					24
-41 to -70% CC	2					2
-16 to -40% CC	6					6
Total	32					32
All Hardwood	1,855	161	1	16	89	2,122

Table F-16 Acres of Verified Change in the Sequoia National Forest by Cause and Shrub/Chaparral CALVEG Type

	Fire	Harvest	Regrowth	Unverified	All Causes
Basin Sagebrush					
Grass Decrease > 15%	7				7
Total	7				7
Chamise					
Grass Decrease > 15%	455			68	524
Total	455			68	524
Ceanothus Mixed Chaparral					
Grass Decrease > 15%	603	41		22	666
Grass Increase > 15%			3	7	10
Total	603	41	3	29	676
Huckleberry Oak					
Grass Increase > 15%				4	4
Grass Decrease > 15%	3,017	1		26	3,043
Grass Increase > 15%			36	20	56
Total	3,017	1	36	50	3,103
All Shrub/Chaparral	4,081	42	39	147	4,310

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Table F-17 Acres of Verified Change in the Sequoia National Forest by Cause and Grass/Forb CALVEG Type

	Fire	Harvest	Develop- ment	Unverified	All Causes
Annual Grass/Forb					
Grass Decrease > 15%	758	1	2	81	843
Grass Increase > 15%				5	5
Total	758	1	2	86	848
Annual Grass/Forb					
Grass Decrease > 15%	57				57
Grass Increase > 15%				4	4
Total	57			4	61
All Grass/Forb	815	1	2	90	909

Table F-18 Acres of Verified Change in the Sierra National Forest by Cause and Conifer CALVEG Type

	Fire	Harvest	Pest- related	Regrowth	Other	Unverifie d	All Causes
Jeffrey Pine							0
-71 to -100% CC	1					4	5
-41 to -70% CC	2					3	5
-16 to -40% CC	12					15	28
Total	15					22	38
Lodgepole Pine							0
-71 to -100% CC		20	6				26
-41 to -70% CC		10	1				11
-16 to -40% CC		11	1			1	13
+16 to +40% CC				1			1
Total		42	8	1		1	51
Mixed Conifer - Fir							0
-71 to -100% CC	1	251	1		4	10	267
-41 to -70% CC	6	99	6		0	7	117
-16 to -40% CC	16	164			1	22	203
+16 to +40% CC				520		38	558
+41 to +100% CC				10			10
Total	23	514	7	529	5	77	1,155
Mixed Conifer - Pine							0
-71 to -100% CC	63	88				16	167
-41 to -70% CC	6	27				1	35
-16 to -40% CC	158	161				20	339
+16 to +40% CC				1,093		16	1,109
+41 to +100% CC				101		5	106
Total	228	277		1,194		58	1,757
Gray Pine							0
-71 to -100% CC	4				0		4
-41 to -70% CC					5		5
-16 to -40% CC	1				1		2
Total	5				6		12
Ponderosa Pine							0
-71 to -100% CC	430	233			36	32	730
-41 to -70% CC	28	141	8		16	19	213
-16 to -40% CC	504	269			11	38	822
+16 to +40% CC				457		8	465
+41 to +100% CC				389		22	411
Total	962	643	8	847	64	118	2,642

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Table F-18 Acres of Verified Change in the Sierra National Forest by Cause and Conifer CALVEG Type (cont.)

	Fire	Harvest	Pest-related	Regrowth	Other	Unverified	All Causes
Red Fir							
-71 to -100% CC		109	3			3	115
-41 to -70% CC		70	2			10	82
-16 to -40% CC		68				4	72
+16 to +40% CC				75		60	135
+41 to +100% CC				3			3
Total		248	5	78		76	407
Subalpine Conifers							
-71 to -100% CC						5	5
-41 to -70% CC							
-16 to -40% CC						2	2
Total						7	7
All Conifer	1,234	1,723	27	2,649	75	359	6,067

Table F-19 Acres of Verified Change in the Sierra National Forest by Cause and Hardwood CALVEG Type

	Fire	Harvest	Pest-related	Regrowth	Other	Unverified	All Causes
Canyon Live Oak							
-71 to -100% CC	366	1			38	1	405
-41 to -70% CC	14	18	5		79	31	146
-16 to -40% CC	282	12			61	6	361
+16 to +40% CC				111		7	118
+41 to +100% CC				10		3	14
Total	661	31	5	121	178	48	1,044
Blue Oak							
-71 to -100% CC	54				2	1	57
-41 to -70% CC	13	2					15
-16 to -40% CC	13						13
+16 to +40% CC						43	43
+41 to +100% CC						2	2
Total	80	2			2	46	130
California Black Oak							
-16 to -40% CC					1		1
Total					1		1
Willow							
-71 to -100% CC					3		3
-16 to -40% CC					2		2
Total					4		4
Interior Live Oak							
-71 to -100% CC	21				3	4	29
-41 to -70% CC	32						32
-16 to -40% CC	30						31
Total	84				4	5	92
All Hardwood	825	32	5	121	188	99	1,270

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Table F-20 Acres of Verified Change in the Sierra National Forest by Cause and Shrub/Chaparral CALVEG Type

	Fire	Harvest	Regrowth	Other	Unverified	All Causes
Chamise						
Grass Decrease > 15%	17					17
Total						
Ceanothus Mixed Chaparral						
Grass Decrease > 15%	122	4		341	57	524
Grass Increase > 15%			381		14	395
Total						
Upper Montane Mixed Shrub						
Grass Decrease > 15%		2			12	14
Grass Increase > 15%			18		2	20
Grass Decrease > 15%		3		2	4	9
Grass Increase > 15%			156		13	169
Total						
All Shrub/Chaparral						

Table F-21 Acres of Verified Change in the Sierra National Forest by Cause and Grass/Forb CALVEG Type

	Fire	Harvest	Regrowth	Other	Unverified	All Causes
Annual Grass/Forb						
Grass Increase > 15%			1			1
Total			1			1
Grass Decrease > 15%				2		2
Grass Increase > 15%						
Total				2		3
All Grass/Forb			1	2		3

Table F-22 Acres of Verified Change in the Toiyabe National Forest by Cause and Conifer CALVEG Type

	Fire	Unverified	All Causes
Jeffrey Pine			
-71 to -100% CC	2		3
-41 to -70% CC	5		5
-16 to -40% CC	3		3
+16 to +40% CC		69	69
+41 to +100% CC		26	26
Total	11	95	106
Lodgepole Pine			
+41 to +100% CC		2	2
Total		2	2
Mixed Conifer - Fir			
-71 to -100% CC	21		21
-41 to -70% CC	42		42
-16 to -40% CC	17		17
+16 to +40% CC		2	2
+41 to +100% CC		3	3
Total	80	5	85

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Table F-22 Acres of Verified Change in the Toiyabe National Forest by Cause and Conifer CALVEG Type (cont.)

	Fire	Unverified	All Causes
Singleleaf Pinyon Pine			
-71 to -100% CC	35		35
-41 to -70% CC	107		107
-16 to -40% CC	141		141
+16 to +40% CC		5	5
+41 to +100% CC		2	2
Total	284	7	291
Subalpine Conifers			
-16 to -40% CC	31		31
+16 to +40% CC		3	3
+41 to +100% CC		1	1
Total	31	4	35
All Conifer	406	112	519

Table F-23 Acres of Verified Change in the Toiyabe National Forest by Cause and Shrub/Chaparral CALVEG Type

	Fire	Other	Unverified	All Causes
Bitterbrush				
Grass Decrease > 15%	40			40
Grass Increase > 15%				
Total	40			41
Basin Sagebrush				
Grass Decrease > 15%	26	12		38
Grass Increase > 15%			18	18
Total	26	12	18	56
Upper Montane Mixed Chaparral				
Grass Decrease > 15%	2			2
Total	2			2
All Shrub/Chaparral	69	12	19	99

Table F-24 Acres of Verified Change in the Toiyabe National Forest by Cause and Grass/Forb CALVEG Type

	Fire	All Causes
Unknown Grass (obsolete)		
Grass Decrease > 15%	3	3
Total	3	3
All Grass/Forb	3	3