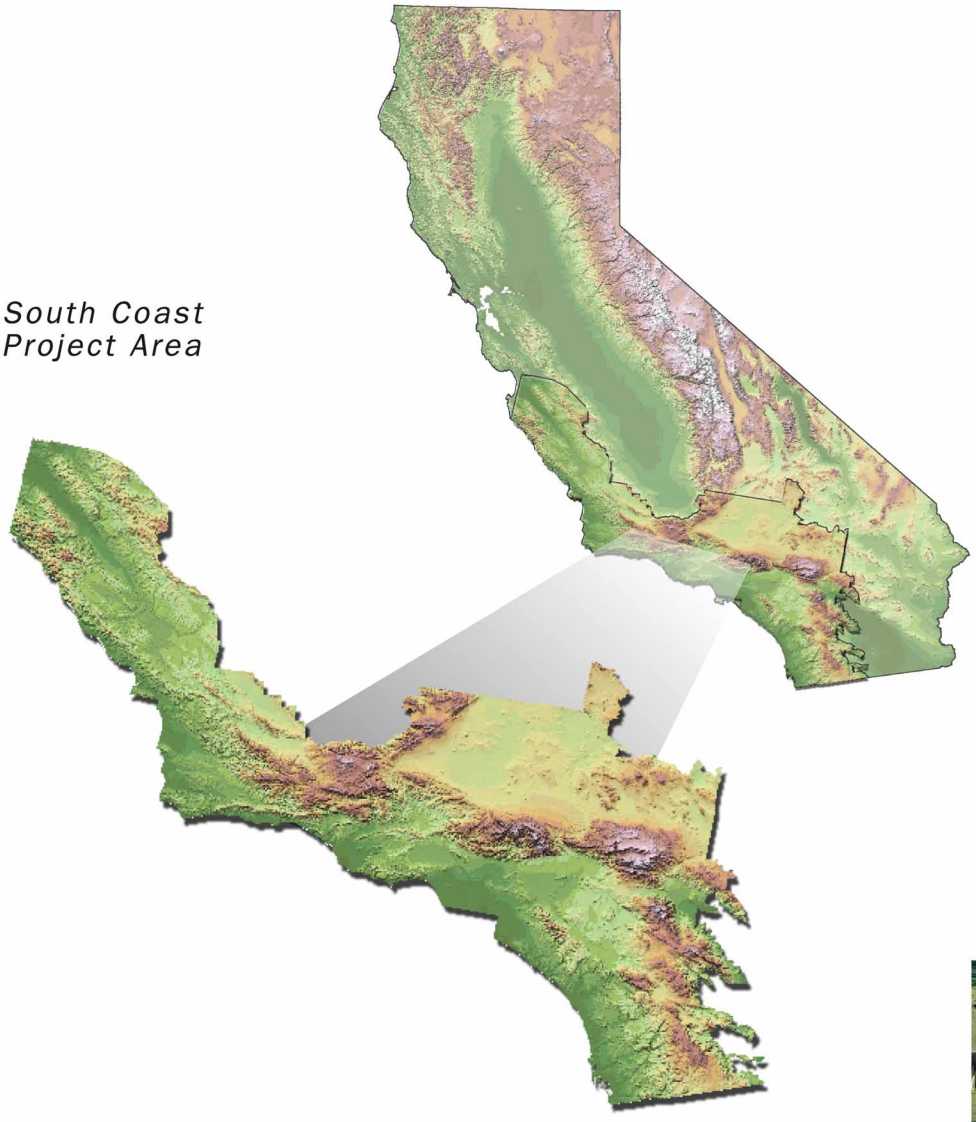
Monitoring Land Cover Changes in California

A USDA Forest Service and
California Department of Forestry and Fire Protection
Cooperative Monitoring Program

July 2002



South Coast Project Area

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California Land Cover Mapping and Monitoring Program

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ABSTRACT

This report summarizes vegetation changes between 1992 and 1997 for the South Coast project area. The area covers portions of Imperial, Kern, Los Angeles, Monterey, Orange, Riverside, San Benito, San Bernardino, San Diego, San Luis Obispo, Santa Barbara and Ventura counties. The project area also completely encompasses the Angeles, Cleveland, Los Padres, and San Bernardino National Forests. 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. Cause of land cover change is also determined by experts on the ground and with ancillary data layers. Summary tables provide estimates of land cover change by lifeform type, Wildlife Habitat Relationships System (WHR) type, ownership, CALVEG type (Forest Service Ownership) and cause.

For more information about the LCMMP, or to download data and maps, visit our web page at http://frap.cdf.ca.gov/projects/land_cover/intex.html

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SUMMARY & HIGHLIGHTS

The South Coast project area covers 19.9 million acres, which includes portions of Imperial, Kern, Los Angeles, Monterey, Orange, Riverside, San Benito, San Bernardino, San Diego, San Luis Obispo, Santa Barbara and Ventura counties. The project area completely encompasses four national forests (Angeles, Cleveland, Los Padres and San Bernardino), as well as other federal, state, county and privately owned lands. This report assesses land cover changes on 16.4 million acres within hardwood, conifer, shrub/chaparral and grass/forb vegetation types. Although the total project area spans 19.9 million acres, 3.5 million acres are not forest, shrub/chaparral or grass/forb (e.g., urban, agriculture and water) and were not assessed in this report.

The California Land Cover Mapping and Monitoring Program (LCMMP) uses Landsat Thematic Mapper (TM) satellite imagery, which 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, to detect changes in land cover. For the South Coast project area, changes are determined between 1992 and 1997. For hardwood and conifer canopy 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, grass and 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 for most change areas. The monitoring data is very reliable, with an overall accuracy of 89.6%.

All Vegetation

- Results show that 98.6% of the vegetation in the assessed 16.4 million acres does not have a detectable change between 1992 and 1997.
- Decreases across vegetation types occur on approximately 201,000 acres or 1.2%, and increases on about 35,500 acres or 0.2%.
- Wildfire is the largest identified cause, affecting 184,995 acres and accounting for 78% of all change (93% of the vegetation decrease).

County Highlights

- San Luis Obispo County shows the largest area affected by a vegetation decrease (106,814 acres; 6.0%), mostly caused by wildfire.

National Forest Highlights

- The Los Padres National Forest (NF) displays a decrease in vegetation on 99,056 acres (5.7%).
- The Cleveland NF shows a vegetation increase on 18,273 acres (4.5%).
- Wildfire causes 85% of the vegetation change (123,083 acres) on Forest Service land and is concentrated on the Los Padres NF (98,222 acres).

Hardwoods

- The largest hardwood canopy cover decrease occurs in the blue oak woodland type (15,194 acres; 1.8%).
- Forest Service land experiences a hardwood canopy cover decrease on 15,728 acres (4.7%), primarily caused by wildfire.

County Highlights

- San Luis Obispo County exhibits the greatest decrease in hardwood canopy cover due to wildfire (15,864 acres).
- Monterey County shows a decrease in hardwood canopy cover on 8,367 acres (1.4%).

National Forest Highlights

- The Los Padres NF shows a hardwood canopy cover decrease on 14,816 acres (6.4%).
- On the Los Padres NF, blue oak canopy cover decreases on 9,544 acres (21.8%), live oak-madrone canopy cover decreases on 1,987 acres (3.5%) and coast live oak canopy cover decreases on 1,553 acres (2.2%). This is mostly caused by fire.
- Wildfire causes almost 98% of the hardwood change (15,629 acres) in the national forests, mainly concentrated in the Los Padres NF (14,739 acres).

Conifers

- Conifer lands display 9,565 acres of canopy cover decrease (0.8%), and show an increase on 414 acres (<0.1%).
- The montane hardwood-conifer type exhibits the largest area of canopy cover decrease, affecting 4,545 acres and 2.8%.
- Wildfire is the major change agent within conifers, accounting for 88%, or 8,827 acres, of the change.

County Highlights

- Conifer canopy cover decreases on 2,822 acres (5.4%) in Monterey County, mostly caused by wildfire.
- San Luis Obispo County shows a decrease on 1,338 acres of its conifer land (33.1%), which is all caused by wildfire.

National Forest Highlights

- Coulter pine in the Los Padres NF shows the largest decrease in canopy cover, affecting 3,847 acres (8.3%; almost exclusively caused by wildfire).
- Bigcone Douglas fir on the Cleveland NF shows the greatest increase in conifer canopy cover, increasing on 324 acres (4.4%).
- Wildfire is responsible for 91% of conifer canopy cover change (7,578 acres).

Shrub/Chaparral

- Shrub/chaparral decrease occurs on over 154,00 acres (1.6%), and an increase occurs on 28,112 acres (0.3%).
- Montane chaparral type shows the largest decrease (83,474 acres; 4.4%).

County Highlights

- Shrub/chaparral in San Luis Obispo County shows a decrease on 86,490 acres (23.8%) and is mostly caused by wildfire.
- Los Angeles County experiences a decrease in shrub/chaparral on 24,143 acres (2.0%).

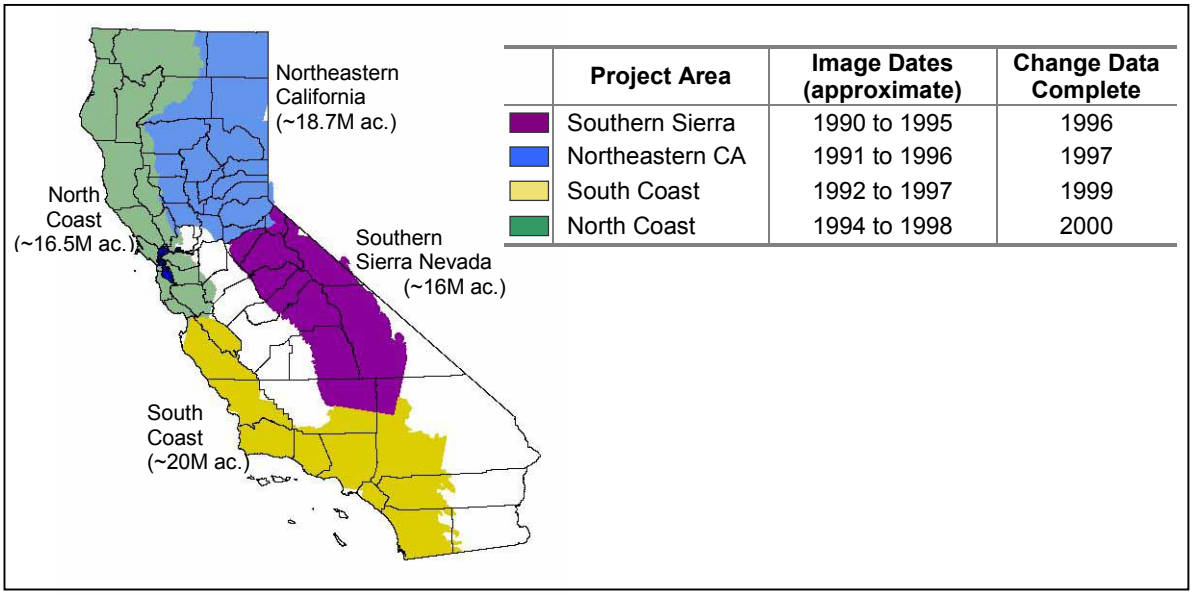
National Forest Highlights

- The Los Padres NF shows a decrease in shrub/chaparral on 78,875 acres (7.0% of its area; mostly due to wildfire).
- The Cleveland NF shows an increase of shrub/chaparral on 17,691 acres (4.9%), which is mostly caused by regeneration.
- Over 90% of the change is due to wildfire on all forests except the Cleveland NF, where regeneration is the main cause of change.

INTRODUCTION

The California Land Cover Mapping and Monitoring Program (LCMMP*) is a collaboration between the USDA Forest Service (FS) and the California Department of Forestry and Fire Protection (CDF) to create seamless vegetation data and monitoring data, across most ownerships and vegetation types within the state. 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 GIS analysis. Monitoring data created by the LCMMP quantifies changes in California's landscape and provides necessary information for regional assessment across jurisdictional boundaries. These data provide consistent, high quality information to manage, assess and protect California's diverse vegetation resources at a low per acre cost (approximately 2 cents per acre).

Monitoring land cover change for the first statewide cycle occurs in one of four distinct project areas per year (Figure 1). Each project area will be revisited during the second cycle. Analysis is complete for all project areas in the first cycle. Land cover monitoring maps can be downloaded from http://frap.cdf.ca.gov/data/frapgismaps/select.asp. 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.



	Project Area	Image Dates (approximate)	Change Data Complete
	Southern Sierra	1990 to 1995	1996
	Northeastern CA	1991 to 1996	1997
	South Coast	1992 to 1997	1999
	North Coast	1994 to 1998	2000

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

The FS and CDF have mapping, resource management and resource protection responsibilities across much of the non-irrigated and non-urban land in the South Coast region. The FS manages most resource activities within the national forests, such as recreation, forest health programs, fire protection, timber management and grazing allotments. CDF is responsible for providing

*For additional information visit our web pages at http://frap.cdf.ca.gov/projects/land_cover/index.html

fire protection on most private and state lands, regulating timber harvests on private lands and monitoring resource conditions across all wildlands in the area. 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 (e.g., Fish and Game, Parks and Recreation, State Water Resources Control Board), county governments, city governments and other interested parties.

The South Coast project area covers 19.9 million acres. The area covers some or most of Imperial, Kern, Los Angeles, Monterey, Orange, Riverside, San Benito, San Bernardino, San Diego, San Luis Obispo, Santa Barbara and Ventura counties. It completely encompasses four national forests (Angeles, Cleveland, Los Padres and San Bernardino) and other federal, state and privately owned lands (Figures 2 and 3). This report assesses land cover changes on 16.4 million acres within conifer, hardwood, shrub/chaparral and grass/forb vegetation types. Although the total project area spans 19.9 million acres of land, 3.5 million acres are not forest, shrub, chaparral or grass lands (e.g., urban, agriculture, barren and water) and are not included in this analysis.

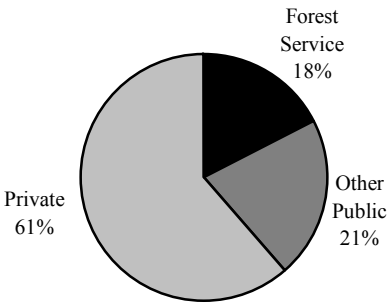


Figure 2. Land ownership distribution.

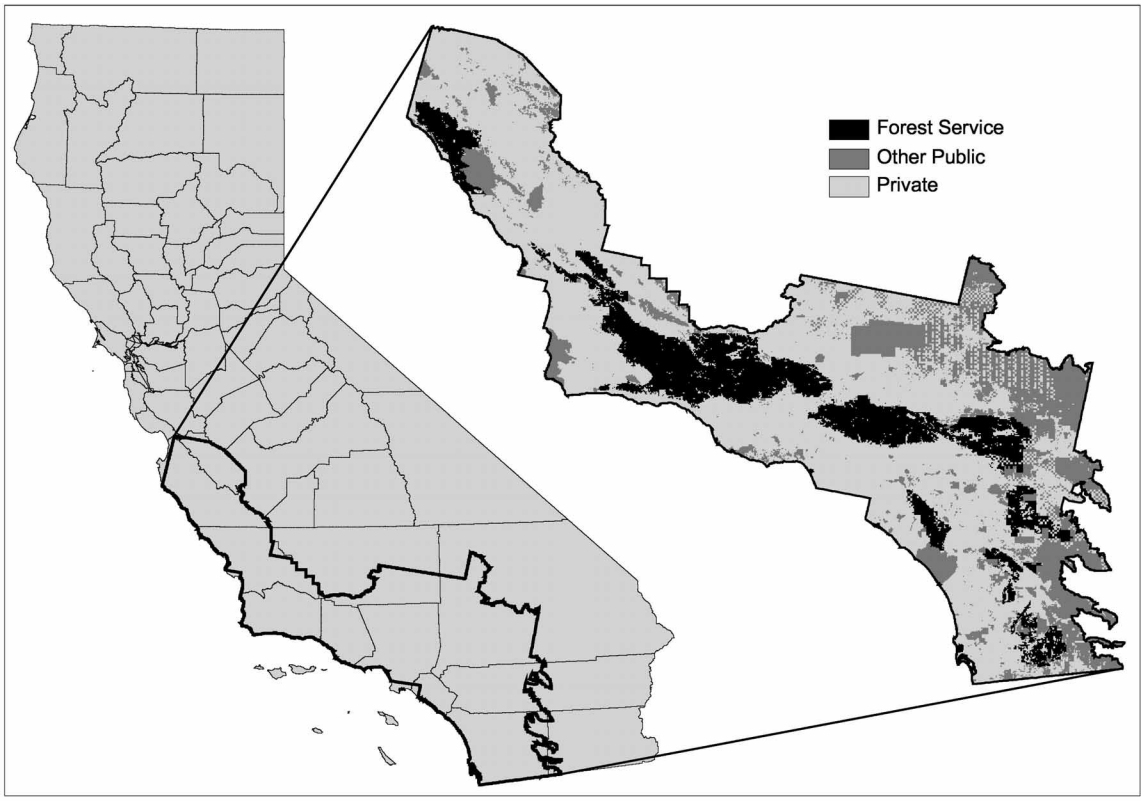


Figure 3. Location of South Coast Project Area and corresponding land ownership.

Table 1 shows the proportion of each county covered by the project area. In this report, no county is analyzed in its entirety, as the boundary of the South Coast project area does not overlap completely with any county. This is because project area boundaries are defined predominantly by ecological zones. Other factors are also taken into account when defining project area boundaries, such as county, National Forest and TM scene boundaries. Additionally, islands, deserts and agriculturally dominated areas are excluded from the project area.

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

COUNTY	Private	Public	Total Acres in County	% of County Analyzed
	Acres	Acres	Acres	%
Imperial	13,204	78,766	2,868,483	3
Kern	916,617	384,468	5,223,231	25
Los Angeles	1,665,292	786,048	2,615,328	94
Monterey	1,412,994	604,469	2,120,174	95
Orange	398,210	76,921	511,480	93
Riverside	1,193,951	804,059	4,672,261	43
San Benito	687,187	131,120	889,395	92
San Bernardino	1,587,532	1,954,545	12,866,979	28
San Diego	1,299,393	1,142,517	2,712,246	90
San Luis Obispo	1,651,993	372,751	2,124,785	95
Santa Barbara	871,678	763,601	1,759,195	93
Ventura	577,636	601,074	1,188,255	99

CHANGE DETECTION MONITORING PROCEDURES

Images and Maps

The LCMMP uses two dates of TM imagery to derive land cover changes. Change detection techniques interpret differences in spectral reflectance to produce an image that depicts various levels of vegetation change. A difference in spectral reflectance (the amount of sunlight reflected from surface features to the satellite in space) between these image dates indicates where change probably occurred (for further details, see Appendix B). For hardwood and conifer canopy 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, grass and forb vegetation types, the change classes are quantified as a decrease or increase in vegetation cover of 16% or greater (Figure 5; Table 2).

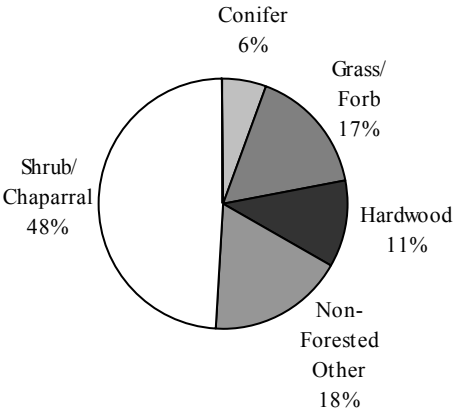


Figure 4. Proportion of each lifeform in project area.

The overall accuracy of the change map is 89.6%. A total of 260 randomly selected change areas with known reference information were evaluated

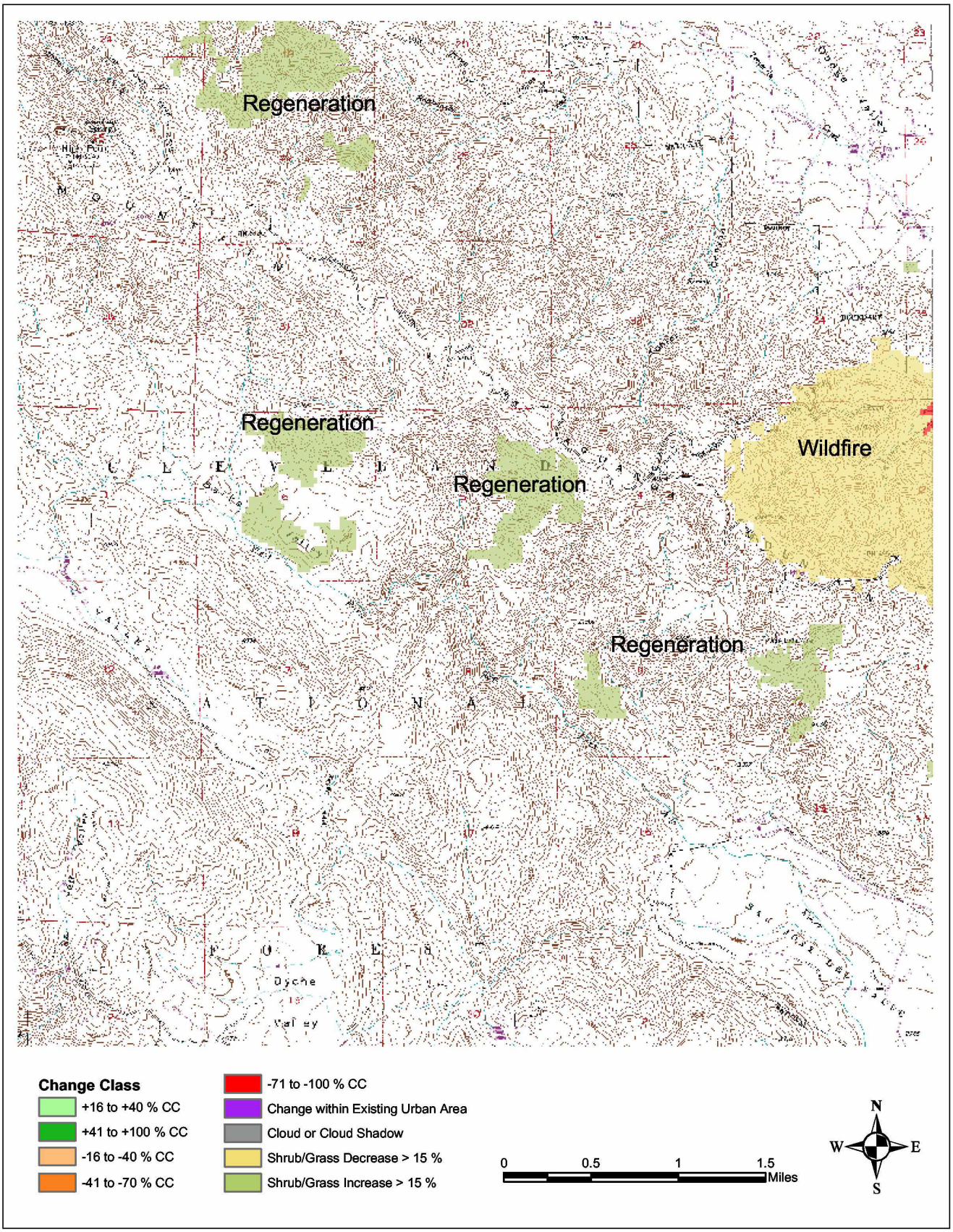


Figure 5. Portion of change map with verified cause in the Palomar Observatory quadrangle, Cleveland National Forest

to assess the accuracy of the change map. Out of the 260 sample sites, 233 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 fairly detailed vegetation classification system (e.g., Blue Oak Woodland, Ponderosa Pine and Coastal Scrub). CALVEG types are more specific (e.g., Coast Live Oak and Coulter Pine) than WHR types, 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 the information in that layer. Within national forest boundaries, LCMMP vegetation data is used, which contains lifeform 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 overlay, fieldwork, photo interpretation and interpretation by land managers, landowners and other stakeholders. The GIS overlay uses the CDF forest practices database, FS stand record system and statewide fire history layer to attribute changes caused by harvests, regeneration and wildfires. FS resource managers interpret change maps by applying local knowledge and fieldwork to identify sources of change on Forest Service lands. Similarly, UC Integrated Hardwood Rangeland Management Program (IHRMP) personnel consult private landowners to verify causes of change in hardwood rangelands. Despite all these efforts, full coverage of 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.

INTERPRETING RESULTS

Vegetation change represent areas that undergo some form of vegetation decrease or increase between image dates (refer to Figure 1a in Appendix A for exact dates). For hardwood and conifer canopy 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, grass and 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 for the methods to detect. Table 2 describes the different change classes.

Multiple change classes are created to represent different 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 canopy cover
-41 to -70% CC	41 to 70% decrease in canopy cover
-16 to -40% CC	16 to 40% decrease in canopy cover
+15 to -15% CC (Little or No Change)	Little or no change (in canopy cover or shrub/chaparral)
+16 to +40% CC	16 to 40% increase in canopy cover
+41 to +100% CC	41 to 100% increase in canopy cover
Shrub/Grass Decrease > 15%	16 to 100% decrease in shrub/grass
Shrub/Grass Increase > 15%	16 to 100% increase in shrub/grass
Non-vegetation Change	Change not related to a vegetation change
Change Within Existing Developed Area	Change within urban area
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 proportion. A particular value in acres, such as 15,000 acres, implies 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 1.8% of blue oak woodland experiences a decrease in canopy cover, then 1.8% of the blue oak woodland analyzed in the project area experiences a canopy cover change of 16% or more. This does **not** mean that 1.8% of blue oak woodland is gone, the canopy cover of blue oak woodland has decreased by 1.8% or the volume of blue oak woodland decreased by 1.8%.

Keep 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

intensity) 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. Complex interactions between factors such as site quality, vegetation composition and structure, and fire intensity determine conditions at the two monitoring dates, and thus whether a change can be detected. Additional research is needed to explore potential improvements in the methodology for monitoring brushlands.

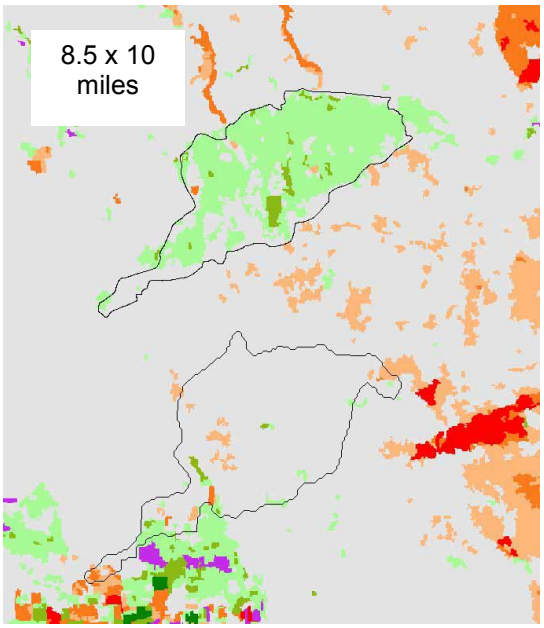


Figure 6. Comparison of two fires that burned in chaparral dominated areas.

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 easily verified because the FS and CDF maintain a 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.

Many causes are extremely difficult to verify, particularly causes that affect only small areas, such as development. Because a particular cause may have none or a low area affected, it does not necessarily mean that the particular cause was not important. The unverified cause acreage could belong to any of the categories mentioned in this report, such as fire or development. But the unverified cause could also be due to other cause agents, such as a landslide or management activity. Acres listed for the different cause agents tend to represent a minimum acreage of cause.

Calculating a "net" change by simply comparing decrease and increase acres is not appropriate. Vegetation decreases are usually quick and dramatic, such as 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%. A decrease in large trees or other mature vegetation types will take decades to regrow, but many of the increases are in younger vegetation types and represent less than a single decade of growth. Some decreases in vegetation, such as development and conversion to vineyard, are permanent losses to that particular vegetation. Comparing vegetation that is permanently lost or removed to vegetation that has temporarily increased is not appropriate.

DISCUSSION OF RESULTS: ENTIRE PROJECT AREA

All Vegetation

Of the 19.9 million acres in the project area, about 3.5 million acres are not vegetated (e.g., water, urban). The 16.4 million vegetated acres are composed of the shrub/chaparral, grass/forb, hardwood and conifer lifeforms, each covering 9.8, 3.3, 2.2 and 1.2 million acres, respectively.

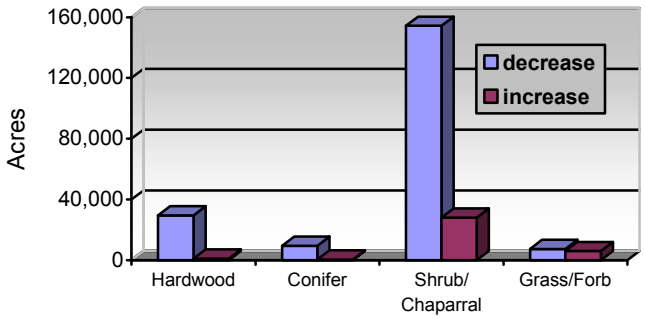


Figure 7. Acres of vegetation change by lifeform.

Approximately 98.6% of the vegetation in the project area does not show a detected change between 1992 and 1997. Decreases in vegetation cover occur on approximately 1.2% of the analyzed 16.4 million acres in the project area and increases total about 0.2%. Most of this change occurs in the shrub/chaparral lifeform (Figure 7). All lifeforms show a larger area affected by a decrease in vegetation than an increase. See Appendix G for more detailed change tables.

Cause of change is verified on 212,771 acres (90% of the change in the project area). Wildfire is the dominant cause agent, affecting 184,995 acres in the project area. Regeneration is a large cause agent, verified on 25,057 acres in the project area. Development is verified on approximately 1,800 acres.

Hardwoods

Within the project area, hardwood vegetation types total approximately 2.2 million acres. Blue oak and blue oak/foothill pine encompass about 49% of this area, while coastal oak woodlands cover about 35%, and montane hardwood about 13%. Within the hardwood area, a canopy cover decrease of at least 16% occurs on 1.4%, and an increase on about 0.05 % (see Figure 7). The cause of change within the hardwood lifeform is verified on 26,875 acres (88% of the change). Again, wildfire is the largest cause agent within the hardwood lifeform, affecting 26,196 acres, or 86% of the change. Development, regeneration and prescribed burns are verified causes on very few acres. Cause is unverified on 3,757 acres within the hardwoods, of which 3000 acres are a decrease in canopy cover.

In the hardwood lifeform, the blue oak woodland type exhibits a canopy cover decrease on 15,154 acres (1.8%) and shows a canopy cover increase on 591 acres (0.1%). Proportionally, the montane hardwood type experiences the highest canopy cover decrease (2.2% of its area), and the valley foothill riparian type shows the highest canopy cover increase (0.2% of its area). Table 3 shows canopy cover change by hardwood WHR type. All hardwood types display a canopy cover decrease over a larger area than the area showing a canopy cover increase.

Table 3. Acres of Hardwood Canopy Cover Change by WHR Type

WHR Type	Decrease in CC	% Decrease	Increase in CC	% Increase	Total Change	Total % Change
Blue Oak/Foothill Pine	1,218	0.5	19	< 0.1	1,237	0.5
Blue Oak Woodland	15,194	1.8	591	0.1	15,785	1.9
Coastal Oak Woodland	5,978	0.8	305	< 0.1	6,283	0.8
Desert Riparian	0	0	0	0	0	0
Montane Hardwood	6,596	2.2	102	< 0.1	6,698	2.2
Montane Riparian	39	0.6	0	0	39	0.6
Valley Oak Woodland	250	0.5	2	< 0.1	252	0.5
Valley Foothill Riparian	327	4.9	10	0.1	337	5.0
Total	**29,602**	**1.4**	**1029**	**< 0.1**	**30,631**	**1.4**

Within the hardwood lifeform, wildfire is the principal verified cause in the blue oak/foothill pine, blue oak woodland, coastal oak woodland, montane hardwood, and montane riparian types (Table 4). Within the valley oak woodland and valley foothill riparian, the cause is mostly unverified.

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

WHR Type	Wildfire	Develop-ment	Regen-eration	Prescribed Burn	Unverified Causes	All Causes
Blue Oak/Foothill Pine	1,080	0	0	0	157	1,237
Blue Oak Woodland	13,833	0	0	164	1,789	15,786
Coastal Oak Woodland	4,887	34	223	209	928	6,281
Montane Hardwood	6,303	0	48	0	347	6,698
Montane Riparian	17	0	0	0	23	40
Valley Oak Woodland	76	0	0	0	176	252
Valley Foothill Riparian	0	0	0	0	337	337
Total	**26,196**	**34**	**271**	**373**	**3,757**	**30,631**

Looking at the county level, the hardwoods in San Luis Obispo County experience the largest decrease in canopy cover in both area and proportion (17,016 acres and 3.2%). Monterey County also has a large area affected by canopy cover decrease, at 8,367 acres (1.4%). Monterey County shows the largest area of canopy cover increase (558 acres; 0.1%), and Riverside County displays the largest proportion of canopy cover increase (0.5%, 164 acres). Kern, Los Angeles, San Benito, San Bernardino, San Luis Obispo, Santa Barbara and Ventura counties all have very little area of increased hardwood canopy cover (all < 0.1%). All counties within the project area have more acreage of canopy cover decrease than canopy cover increase. Table 5 shows the area and proportion of canopy cover change by county.

Table 5. Acres of Hardwood Canopy Cover Change by County

County	Decrease in CC	% Decrease	Increase in CC	% Increase	Total Change	Total % Change
Kern	290	0.3	9	< 0.1	299	0.4
Los Angeles	778	0.9	11	< 0.1	789	1.0
Monterey	8,367	1.4	558	0.1	8,925	1.5
Orange	66	0.5	20	0.1	86	0.6
Riverside	489	1.6	164	0.5	653	2.1
San Benito	96	< 0.1	0	0	96	< 0.1
San Bernardino	30	0.1	3	< 0.1	33	0.1
San Diego	428	0.4	144	0.1	572	0.5
San Luis Obispo	17,016	3.2	121	< 0.1	17,137	3.3
Santa Barbara	1,734	0.4	0	0	1,734	0.4
Ventura	310	0.3	0	0	310	0.3
Total	**29,604**	**1.4**	**1030**	**< 0.1**	**30,634**	**1.4**

For the following counties, wildfire is the major verified cause of change in the hardwood lifeform: Los Angeles, Monterey, San Diego, San Luis Obispo and Santa Barbara (Table 6). Development is the verified cause of hardwood canopy cover change in only one county (Orange County).

Table 6. Acres of Hardwood Change by Cause and County

County	Wildfire	Develop-ment	Regen-eration	Prescribed Burn	Unverified Cause	All Causes
Kern	0	0	0	0	298	298
Los Angeles	674	0	0	8	108	790
Monterey	7,594	0	0	0	1,331	8,925
Orange	0	34	18	0	33	85
Riverside	238	0	152	0	263	653
San Benito	0	0	0	0	96	96
San Bernardino	25	0	0	0	8	33
San Diego	303	0	101	0	167	571
San Luis Obispo	15,864	0	0	365	907	17,136
Santa Barbara	1,432	0	0	0	303	1,735
Ventura	67	0	0	0	243	310
Total	**26,197**	**34**	**271**	**373**	**3,757**	**30,632**

When analyzed by ownership, Forest Service land shows the largest area and proportion of hardwood canopy cover decrease (Table 7). Decrease affects 15,728 acres, which equates to 4.7% of Forest Service land. Hardwood canopy cover increase was very slight over the entire project area (less than 0.1 %).

Table 7. Acres of Hardwood Canopy Cover Change by Owner

Owner	Decrease in CC	% Decrease	Increase in CC	% Increase	Total Change	Total % Change
Forest Service	15,728	4.7	226	0.1	15,954	4.8
Other Public	5,880	1.8	299	0.1	6,179	1.9
Private	7,995	0.5	503	< 0.1	8,498	0.6
Total	**29,603**	**1.4**	**1028**	**< 0.1**	**30,631**	**1.4**

Among all owner classes, the major verified cause of hardwood canopy cover change is wildfire. Approximately one-third of the change on private land could not be verified (2,934 acres), with 2,475 acres, or 84%, displaying a decrease in canopy cover. Table 8 shows the cause by ownership.

Table 8. Acres of Hardwood Change by Cause and Owner

Owner	Wildfire	Develop-ment	Regen-eration	Prescribed Burn	Unverified Cause	All Causes
Forest Service	15,629	0	219	3	104	15,955
Other Public	5,451	0	8	0	719	6,178
Private	5,116	34	44	370	2,934	8,498
Total	**26,196**	**34**	**271**	**373**	**3,757**	**30,631**

Conifers

The conifer lifeform encompasses about 1.2 million acres in the South Coast Project Area. The dominant WHR types are Jeffrey pine, montane hardwood-conifer, pinyon-juniper, and Sierran mixed conifer, which comprise about 91% of the area. Pinyon-juniper covers about 30% of the conifer area, while Sierran mixed conifer covers 26%, Jeffrey pine covers 21% and montane hardwood-conifer covers 14%. The remaining 9% of the conifer area is covered with ponderosa pine (5.1%), juniper (1.4%), redwood (0.9%), closed cone pine-cypress (0.8%), sub-alpine conifer (0.7%), Douglas fir (0.1%), and white fir (< 0.1%).

Conifers exhibit canopy cover decrease on 9,565 acres (0.8% of its area) within the project area. An increase in conifer canopy cover occurs on 414 acres, which is a very small proportion of the total acreage (< 0.05 %). Wildfire is the major verified cause of change within the conifer lifeform, affecting 8,827 acres (88% of the conifer change). Mortality, regeneration, and unverified cause total approximately 400 acres each (see Table 10).

The montane hardwood-conifer type shows the largest area of canopy cover decrease, affecting 4,545 acres (2.8%). The closed cone pine-cypress type shows the largest proportion affected by canopy cover decrease (6.1%; 552 acres). The redwood type also has an appreciable proportion of its area displaying canopy cover decrease (4.0%; 432 acres). The juniper, Douglas fir, subalpine conifer, and white fir types have no detected change. Table 9 shows the conifer canopy cover change by type.

Table 9. Acres of Conifer Canopy Cover Change by WHR Type

WHR Type	Decrease in CC	% Decrease	Increase in CC	% Increase	Total Change	Total % Change
Juniper	0	0	0	0	0	0
Closed Cone Pine-Cypress	552	6.1	0	0	552	6.1
Douglas Fir	0	0	0	0	0	0
Jeffrey Pine	940	0.4	36	< 0.1	976	0.4
Montane Hardwood-Conifer	4,545	2.8	351	0.2	4,896	3.0
Pinyon-Juniper	2,046	0.6	0	0	2,046	0.6
Ponderosa Pine	370	0.6	0	0	370	0.6
Redwood	432	4.0	3	< 0.1	435	4.1
Subalpine Conifer	0	0	0	0	0	0
Sierran Mixed Conifer	680	0.2	24	< 0.1	704	0.2
White Fir	0	0	0	0	0	0
Total	**9,565**	**0.8**	**414**	**< 0.1**	**9,979**	**0.9**

For all WHR types in the conifer lifeform, except Jeffrey pine, wildfire is the dominant cause of change (Table 10). Montane hardwood-conifer and pinyon-juniper have the most acres affected by wildfire (4,530 and 2,046 acres, respectively). In addition to wildfire (405 acres), the Jeffrey pine type is also affected by mortality (209 acres) and unverified causes (325 acres).

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

WHR Type	Wildfire	Mortality	Regen-eration	Unverified Cause	All Causes
Closed Cone Pine-Cypress	523	0	0	29	552
Jeffrey Pine	405	209	36	325	975
Montane Hardwood-Conifer	4,530	0	351	15	4,896
Pinyon-Juniper	2,046	0	0	0	2,046
Ponderosa Pine	367	0	0	3	370
Redwood	432	0	0	3	435
Sierran Mixed Conifer	524	150	24	7	705
Total	**8,827**	**359**	**411**	**382**	**9,979**

Monterey County has the largest area exhibiting conifer canopy cover decrease, with 2,822 acres (5.4%) affected. San Luis Obispo County shows a decrease on 33.1% of the conifer area (1,338 acres). San Diego County experiences both the largest area and highest proportion of canopy cover increase, with 389 acres and 0.4% (Table 11).

Table 11. Acres of Conifer Canopy Cover Change by County

County	Decrease in CC	% Decrease	Increase in CC	% Increase	Total Change	Total % Change
Imperial	0	0	0	0	0	0
Kern	0	0	0	0	0	0
Los Angeles	1,949	1.1	0	0	1,949	1.1
Monterey	2,822	5.4	3	< 0.1	2,825	5.4
Orange	0	0	0	0	0	0
Riverside	854	0.7	23	< 0.1	877	0.7
San Benito	0	0	0	0	0	0
San Bernardino	967	0.3	0	0	967	0.3
San Diego	555	0.6	389	0.4	944	1.0
San Luis Obispo	1,338	33.1	0	0	1,338	33.1
Santa Barbara	1,073	2.1	0	0	1,073	2.1
Ventura	7	< 0.1	0	0	7	< 0.1
Total	**9,565**	**0.8**	**415**	**< 0.1**	**9,980**	**0.9**

Within each county, except for San Diego and Ventura, wildfire is the dominant verified cause of change (Table 12). Regeneration affects 389 acres, or 41% of the conifer change in San Diego County. Mortality is only verified as a cause of change in one county, affecting 359 acres in Los Angeles County.

Table 12. Acres of Conifer Change by Cause and County

County	Wildfire	Mortality	Regen-eration	Unverified Cause	All Causes
Los Angeles	1,259	359	0	331	1,949
Monterey	2,816	0	0	9	2,825
Riverside	851	0	23	4	878
San Bernardino	967	0	0	0	967
San Diego	523	0	389	32	944
San Luis Obispo	1,338	0	0	0	1,338
Santa Barbara	1,073	0	0	0	1,073
Ventura	0	0	0	7	7
Total	**8,827**	**359**	**412**	**383**	**9,981**

Forest Service land has the largest area and proportion of its area showing conifer canopy cover decrease (Table 13). A decrease in canopy cover affects 7,949 acres, or 1.0%, of Forest Service land. All ownership classes experience a canopy cover increase on less than 0.1% of their land. All ownership classes display a larger area of canopy cover decrease than canopy cover increase.

Table 13. Acres of Conifer Canopy Cover Change by Owner

Owner	Decrease in CC	% Decrease	Increase in CC	% Increase	Total Change	Total % Change
Forest Service	7,949	1.0	365	< 0.1	8,314	1.1
Other Public	646	0.4	22	< 0.1	668	0.4
Private	971	0.5	27	< 0.1	998	0.5
Total	**9,566**	**0.8**	**414**	**< 0.1**	**9,980**	**0.9**

On Forest Service conifer land, most of the change in canopy cover is due to wildfire (7,578 acres; 91% of the change). However, mortality and regeneration are also verified causes, equaling 359 and 362 acres, respectively (Table 14). On private land, wildfire accounts for about 64% (641 acres) of the change, and the cause is unverified on 33% (330 acres), all of which is a decrease in canopy cover.

Table 14. Acres of Conifer Change by Cause and Owner

Owner	Wildfire	Mortality	Regen-eration	Unverified Cause	All Causes
Forest Service	7,578	359	362	15	8,314
Other Public	608	0	22	38	668
Private	641	0	27	330	998
Total	**8,827**	**359**	**411**	**383**	**9,980**

Shrub/Chaparral

The shrub/chaparral lifeform encompasses about 9.8 million acres, which covers more area than any other lifeform in the project area. The major shrub/chaparral WHR types in the project area are desert scrub (24%), montane chaparral (19%), chamise-redshank chaparral (7%), mixed chaparral (7%) and alkali scrub (6%), together covering 64% of the shrub/chaparral in the project area. Undetermined WHR types compose 32% of the shrub/chaparral lifeform. The remaining 4% is composed of coastal scrub (3%), sagebrush (0.6%), desert succulent scrub (0.2%), alpine dwarf shrub (< 0.1%) and desert wash (< 0.1%).

The shrub/chaparral lifeform displays a decrease in vegetation cover on 154,390 acres (1.6% of its area) and shows an increase on 11,994 acres, or 0.6%. Wildfire accounts for 80% (145,090 acres) of the change incurred in the shrub/chaparral lifeform. Development is a verified cause on about 1% (1,591 acres) of the change area, while regeneration accounts for 13% (23,811 acres). The cause is unverified on 6% (11,817 acres) of the change area in the shrub/chaparral lifeform.

Among the different WHR types, montane chaparral displays the largest area and proportion affected by a decrease in shrub/chaparral cover, decreasing on 83,474 acres, or 4.4% of its area (Table 15). Chamise-redshank chaparral also experiences a large decrease in cover (23,494 acres; 3.5%). The montane chaparral type experiences the largest shrub/chaparral increase, at 11,994 acres (0.6%). Chamise-redshank chaparral experiences the highest proportion of increase, with a cover increase on 1.5% (9,902 acres). Alpine dwarf shrub, desert succulent scrub and desert wash show no detectable increase or decrease in cover, but together comprise only 0.2% of the shrub/chaparral lifeform. Of the WHR types that show change, all shrub/chaparral types exhibit a larger decrease in cover than an increase in cover.

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

WHR Type	Decrease in Cover	% Decrease	Increase in Cover	% Increase	Total Change	Total % Change
Alpine Dwarf Shrub	0	0	0	0	0	0
Alkali Scrub	35	< 0.1	19	< 0.1	54	< 0.1
Chamise-Redshank Chaparral	23,494	3.5	9,902	1.5	33,396	5.0
Coastal Scrub	6,272	2.2	304	0.1	6,576	2.3
Desert Scrub	1,055	< 0.1	12	< 0.1	1,067	< 0.1
Desert Succulent Scrub	0	0	0	0	0	0
Desert Wash	0	0	0	0	0	0
Mixed Chaparral	9,425	1.3	2,089	0.3	11,514	1.6
Montane Chaparral	83,474	4.4	11,994	0.6	95,468	5.0
Sagebrush	41	0.1	21	< 0.1	62	0.1
Undetermined Shrub/Chaparral	30,596	1.0	3,771	0.1	34,367	1.1
Total	**154,392**	**1.6**	**28,112**	**0.3**	**182,504**	**1.9**

Wildfire accounts for at least 70% of the change in the chamise-redshank chaparral, coastal scrub, desert scrub, mixed chaparral, montane chaparral and undetermined WHR types (Table 16). Wildfire is the cause of decreased shrub/chaparral cover in 81,531acres of montane chaparral, 23,224 acres of chamise-redshank chaparral and 24,530 acres of undetermined shrub/chaparral types. Development is mostly concentrated in the undetermined chaparral type, affecting 1,517 acres. Regeneration is most prevalent in the chamise-redshank chaparral (9,378 acres) and the montane chaparral (11,680 acres).

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

WHR Type	Wildfire	Develop-ment	Mort-ality	Regen-eration	Pre-scribed Burn	Unverified Cause	All Causes
Alkali Scrub	0	0	0	0	0	54	54
Chamise-Redshank Chap.*	23,244	10	0	9,378	6	759	33,397
Coastal Scrub	5,951	3	0	28	4	590	6,576
Desert Scrub	794	0	0	0	0	273	1067
Mixed Chaparral	9,005	25	0	1,815	0	668	11,513
Montane Chaparral	81,531	36	80	11,680	24	2,118	95,469
Sagebrush	35	0	0	0	0	27	62
Undetermined Shrub/Chap.	24,530	1,517	0	910	79	7,330	34,366
Total	**145,090**	**1,591**	**80**	**23,811**	**113**	**11,819**	**182,504**

* Chaparral

San Luis Obispo County exhibits a very large decrease in shrub/chaparral cover, both in area and proportion (86,490 acres; 24%; Table 17). Los Angeles County also experiences a large decrease in shrub/chaparral, having a decrease in cover on 24,142 acres (2.0%). The county showing the largest increase in shrub/chaparral cover is San Diego County, with an increase on 12,943 acres (0.9%). Riverside County displays the highest proportion of shrub/chaparral increase at 1.0% (11,997 acres). Imperial County shows no detected change in the shrub/chaparral lifeform. Of the counties that show change (all but Imperial), only Riverside County exhibits a larger increase in shrub/chaparral than decrease.

Table 17. Acres of Shrub/Chaparral Change by County

County	Decrease in Cover	% Decrease	Increase in Cover	% Increase	Total Change	Total % Change
Imperial	0	0	0	0	0	0
Kern	923	0.1	91	< 0.1	1,014	0.1
Los Angeles	24,143	2.0	1,885	0.2	26,028	2.2
Monterey	5,981	1.4	434	0.1	6,415	1.5
Orange	740	0.5	581	0.4	1,321	0.9
Riverside	10,295	0.8	11,997	1.0	22,292	1.8
San Benito	62	0.1	0	0	62	0.1
San Bernardino	2,345	0.1	44	< 0.1	2,389	0.1
San Diego	18,430	1.2	12,943	0.9	31,373	2.1
San Luis Obispo	86,490	23.8	5	< 0.1	86,495	23.8
Santa Barbara	2,763	0.4	0	0	2,763	0.4
Ventura	2,219	0.4	131	< 0.1	2,350	0.4
Total	**154,391**	**1.6**	**28,111**	**0.3**	**182,502**	**1.9**

Wildfire is a major cause of change in many counties, including Los Angeles, Monterey, San Bernardino, San Luis Obispo, and Santa Barbara County, accounting for at least 80% of the change in these counties (Table 18). San Luis Obispo County in particular has a very large area affected by a wildfire, totaling over 86,000 acres. Development is verified in Orange, Riverside, and San Diego Counties, but is most prevalent in San Diego County (1,177 acres). Regeneration is most prevalent in Riverside (11,433 acres) and San Diego Counties (11,991 acres).

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

County	Wildfire	Develop-ment	Mortality	Regen-eration	Prescribed Burn	Unverified Cause	All Causes
Kern	0	0	0	0	0	1,014	1,014
Los Angeles	22,192	0	80	0	49	3,708	26,029
Monterey	5,193	0	0	0	0	1,222	6,415
Orange	0	345	0	382	0	594	1321
Riverside	9,558	69	0	11,433	0	1,232	22,292
San Benito	0	0	0	0	0	62	62
San Bernardino	2,251	0	0	5	0	133	2,389
San Diego	15,761	1,177	0	11,991	0	2,444	31,373
San Luis Obispo	86,197	0	0	0	64	234	86,495
Santa Barbara	2,404	0	0	0	0	358	2,762
Ventura	1,534	0	0	0	0	816	2,350
Total	**145,090**	**1,591**	**80**	**23,811**	**113**	**11,817**	**182,502**

Of the owner classes in the project area, the shrub/chaparral on Forest Service land shows the largest area and proportion affected by a decrease in cover (101,611 acres; 4.4%). Forest Service land also shows the largest increase in cover, in both its area (18,293 acres) and proportion (0.8%). All owner classes display a larger decrease in shrub/chaparral cover than increase (Table 19).

Table 19. Acres of Shrub/Chaparral Change by Owner

Owner	Decrease in Cover	% Decrease	Increase in Cover	% Increase	Total Change	Total % Change
Forest Service	101,611	4.4	18,293	0.8	119,904	5.2
Other Public	16,363	0.5	4,814	0.2	21,177	0.7
Private	36,417	0.8	5,005	0.1	41,422	0.9
Total	**154,391**	**1.6**	**28,112**	**0.3**	**182,503**	**1.9**

Wildfire accounts for much (at least 70%) of the change in all owner classes. Forest Service land has the largest change due to wildfire (99,563 acres). Of the verified development in shrub/chaparral, 96%, or 1,534 acres, occur on private land. Regeneration affects 17,627 acres of Forest Service land (Table 20). On private land, cause is unverified on 6,920 acres, with 4,245 acres displaying a decrease in shrub/chaparral.

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

Owner	Wildfire	Develop-ment	Mortality	Regen-eration	Prescribed Burn	Unverified Cause	All Causes
Forest Service	99,563	6	80	17,627	26	2,602	119,904
Other Public	14,985	52	0	3,844	0	2,296	21,177
Private	30,542	1,534	0	2,339	88	6,920	41,423
Total	**145,090**	**1,592**	**80**	**23,810**	**114**	**11,818**	**182,504**

DISCUSSION OF RESULTS: FOREST SERVICE LAND

All Vegetation

Within the 19.9 million acre project area, Forest Service land covers about 3.5 million acres. The Los Padres National Forest covers approximately 1.76 million acres, the San Bernardino NF covers 666,000 acres, the Angeles NF covers 658,000 acres and the Cleveland NF covers 413,000 acres. Together, the four national forests in the project area display a decrease in vegetation cover on 125,771 acres (3.6%), and an increase on 18,888 acres (0.5%).

Among the national forests, the Los Padres National Forest (NF) displays the largest decrease in vegetation, with 98,256 acres (5.7%) affected. The Angeles NF also has a fairly large area experiencing a decrease in vegetation (17,606 acres, and 2.7%, proportionally). The Cleveland NF shows an increase in vegetation cover on 18,273 acres (4.7%; Table 21). Only one national forest, the Cleveland, exhibits more vegetation increase than decrease. See Appendix G for more detailed change tables.

Table 21. Acres of Change of All Vegetation by National Forest

Forest	Decrease in Veg.	% Decrease	Increase in Veg.	% Increase	Total Change	Total % Change
Angeles	17,606	2.7	366	0.1	17,972	2.8
Cleveland	3,203	0.8	18,273	4.5	21,476	5.3
Los Padres	99,056	5.7	70	< 0.1	99,126	5.7
San Bernardino	5,906	0.9	179	< 0.1	6,085	0.9
Total	**125,771**	**3.6**	**18,888**	**0.5**	**144,659**	**4.1**

On the Angeles, Los Padres, and San Bernardino National Forests, wildfire is the principal verified cause of all vegetation change, accounting for 88%, 99%, and 97%, respectively (Table 22). Regeneration, on the other hand, is the major cause of change on the Cleveland NF, affecting 18,205 acres. The Angeles National Forest is the only forest to have a verified decrease in vegetation caused by mortality; this affects 439 acres.

Table 22. Acres of All Vegetation Change by Cause and National Forest

Forest	Wildfire	Develop-ment	Mortality	Regen-eration	Prescribed Burn	Unverified Cause	All Causes
Angeles	15,864	0	439	0	29	1,640	17,972
Cleveland	3,154	6	0	18,205	0	112	21,477
Los Padres	98,222	0	0	0	0	905	99,127
San Bernardino	5,844	0	0	5	0	237	6,086
Total	**123,084**	**6**	**439**	**18,210**	**29**	**2,894**	**144,662**

Hardwoods

Combined, the four national forests within the project area show a decrease in hardwood canopy cover on 15,728 acres (4.7%), and an increase on 226 acres (0.1%). The Los Padres NF contains most of this decrease, with a canopy cover decrease on 14,816 acres and 6.4% of its area (Table 23). The largest increase of both area and proportion occurs on the Cleveland National Forest, with canopy cover increasing on 219 acres and 1.0% of its hardwood area. The only national forest out of the four to display a larger area of hardwood increase than decrease is the Cleveland NF, with a 111 acre decrease in hardwood canopy cover and a 219 acre increase.

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

Among the CALVEG types and national forests in the hardwood lifeform, blue oak in the Los Padres NF has the largest decrease in canopy cover (9,544 acres, or 21.8% of the blue oak in the Los Padres). The Los Padres NF also experiences a large decrease in hardwood canopy cover in the live oak-madrone (1,987 acres; 3.5%) and coast live oak (1,553, 2.2%) CALVEG Types. Except for the live oak-madrone and California black oak in the Cleveland NF, all CALVEG types in all forests display a larger area of decreased canopy cover than increase. Most hardwood CALVEG types exhibit little or no detectable canopy cover increase. Canyon live oak in the Cleveland NF and willow-alder in the San Bernardino NF exhibit no change. See Table 23 for details.

Table 23. Acres of Hardwood Canopy Cover Change by National Forest and CALVEG Type

Forest	CAL-VEG**	Decrease in CC	% Decrease	Increase in CC	% Increase	Total Change	Total % Change
Angeles	QA	406	4.5	0	0	406	4.5
	QC	201	0.4	0	0	201	0.4
	Other*	2	0.1	0	0	2	0.1
	Total	**609**	**1.0**	**0**	**0**	**609**	**1.0**
Cleveland	QA	103	0.6	178	1.1	281	1.7
	QC	0	0	0	0	0	0
	QK	8	0.3	42	1.5	50	1.8
	Total	**111**	**0.5**	**219**	**1.0**	**330**	**1.5**
Los Padres	Q1	1,987	3.5	0	0	1,987	3.5
	QA	1,553	2.2	2	< 0.1	1,555	2.2
	QC	349	0.8	0	0	349	0.8
	QD	9,544	21.8	0	0	9,544	21.8
	QT	511	3.3	3	< 0.1	514	3.3
	Other*	873	21.6	0	0	873	21.6
	Total	**14,816**	**6.4**	**5**	**< 0.1**	**14,821**	**6.4**
San Bernardino	QC	39	0.3	0	0	39	0.3
	QK	130	2.0	0	0	130	2.0
	QY	0	0	0	0	0	0
	Other*	23	1.3	2	0.1	25	1.4
	Total	**192**	**0.8**	**2**	**< 0.1**	**194**	**0.8**
All Forests		**15,728**	**4.7**	**226**	**0.1**	**15,954**	**4.8**

*CALVEG types composing less than 5% of the hardwood lifeform in the particular forest are combined into this category.
** See Appendix F for CALVEG code descriptions.

Wildfire causes at least 95% of the change in hardwood canopy cover on all forests except the Cleveland NF, where regeneration is the major verified cause of change (Table 24). The Los Padres NF has a large amount of hardwood affected by wildfire (14,739 acres). Wildfire is the largest verified cause of change in all CALVEG types in the Angeles, Los Padres and San Bernardino National Forests, mostly affecting the blue oak CALVEG type in the Los Padres NF (9,544 acres). In the Cleveland NF, regeneration is the major cause of change in the coast live oak and California black oak.

Table 24. Acres of Hardwood Change by Cause, National Forest and CALVEG Type

Forest	CAL-VEG**	Wildfire	Regen-eration	Prescribed Burn	Unverified Cause	All Causes
Angeles	QA	403	0	3	0	406
	QC	192	0	0	9	201
	QY	0	0	0	2	2
	Total	**595**	**0**	**3**	**11**	**609**
Cleveland	QA	100	178	0	3	281
	QK	8	42	0	0	50
	Total	**108**	**219**	**0**	**3**	**330**
Los Padres	Q1	1,987	0	0	0	1,987
	QA	1,490	0	0	64	1,554
	QD	9,544	0	0	0	9,544
	Other*	1,718	0	0	18	1,736
	Total	**14,739**	**0**	**0**	**82**	**14,821**
San Bernardino	DM	10	0	0	0	10
	QA	13	0	0	2	15
	QC	33	0	0	6	39
	QK	130	0	0	0	130
	Total	**186**	**0**	**0**	**8**	**194**
All Forests		**15,628**	**219**	**3**	**104**	**15,954**

*CALVEG types composing less than 5% of the hardwood lifeform in the particular forest are combined into this category.
** See Appendix F for CALVEG code descriptions.

Conifers

Of the conifer on the national forests, the Los Padres NF exhibits the largest area and highest proportion of area exhibiting a canopy cover decrease, with 5,090 acres and 1.4% affected (Table 25). The Angeles NF also has a large area and high proportion showing a decrease in hardwood canopy cover (1,397 acres and 1.1%). The Cleveland NF has the largest area and highest proportion of area experiencing a conifer canopy cover increase, affecting 362 acres and 1.8%. The Cleveland NF is also the only forest whose area underwent a larger conifer canopy cover increase than decrease.

Of the conifer CALVEG types and national forests, coulter pine in the Los Padres NF exhibits the largest decrease in conifer canopy cover (3,847 acres and 8.3%). The singleleaf pinyon pine CALVEG type in the Angeles NF also shows a large decrease in conifer canopy cover (945 acres and 5.0%). The largest increase in conifer canopy cover occurs in the bigcone Douglas-fir CALVEG type in the Cleveland NF, with an increase in canopy cover on 324 acres (4.4%). None of the CALVEG types in the Angeles and San Bernardino NF exhibit an increase in conifer canopy cover (Table 25).

Table 25. Acres of Conifer Canopy Cover Change by National Forest and CALVEG Type

Forest	CAL-VEG**	Decrease in CC	% Decrease	Increase in CC	% Increase	Total Change	Total % Change
Angeles	DM	66	0.2	0	0	66	0.2
	MF	86	0.2	0	0	86	0.2
	MP	90	0.8	0	0	90	0.8
	PJ	945	5.0	0	0	945	5.0
	Other*	209	4.1	0	0	209	4.1
	Total	**1,397**	**1.1**	**0**	**0**	**1,397**	**1.1**
Cleveland	DM	5	0.1	324	4.4	329	4.5
	JP	0	0	13	0.2	13	0.2
	MF	0	0	15	0.4	15	0.4
	PC	0	0	11	0.6	11	0.6
	Other*	0	0	0	0	0	0
	Total	**5**	**< 0.1**	**362**	**1.8**	**367**	**1.8**
Los Padres	JP	0	0	0	0	0	0
	MF	79	0.2	0	0	79	0.2
	PC	3,847	8.3	0	0	3,847	8.3
	PJ	0	0	0	0	0	0
	Other*	1,164	3.4	3	< 0.1	1,167	3.4
	Total	**5,090**	**1.4**	**3**	**< 0.1**	**5,093**	**1.4**
San Bernardino	DM	28	0.2	0	0	28	0.2
	EP	0	0	0	0	0	0
	JP	100	0.7	0	0	100	0.7
	MF	1	< 0.1	0	0	1	< 0.1
	MP	256	0.2	0	0	256	0.2
	PJ	1,038	1.8	0	0	1,038	1.8
	Other*	33	0.2	0	0	33	0.2
	Total	**1,456**	**0.5**	**0**	**0**	**1,456**	**0.5**
All Forests		**7,948**	**1.0**	**365**	**< 0.1**	**8,313**	**1.1**

* 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.

Over 99% of the cause of conifer canopy cover change on the Los Padres (5,079 acres) and San Bernardino (1,456 acres) National Forests is due to wildfire. On the Angeles NF, wildfire is also a major cause (1,038 acres), but mortality also plays a role (359 acres). Regeneration is the main cause of change on the Cleveland NF. See Table 26 for details.

Wildfire is the cause of all conifer canopy cover change on all CALVEG types on the San Bernardino NF and the cause of most of the change on the Los Padres NF (Table 24). Wildfire affects 3,844 acres of coulter pine in the Los Padres NF, 1,038 acres of singleleaf pinyon pine in the San Bernardino NF and 945 acres of singleleaf pinyon pine in the Angeles NF. A majority of the mortality occurring in the Angeles NF affects the Jeffrey pine CALVEG type (209 acres). Regeneration is the cause of conifer canopy cover change on 324 acres of bigcone Douglas-fir in the Cleveland NF.

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

Forest	CAL-VEG**	Wildfire	Mortality	Regen-eration	Unverified Cause	All Causes
Angeles	DM	66	0	0	0	66
	JP	0	209	0	0	209
	MF	0	86	0	0	86
	MP	27	64	0	0	91
	PJ	945	0	0	0	945
	Total	**1,038**	**359**	**0**	**0**	**1397**
Cleveland	DM	5	0	324	0	329
	Other*		0	39	0	39
	Total	**5**	**0**	**363**		**368**
Los Padres	DM	397	0	0	6	403
	MF	79	0	0	0	79
	PC	3,844	0	0	3	3,847
	PP	351	0	0	3	354
	RW	406	0	0	3	409
	Total	**5,077**	**0**	**0**	**15**	**5,092**
San Bernardino	JP	100	0	0	0	100
	MP	256	0	0	0	256
	PJ	1,038	0	0	0	1,038
	Other*	62	0	0	0	62
	Total	**1,456**	**0**	**0**	**0**	**1,456**
All Forests		**7,576**	**359**	**363**	**15**	**8,313**

* 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.

Shrub/Chaparral

Together, the national forests show a 101,611 acre decrease in shrub/chaparral cover, which equates to 4.4% of shrub/chaparral on Forest Service land. The Los Padres NF shows the largest shrub/chaparral cover decrease in both its area and proportion (78,875 acres; 7.0%). The Cleveland NF shows the largest shrub/chaparral increase in area and proportion, totaling 17,691 acres and 4.9% (Table 27). All forests in the project area, except the Cleveland NF, display a larger shrub/chaparral cover decrease than increase.

Over half of the shrub/chaparral vegetation decrease on Forest Service land is concentrated in the lower montane mixed chaparral CALVEG type of the Los Padres NF, totaling 58,012 acres, or 7.2% of its area in the Los Padres NF. Additionally, a large decrease in cover occurs in the chamise CALVEG type on the Los Padres NF (13,620 acres and 18.3%) and the lower montane mixed chaparral on the Angeles NF (11,889 acres and 3.7%). The largest increase in shrub/chaparral cover occurs on the Cleveland NF, affecting 8,764 acres (5.1%) of the lower montane mixed chaparral and 6,527 acres (21.8%) of the redshank chaparral CALVEG types.

Table 27. Acres of Shrub/Chaparral Change by National Forest and CALVEG Type

Forest	CAL-VEG**	Decrease in Cover	% Decrease	Increase in CC	% Increase	Total Change	Total % Change
Angeles	CA	1,902	3.7	89	0.2	1,991	3.9
	CQ	11,889	3.7	71	< 0.1	11,960	3.7
	CZ	167	0.6	3	< 0.1	170	0.7
	Other*	1,468	2.3	203	0.3	1,671	2.6
	Total	**15,426**	**3.3**	**366**	**0.1**	**15,792**	**3.4**
Cleveland	CA	511	0.7	1,927	2.5	2,438	3.2
	CD	917	4.3	1	< 0.1	918	4.3
	CQ	348	0.2	8,764	5.1	9,112	5.3
	CR	957	3.2	6,527	21.8	7,484	25.0
	CS	113	0.5	392	1.8	505	2.3
	Other*	239	0.7	81	0.2	320	0.9
	Total	**3,085**	**0.9**	**17,692**	**4.9**	**20,777**	**5.8**
Los Padres	CA	13,620	18.3	0	0	13,620	18.3
	CQ	58,012	7.2	22	< 0.1	58,034	7.2
	CT	894	1.3	0	0	894	1.3
	SB	211	0.3	12	< 0.1	223	0.3
	SS	2,936	4.9	23	< 0.1	2,959	4.9
	Other*	3,201	6.2	3	< 0.1	3,204	6.2
	Total	**78,874**	**7.0**	**60**	**< 0.1**	**78,934**	**7.0**
San Bernardino	CA	154	0.4	59	0.1	213	0.5
	CQ	1,173	1.0	0	0	1,173	1.0
	CR	1,677	3.0	101	0.2	1,778	3.2
	CX	43	0.1	0	0	43	0.1
	CZ	913	1.3	1	< 0.1	914	1.3
	SB	209	1.1	0	0	209	1.1
	Other*	57	0.3	15	0.1	72	0.4
	Total	**4,226**	**1.2**	**176**	**< 0.1**	**4,402**	**1.2**
All Forests		**101,611**	**4.4**	**18,294**	**0.8**	**119,905**	**5.2**

* CALVEG types composing less than 5% of the shrub/chaparral in the particular forest are combined into this category.
** See Appendix F for CALVEG code descriptions.

Wildfire is the dominant verified cause of shrub/chaparral change (over 95% of the cause) on the Angeles, Los Padres, and San Bernardino National Forests. Regeneration is the major cause of cover change on the Cleveland NF. See table 28 for details.

Except for the CALVEG types in the Cleveland NF, wildfire is the major cause of change in all shrub/chaparral CALVEG types on all forests. Wildfire is the verified cause on 57,532 acres of the lower montane mixed chaparral and 13,593 acres of the chamise CALVEG types in the Los Padres NF. The lower montane mixed chaparral of the Angeles NF has 11,018 acres affected by wildfire. Regeneration is the main cause for all CALVEG types in the Cleveland NF, mostly affecting lower montane mixed chaparral (8,753 acres) and redshank chaparral (6,518 acres).

Table 28. Acres of Shrub/Chaparral Change by Cause, National Forest and CALVEG Type

Forest	CAL-VEG**	Wildfire	Develop-ment	Mortality	Regen-eration	Prescribed Burn	Unverified Cause	All Causes
Angeles	CA	1,856	0	0	0	0	135	1,991
	CQ	11,018	0	0	0	19	923	11,960
	SS	654	0	0	0	4	175	833
	Other*	685	0	80	0	2	240	1007
	Total	**14,213**	**0**	**80**	**0**	**25**	**1,473**	**15,791**
Cleveland	CA	507	0	0	1,901	0	30	2,438
	CQ	318	6	0	8,753	0	36	9,113
	CR	957	0	0	6,518	0	10	7,485
	Other*	1,257	0	0	452	0	34	1,743
	Total	**3,039**	**6**	**0**	**17,624**	**0**	**110**	**20,779**
Los Padres	CA	13,593	0	0	0	0	28	13,621
	CQ	57,532	0	0	0	0	502	58,034
	Other*	7,018	0	0	0	0	261	7,279
	Total	**78,143**	**0**	**0**	**0**	**0**	**791**	**78,934**
San Bernardino	CQ	1,126	0	0	0	0	48	1,174
	CR	1,677	0	0	0	0	101	1,778
	CZ	913	0	0	0	0	1	914
	Other*	454	0	0	5	0	78	537
	Total	**4,170**	**0**	**0**	**5**	**0**	**228**	**4,403**
All Forests		**99,565**	**6**	**80**	**17,629**	**25**	**2,602**	**119,907**

* CALVEG types composing less than 5% of the shrub/chaparral in the particular forest are combined into this category.
** See Appendix F for CALVEG code descriptions.

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 contact the USDA Forest Service at (916) 454-0803 or CDF-FRAP at (916) 227-2651.

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 – Classes of vegetation change 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. The Non-vegetation class accounts for changes in lake water levels and snow in higher elevations.

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 contain information on the amount of reflected sunlight from ground features within specific wavelengths. The seventh 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 hardwood, conifer, 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.

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 South Coast project area requires six TM images from each date (12 total TM images). Images for each year are selected as close to the same month as possible to minimize differences in vegetation moisture content and shadow effects. Images are also selected for minimal cloud coverage. TM imagery consists of thousands of pixels, each having a spatial resolution of 900 m^2 (30 m on each side) or approximately 1/5 of an acre. Figure 1a shows the image boundaries, path, row and date for the imagery used in South Coast project area.

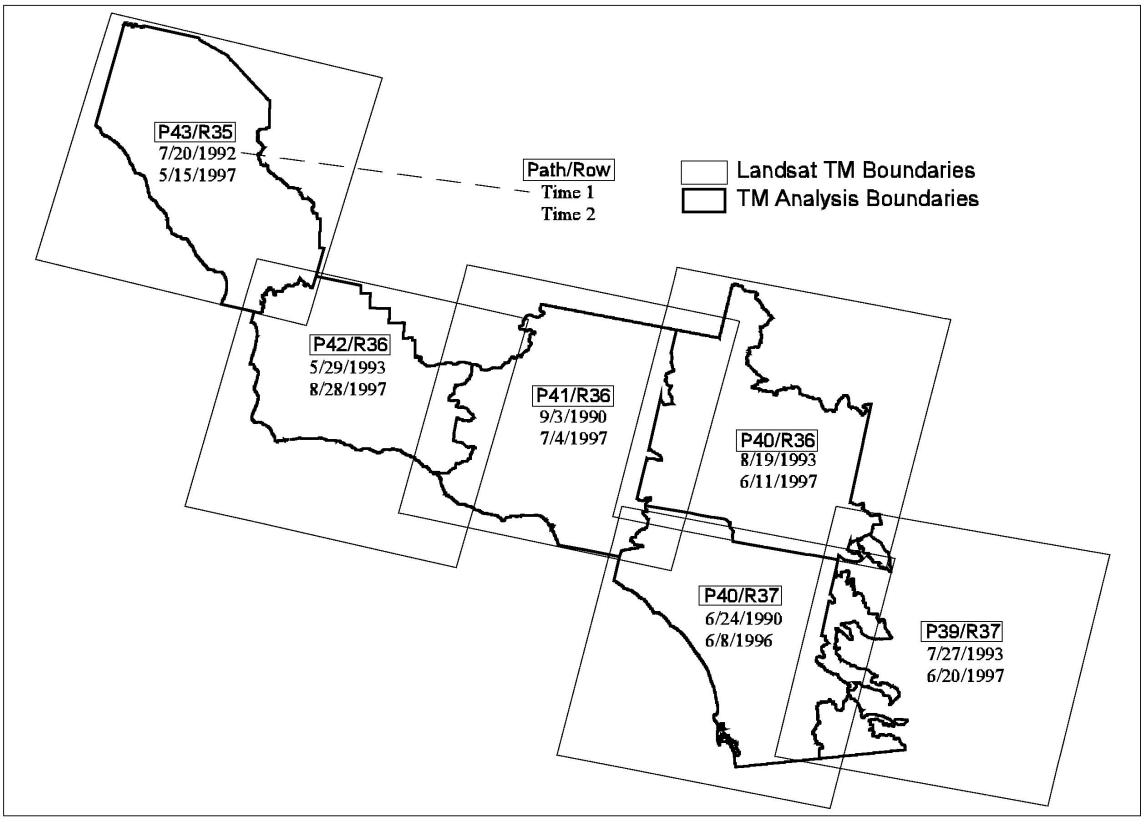


Figure 1a. TM imagery for the South Coast Project Area.

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 fairly detailed vegetation classification system (e.g., Blue Oak Woodland, Ponderosa Pine, and Coastal Scrub). Every WHR type is represented by a lifeform (See Appendix E for

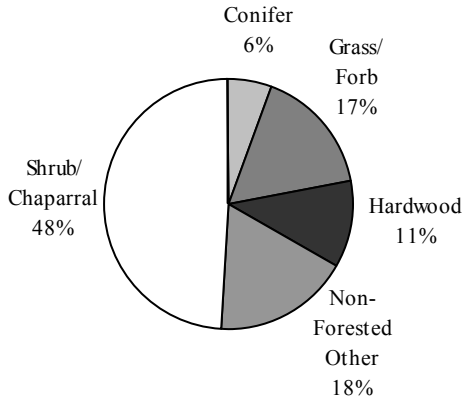


Figure 2a. Proportion of each lifeform in project area.

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/crosswalk CALVEG types from WHR types or other vegetation labels from non-LCMMP vegetation layers. For this analysis of the South Coast Project Area, CALVEG types are mapped, and hence analyzed, only on Forest Service land. However, future iterations of change detection analysis will have CALVEG types for the entire project area, as vegetation mapping by the LCMMP will encompass the entire project area and not just Forest Service land. For example, the LCMMP vegetation layer currently covers a large portion of the South Coast Project Area, but the LCMMP vegetation data available at the time of the first image is limited to Forest Service land. See Appendix F of CALVEG code descriptions.

Because LCMMP vegetation data is not available for the entire project area, the best available vegetation data are collected and combined into one seamless layer (Table 1a). Layers in polygon format are converted to pixel format. In areas that overlap, the most current and accurate vegetation data are used. Vegetation layers not containing a WHR classification (Mayer and Laudenslayer, 1988) are given a WHR classification based on the information in that layer. Within national forest boundaries, LCMMP vegetation data are used. The CDF Hardwood Rangelands map is then used where LCMMP vegetation data does not exist. SOCAL vegetation data are used where LCMMP and CDF data does not exist. For all remaining areas, the GAP vegetation data are used.

Table 1a. Vegetation Data for the South Coast Project Area

Name	Classification	Source	Scale	Extent	% Of Project Area
CA Mapping & Monitoring Program Vegetation Data	CALVEG / WHR	1991 TM imagery	2.5 acre mmu*	Angeles NF, Cleveland NF, Los Padres NF, San Bernardino NF	20
Hardwood Rangelands	WHR	CDF, updated 1990	Pixel size of 625 m^2 (25 meters on each side; 0.15 acres)	Hardwood rangelands below 5000 ft. elevation	32
SOCAL Vegetation	Modified Holland/WHR	Aerial photos	5 acres	All of Orange, Riverside and San Diego Counties. Portions of Los Angeles and San Bernardino County	32
GAP Analysis 1990	WHR used	Varies; TM imagery, Field data	100 hectares (~250 acres)	Statewide	16

*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 Northeastern California Project Area

Name	Description	Data Type	Scale	Source	Extent
Ownership	Local, state federal, private	Polygon	1:100,000	Teale Data Center	Statewide
County	County boundaries	Polygon	1:24,000	Teale 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
NHFEU* Boundaries	Ecological subsection boundaries	Polygon	1:7,500,000	FS	Statewide
Aerial Photos	9” x 9”	Print photograph	1:15,840 nominal	FS	Forest Service lands
Field Plots	Transects	Ground measures	NA	CA Mapping & Monitoring Program	Selected sites within project area

*National Hierarchical Framework of Ecological Units.

APPENDIX B – Methodology

Database Building

Database building requires the preparation of thematic mapper (TM) imagery for processing and the creation of a seamless vegetation layer. The early date TM image (time 1) is registered to the later date TM image (time 2). Registration functions to create overlapping images and is accomplished by placing control points that identify identical features throughout both images. These features 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 eliminate any false changes. The images are then radiometrically corrected to account for differences in atmospheric conditions (e.g., haze and water vapor). This process entails the selection dark and light groups of pixels in each image date and applies a regression-based correction to the early image date to effectively remove differences in atmospheric conditions (Schott et al., 1988).

A seamless vegetation layer is mosiacked together using the best available vegetation data (Table 1a in Appendix A). This produces the best possible vegetation layer spanning the entire project area. Layers that are in polygon format are converted to pixel format. In the mosaic process, precedence is given to the LCMMP vegetation layers, then the CDF hardwood layer, then the SOCAL vegetation layer and finally the GAP data, which fills in any remaining areas. Vegetation layers not containing WHR information are given WHR information by extrapolation from data in that vegetation layer, which creates a WHR vegetation map for the entire project area. See Appendix A for more details on the vegetation layer.

Change Processing

Co-registered and radiometrically corrected TM imagery are analyzed for change by applying a Kauth-Thomas transformation to both dates of imagery (Kauth and Thomas, 1976). 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 0.52 μm, which corresponds to the color blue. The thermal-IR band is not used for this work because its pixel size is 120 meters on each side (all other bands are 30 meters on each side). For each TM image, the Kauth-Thomas transformation uses the spectral information from six bands and 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. 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; time2 – time 1) to produce a new image depicting changes in those components on a pixel-by-pixel basis.

To reduce the variability of a change map produced on a pixel-by-pixel basis, image segmentation is employed, which produces regions, or polygons of spectrally similar pixels. This is accomplished by extracting bands 3 and 4 of the first image (time 1) and generating a texture band from band 4 of the first image. The multiband layers are input into the segmentation process (Ryherd and Woodcock, 1990) to create regions. For each region, the average (or mean value) of the change in brightness, greenness and wetness are calculated and given to that region.

Change Labeling

Change labeling is a multi-step process that converts the change image to a change map that depicts decreases and increases in canopy cover or changes in shrub/grass (Figure 5 of main report). The change image is divided into multiple parts, with each part (or map subset) corresponding to a different lifeform type (e.g., conifer, hardwood, shrub/chaparral). This is accomplished by overlaying the vegetation layer and selecting those areas in the change image that have the same lifeform. The result is multiple change images, with each one corresponding to a different lifeform and spatial extent. An unsupervised classification is performed on each individual lifeform change image, which results in 50 distinct classes, each displaying similar levels of brightness, greenness and wetness. These groupings are temporarily labeled according to their level of change based on a qualitative gradient from large decreases in vegetation to large increases in vegetation.

In order to quantify the temporary labels described above, a machine-learning classifier (MLC) is utilized to create a final change map with the proportion of canopy cover change for each region (Levien et al, 1999). This type of quantitative classification scheme is considered more useful to resource managers than a qualitative gradient of change classes, which has been used for previous project areas. The MLC assigns each region to one of 11 change classes (Table 1b) based on several inputs, including the qualitative vegetation gradient and ancillary data layers (roads, slope, aspect and others). Image appearance, photo interpretation, vegetation and topographic maps and bispectral plots (e.g., greenness vs. wetness) also aid in assigning the change classes. Each individual lifeform change image is 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 canopy cover
-41 to -70% CC	41 to 70% decrease in canopy cover
-16 to -40% CC	16 to 40% decrease in canopy cover
+15 to -15% CC (Little or No Change)	Little or no change (in canopy cover or shrub/chaparral)
+16 to +40% CC	16 to 40% increase in canopy cover
+41 to +100% CC	41 to 100% increase in canopy cover
Shrub/Grass Decrease > 15%	16 to 100% decrease in shrub/grass
Shrub/Grass Increase > 15%	16 to 100% increase in shrub/grass
Non-vegetation Change	Change not related to a vegetation change
Change Within Existing Developed Area	Change within urban area
Cloud or Cloud Shadow	Cloud or cloud shadow (prevents change assessment)

This classification system is designed to discriminate between different levels of canopy cover changes (i.e., 16 to 40% CC decrease vs. 71 to 100% CC decrease). The +15 to -15% CC (little or no change) indicates that change did not occur, or that the change was too subtle to be detected. The non-vegetation change class accounts for variations in lake or reservoir water levels and snow pack in the higher elevations. Change within an existing urban area class is designated for changes observed in the urban landscape. 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 had changed or remained stable in these areas.

Cause Verification

Once the final change map is complete, an attempt is made to verify cause on all change areas. GIS overlay, fieldwork and photo interpretation are used to determine the causes of change areas. The statewide fire history database is overlaid onto the change map to attribute changes caused by wildfires (Figure 5 of main report). A series of cause identification workshops are conducted and include FS resource managers, CDF personnel and other stakeholders in the project area. FS, CDF and other land managers interpret change maps by applying local knowledge and fieldwork to identify sources of change on Forest Service lands. Similarly, UC Integrated Hardwood Rangeland Management Program (IHRMP) personnel consult 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 these efforts, full coverage of cause verification is 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, 260 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 by creating 10 to 30 acre polygons out of the change areas, then randomly selecting from those polygons. These areas were interpreted for canopy cover and shrub/chaparral change using color aerial photography at a scale of 1:15,840 and field collected data. In essence, this assessment takes the 260 reference sites with known vegetation change and compares them to the classified, or calculated, change.

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	Shrub/Grass Decrease > 15%
8	Shrub/Grass Increase > 15%
9	Change Within Existing Developed Area
15	Cloud or Cloud Shadow

Table 2c displays the error matrix for the South Coast project area. (See Table 1c for change code descriptions). The overall accuracy of the change map is 89.6%. This means that of the 260 sample sites, 233 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) are also evident. For example, in Table 2c, one site is classified as little or no change when the reference

Table 2c. Change Map Accuracy Assessment for the South Coast Project Area

Reference Class

Classified As: Change Code	1	2	3	4	5	6	7	8	9	15	Total
1	7										**7**
2		12									**12**
3			5	2							**7**
4			1	148	1		3	7	2		**162**
5					4						**4**
6						1					**1**
7				4			15		1		**20**
8				1	1			15			**17**
9				4					25		**29**
15										1	**1**
Total	**7**	**12**	**6**	**159**	**6**	**1**	**18**	**22**	**28**	**1**	**260**

class shows it was actually a 16 to 40% decrease in canopy cover. Therefore, one area was omitted from the correct –16 to –40% CC class and committed to the incorrect +15 to –15% CC (little or no change) class. The producer's accuracy of each change class ranged from 67% to 100% and the user's accuracy ranged from 71% to 100% (Table 3c). Producer's accuracy represents how well a particular class is classified. Or in other words, of all the referenced sites that have a particular change class, how many times (or what proportion) did those sites get classified as such? For instance, of the six reference sites with a –15 to –40% CC, five 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. As an example, seven sites are classified into the –15 to –40% CC class, but five 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

Producer's Accuracy		
1	7/7	100%
2	12/12	100%
3	5/6	83%
4	148/159	93%
5	4/6	67%
6	1/1	100%
7	15/18	83%
8	15/22	68%
9	25/28	89%
15	1/1	100%

User's Accuracy		
1	7/7	100%
2	12/12	100%
3	5/7	71%
4	148/162	91%
5	4/4	100%
6	1/1	100%
7	15/20	75%
8	15/17	88%
9	25/29	86%
15	1/1	100%

The accuracy assessment also shows how well the methods classify decreases and increases. 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. Also, a referenced decrease site is never classified as an increase and a referenced increase site is never classified as a decrease.

APPENDIX D – WHR TYPE DECRIPTIONS

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

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

SIERRAN MIXED CONIFER	MONTANE HARDWOOD-CONIFER	PINYON -JUNIPER	PONDEROSA PINE	JEFFREY PINE
white fir **Douglas fir** **ponderosa pine** **sugar pine** **incense cedar**		**singleleaf pinyon** **parry pinyon** **juniper**	**ponderosa pine**	**Jeffrey pine**
giant sequoia	Ponderosa pine incense cedar Douglas fir tanoak madrone canyon live oak coast live oak	Jeffrey pine ponderosa pine	white fir incense cedar coulter pine Jeffrey pine sugar pine Douglas fir bigcone Douglas fir	ponderosa pine coulter pine sugar pine lodgepole pine white fir red fir limber pine incense cedar

MIXED CHAPARRAL	MONTANE CHAPARRAL	CHAMISE-REDSHANK
oaks **ceanothus** **manzanita**	**ceanothus** **manzanita** **bitter cherry**	**chamise** **redshank**
chamise mountain mahogany buckeye sumac buckthorn California fremontia		toyon sumac buckthorn ceanothus manzanita scrub oak

Source: Mayer and Laudenslayer, 1988.

APPENDIX E - VEGETATION HIERARCHY

Lifeform	WHR Code	WHR Type
Hardwood	BOP	Blue Oak- Foothill Pine
	BOW	Blue Oak Woodland
	COW	Coastal Oak Woodland
	DRI	Desert Riparian
	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
	JPN	Jeffrey Pine
	MHC	Montane Hardwood-conifer
	PJN	Pinyon-Juniper
	PPN	Ponderosa Pine
	RDW	Redwood
	SCN	Subalpine Conifer
	SMC	Sierran Mixed Conifer
	WFR	White Fir
Shrub/ Chaparral	ADS	Alpine Dwarf Shrub
	ASC	Alkali Scrub
	CRC	Chamise-Redshank Chaparral
	CSC	Coastal Scrub
	DSC	Desert Scrub
	DSS	Desert Succulent Scrub
	DSW	Desert Wash
	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	Q1	Live Oak-Madrone
	QA	Coast Live Oak
	QC	Canyon Live Oak
	QD	Blue Oak
	QK	California Black Oak
	QL	Valley Oak
	QN	Englemann Oak
	QT	Tanoak-Madrone
	QU	California Bay (Now CALVEG code QB)
	QV	Black Walnut
	QY	Willow-Alder
Conifer	AB	Santa Lucia Fir
	DF	Pacific Douglas-Fir
	DM	Bigcone Douglas-Fir
	EP	Eastside Pine
	JP	Jeffrey Pine
	KP	Knobcone Pine
	MC	Cuyamaca Cypress
	MF	Mixed Conifer-Fir
	MP	Mixed Conifer-Pine
	MT	Tecate cypress
	PC	Coulter Pine
	PD	Gray Pine
	PJ	Singleleaf Pinyon Pine
	PL	Limber Pine
	PP	Ponderosa Pine
	PQ	Fourneedle Pinyon Pine
	RW	Redwood
	SA	Subalpine Conifers
Shrub/Chaparral	AC	Cushion Plant
	BS	Basin Sagebrush
	CA	Chamise
	CC	Ceanothus Mixed Chaparral
	CD	Southern Mixed Chaparral
	CO	Sumac Shrub (now CALVEG Code SM)
	CQ	Lower Montane Mixed Chaparral
	CR	Redshank Chaparral
	CS	Scrub Oak
	CT	Tucker Scrub Oak
	CX	Montane Mixed Chaparral
	CZ	Semi-Desert Chaparral
	DX	Mixed Desert Shrub
	SB	Buckwheat-White Sage
	SS	California Sagebrush

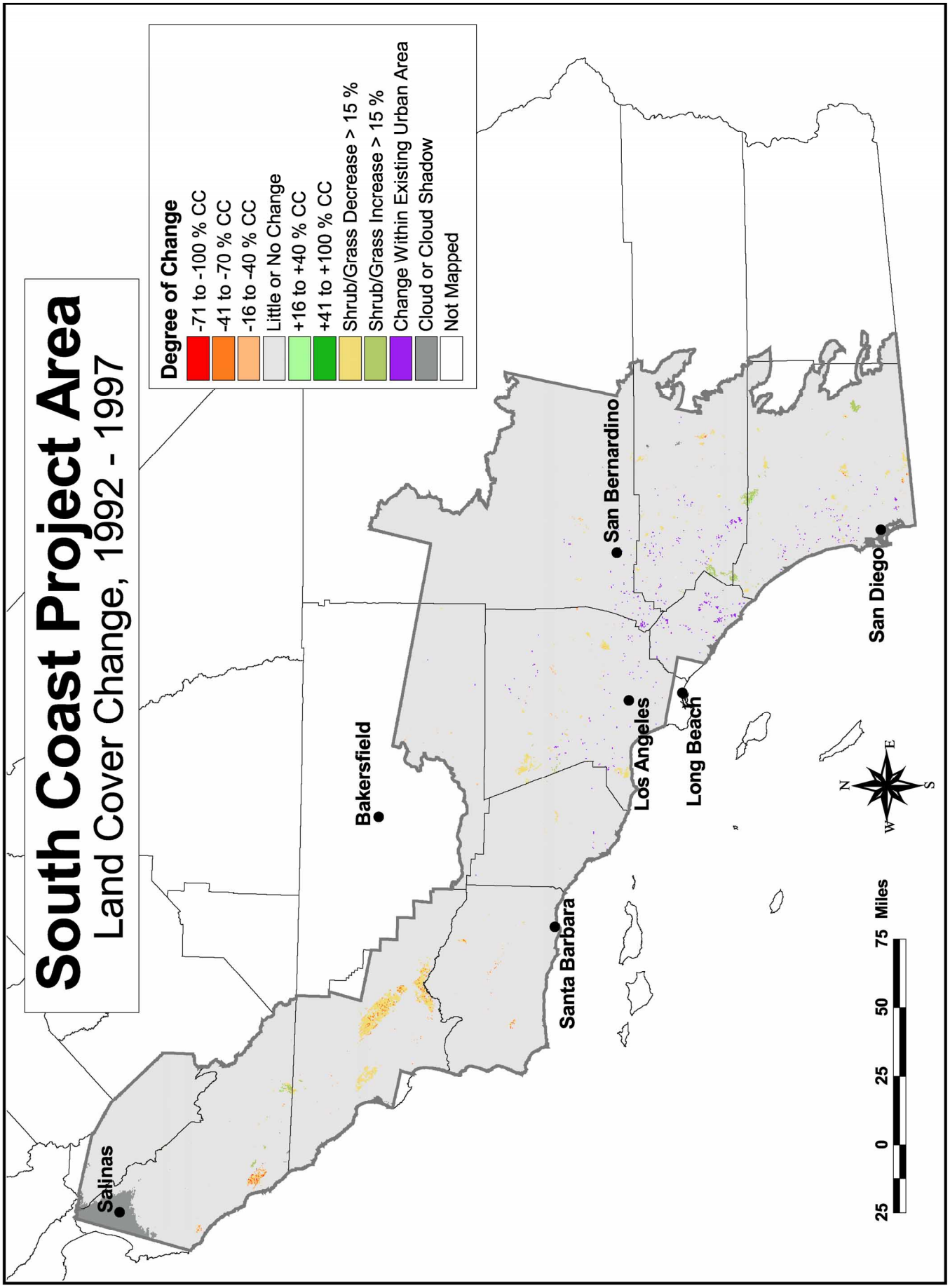
Source: USDA Forest Service Regional Ecology Group, 1981.

APPENDIX G – DETAILED MAPS AND TABLES

Appendix G

Project Area Maps and Tables

Contents



Monitoring Land Cover Changes in California – South Coast Project Area

Table P-1. Acres of Classified Change by Lifeform Type

	Conifer		Hardwood		Grass/Forb		Shrub/ Chaparral		Non- Forested Other		All Lifeforms	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
-71 to -100% CC	393	0	233	0							626	0
-41 to -70% CC	2,814	0	11,846	1							14,659	0
-16 to -40% CC	6,359	1	17,525	1							23,883	0
+15 to -15% CC	1,153,726	99	2,144,451	98	3,247,896	98	9,605,493	98	3,382,282	96	19,533,848	98
+16 to +40% CC	409	0	1,011	0							1,419	0
+41 to +100% CC	6	0	18	0							23	0
Shrub/Grass Decrease > 15%					7,344	0	154,390	2			161,734	1
Shrub/Grass Increase > 15%					6,061	0	28,112	0			34,173	0
Non-Vegetation Change					215	0	73	0	39,981	1	40,269	0
Cloud or Cloud Shadow	163	0	21,959	1	38,661	1	14,304	0	90,322	3	165,410	1
Total	1,163,868	100	2,197,042	100	3,300,177	100	9,802,372	100	3,512,585	100	19,976,045	100

Table P-2. Acres of Classified Change by Hardwood Cover Type

	Blue Oak/ Foothill Pine		Blue Oak Woodland		Coastal Oak Woodland		Desert Riparian		Montane Hardwood	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
-71 to -100% CC	1	0	5	0	116	0			42	0
-41 to -70% CC	392	0	6,302	1	2,384	0			2,610	1
-16 to -40% CC	826	0	8,887	1	3,478	0			3,945	1
+15 to -15% CC	227,243	99	830,016	98	734,551	97	5,728	100	287,268	97
+16 to +40% CC	19	0	591	0	297	0			91	0
+41 to +100% CC					8	0			10	0
Cloud or Cloud Shadow	201	0	1,630	0	18,357	2			1,191	0
Total	228,681	100	847,432	100	759,190	100	5,728	100	295,157	100

	Montane Riparian		Valley Oak Woodland		Valley Foothill Riparian		Unknown Hardwood Type		All Hardwoods	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
-71 to -100% CC	20	0			49	1			233	0
-41 to -70% CC			41	0	117	2			11,846	1
-16 to -40% CC	19	0	209	0	161	2			17,525	1
+15 to -15% CC	6,484	99	46,781	99	6,349	88	29	35	2,144,451	98
+16 to +40% CC			2	0	10	0			1,011	0
+41 to +100% CC									18	0
Cloud or Cloud Shadow					526	7	54	65	21,959	1
Total	6,524	100	47,034	100	7,212	100	83	100	2,197,042	100

Table P-3. Acres of Classified Change by Conifer Cover Type

	Juniper		Closed-Cone Pine-Cypress		Douglas Fir		Jeffrey Pine		Montane Hardwood - Conifer		Pinyon-Juniper	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
-71 to -100% CC		0	137	1		0		0	195	0	0	0
-41 to -70% CC		0	81	1		0		0	2,451	1	19	0
-16 to -40% CC		0	335	4		0	940	0	1,898	1	2,027	1
+15 to -15% CC	15,804	100	8,559	94	1,220	100	240,724	100	159,245	97	351,848	99
+16 to +40% CC		0		0		0	30	0	351	0		0
+41 to +100% CC		0		0		0	6	0		0		0
Cloud or Cloud Shadow		0		0		0		0		0		0
Total	15,804	100	9,111	100	1,220	100	241,699	100	164,141	100	353,893	100

	Ponderosa Pine		Redwood		Subalpine Conifer		Sierra Mixed Conifer		White Fir		All Conifer	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
-71 to -100% CC			4	0			56	0			393	0
-41 to -70% CC	80	0	118	1			64	0			2,814	0
-16 to -40% CC	290	0	310	3			560	0			6,359	1
+15 to -15% CC	58,596	99	10,278	96	8,005	100	299,066	100	383	100	1,153,726	99
+16 to +40% CC			3	0			24	0			409	0
+41 to +100% CC											6	0
Cloud or Cloud Shadow	22	0			12	0	130	0			163	0
Total	58,989	100	10,713	100	8,016	100	299,900	100	383	100	1,163,868	100

Table P-4. Acres of Classified Change by Shrub/Chaparral Types

	Alkali Dwarf Shrub		Alkali Scrub		Chamise - Redshank Chaparral		Coastal Shrub		Desert Scrub		Desert Suculent Scrub	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
Shrub/Grass Decrease > 15%			35	0	23,494	4	6,272	2	1,055	0		
+15 to -15% CC	63	100	588,827	100	634,030	95	284,552	98	2,374,155	100	18,447	100
Shrub/Grass Increase > 15%			19	0	9,902	1	304	0	12	0		
Non-Vegetation Change												
Cloud or Cloud Shadow					512	0	13	0				
Total	63	100	588,881	100	667,939	100	291,141	100	2,375,222	100	18,447	100

	Desert Wash		Mixed Chaparral		Montane Chaparral		Sagebrush		Unknown Shrub /Chaparral		All Shrub/ Chaparral	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
Shrub/Grass Decrease > 15%			9,425	1	83,474	4	41	0	30,596	1	154,390	2
+15 to -15% CC	3,914	100	704,539	98	1,801,684	95	58,332	100	3,136,949	99	9,605,493	98
Shrub/Grass Increase > 15%			2,089	0	11,994	1	21	0	3,771	0	28,112	0
Non-Vegetation Change							19	0	54	0	73	0
Cloud or Cloud Shadow			791	0	427	0			12,562	0	14,304	0
Total	3,914	100	716,843	100	1,897,578	100	58,413	100	3,183,930	100	9,802,372	100

Table P-5. Acres of Verified Change by Cause for All Lifeform Cover Types and Owner Classes

	Change within existing urban area	Wildfire	Develop-ment	Mortality	Prescribed Burn	Regener-ation	Unknown Cause	All Causes
-71 to -100% CC		563					63	626
-41 to -70% CC		14,091			91		477	14,659
-16 to -40% CC		20,369	34	359	282		2,839	23,883
+16 to +40% CC						660	760	1,419
+41 to +100% CC						23		23
Shrub/Grass Decrease > 15%		149,973	1,756	80	116		9,810	161,734
Shrub/Grass Increase > 15%						24,374	9,798	34,173
Non-Vegetation Change	39,398						871	40,269
Total	39,398	184,995	1,790	439	489	25,057	24,619	276,787

Table P-6. Acres of Classified Change by Lifeform Type and Owner Class

	Forest Service											
	Conifer		Hardwood		Grass/ Forb		Shrub/ Chaparral		Non-Forested Other		National Forest Total	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
-71 to -100% CC	225	0	78	0							303	0
-41 to -70% CC	2,636	0	7,133	2							9,768	0
-16 to -40% CC	5,088	1	8,517	3							13,606	0
+15 to -15% CC	762,400	99	321,309	95	41,709	99	2,191,545	95	36,616	100	3,353,580	96
+16 to +40% CC	365	0	209	0							574	0
+41 to +100% CC			18	0							18	0
Shrub/Grass Decrease > 15%					483	1	101,611	4			102,094	3
Shrub/Grass Increase > 15%					4	0	18,293	1			18,297	1
Non-Vegetation Change					31	0			59	0	91	0
Cloud or Cloud Shadow	163	0					292	0			455	0
Total	770,877	100	337,264	100	42,227	100	2,311,741	100	36,675	100	3,498,784	100

	Other Public											
	Conifer		Hardwood		Grass/ Forb		Shrub/ Chaparral		Non-Forested Other		Other Public Total	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
-71 to -100% CC	120	0	48	0							168	0
-41 to -70% CC	90	0	2,700	1							2,790	0
-16 to -40% CC	435	0	3,132	1							3,568	0
+15 to -15% CC	180,914	100	325,439	97	343,995	95	3,079,717	99	206,709	96	4,136,774	98
+16 to +40% CC	17	0	299	0							315	0
+41 to +100% CC	6	0									6	0
Shrub/Grass Decrease > 15%					4,730	1	16,363	1			21,093	1
Shrub/Grass Increase > 15%					4,996	1	4,814	0			9,810	0
Non-Vegetation Change									1,228	1	1,228	0
Cloud or Cloud Shadow			4,000	1	8,052	2	5,791	0	7,962	4	25,805	1
Total	181,582	100	335,618	100	361,774	100	3,106,686	100	215,899	100	4,201,558	100

	Private													
	Conifer		Hardwood		Grass/ Forb		Shrub/ Chaparral		Non-Forested Other		Private Total		All Owners	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
-71 to -100% CC	48	0	108	0							155	0	626	0
-41 to -70% CC	88	0	2,013	0							2,101	0	14,659	0
-16 to -40% CC	835	0	5,875	0							6,710	0	23,883	0
+15 to -15% CC	210,412	100	1,497,703	98	2,862,192	99	4,334,230	99	3,138,958	96	12,043,494	98	19,533,848	98
+16 to +40% CC	27	0	503	0							530	0	1,419	0
+41 to +100% CC													23	0
Shrub/Grass Decrease > 15%					2,131	0	36,417	1			38,548	0	161,734	1
Shrub/Grass Increase > 15%					1,060	0	5,005	0			6,065	0	34,173	0
Non-Vegetation Change					184	0	73	0	38,694	1	38,950	0	40,269	0
Cloud or Cloud Shadow			17,959	1	30,609	1	8,221	0	82,360	3	139,150	1	165,410	1
Total	211,409	100	1,524,160	100	2,896,176	100	4,383,946	100	3,260,011	100	12,275,702	100	19,976,045	100

Table P-7. Acres of Classified Change 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					1	0	1	0
-41 to -70% CC	371	22	9	0	12	0	392	0
-16 to -40% CC	311	19	101	0	414	0	826	0
+15 to -15% CC (little or no change)	989	59	51,467	100	174,787	100	227,243	99
+16 to +40% CC			3	0	16	0	19	0
Cloud or Cloud Shadow			112	0	89	0	201	0
Total	1,671	100	51,692	100	175,318	100	228,681	100
Blue Oak Woodland								
-71 to -100% CC			3	0	2	0	5	0
-41 to -70% CC	4,628	10	392	0	1,282	0	6,302	1
-16 to -40% CC	4,981	11	815	1	3,091	0	8,887	1
+15 to -15% CC (little or no change)	35,403	79	159,586	99	635,028	99	830,016	98
+16 to +40% CC			210	0	382	0	591	0
Cloud or Cloud Shadow			587	0	1,043	0	1,630	0
Total	45,012	100	161,593	100	640,827	100	847,432	100
Coastal Oak Woodland								
-71 to -100% CC	52	0	30	0	34	0	116	0
-41 to -70% CC	766	1	1,018	1	600	0	2,384	0
-16 to -40% CC	1,278	1	480	1	1,720	0	3,478	0
+15 to -15% CC (little or no change)	94,404	98	82,620	95	557,527	97	734,551	97
+16 to +40% CC	174	0	28	0	95	0	297	0
+41 to +100% CC	8	0					8	0
Cloud or Cloud Shadow			3,068	4	15,290	3	18,357	2
Total	96,681	100	87,244	100	575,265	100	759,190	100
Desert Riparian								
+15 to -15% CC (little or no change)			1,362	100	4,367	100	5,728	100
Total			1,362	100	4,367	100	5,728	100
Montane Hardwood								
-71 to -100% CC	26	0	10	0	5	0	42	0
-41 to -70% CC	1,356	1	1,220	5	34	0	2,610	1
-16 to -40% CC	1,897	1	1,651	7	397	0	3,945	1
+15 to -15% CC (little or no change)	187,406	98	20,925	87	78,937	98	287,268	97
+16 to +40% CC	35	0	50	0	7	0	91	0
+41 to +100% CC	10	0					10	0
Cloud or Cloud Shadow			127	1	1,064	1	1,191	0
Total	190,730	100	23,983	100	80,444	100	295,157	100
Montane Riparian								
-71 to -100% CC					20	1	20	0
-16 to -40% CC	2	0	4	0	13	1	19	0
+15 to -15% CC (little or no change)	2,432	100	1,926	100	2,127	98	6,484	99
Total	2,434	100	1,930	100	2,160	100	6,524	100
Valley Oak Woodland	675	92	4,041	100	42,066	100	46,781	99
-41 to -70% CC	11	2			30	0	41	0
-16 to -40% CC	49	7			160	0	209	0
+16 to +40% CC					2	0	2	0
Total	735	100	4,041	100	42,258	100	47,034	100

Table P-7. Acres of Classified Change by Hardwood Cover Type and Owner Class (cont.)

	Forest Service		Other Public		Private		All Owners	
	Acres	%	Acres	%	Acres	%	Acres	%
Valley Foothill Riparian								
-71 to -100% CC			5	0	45	1	49	1
-41 to -70% CC			61	2	56	2	117	2
-16 to -40% CC			81	2	80	2	161	2
+15 to -15% CC (little or no change)	1	100	3,514	94	2,835	82	6,349	88
+16 to +40% CC			9	0	2	0	10	0
Cloud or Cloud Shadow			85	2	441	13	526	7
Total	1	100	3,753	100	3,459	100	7,212	100
Unknown Hardwood								
+15 to -15% CC (little or no change)					29	47	29	35
Cloud or Cloud Shadow			21	100	33	53	54	65
Total			21	100	62	100	83	100
All Hardwood	337,264		335,618		1,524,160		2,197,042	

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

	Forest Service		Other Public		Private		All Owners	
	Acres	%	Acres	%	Acres	%	Acres	%
Juniper								
+15 to -15% CC (little or no change)			14,982	100	822	100	15,804	100
Total			14,982	100	822	100	15,804	100
Closed Cone Pine - Cypress								
-71 to -100% CC			120	2	16	1	137	1
-41 to -70% CC			69	1	12	0	81	1
-16 to -40% CC			296	6	39	1	335	4
+15 to -15% CC (little or no change)	1,177	100	4,454	90	2,927	98	8,559	94
Total	1,177	100	4,940	100	2,993	100	9,111	100
Douglas Fir								
+15 to -15% CC (little or no change)	1,215	100			5	100	1,220	100
Total	1,215	100			5	100	1,220	100
Jeffrey Pine								
-16 to -40% CC	310	0	79	0	551	1	940	0
+15 to -15% CC (little or no change)	69,323	100	79,052	100	92,348	99	240,724	100
+16 to +40% CC	13	0	17	0	1	0	30	0
+41 to +100% CC			6	0			6	0
Total	69,646	100	79,154	100	92,900	100	241,699	100
Montane Hardwoods Conifer								
-71 to -100% CC	193	0			3	0	195	0
-41 to -70% CC	2,402	2	20	0	30	0	2,451	1
-16 to -40% CC	1,789	1	14	0	96	1	1,898	1
+15 to -15% CC (little or no change)	133,047	97	8,614	100	17,584	99	159,245	97
+16 to +40% CC	335	0			17	0	351	0
Total	137,764	100	8,648	100	17,729	100	164,141	100
Pinyon - Juniper								
-41 to -70% CC	12	0			6	0	19	0
-16 to -40% CC	1,970	1			57	0	2,027	1
+15 to -15% CC (little or no change)	271,619	99	50,084	100	30,145	100	351,848	99
Total	273,601	100	50,084	100	30,209	100	353,893	100
Ponderosa Pine								
-41 to -70% CC	80	0	0	0			80	0
-16 to -40% CC	274	1	14	0	2	0	290	0
+15 to -15% CC (little or no change)	44,777	99	2,828	100	10,991	100	58,596	99
Cloud or Cloud Shadow	22	0					22	0
Total	45,154	100	2,842	100	10,993	100	58,989	100
Redwood								
-71 to -100% CC	4	0					4	0
-41 to -70% CC	110	2	1	0	8	0	118	1
-16 to -40% CC	293	4	6	2	11	0	310	3
+15 to -15% CC (little or no change)	6,602	94	381	98	3,294	99	10,278	96
+16 to +40% CC	3	0					3	0
Total	7,012	100	388	100	3,313	100	10,713	100
Subalpine Conifer								
+15 to -15% CC (little or no change)	5,965	100	2,040	100			8,005	100
Cloud or Cloud Shadow	12	0					12	0
Total	5,976	100	2,040	100			8,016	100

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

	Forest Service		Other Public		Private		All Owners	
	Acres	%	Acres	%	Acres	%	Acres	%
Sierran Mixed Conifer								
-71 to -100% CC	28	0			28	0	56	0
-41 to -70% CC	32	0			33	0	64	0
-16 to -40% CC	453	0	26	0	81	0	560	0
+15 to -15% CC (little or no change)	228,675	100	18,478	100	51,912	100	299,066	100
+16 to +40% CC	15	0			10	0	24	0
Cloud or Cloud Shadow	130	0					130	0
Total	229,332	100	18,504	100	52,063	100	299,900	100
White Fir								
+15 to -15% CC (little or no change)					383	100	383	100
Total					383	100	383	100
All Conifer	770,877		181,582		211,409		1,163,868	

Table P-9. Acres of Classified Change by Shrub/Chaparral Types 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)	63	100					63	100
Total	63	100					63	100
Alkali Scrub								
Shrub/Grass Decrease > 15%			11	0	24	0	35	0
+15 to -15% CC (little or no change)			263,960	100	324,867	100	588,827	100
Shrub/Grass Increase > 15%				0	19	0	19	0
Total			263,971	100	324,910	100	588,881	100
Chamise - Redshank Chaparral								
Shrub/Grass Decrease > 15%	18,823	6	1,294	1	3,378	2	23,494	4
+15 to -15% CC (little or no change)	304,867	92	121,460	99	207,703	98	634,030	95
Shrub/Grass Increase > 15%	8,703	3	151	0	1,049	0	9,902	1
Cloud or Cloud Shadow					512	0	512	0
Total	332,393	100	122,904	100	212,641	100	667,939	100
Coastal Scrub								
Shrub/Grass Decrease > 15%	4,898	2	377	4	997	2	6,272	2
+15 to -15% CC (little or no change)	226,543	98	9,450	96	48,559	98	284,552	98
Shrub/Grass Increase > 15%	263	0	12	0	30	0	304	0
Cloud or Cloud Shadow			1	0	11	0	13	0
Total	231,703	100	9,841	100	49,597	100	291,141	100
Desert Scrub								
Shrub/Grass Decrease > 15%	894	1	56	0	104	0	1,055	0
+15 to -15% CC (little or no change)	73,565	99	1,325,510	100	975,081	100	2,374,155	100
Shrub/Grass Increase > 15%					12	0	12	0
Total	74,460	100	1,325,566	100	975,197	100	2,375,222	100
Desert Succulent Scrub								
+15 to -15% CC (little or no change)			2,959	100	15,489	100	18,447	100
Total			2,959	100	15,489	100	18,447	100
Desert Wash								
+15 to -15% CC (little or no change)			1,150	100	2,764	100	3,914	100
Total			1,150	100	2,764	100	3,914	100
Mixed Chaparral								
Shrub/Grass Decrease > 15%	5,135	3	2,893	1	1,397	0	9,425	1
+15 to -15% CC (little or no change)	159,790	97	268,153	99	276,596	99	704,539	98
Shrub/Grass Increase > 15%	407	0	995	0	687	0	2,089	0
Cloud or Cloud Shadow			95	0	696	0	791	0
Total	165,333	100	272,135	100	279,375	100	716,843	100
Montane Chaparral								
Shrub/Grass Decrease > 15%	71,081	5	2,483	2	9,909	3	83,474	4
+15 to -15% CC (little or no change)	1,392,934	95	107,255	96	301,494	97	1,801,684	95
Shrub/Grass Increase > 15%	8,915	1	2,208	2	871	0	11,994	1
Cloud or Cloud Shadow	292	0	40	0	95	0	427	0
Total	1,473,221	100	111,987	100	312,370	100	1,897,578	100

Table P-9. Acres of Classified Change by Shrub/Chaparral Types and Owner Class (cont.)

	Forest Service		Other Public		Private		All Owners	
	Acres	**%**	**Acres**	**%**	**Acres**	**%**	**Acres**	**%**
Sagebrush								
Shrub/Grass Decrease > 15%	19	0			22	0	41	0
+15 to -15% CC (little or no change)	19,818	100	6,386	100	32,129	100	58,332	100
Non-Vegetation Change					19	0	19	0
Shrub/Grass Increase > 15%					21	0	21	0
Total	19,837	100	6,386	100	32,190	100	58,413	100
Unknown Shrub/Chaparral								
Shrub/Grass Decrease > 15%	761	5	9,249	1	20,587	1	30,596	1
+15 to -15% CC (little or no change)	13,964	95	973,436	98	2,149,549	99	3,136,949	99
Shrub/Grass Increase > 15%			280	0	358	0	638	0
Non-Vegetation Change					56	0	56	0
Cloud or Cloud Shadow			5,655	1	6,907	0	12,562	0
Total	14,725	100	988,619	100	2,177,455	100	3,180,800	100
All Shrub/Chaparral	2,311,741		3,106,686		4,383,946		9,802,372	

Table P-10. Acres of Verified Change in all Hardwood Cover Types by Cause and Owner Class

	Wildfire	Develop-ment	Regener-ation	Prescribed Burn	Unknown Cause	All Causes
National Forest						
-71 to -100% CC	78					78
-41 to -70% CC	7,119				14	7,133
-16 to -40% CC	8,432			3	82	8,517
+16 to +40% CC			202		7	209
+41 to +10% CC			18			18
Total	15,629		219	3	104	15,954
Other Public						
-71 to -100% CC	40				7	48
-41 to -70% CC	2,635				65	2,700
-16 to -40% CC	2,776				356	3,132
+16 to +40% CC			8		290	299
Total	5,451		8		719	6,179
Private						
-71 to -100% CC	52				56	108
-41 to -70% CC	1,527			91	394	2,013
-16 to -40% CC	3,537	34		279	2,025	5,875
+16 to +40% CC			44		460	503
Total	5,116	34	44	370	2,934	8,498
All Hardwood Change	26,196	34	271	373	3,757	30,632

Table P-11. Acres of Verified Change in all Conifer Cover Types by Cause and Owner Class

	Wildfire	Mortality	Regener-ation	Unknown Cause	All Causes
Forest Service					
-71 to -100% CC	225				225
-41 to -70% CC	2,636				2,636
-16 to -40% CC	4,717	359		12	5,088
+16 to +40% CC			362	3	365
Total	7,578	359	362	15	8,314
Other Public					
-71 to -100% CC	120				120
-41 to -70% CC	90				90
-16 to -40% CC	398			38	435
+16 to +40% CC			17		17
+41 to +100% CC			6		6
Total	608		22	38	668
Private					
-71 to -100% CC	48				48
-41 to -70% CC	85			3	88
-16 to -40% CC	509			327	835
+16 to +40% CC			27		27
Total	641		27	330	998
All Conifer Change	8,827	359	411	382	9,979

Table P-12. Acres of Verified Change in the Shrub/Chaparral Cover Type by Cause and Owner Class

	Wildfire	Develop-ment	Mortality	Regener-ation	Prescribed Burn	Unknown Cause	All Causes
Forest Service							
Shrub/Grass Decrease > 15%	99,563	6	80		26	1,937	101,611
Shrub/Grass Increase > 15%				17,627		665	18,293
Total	99,563	6	80	17,627	26	2,602	119,904
Other Public							
Shrub/Grass Decrease > 15%	14,985	52				1,326	16,363
Shrub/Grass Increase > 15%				3,844		970	4,814
Total	14,985	52		3,844		2,296	21,177
Private							
Shrub/Grass Decrease > 15%	30,542	1,534			88	4,254	36,417
Shrub/Grass Increase > 15%				2,339		2,666	5,005
Non-Vegetation Change						73	73
Total	30,542	1,534		2,339	88	6,992	41,494
All Shrub/Chaparral Change	145,090	1,591	80	23,811	114	11,890	182,575

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 change by hardwood type.
4. Table of change by conifer type.
5. Table of change by shrub/chaparral type.
6. Table of hardwood change by cause.
7. Table of conifer change by cause.
8. Table of shrub/chaparral change by cause.

Table C-1. Acres of Classified Change in Imperial County by Lifeform Type and Owner Class

	Other Public								Private							
	Conifer		**Non-Forested Other**		**Shrub/ Chaparral**		**Other Public Total**		**Conifer**		**Non-Forested Other**		**Shrub/ Chaparral**		**Private Total**	
	Arces	%	Arces	%	Arces	%	Arces	%	Arces	%	Arces	%	Arces	%	Arces	%
+15 to -15% CC	31,864	100	3,060	100	43,842	100	78,766	100	2,718	100	119	100	10,367	100	13,204	100
Total	31,864	100	3,060	100	43,842	100	78,766	100	2,718	100	119	100	10,367	100	13,204	100

	All Owners							
	Conifer		**Non-Forested Other**		**Shrub/ Chaparral**		**All Owners Total**	
	Arces	%	Arces	%	Arces	%	Arces	%
+15 to -15% CC	34,582	100	3,179	100	54,209	100	91,970	100
Total	34,582	100	3,179	100	54,209	100	91,970	100

Table C-2. Acres of Classified Change in Imperial County by Conifer Cover Type and Owner Class

	Other Public		**Private**		**All Owners**	
	Acres	%	Acres	%	Acres	%
Juniper						
+15 to -15% CC (little or no change)	14,950	47	725	27	15,674	45
Total	14,950	47	725	27	15,674	45
Jeffrey Pine						
+15 to -15% CC (little or no change)	16,914	53	1,993	73	18,908	55
Total	16,914	53	1,993	73	18,908	55
All Conifer	31,864	100	2,718	100	34,582	100

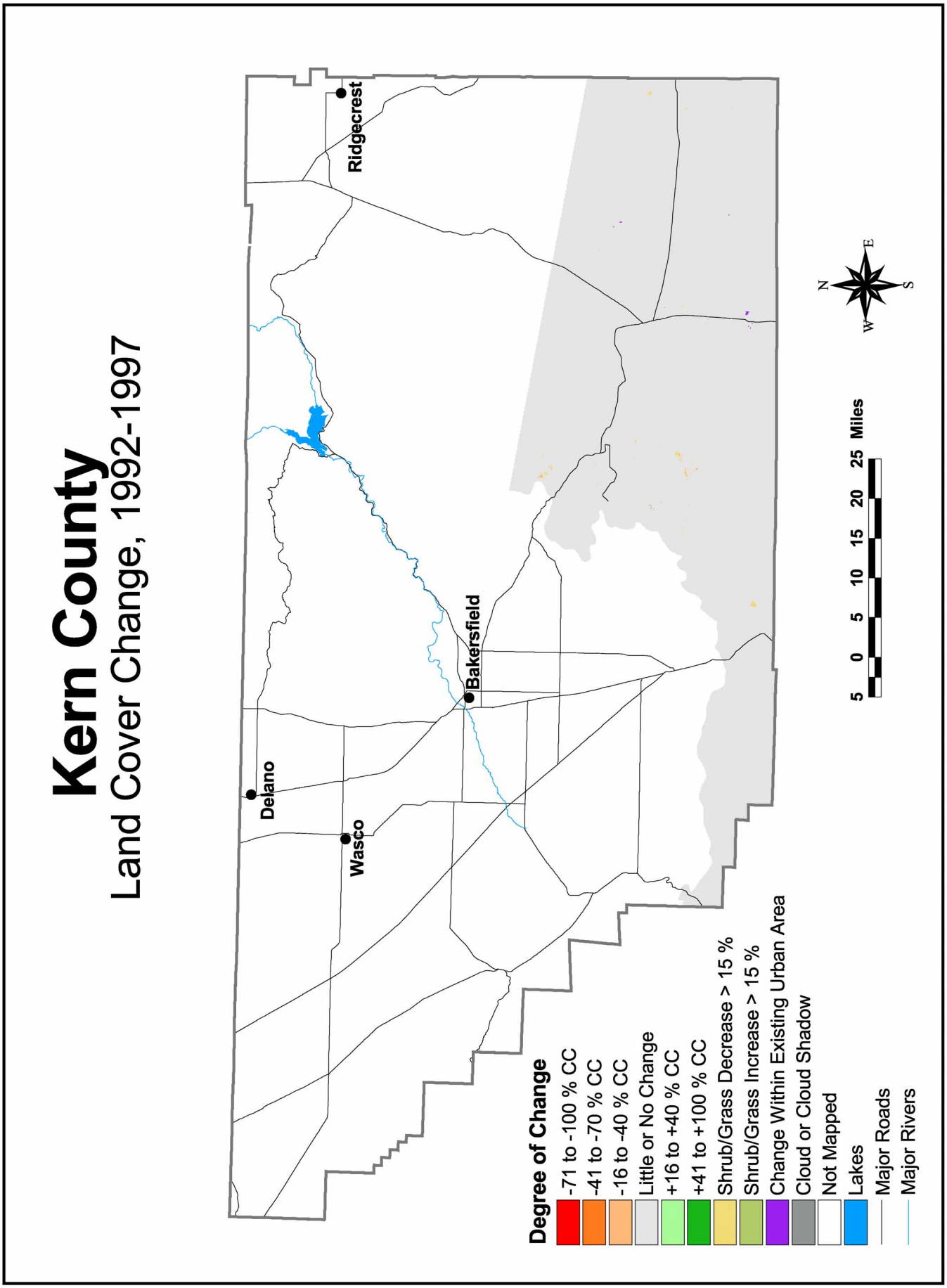

Kern County
Land Cover Change, 1992-1997
Ridgecrest
Bakersfield
Delano
Wasco
N
E
S
W
5 0 5 10 15 20 25 Miles
Degree of Change
-71 to -100 % CC
-41 to -70 % CC
-16 to -40 % CC
Little or No Change
+16 to +40 % CC
+41 to +100 % CC
Shrub/Grass Decrease > 15 %
Shrub/Grass Increase > 15 %
Change Within Existing Urban Area
Cloud or Cloud Shadow
Not Mapped
Lakes
Major Roads
Major Rivers

Table C-3. Acres of Classified Change in Kern County by Lifeform Type and Owner Class

	Forest Service											
	Conifer		Hardwood		Grass/ Forb		Non-Forested Other		Shrub/ Chaparral		Forest Service Total	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
-41 to -70% CC												
-16 to -40% CC												
+15 to -15% CC (little or no change)	54,517	100	2,083	100	2,786	100	468	100	5,890	100	65,743	100
+16 to +40% CC												
Shrub/Grass Decrease > 15%												
Shrub/Grass Increase > 15%												
Non-Vegetation Change												
Total	54,517	100	2,083	100	2,786	100	468	100	5,890	100	65,743	100

	Other Public											
	Conifer		Hardwood		Grass/ Forb		Non-Forested Other		Shrub/ Chaparral		Other Public Total	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
-41 to -70% CC												
-16 to -40% CC			21	0							21	0
+15 to -15% CC (little or no change)	29	100	6,342	100	42,670	100	8,003	100	261,510	100	318,554	100
+16 to +40% CC												
Shrub/Grass Decrease > 15%					2	0			139	0	140	0
Shrub/Grass Increase > 15%									3	0	3	0
Non-Vegetation Change							6	0			6	0
Total	29	100	6,363	100	42,672	100	8,010	100	261,652	100	318,725	100

	Private											
	Conifer		Hardwood		Grass/ Forb		Non-Forested Other		Shrub/ Chaparral		Private Total	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
-41 to -70% CC			7	0							7	0
-16 to -40% CC			261	0							262	0
+15 to -15% CC (little or no change)	12,672	100	74,340	100	299,977	100	49,297	100	478,940	100	915,226	100
+16 to +40% CC			9	0							9	0
Shrub/Grass Decrease > 15%					70	0			784	0	854	0
Shrub/Grass Increase > 15%					1	0			88	0	89	0
Non-Vegetation Change							171	0			171	0
Total	12,672	100	74,617	100	300,048	100	49,468	100	479,812	100	916,617	100

	All Owners											
	Conifer		Hardwood		Grass/ Forb		Non-Forested Other		Shrub/ Chaparral		All Owners Total	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
-41 to -70% CC			7	0							7	0
-16 to -40% CC			283	0							283	0
+15 to -15% CC (little or no change)	67,217	100	82,764	100	345,433	100	57,768	100	746,340	100	1,299,522	100
+16 to +40% CC			9	0							9	0
Shrub/Grass Decrease > 15%					71	0			923	0	994	0
Shrub/Grass Increase > 15%					1	0			91	0	92	0
Non-Vegetation Change							177	0			177	0
Total	67,217	100	83,062	100	345,505	100	57,946	100	747,354	100	1,301,085	100

Table C-4. 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								
+15 to -15% CC (little or no change)	6	0	353	6	1,452	2	1,811	2
Total	6	0	353	6	1,452	2	1,811	2
Blue Oak Woodland								
-16 to -40% CC			15	0	89	0	104	0
+15 to -15% CC (little or no change)	39	2	4,671	73	38,142	51	42,852	52
Total	39	2	4,686	74	38,231	51	42,956	52
Coastal Oak Woodland								
-16 to -40% CC			4	0	6	0	10	0
+15 to -15% CC (little or no change)	8	0	41	1	4,571	6	4,620	6
Total	8	0	45	1	4,577	6	4,631	6
Montane Hardwood								
-16 to -40% CC			2	0	124	0	126	0
-41 to -70% CC					7	0	7	0
+15 to -15% CC (little or no change)	2,030	97	426	7	16,046	22	18,502	22
+16 to +40% CC					7	0	7	0
Total	2,030	97	428	7	16,183	22	18,641	22
Valley Oak Woodland								
-16 to -40% CC					42	0	42	0
+15 to -15% CC (little or no change)			851	13	14,128	19	14,979	18
+16 to +40% CC					2	0	2	0
Total			851	13	14,173	19	15,023	18
All Hardwood	2,083	100	6,363	100	74,617	100	83,062	100

Table C-5. 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	%
Jeffrey Pine								
+15 to -15% CC (little or no change)	6,575	12	1	2	2,962	23	9,537	14
Total	6,575	12	1	2	2,962	23	9,537	14
Montane Hardwoods Conifer								
+15 to -15% CC (little or no change)					101	1	101	0
Total					101	1	101	0
Pinyon - Juniper								
+15 to -15% CC (little or no change)	35,750	66	18	61	6,739	53	42,507	63
Total	35,750	66	18	61	6,740	53	42,507	63
Ponderosa Pine								
+15 to -15% CC (little or no change)			9	32	439	3	448	1
Total			9	32	439	3	448	1
Sierran Mixed Conifer								
+15 to -15% CC (little or no change)	12,193	22	1	5	2,048	16	14,242	21
Total	12,193	22	1	5	2,048	16	14,242	21
White Fir								
+15 to -15% CC (little or no change)					383	3	383	1
Total					383	3	383	1
All Conifer	54,517	100	29	100	12,672	100	67,217	100

Table C-6. 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	%
Alkali Scrub								
Shrub/Grass Decrease > 15 %			11	0	24	0	35	0
+15 to -15 % CC (Little or No Change)			110,649	42	85,847	18	196,495	26
Shrub/Grass Increase > 15 %					19	0	19	0
Total			110,660	42	85,889	18	196,549	26
Chamise - Redshank Chaparral								
+15 to -15 % CC (Little or No Change)								
Total								
Coastal Scrub								
+15 to -15 % CC (Little or No Change)	1,384	24			552	0	1,937	0
Total	1,384	24			552	0	1,937	0
Desert Scrub								
Shrub/Grass Decrease > 15 %			56	0	101	0	157	0
+15 to -15 % CC (Little or No Change)	3,060	52	134,036	51	255,942	53	393,037	53
Total	3,060	52	134,092	51	256,043	53	393,194	53
Mixed Chaparral								
Shrub/Grass Decrease > 15 %					2	0	2	0
+15 to -15 % CC (Little or No Change)			320	0	7,437	2	7,757	1
Total			320	0	7,439	2	7,759	1
Montane Chaparral								
+15 to -15 % CC (Little or No Change)	815	14			96	0	911	0
Total	815	14			96	0	911	0
Sagebrush								
Shrub/Grass Increase > 15 %					5	0	5	0
+15 to -15 % CC (Little or No Change)	469	8			2,764	1	3,234	0
Total	469	8			2,770	1	3,239	0
Undetermined Shrub/Chaparral								
Shrub/Grass Decrease > 15 %			72	0	657	0	729	0
+15 to -15 % CC (Little or No Change)	163	3	16,506	6	126,302	26	142,970	19
Shrub/Grass Increase > 15 %			3	0	63	0	67	0
Total	163	3	16,581	6	127,022	26	143,766	19
All Shrub/Chaparral	5,890	100	261,652	100	479,812	100	747,354	100

Table C-7. Acres of Verified Change in Kern County by Cause and Hardwood Cover Type

	Unknown Cause	All Causes
Blue Oak Woodland		
-16 to -40% CC	104	104
Total	104	104
Coastal Oak Woodland		
-16 to -40% CC	10	10
Total	10	10
Montane Hardwood		
-41 to -70% CC	7	7
-16 to -40% CC	126	126
+16 to +40% CC	7	7
Total	140	140
Valley Oak Woodland		
-16 to -40% CC	42	42
+16 to +40% CC	2	2
Total	45	45
All Hardwood	298	298

Table C-8. Acres of Verified Change in Kern County by Cause and Shrub/Chaparral Cover Type

	Unknown Cause	All Causes
Alkali Scrub		
Shrub/Grass Decrease > 15 %	35	35
Shrub/Grass Increase > 15 %	19	19
Total	54	54
Desert Scrub		
Shrub/Grass Decrease > 15 %	157	157
Total	157	157
Mixed Chaparral		
Shrub/Grass Decrease > 15 %	2	2
Total	2	2
Sagebrush		
Shrub/Grass Increase > 15 %	5	5
Total	5	5
Undetermined Shrub/Chaparral		
Shrub/Grass Decrease > 15 %	729	729
Shrub/Grass Increase > 15 %	67	67
Total	796	796
All Shrub/Chaparral	1,014	1,014

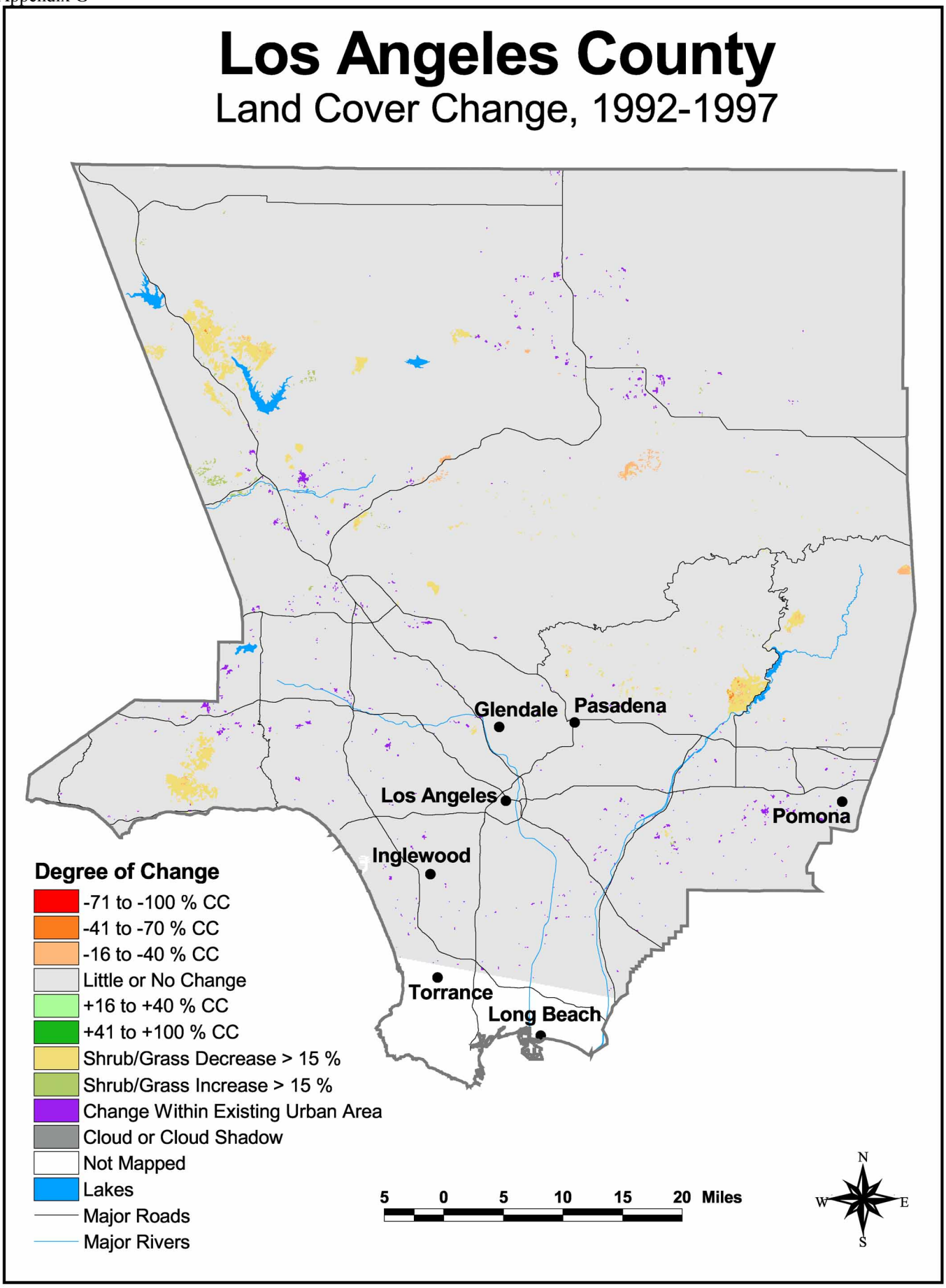

Los Angeles County
Land Cover Change, 1992-1997
Glendale
Pasadena
Los Angeles
Pomona
Inglewood
Torrance
Long Beach
Degree of Change
-71 to -100 % CC
-41 to -70 % CC
-16 to -40 % CC
Little or No Change
+16 to +40 % CC
+41 to +100 % CC
Shrub/Grass Decrease > 15 %
Shrub/Grass Increase > 15 %
Change Within Existing Urban Area
Cloud or Cloud Shadow
Not Mapped
Lakes
Major Roads
Major Rivers
5 0 5 10 15 20 Miles
N
W
E
S

Table C-9. Acres of Classified Change in Los Angeles County by Lifeform Type and Owner Class

	Forest Service											
	Conifer		Hardwood		Grass/ Forb		Non-Forested Other		Shrub/ Chaparral		Forest Service Total	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
-71 to -100% CC												
-41 to -70% CC			112	0							112	0
-16 to -40% CC	1,397	1	496	1							1,893	0
+15 to -15% CC (little or no change)	115,727	99	60,386	99	2,088	92	7,878	100	452,803	97	638,882	97
+16 to +40% CC												
Shrub/Grass Decrease > 15%					174	8			15,607	3	15,781	2
Shrub/Grass Increase > 15%									368	0	368	0
Non-Vegetation Change							7	0			7	0
Cloud or Cloud Shadow												
Total	117,124	100	60,995	100	2,262	100	7,884	100	468,778	100	657,043	100

	Other Public											
	Conifer		Hardwood		Grass/ Forb		Non-Forested Other		Shrub/ Chaparral		Other Public Total	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
-71 to -100% CC												
-41 to -70% CC												
-16 to -40% CC	38	1	59	2							96	0
+15 to -15% CC (little or no change)	4,363	99	3,329	98	7,900	98	13,551	99	97,923	98	127,066	98
+16 to +40% CC												
Shrub/Grass Decrease > 15%					128	2			1,620	2	1,747	1
Shrub/Grass Increase > 15%									15	0	15	0
Non-Vegetation Change							81	1			81	0
Cloud or Cloud Shadow												
Total	4,401	100	3,388	100	8,027	100	13,632	100	99,558	100	129,006	100

	Private											
	Conifer		Hardwood		Grass/ Forb		Non-Forested Other		Shrub/ Chaparral		Private Total	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
-71 to -100% CC			5	0							5	0
-41 to -70% CC			9	0							9	0
-16 to -40% CC	515	1	97	1							612	0
+15 to -15% CC (little or no change)	47,581	99	17,792	99	89,765	99	832,307	99	661,168	99	1,648,613	99
+16 to +40% CC			11	0							11	0
Shrub/Grass Decrease > 15%					523	1			6,916	1	7,440	0
Shrub/Grass Increase > 15%									1,502	0	1,502	0
Non-Vegetation Change							7,095	1			7,095	0
Cloud or Cloud Shadow							7	0			7	0
Total	48,095	100	17,914	100	90,289	100	839,408	100	669,586	100	1,665,292	100

Table C-9. Acres of Classified Change in Los Angeles County by Lifeform Type and Owner Class (cont.)

	All Owners											
	Conifer		Hardwood		Grass/ Forb		Non-Forested Other		Shrub/ Chaparral		All Owners Total	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
-71 to –100% CC			5	0							5	0
-41 to -70% CC			121	0							121	0
-16 to -40% CC	1,949	1	652	1							2,601	0
+15 to -15% CC (little or no change)	167,672	99	81,507	99	99,753	99	853,735	99	1,211,894	98	2,414,560	98
+16 to +40% CC			11	0							11	0
Shrub/Grass Decrease > 15%					825	1			24,143	2	24,968	1
Shrub/Grass Increase > 15%									1,885	0	1,885	0
Non-Vegetation Change							7,182	1			7,182	0
Cloud or Cloud Shadow							7	0			7	0
Total	169,620	100	82,296	100	100,578	100	860,924	100	1,237,922	100	2,451,340	100

Table C-10. Acres of Classified Change in Los Angeles County by Hardwood Cover Type and Owner Class

	Forest Service		Other Public		Private		All Owners	
	Acres	%	Acres	%	Acres	%	Acres	%
Blue Oak Foothill Pine								
+15 to -15% CC (little or no change)	454	1			257	1	711	1
Total	454	1			257	1	711	1
Blue Oak Woodland								
+15 to -15% CC (little or no change)	337	1			1,199	7	1,536	2
Total	337	1			1,199	7	1,536	2
Coastal Oak Woodland								
-41 to -70% CC	83	0				0	83	0
-16 to -40% CC	323	1	59	2	39	0	421	1
+15 to -15% CC (little or no change)	8,724	14	1,973	58	7,840	44	18,537	23
+16 to +40% CC					10	0	10	0
Total	9,130	15	2,031	60	7,890	44	19,051	23
Desert Riparian								
+15 to -15% CC (little or no change)					572	3	572	1
Total					572	3	572	1
Montane Hardwood								
-41 to -70% CC	29	0					29	0
-16 to -40% CC	172	0			10	0	182	0
+15 to -15% CC (little or no change)	49,678	81	191	6	4,029	22	53,897	65
Total	49,879	82	191	6	4,039	23	54,108	66
Montane Riparian								
-71 to -100 % CC					5	0	5	0
-16 to -40 % CC	2	0			11	0	13	0
+15 to -15 % CC (Little or No Change)	1,146	2			847	5	1,993	2
+16 to +40 % CC							0	0
Total	1,148	2			863	5	2,011	2
Valley Oak Woodland								
-16 to -40% CC							0	0
+15 to -15% CC (little or no change)	46	0	1,161	34	2,368	13	3,576	4
Total	46	0	1,162	34	2,368	13	3,576	4
Valley Foothill Riparian								
-41 to -70% CC					9	0	9	0
-16 to -40% CC					36	0	36	0
+15 to -15% CC (little or no change)	1	0	4	0	681	4	686	1
+16 to +40% CC					1	0	1	0
Total	1	0	4	0	727	4	732	1
All Hardwood	60,995	100	3,388	100	17,914	100	82,296	100

Table C-11. Acres of Classified Change in Los Angeles County by Conifer Cover Type and Owner Class

	Forest Service		Other Public		Private		All Owners	
	Acres	%	Acres	%	Acres	%	Acres	%
Juniper								
+15 to -15% CC (little or no change)			7	0	93	0	100	0
Total			7	0	93	0	100	0
Jeffrey Pine								
-16 to -40% CC	209	0	38	1	509	1	756	0
+15 to -15% CC (little or no change)	4,623	4	4,318	98	45,264	94	54,205	32
Total	4,833	4	4,355	99	45,772	95	54,960	32
Montane Hardwoods Conifer								
-16 to -40% CC	66	0			6	0	72	0
+15 to -15% CC (little or no change)	42,218	36	14	0	1,061	2	43,292	26
Total	42,284	36	14	0	1,067	2	43,364	26
Pinyon - Juniper								
-16 to -40% CC	945	1					945	1
+15 to -15% CC (little or no change)	18,041	15	2	0	416	1	18,460	11
Total	18,986	16	2	0	416	1	19,404	11
Sierran Mixed Conifer								
-16 to -40% CC	176	0					176	0
+15 to -15% CC (little or no change)	50,845	43	23	1	747	2	51,615	30
Total	51,021	44	23	1	747	2	51,791	31
All Conifer	117,124	100	4,401	100	48,095	100	169,620	100

Table C-12. Acres of Classified Change in Los Angeles County by Shrub/Chaparral Cover Type and Owner Class

	Forest Service		Other Public		Private		All Owners	
	Acres	%	Acres	%	Acres	%	Acres	%
Alkali Scrub								
+15 to -15 % CC (Little or No Change)			38,014	38	99,747	15	137,760	11
Total			38,014	38	99,747	15	137,760	11
Chamise - Redshank Chaparral								
Shrub/Grass Decrease > 15 %	1,905	0	21	0	1,039	0	2,964	0
+15 to -15 % CC (Little or No Change)	49,807	11	1,485	1	33,335	5	84,627	7
Shrub/Grass Increase > 15 %	89	0			22	0	111	0
Total	51,802	11	1,505	2	34,395	5	87,702	7
Coastal Scrub								
Shrub/Grass Decrease > 15 %	1,352	0	1	0	161	0	1,514	0
+15 to -15 % CC (Little or No Change)	43,432	9	383	0	5,648	1	49,462	4
Shrub/Grass Increase > 15 %	200	0	3	0	4	0	208	0
Total	44,984	10	386	0	5,814	1	51,185	4
Desert Scrub								
Shrub/Grass Decrease > 15 %					3	0	3	0
+15 to -15 % CC (Little or No Change)	240	0	17,195	17	133,836	20	151,270	12
Shrub/Grass Increase > 15 %					9	0	9	0
Total	240	0	17,195	17	133,848	20	151,282	12
Mixed Chaparral								
Shrub/Grass Decrease > 15 %	167	0	1	0	102	0	270	0
+15 to -15 % CC (Little or No Change)	25,664	5	3,037	3	49,964	7	78,664	6
Shrub/Grass Increase > 15 %	3	0			9	0	12	0
Total	25,833	6	3,037	3	50,076	7	78,946	6
Montane Chaparral								
Shrub/Grass Decrease > 15 %	11,629	2	1,068	1	3,940	1	16,637	1
+15 to -15 % CC (Little or No Change)	321,766	69	24,901	25	94,746	14	441,412	36
Shrub/Grass Increase > 15 %	71	0	1	0	49	0	121	0
Total	333,465	71	25,970	26	98,735	15	458,170	37
Sagebrush								
+15 to -15 % CC (Little or No Change)	802	0	131	0	9,593	1	10,526	1
Shrub/Grass Increase > 15 %					15	0	15	0
Total	802	0	131	0	9,608	1	10,541	1
Undetermined Shrub/Chaparral								
Shrub/Grass Decrease > 15 %	554	0	530	1	1,671	0	2,755	0
+15 to -15 % CC (Little or No Change)	11,093	2	12,781	13	234,298	35	258,172	21
Shrub/Grass Increase > 15 %	5	0	11	0	1,393	0	1,409	0
Total	11,653	2	13,321	13	237,363	35	262,337	21
All Shrub/Chaparral	468,778	100	99,558	100	669,586	100	1,237,922	100

Table C-13. Acres of Verified Change in Los Angeles County by Cause and Hardwood Cover Type

	Wildfire	Prescribed Burn	Unknown Cause	All Causes
Coastal Oak Woodland				
-41 to –70% CC	83			83
-16 to –40% CC	397	8	15	421
+16 to +40% CC			10	10
Total	481	8	25	514
Montane Hardwood				
-41 to -70% CC	29			29
-16 to -40% CC	164		18	182
Total	193		18	211
Montane Riparian				
-71 to -100% CC			5	5
-16 to -40% CC			13	13
+16 to +40% CC			0	0
Total			18	18
Valley Oak Woodland				
-16 to -40% CC	0			0
Total	0			0
Valley Foothill Riparian				
-41 to -70% CC			9	9
-16 to -40% CC			36	36
+16 to +40% CC			1	1
Total			46	46
All Hardwood	674	8	108	789

Table C-14. Acres of Verified Change in Los Angeles County by Cause and Conifer Cover Type

	Wildfire	Mortality	Unknown Cause	All Causes
Jeffrey Pine				
-16 to -40% CC	221	209	325	756
Total	221	209	325	756
Montane Hardwoods Conifer				
-16 to -40% CC	66		6	72
Total	66		6	72
Pinyon - Juniper				
-16 to -40% CC	945			945
Total	945			945
Sierran Mixed Conifer				
-16 to -40% CC	27	150		176
Total	27	150		176
All Conifer	1,259	359	331	1,949

Table C-15. Acres of Verified Change in Los Angeles County by Cause and Shrub/Chaparral Cover Type

	Wildfire	Mortality	Prescribed Burn	Unknown Cause	All Causes
Chamise-Redshank Chaparral					
Shrub/Grass Decrease > 15 %	2,902		6	57	2,964
Shrub/Grass Increase > 15 %				111	111
Total	2,902		6	168	3,075
Coastal Scrub					
Shrub/Grass Decrease > 15 %	1,339		4	171	1,514
Shrub/Grass Increase > 15 %				208	208
Total	1,339		4	378	1,722
Desert Scrub					
Shrub/Grass Decrease > 15 %				3	3
Shrub/Grass Increase > 15 %				9	9
Total				12	12
Mixed Chaparral					
Shrub/Grass Decrease > 15 %	130			140	270
Shrub/Grass Increase > 15 %				12	12
Total	130			152	281
Montane Chaparral					
Shrub/Grass Decrease > 15 %	15,428	80	24	1,105	16,637
Shrub/Grass Increase > 15 %				121	121
Total	15,428	80	24	1,227	16,758
Sagebrush					
Shrub/Grass Increase > 15 %				15	15
Total				15	15
Undetermined Shrub/Chaparral					
Shrub/Grass Decrease > 15 %	2,393		15	347	2,755
Shrub/Grass Increase > 15 %				1,409	1,409
Total	2,393		15	1,756	4,165
All Shrub/Chaparral	22,192	80	49	3,708	26,028

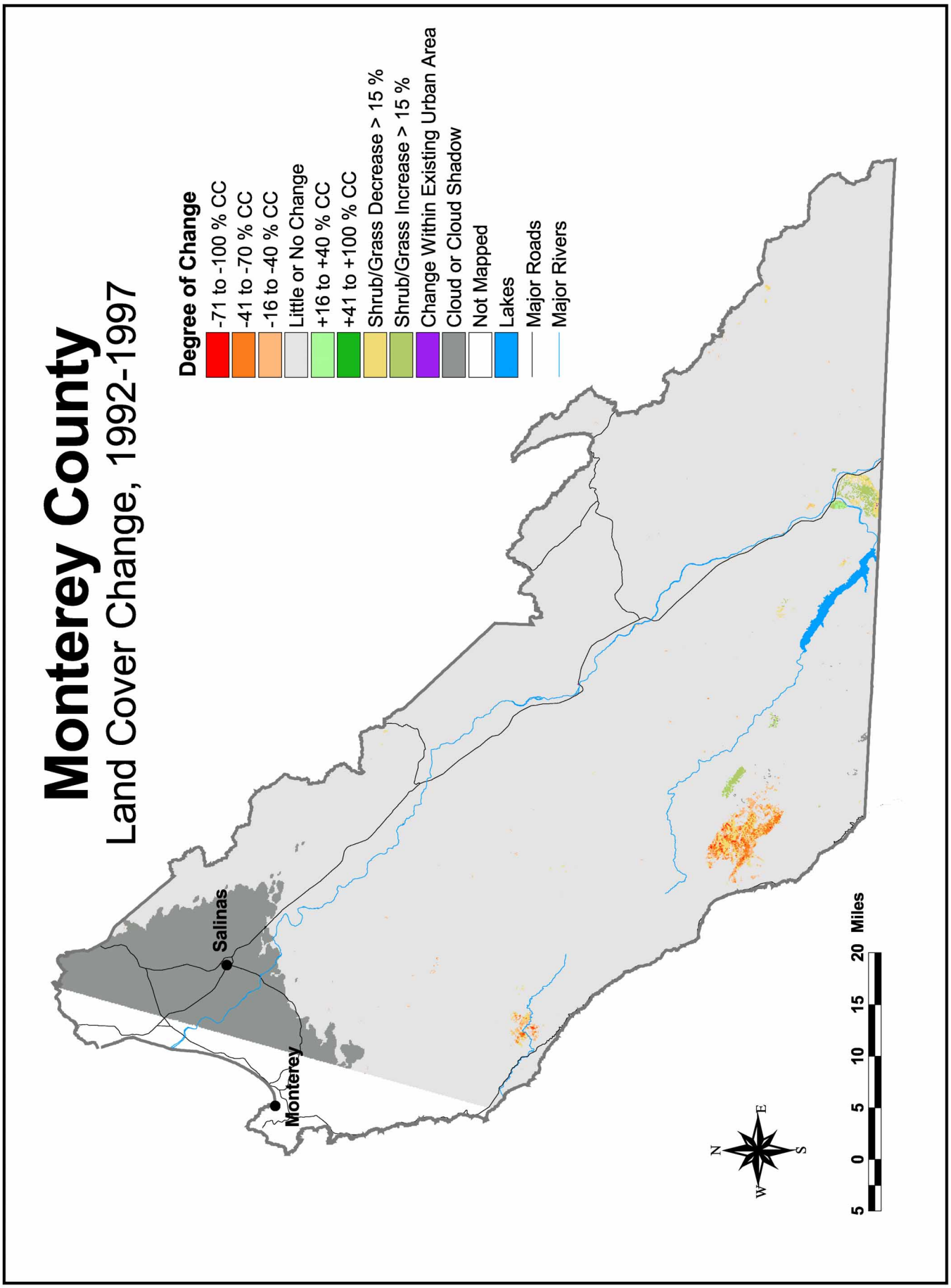

Monterey County
Land Cover Change, 1992-1997
Degree of Change
-71 to -100 % CC
-41 to -70 % CC
-16 to -40 % CC
Little or No Change
+16 to +40 % CC
+41 to +100 % CC
Shrub/Grass Decrease > 15 %
Shrub/Grass Increase > 15 %
Change Within Existing Urban Area
Cloud or Cloud Shadow
Not Mapped
Lakes
Major Roads
Major Rivers
Salinas
Monterey
N
W
E
S
5 0 5 10 15 20 Miles

Table C-16. Acres of Classified Change in Monterey County by Lifeform Type and Owner Class

	Forest Service											
	Conifer		Hardwood		Grass/ Forb		Non-Forested Other		Shrub/ Chaparral		Forest Service Total	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
-71 to -100% CC	191	0	4	0							195	0
-41 to -70% CC	1,121	2	1,200	1							2,322	1
-16 to -40% CC	1,372	3	1,523	2							2,895	1
+15 to -15% CC (little or no change)	43,457	94	78,429	97	8,184	100	433	100	163,686	98	294,189	97
+16 to +40% CC	3	0	3	0							6	0
Shrub/Grass Decrease > 15%									3,344	2	3,344	1
Shrub/Grass Increase > 15%									12	0	12	0
Non-Vegetation Change												
Cloud or Cloud Shadow									292	0	292	0
Total	46,144	100	81,159	100	8,184	100	434	100	167,333	100	303,254	100

	Other Public											
	Conifer		Hardwood		Grass/ Forb		Non-Forested Other		Shrub/ Chaparral		Other Public Total	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
-71 to -100% CC			35	0							35	0
-41 to -70% CC	21	4	2,329	2							2,351	1
-16 to -40% CC	34	6	2,481	2							2,515	1
+15 to -15% CC (little or no change)	476	90	131,423	94	58,546	83	14,084	68	62,214	90	266,742	89
+16 to +40% CC			189	0							189	0
Shrub/Grass Decrease > 15%					1,870	3			2,146	3	4,016	1
Shrub/Grass Increase > 15%					4,067	6			240	0	4,306	1
Non-Vegetation Change							194	1			194	0
Cloud or Cloud Shadow			3,776	3	6,202	9	6,309	31	4,582	7	20,869	7
Total	531	100	140,232	100	70,685	100	20,586	100	69,181	100	301,215	100

	Private											
	Conifer		Hardwood		Grass/ Forb		Non-Forested Other		Shrub/ Chaparral		Private Total	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
-71 to -100% CC	3	0									3	0
-41 to -70% CC	30	1	52	0							82	0
-16 to -40% CC	50	1	743	0							792	0
+15 to -15% CC (little or no change)	5,729	99	374,689	95	538,980	95	162,818	68	198,986	96	1,281,203	91
+16 to +40% CC			367	0							367	0
Shrub/Grass Decrease > 15%					123	0			492	0	615	0
Shrub/Grass Increase > 15%					178	0			182	0	361	0
Non-Vegetation Change							19	0			19	0
Cloud or Cloud Shadow			16,649	4	28,847	5	77,060	32	6,997	3	129,553	9
Total	5,812	100	392,499	100	568,128	100	239,897	100	206,657	100	1,412,994	100

Table C-16. Acres of Classified Change in Monterey County by Lifeform Type and Owner Class (cont.)

	All Owners											
	Conifer		Hardwood		Grass/ Forb		Non-Forested Other		Shrub/ Chaparral		All Owners Total	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
-71 to -100% CC	194	0	39	0							233	0
-41 to -70% CC	1,173	2	3,581	1							4,754	0
-16 to -40% CC	1,456	3	4,747	1							6,202	0
+15 to -15% CC (little or no change)	49,663	95	584,541	95	605,710	94	177,335	68	424,886	96	1,842,133	91
+16 to +40% CC	3	0	558	0							561	0
Shrub/Grass Decrease > 15%					1,993	0			5,981	1	7,974	0
Shrub/Grass Increase > 15%					4,245	1			434	0	4,679	0
Non-Vegetation Change							213	0			213	0
Cloud or Cloud Shadow			20,424	3	35,049	5	83,369	32	11,871	3	150,714	7
Total	52,487	100	613,890	100	646,997	100	260,917	100	443,171	100	2,017,463	100

Table C-17. Acres of Classified Change in Monterey County by Hardwood Cover Type and Owner Class

	Forest Service		Other Public		Private		All Owners	
	Acres	%	Acres	%	Acres	%	Acres	%
Blue Oak Foothill Pine								
-41 to -70% CC			6	0			6	0
-16 to -40% CC			85	0	92	0	177	0
+15 to -15% CC (little or no change)	6	0	7,165	5	42,609	11	49,780	8
+16 to +40% CC			3	0	10	0	13	0
Cloud or Cloud Shadow			82	0	81	0	163	0
Total	6	0	7,341	5	42,791	11	50,139	8
Blue Oak Woodland								
-71 to -100% CC			3	0			3	0
-41 to -70% CC	8	0	211	0	21	0	240	0
-16 to -40% CC	41	0	527	0	339	0	907	0
+15 to -15% CC (little or no change)	3,267	4	85,141	61	210,372	54	298,780	49
+16 to +40% CC			144	0	356	0	500	0
Cloud or Cloud Shadow			453	0	1,023	0	1,476	0
Total	3,315	4	86,480	62	212,111	54	301,905	49
Coastal Oak Woodland								
-71 to -100% CC			22	0			22	0
-41 to -70% CC	75	0	899	1	8	0	982	0
-16 to -40% CC	105	0	262	0	128	0	495	0
+15 to -15% CC (little or no change)	5,078	6	28,786	21	92,329	24	126,193	21
+16 to +40% CC					1	0	1	0
Cloud or Cloud Shadow			3,044	2	14,081	4	17,125	3
Total	5,258	6	33,012	24	106,548	27	144,818	24
Montane Hardwood								
-71 to -100% CC	4	0	10	0			14	0
-41 to -70% CC	1,118	1	1,213	1	13	0	2,344	0
-16 to -40% CC	1,378	2	1,606	1	143	0	3,127	1
+15 to -15% CC (little or no change)	69,965	86	9,391	7	21,447	5	100,803	16
+16 to +40% CC	3	0	41	0			44	0
Cloud or Cloud Shadow			125	0	1,063	0	1,188	0
Total	72,468	89	12,386	9	22,665	6	107,519	18
Valley Oak Woodland								
-41 to -70% CC				0	10	0	10	0
-16 to -40% CC				0	41	0	41	0
+15 to -15% CC (little or no change)	112	0	937	1	7,929	2	8,978	1
Total	112	0	937	1	7,980	2	9,029	1
Valley Foothill Riparian								
+15 to -15% CC (little or no change)			3	0	4	0	7	0
Cloud or Cloud Shadow			52	0	400	0	452	0
Total			54	0	404	0	458	0
Unknown Hardwood								
Cloud or Cloud Shadow			21	0			21	0
Total			21	0			21	0
All Hardwood	81,159	100	140,232	100	392,499	100	613,890	100

Table C-18. Acres of Classified Change in Monterey County by Conifer Cover Type and Owner Class

	Forest Service		Other Public		Private		All Owners	
	Acres	%	Acres	%	Acres	%	Acres	%
Douglas Fir								
+15 to -15% CC (little or no change)	1,215	3			5	0	1,220	2
Total	1,215	3			5	0	1,220	2
Montane Hardwoods Conifer								
-71 to -100% CC	187	0			3	0	189	0
-41 to -70% CC	931	2	20	4	23	0	974	2
-16 to -40% CC	805	2	14	3	37	1	856	2
+15 to -15% CC (little or no change)	25,676	56	85	16	1,399	24	27,161	52
Total	27,599	60	119	22	1,462	25	29,180	56
Ponderosa Pine								
-41 to -70% CC	80	0					80	0
-16 to -40% CC	274	1	14	3	2	0	290	1
+15 to -15% CC (little or no change)	9,964	22	10	2	1,031	18	11,004	21
Total	10,318	22	24	5	1,032	18	11,375	22
Redwood								
-71 to -100% CC	4	0					4	0
-41 to -70% CC	110	0	1	0	8	0	118	0
-16 to -40% CC	293	1	6	1	11	0	310	1
+15 to -15% CC (little or no change)	6,602	14	381	72	3,294	57	10,278	20
+16 to +40% CC	3	0					3	0
Total	7,012	15	388	73	3,313	57	10,713	20
All Conifer	46,144	100	531	100	5,812	100	52,487	100

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

	Forest Service		Other Public		Private		All Owners	
	Acres	%	Acres	%	Acres	%	Acres	%
Chamise - Redshank Chaparral								
Shrub/Grass Decrease > 15 %	171	0	189	0	1	0	361	0
+15 to -15 % CC (Little or No Change)	16,226	10	798	1	3,267	2	20,290	5
Cloud or Cloud Shadow					512	0	512	0
Total	16,397	10	987	1	3,780	2	21,164	5
Coastal Scrub								
Shrub/Grass Decrease > 15 %	79	0			5	0	84	0
+15 to -15 % CC (Little or No Change)	10,018	6	302	0	1,904	1	12,224	3
Cloud or Cloud Shadow			1	0	11	0	12	0
Total	10,098	6	303	0	1,919	1	12,320	3
Mixed Chaparral								
Shrub/Grass Decrease > 15 %	33	0	28	0	2	0	63	0
+15 to -15 % CC (Little or No Change)	673	0	337	0	1,666	1	2,676	1
Total	706	0	365	1	1,668	1	2,739	1
Montane Chaparral								
Shrub/Grass Decrease > 15 %	3,060	2	66	0	31	0	3,157	1
+15 to -15 % CC (Little or No Change)	136,528	82	709	1	8,598	4	145,836	33
Shrub/Grass Increase > 15 %	12	0					12	0
Cloud or Cloud Shadow	292	0	0	0	95	0	387	0
Total	139,892	84	776	1	8,725	4	149,392	34
Undetermined Shrub/Chaparral								
Shrub/Grass Decrease > 15 %			1,863	3	453	0	2,316	1
+15 to -15 % CC (Little or No Change)	241	0	60,068	87	183,552	89	243,860	55
Shrub/Grass Increase > 15 %			240	0	182	0	422	0
Cloud or Cloud Shadow			4,581	7	6,378	3	10,959	2
Total	241	0	66,751	96	190,565	92	257,557	58
All Shrub/Chaparral	167,333	100	69,181	100	206,657	100	443,171	100

Table C-20. Acres of Verified Change in Monterey County by Cause and Hardwood Cover Type

	Wildfire	Unknown Cause	All Causes
Blue Oak Foothill Pine			
-41 to -70% CC	6		6
-16 to -40% CC	79	98	177
+16 to +40% CC		13	13
Total	86	111	196
Blue Oak Woodland			
-71 to -100% CC		3	3
-41 to -70% CC	215	24	240
-16 to -40% CC	420	487	907
+16 to +40% CC		500	500
Total	635	1,014	1,649
Coastal Oak Woodland			
-71 to -100% CC	22		22
-41 to -70% CC	975	7	982
-16 to -40% CC	399	96	495
+16 to +40% CC		1	1
Total	1,396	105	1,500
Montane Hardwood			
-71 to -100% CC	14		14
-41 to -70% CC	2,344		2,344
-16 to -40% CC	3,120	7	3,127
+16 to +40% CC		44	44
Total	5,478	51	5,529
Valley Oak Woodland			
-41 to -70% CC		10	10
-16 to -40% CC		41	41
Total		51	51
All Hardwood	7,594	1,331	8,925

Table C-21. Acres of Verified Change in Monterey County by Cause and Conifer Cover Type

	Wildfire	Unknown Cause	All Causes
Montane Hardwoods Conifer			
-71 to -100% CC	189		189
-41 to -70% CC	974		974
-16 to -40% CC	853	3	856
Total	2,017	3	2,019
Ponderosa Pine			
-41 to -70% CC	80		80
-16 to -40% CC	287	3	290
Total	367	3	370
Redwood			
-71 to -100% CC	4		4
-41 to -70% CC	118		118
-16 to -40% CC	310		310
+16 to +40% CC		3	3
Total	432	3	435
All Conifer	2,816	9	2,825

Table C-22. Acres of Verified Change in Monterey County by Cause and Shrub/Chaparral Cover Type

	Wildfire	Unknown Cause	All Causes
Chanise - Redshank Chaparral			
Shrub/Grass Decrease > 15 %	355	7	361
Total	355	7	361
Coastal Scrub			
Shrub/Grass Decrease > 15 %	84		84
Total	84		84
Mixed Chaparral			
Shrub/Grass Decrease > 15 %	58	4	63
Total	58	4	63
Montane Chaparral			
Shrub/Grass Decrease > 15 %	3,024	133	3,157
Shrub/Grass Increase > 15 %		12	12
Total	3,024	145	3,169
Undetermined Shrub/Chaparral			
Shrub/Grass Decrease > 15 %	1,672	645	2,316
Shrub/Grass Increase > 15 %		422	422
Total	1,672	1,067	2,738
All Shrub/Chaparral	5,193	1,222	6,415

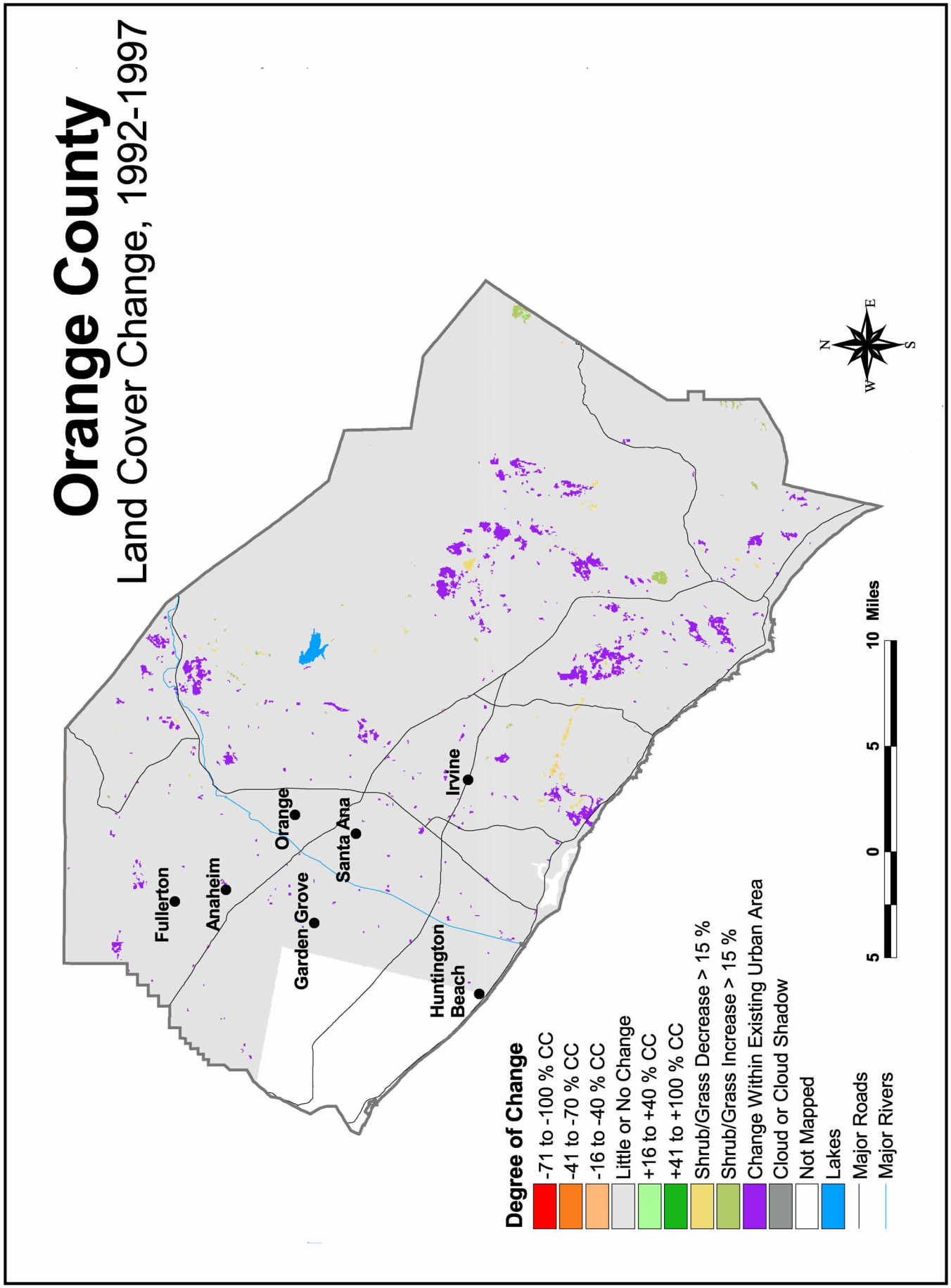

Orange County
Land Cover Change, 1992-1997
Fullerton
Anaheim
Garden Grove
Orange
Santa Ana
Irvine
Huntington Beach
N
E
S
W
5
0
5
10 Miles
Degree of Change
-71 to -100 % CC
-41 to -70 % CC
-16 to -40 % CC
Little or No Change
+16 to +40 % CC
+41 to +100 % CC
Shrub/Grass Decrease > 15 %
Shrub/Grass Increase > 15 %
Change Within Existing Urban Area
Cloud or Cloud Shadow
Not Mapped
Lakes
Major Roads
Major Rivers

Table C-23. Acres of Classified Change in Orange County by Lifeform Type and Owner Class

	Forest Service											
	Conifer		Hardwood		Grass/ Forb		Non-Forested Other		Shrub/ Chaparral		Forest Service Total	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
-41 to -70% CC												
-16 to -40% CC			3	0							3	0
+15 to -15% CC (little or no change)	1,346	100	4,382	100	35	100	86	100	48,349	100	54,198	100
+16 to +40% CC			2	0							2	0
Shrub/Grass Decrease > 15%									10	0	10	0
Shrub/Grass Increase > 15%									144	0	144	0
Non-Vegetation Change												
Total	1,346	100	4,387	100	35	100	86	100	48,503	100	54,358	100

	Other Public											
	Conifer		Hardwood		Grass/ Forb		Non-Forested Other		Shrub/ Chaparral		Other Public Total	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
-41 to -70% CC												
-16 to -40% CC	7	0							7	0	7	0
+15 to -15% CC (little or no change)	1,620	100	4,397	100	7,371	99	9,037	100	22,425	99	1,620	100
+16 to +40% CC												
Shrub/Grass Decrease > 15%							11	0	11	0		
Shrub/Grass Increase > 15%			4	0			11	0	15	0		
Non-Vegetation Change					106	1			106	0		
Total	1,627	100	4,401	100	7,477	100	9,059	100	22,564	100	1,627	100

	Private											
	Conifer		Hardwood		Grass/ Forb		Non-Forested Other		Shrub/ Chaparral		Private Total	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
-41 to -70% CC			2	0							2	0
-16 to -40% CC			54	1							54	0
+15 to -15% CC (little or no change)	69	100	7,668	99	41,298	99	248,953	96	89,362	99	387,349	97
+16 to +40% CC			18	0							18	0
Shrub/Grass Decrease > 15%					76	0			719	1	796	0
Shrub/Grass Increase > 15%					241	1			425	0	666	0
Non-Vegetation Change							9,325	4			9,325	2
Total	69	100	7,741	100	41,615	100	258,278	100	90,507	100	398,210	100

	All Owners											
	Conifer		Hardwood		Grass/ Forb		Non-Forested Other		Shrub/ Chaparral		All Owners Total	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
-41 to -70% CC			2	0							2	
-16 to -40% CC			63	0							63	0
+15 to -15% CC (little or no change)	1,415	100	13,670	99	45,730	99	256,410	96	146,747	99	463,972	98
+16 to +40% CC			20	0							20	0
Shrub/Grass Decrease > 15%					76	0			740	0	816	0
Shrub/Grass Increase > 15%					245	1			581	0	826	0
Non-Vegetation Change							9,431	4			9,431	2
Total	1,415	100	13,756	100	46,051	100	265,840	100	148,068	100	475,131	100

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

	Forest Service		Other Public		Private		All Owners	
	Acres	%	Acres	%	Acres	%	Acres	%
Coastal Oak Woodland								
-41 to -70% CC					2	0	2	0
-16 to -40% CC	3	0	3	0	49	1	55	0
+15 to -15% CC (little or no change)	2,359	54	1,207	74	7,045	91	10,611	77
+16 to +40% CC	2	0			18	0	20	0
Total	2,364	54	1,211	74	7,114	92	10,688	78
Montane Hardwood								
+15 to -15% CC (little or no change)	2,023	46			24	0	2,047	15
Total	2,023	46			24	0	2,047	15
Valley Oak Woodland								
-16 to -40% CC					5	0	5	0
+15 to -15% CC (little or no change)			140	9	346	4	486	4
Total			140	9	350	5	490	4
Valley Foothill Riparian								
-16 to -40% CC			4	0		0	4	0
+15 to -15% CC (little or no change)			273	17	254	3	526	4
Total			276	17	254	3	530	4
All Hardwood	4,387	100	1,627	100	7,741	100	13,756	100

Table C-25. Acres of Classified Change in Orange County by Conifer Cover Type and Owner Class

	Forest Service		Private		All Owners	
	Acres	%	Acres	%	Acres	%
Closed Cone Pine - Cypress						
+15 to -15% CC (little or no change)			6	8	6	0
Total			6	8	6	0
Montane Hardwoods Conifer						
+15 to -15% CC (little or no change)	1,346	100	63	92	1,409	100
Total	1,346	100	63	92	1,409	100
All Conifer	1,346	100	69	100	1,415	100

Table C-26. Acres of Classified Change in Orange County by Shrub/Chaparral Cover Type and Owner Class

	Forest Service		Other Public		Private		All Owners	
	Acres	%	Acres	%	Acres	%	Acres	%
Chamise-Redshank Chaparral								
Shrub/Grass Decrease > 15 %					23	0	23	0
+15 to -15 % CC (Little or No Change)	10,185	21	933	10	11,656	13	22,773	15
Shrub/Grass Increase > 15 %	12	0		0	81	0	93	0
Total	10,197	21	933	10	11,760	13	22,889	15
Coastal Scrub								
Shrub/Grass Decrease > 15 %			1	0	10	0	11	0
+15 to -15 % CC (Little or No Change)	3,778	8	484	5	2,559	3	6,820	5
Shrub/Grass Increase > 15 %					2	0	2	0
Total	3,778	8	485	5	2,571	3	6,834	5
Mixed Chaparral								
Shrub/Grass Decrease > 15 %			4	0	34	0	37	0
+15 to -15 % CC (Little or No Change)	3,539	7	1,013	11	8,115	9	12,667	9
Shrub/Grass Increase > 15 %					114	0	114	0
Total	3,539	7	1,017	11	8,262	9	12,818	9
Montane Chaparral								
Shrub/Grass Decrease > 15 %	10	0					10	0
+15 to -15 % CC (Little or No Change)	30,848	64	484	5	9,544	11	40,876	28
Shrub/Grass Increase > 15 %	133	0			162	0	295	0
Total	30,991	64	484	5	9,706	11	41,181	28
Undetermined Shrub/Chaparral								
Shrub/Grass Decrease > 15 %			6	0	653	1	659	0
+15 to -15 % CC (Little or No Change)			6,123	68	57,489	64	63,611	43
Shrub/Grass Increase > 15 %			11	0	66	0	78	0
Total			6,140	68	58,208	64	64,347	43
All Shrub/Chaparral	48,503	100	9,059	100	90,507	100	148,068	100

Table C-27. Acres of Verified Change in Orange County by Cause and Hardwood Cover Type

	Development	Regeneration	Unknown Cause	All Causes
Coastal Oak Woodland				
-41 to -70% CC			2	2
-16 to -40% CC	34		21	55
+16 to +40% CC		18	2	20
Total	34	18	25	77
Valley Oak Woodland				
-16 to -40% CC			5	5
Total			5	5
Valley Foothill Riparian				
-16 to -40% CC			4	4
Total			4	4
All Hardwood	34	18	33	86

Table C-28. Acres of Verified Change in Orange County by Cause and Shrub/Chaparral Cover Type

	Development	Regeneration	Unknown Cause	All Causes
Chamise-Redshank Chaparral				
Shrub/Grass Decrease > 15 %			23	23
Shrub/Grass Increase > 15 %		27	66	93
Total		27	89	116
Coastal Scrub				
Shrub/Grass Decrease > 15 %	2		9	11
Shrub/Grass Increase > 15 %			2	2
Total	2		11	13
Mixed Chaparral				
Shrub/Grass Decrease > 15 %	25		12	37
Shrub/Grass Increase > 15 %		50	63	114
Total	25	50	75	151
Montane Chaparral				
Shrub/Grass Decrease > 15 %			10	10
Shrub/Grass Increase > 15 %		294	1	295
Total		294	11	305
Undetermined Shrub/Chaparral				
Shrub/Grass Decrease > 15 %	318		341	659
Shrub/Grass Increase > 15 %		10	67	78
Total	318	10	408	736
All Shrub/Chaparral	345	382	594	1,321

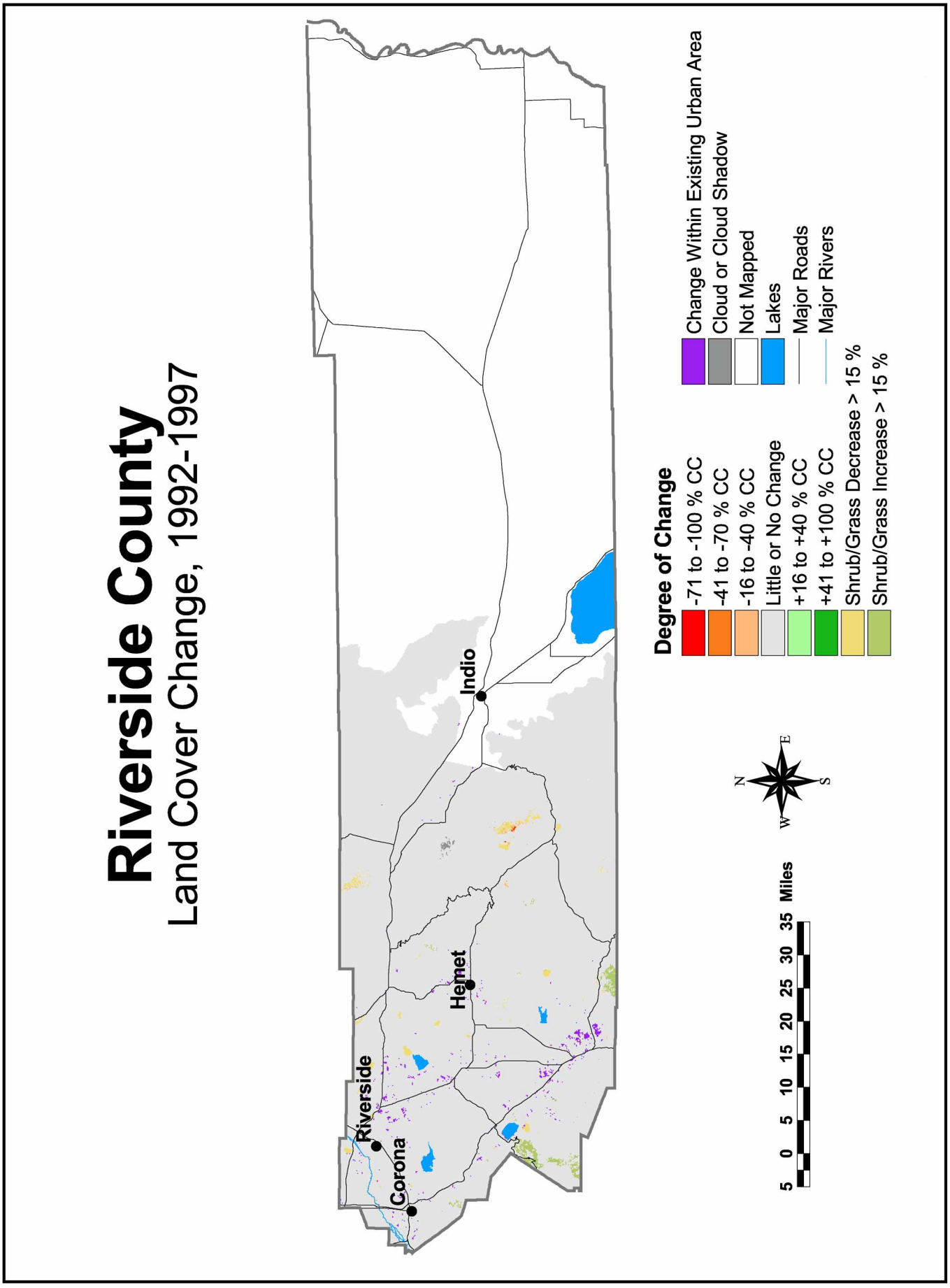

Riverside County
Land Cover Change, 1992-1997
Degree of Change
-71 to -100 % CC
-41 to -70 % CC
-16 to -40 % CC
Little or No Change
+16 to +40 % CC
+41 to +100 % CC
Shrub/Grass Decrease > 15 %
Shrub/Grass Increase > 15 %
Change Within Existing Urban Area
Cloud or Cloud Shadow
Not Mapped
Lakes
Major Roads
Major Rivers
N
E
S
W
5 0 5 10 15 20 25 30 35 Miles
Riverside
Corona
Hemet
Indio

Table C-29. Acres of Classified Change in Riverside County by Lifeform Type and Owner Class

	Forest Service											
	Conifer		Hardwood		Grass/ Forb		Non-Forested Other		Shrub/ Chaparral		Forest Service Total	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
-71 to -100% CC	34	0	21	0							55	0
-41 to -70% CC	60	0	8	0							68	0
-16 to -40% CC	442	1	139	1							582	0
+15 to -15% CC (little or no change)	49,406	99	11,163	97	2,130	100	2,127	100	209,205	94	274,031	95
+16 to +40% CC	22	0	127	1							149	0
Shrub/Grass Decrease > 15%					1	0			3,194	1	3,195	1
Shrub/Grass Increase > 15%									10,558	5	10,558	4
Non-Vegetation Change							4	0			4	0
Cloud or Cloud Shadow												
Total	49,965	100	11,459	100	2,131	100	2,131	100	222,957	100	288,643	100

	Other Public											
	Conifer		Hardwood		Grass/ Forb		Non-Forested Other		Shrub/ Chaparral		Other Public Total	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
-71 to -100% CC			5	0							5	0
-41 to -70% CC			61	1							61	0
-16 to -40% CC	26	0	118	3							144	0
+15 to -15% CC (little or no change)	53,120	100	4,269	96	26,097	98	28,389	99	399,472	99	511,347	99
+16 to +40% CC			9	0							9	0
Shrub/Grass Decrease > 15%					580	2			2,709	1	3,289	1
Shrub/Grass Increase > 15%					24	0			120	0	144	0
Non-Vegetation Change							302	1			302	0
Cloud or Cloud Shadow									116	0	116	0
Total	53,146	100	4,461	100	26,701	100	28,691	100	402,417	100	515,416	100

	Private											
	Conifer		Hardwood		Grass/ Forb		Non-Forested Other		Shrub/ Chaparral		Private Total	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
-71 to -100% CC	29	0	36	0							65	0
-41 to -70% CC	40	0	36	0							76	0
-16 to -40% CC	223	1	65	0							288	0
+15 to -15% CC (little or no change)	19,917	99	13,813	99	129,371	99	428,424	98	584,832	99	1,176,357	99
+16 to +40% CC			29	0							29	0
Shrub/Grass Decrease > 15%					613	0		0	4,392	1	5,005	0
Shrub/Grass Increase > 15%					126	0		0	1,319	0	1,445	0
Non-Vegetation Change							9,850	2			9,850	1
Cloud or Cloud Shadow									837	0	837	0
Total	20,210	100	13,978	100	130,110	100	438,273	100	591,380	100	1,193,951	100

Table C-29. Acres of Classified Change in Riverside County by Lifeform Type and Owner Class (cont.)

	All Owners											
	Conifer		Hardwood		Grass/ Forb		Non-Forested Other		Shrub/ Chaparral		All Owners Total	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
-71 to -100% CC	63	0	62	0							125	0
-41 to -70% CC	100	0	105	0							205	0
-16 to -40% CC	692	1	322	1							1,014	0
+15 to -15% CC (little or no change)	122,444	99	29,245	98	157,598	99	458,940	98	1,193,509	98	1,961,735	98
+16 to +40% CC	23	0	164	1							187	0
Shrub/Grass Decrease > 15%					1,194	1			10,295	1	11,489	1
Shrub/Grass Increase > 15%					150	0			11,997	1	12,147	1
Non-Vegetation Change							10,156	2			10,156	1
Cloud or Cloud Shadow									953	0	953	0
Total	123,321	100	29,898	100	158,942	100	469,096	100	1,216,754	100	1,998,010	100

Table C-30. Acres of Classified Change in Riverside County by Hardwood Cover Type and Owner Class

	Forest Service		Other Public		Private		All Owners	
	Acres	%	Acres	%	Acres	%	Acres	%
Coastal Oak Woodland								
-16 to -40% CC	16	0	12	0	29	0	57	0
+15 to -15% CC (little or no change)	3,483	30	1,033	23	11,123	80	15,638	52
+16 to +40% CC	124	1			28	0	152	1
Total	3,623	32	1,045	23	11,180	80	15,848	53
Montane Hardwood								
-71 to -100% CC	21	0					21	0
-41 to -70% CC	8	0					8	0
-16 to -40% CC	123	1	29	1			152	1
+15 to -15% CC (little or no change)	7,658	67	936	21	845	6	9,438	32
+16 to +40% CC	2	0					2	0
Total	7,813	68	965	22	845	6	9,622	32
Montane Riparian								
-71 to -100% CC					15	0	15	0
-16 to -40% CC					1	0	1	0
+15 to -15% CC (little or no change)	23	0	29	1	58	0	110	0
Total	23	0	29	1	75	1	126	0
Valley Foothill Riparian								
-71 to -100% CC			5	0	21	0	26	0
-41 to -70% CC			61	1	36	0	97	0
-16 to -40% CC			77	2	34	0	111	0
+15 to -15% CC (little or no change)			2,271	51	1,787	13	4,058	14
+16 to +40% CC			9	0	1	0	9	0
Total			2,422	54	1,879	13	4,301	14
All Hardwood	11,459	100	4,461	100	13,978	100	29,898	100

Table C-31. Acres of Classified Change in Riverside 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	1	0			43	0	43	0
+15 to -15% CC (little or no change)	1,141	2	6,005	11	4,553	23	11,699	9
Total	1,142	2	6,005	11	4,596	23	11,743	10
Montane Hardwoods Conifer								
-71 to -100% CC	6	0					6	0
-41 to -70% CC	16	0			4	0	20	0
-16 to -40% CC	42	0			44	0	86	0
+15 to -15% CC (little or no change)	13,317	27	104	0	2,952	15	16,373	13
+16 to +40% CC	22	0			0	0	23	0
Total	13,403	27	104	0	3,001	15	16,508	13
Pinyon - Juniper								
-41 to -70% CC	12	0			6	0	19	0
-16 to -40% CC	202	0			56	0	258	0
+15 to -15% CC (little or no change)	9,296	19	35,177	66	4,811	24	49,283	40
Total	9,510	19	35,177	66	4,874	24	49,560	40
Subalpine Conifer								
+15 to -15% CC (little or no change)	51	0	2,040	4			2,092	2
Total	51	0	2,040	4			2,092	2
Sierran Mixed Conifer								
-71 to -100% CC	28	0			28	0	56	0
-41 to -70% CC	32	0			30	0	61	0
-16 to -40% CC	198	0	26	0	81	0	304	0
+15 to -15% CC (little or no change)	25,601	51	9,795	18	7,601	38	42,997	35
Total	25,858	52	9,821	18	7,739	38	43,419	35
All Conifer	49,965	100	53,146	100	20,210	100	123,321	100

Table C-32. Acres of Classified Change in Riverside County by Shrub/Chaparral Cover Type and Owner Class

	Forest Service		Other Public		Private		All Owners	
	Acres	%	Acres	%	Acres	%	Acres	%
Chamise - Redshank Chaparral								
Shrub/Grass Decrease > 15 %	1,738	1	544	0	584	0	2,866	0
+15 to -15 % CC (Little or No Change)	88,487	40	52,190	13	62,745	11	203,422	17
Shrub/Grass Increase > 15 %	3,473	2	43	0	574	0	4,089	0
Total	93,698	42	52,776	13	63,903	11	210,376	17
Coastal Scrub								
Shrub/Grass Decrease > 15 %	105	0	131	0	97	0	333	0
+15 to -15 % CC (Little or No Change)	11,435	5	705	0	3,774	1	15,914	1
Shrub/Grass Increase > 15 %	2	0			3	0	4	0
Total	11,542	5	835	0	3,874	1	16,252	1
Desert Scrub								
+15 to -15 % CC (Little or No Change)	6,522	3	104,661	26	46,937	8	158,120	13
Total	6,522	3	104,661	26	46,937	8	158,120	13
Desert Succulent Scrub								
+15 to -15 % CC (Little or No Change)			1,829	0	15,071	3	16,900	1
Total			1,829	0	15,071	3	16,900	1
Desert Wash								
+15 to -15 % CC (Little or No Change)			12	0	2,764	0	2,775	0
Total			12	0	2,764	0	2,775	0
Mixed Chaparral								
Shrub/Grass Decrease > 15 %	300	0	674	0	393	0	1,367	0
+15 to -15 % CC (Little or No Change)	23,971	11	37,909	9	30,737	5	92,617	8
Shrub/Grass Increase > 15 %	258	0			15	0	273	0
Cloud or Cloud Shadow			95	0	696	0	791	0
Total	24,529	11	38,678	10	31,841	5	95,048	8
Montane Chaparral								
Shrub/Grass Decrease > 15 %	1,047	0	484	0	299	0	1,830	0
+15 to -15 % CC (Little or No Change)	74,954	34	8,855	2	20,943	4	104,752	9
Shrub/Grass Increase > 15 %	6,826	3	19	0	561	0	7,405	1
Cloud or Cloud Shadow			21	0			21	0
Total	82,827	37	9,379	2	21,803	4	114,008	9
Sagebrush								
Shrub/Grass Decrease > 15 %	3	0			10	0	13	0
+15 to -15 % CC (Little or No Change)	3,617	2	5,546	1	9,021	2	18,184	1
Total	3,620	2	5,546	1	9,031	2	18,197	1
Undetermined Shrub/Chaparral								
Shrub/Grass Decrease > 15 %			877	0	3,009	1	3,886	0
+15 to -15 % CC (Little or No Change)	220	0	187,765	47	392,841	66	580,826	48
Shrub/Grass Increase > 15 %			59	0	166	0	225	0
Cloud or Cloud Shadow					141	0	141	0
Total	220	0	188,701	47	396,157	67	585,078	48
All Shrub/Chaparral	222,957	100	402,417	100	591,380	100	1,216,754	100

Table C-33. Acres of Verified Change in Riverside County by Cause and Hardwood Cover Type

	Wildfire	Regeneration	Unknown Cause	All Causes
Coastal Oak Woodland				
-16 to -40% CC	39		18	57
+16 to +40% CC		150	2	152
Total	39	150	20	209
Montane Hardwood				
-71 to -100% CC	21			21
-41 to -70% CC	8			8
-16 to -40% CC	152			152
+16 to +40% CC		2		2
Total	182	2		184
Montane Riparian				
-71 to -100% CC	15			15
-16 to -40% CC	1			1
Total	17			17
Valley Foothill Riparian				
-71 to -100% CC			26	26
-41 to -70% CC			97	97
-16 to -40% CC			111	111
+16 to +40% CC			9	9
Total			243	243
All Hardwood	238	152	263	653

Table C-34. Acres of Verified Change in Riverside County by Cause and Conifer Cover Type

	Wildfire	Regeneration	Unknown Cause	All Causes
Jeffrey Pine				
-16 to -40% CC	43			43
Total	43			43
Montane Hardwoods Conifer				
-71 to -100% CC	6			6
-41 to -70% CC	20			20
-16 to -40% CC	86			86
+16 to +40% CC		23		23
Total	112	23		135
Pinyon - Juniper				
-71 to -100% CC	0			0
-41 to -70% CC	19			19
-16 to -40% CC	258			258
Total	277			277
Sierran Mixed Conifer				
-71 to -100% CC	56			56
-41 to -70% CC	61			61
-16 to -40% CC	301		4	304
Total	418		4	422
All Conifer	851	23	4	877

Table C-35. Acres of Verified Change in Riverside County by Cause and Shrub/Chaparral Cover Type

	Wildfire	Development	Regeneration	Unknown Cause	All Causes
Chamise - Redshank Chaparral					
Shrub/Grass Decrease > 15 %	2,794	10		62	2,866
Shrub/Grass Increase > 15 %			3,820	269	4,089
Total	2,794	10	3,820	331	6,955
Coastal Scrub					
Shrub/Grass Decrease > 15 %	325	0		8	333
Shrub/Grass Increase > 15 %			2	3	4
Total	325	0	2	10	337
Mixed Chaparral					
Shrub/Grass Decrease > 15 %	1,323			44	1,367
Shrub/Grass Increase > 15 %			247	26	273
Total	1,323		247	70	1,641
Montane Chaparral					
Shrub/Grass Decrease > 15 %	1,744	36		51	1,830
Shrub/Grass Increase > 15 %			7,364	41	7,405
Total	1,744	36	7,364	92	9,235
Sagebrush					
Shrub/Grass Decrease > 15 %	10			3	13
Total	10			3	13
Undetermined Shrub/Chaparral					
Shrub/Grass Decrease > 15 %	3,363	23		501	3,886
Shrub/Grass Increase > 15 %				225	225
Total	3,363	23		726	4,111
All Shrub/Chaparral	9,558	69	11,433	1,232	22,292

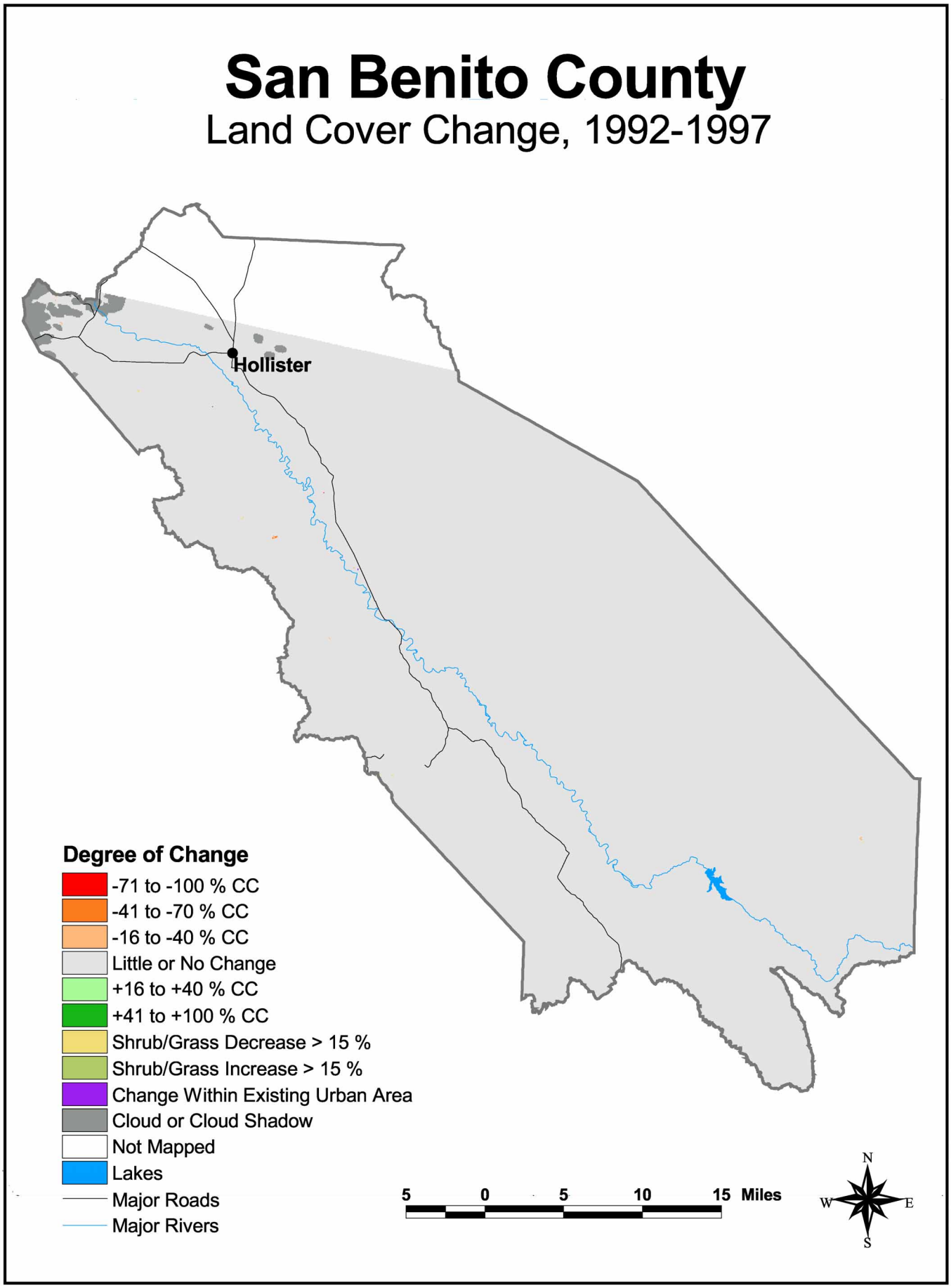

San Benito County
Land Cover Change, 1992-1997
Hollister
Degree of Change
-71 to -100 % CC
-41 to -70 % CC
-16 to -40 % CC
Little or No Change
+16 to +40 % CC
+41 to +100 % CC
Shrub/Grass Decrease > 15 %
Shrub/Grass Increase > 15 %
Change Within Existing Urban Area
Cloud or Cloud Shadow
Not Mapped
Lakes
Major Roads
Major Rivers
5 0 5 10 15 Miles
N
W
E
S

Table C-36. Acres of Classified Change in San Benito County by Lifeform Type and Owner Class

	Other Public											
	Conifer		Hardwood		Grass/ Forb		Non-Forested Other		Shrub/ Chaparral		Other Public Total	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
-71 to -100% CC												
-41 to -70% CC												
-16 to -40% CC												
+15 to -15% CC (little or no change)	5	100	51,250	100	38,032	100	4,398	100	37,425	100	131,110	100
Shrub/Grass Decrease > 15%									10	0	10	0
Non-Vegetation Change												
Cloud or Cloud Shadow												
Total	5	100	51,250	100	38,032	100	4,398	100	37,435	100	131,120	100

	Private											
	Conifer		Hardwood		Grass/ Forb		Non-Forested Other		Shrub/ Chaparral		Private Total	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
-71 to -100% CC			3	0							3	0
-41 to -70% CC			11	0							11	0
-16 to -40% CC			82	0							82	0
+15 to -15% CC (little or no change)	1,072	100	183,269	99	364,023	100	53,942	94	78,165	100	680,471	99
Shrub/Grass Decrease > 15%					1	0			52	0	53	0
Non-Vegetation Change							29	0			29	0
Cloud or Cloud Shadow			1,275	1	1,742	0	3,200	6	322	0	6,539	1
Total	1,072	100	184,640	100	365,766	100	57,171	100	78,539	100	687,187	100

	All Owners											
	Conifer		Hardwood		Grass/ Forb		Non-Forested Other		Shrub/ Chaparral		All Owners Total	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
-71 to -100% CC			3	0							3	0
-41 to -70% CC			11	0							11	0
-16 to -40% CC			82	0							82	0
+15 to -15% CC (little or no change)	1,077	100	234,518	99	402,055	100	58,340	95	115,590	100	811,581	99
Shrub/Grass Decrease > 15%					1	0			62	0	63	0
Non-Vegetation Change							29	0			29	0
Cloud or Cloud Shadow			1,275	1	1,742	0	3,200	5	322	0	6,539	1
Total	1,077	100	235,889	100	403,798	100	61,569	100	115,974	100	818,307	100

Table C-37. Acres of Classified Change in San Benito County by Hardwood Cover Type and Owner Class

	Other Public		Private		All Owners	
	Acres	%	Acres	%	Acres	%
Blue Oak Foothill Pine						
-71 to -100% CC			1	0	1	0
-16 to -40% CC			9	0	9	0
+15 to -15% CC (little or no change)	39,939	78	77,984	42	117,923	50
Total	39,939	78	77,994	42	117,932	50
Blue Oak Woodland						
-71 to -100% CC			2	0	2	0
-41 to -70% CC			11	0	11	0
-16 to -40% CC			33	0	33	0
+15 to -15% CC (little or no change)	9,336	18	79,209	43	88,545	38
Total	9,336	18	79,255	43	88,591	38
Coastal Oak Woodland						
-16 to -40% CC			37	0	37	0
+15 to -15% CC (little or no change)	1,718	3	22,551	12	24,269	10
Cloud or Cloud Shadow			1,201	1	1,201	1
Total	1,718	3	23,789	13	25,507	11
Montane Hardwood						
-16 to -40% CC			1	0	1	0
+15 to -15% CC (little or no change)	214	0	1,306	1	1,519	1
Total	214	0	1,307	1	1,521	1
Valley Oak Woodland						
+15 to -15% CC (little or no change)	44	0	2,165	1	2,209	1
Total	44	0	2,165	1	2,209	1
Valley Foothill Riparian						
-16 to -40% CC			2	0	2	0
+15 to -15% CC (little or no change)			24	0	24	0
Cloud or Cloud Shadow			41	0	41	0
Total			67	0	67	0
Undetermined Hardwood						
+15 to -15% CC (little or no change)			29	0	29	0
Cloud or Cloud Shadow			33	0	33	0
Total			62	0	62	0
All Hardwood	51,250	100	184,640	100	235,889	100

Table C-38. Acres of Classified Change in San Benito County by Conifer Cover Type and Owner Class

	Other Public		Private		All Owners	
	Acres	%	Acres	%	Acres	%
Jeffrey Pine						
+15 to -15% CC (little or no change)	3	63	1	0	4	0
Total	3	63	1	0	4	0
Montane Hardwoods Conifer						
+15 to -15% CC (little or no change)			1,071	100	1,071	99
Total			1,071	100	1,071	99
Sierran Mixed Conifer						
+15 to -15% CC (little or no change)	2	37			2	0
Total	2	37			2	0
All Conifer	5	100	1,072	100	1,077	100

Table C-39. Acres of Classified Change in San Benito County by Shrub/Chaparral Cover Type and Owner Class

	Other Public		Private		All Owners	
	Acres	%	Acres	%	Acres	%
Chamise - Redshank Chaparral						
Shrub/Grass Decrease > 15 %	3	0	6	0	9	0
+15 to -15 % CC (Little or No Change)	524	1	1,758	2	2,281	2
Total	527	1	1,764	2	2,291	2
Coastal Scrub						
+15 to -15 % CC (Little or No Change)			181	0	181	0
Total			181	0	181	0
Mixed Chaparral						
+15 to -15 % CC (Little or No Change)	16	0	369	0	385	0
Total	16	0	369	0	385	0
Undetermined Shrub/Chaparral						
Shrub/Grass Decrease > 15 %	7	0	46	0	53	0
+15 to -15 % CC (Little or No Change)	36,885	99	75,857	97	112,743	97
Cloud or Cloud Shadow			322	0	322	0
Total	36,892	99	76,225	97	113,118	98
All Shrub/Chaparral	37,435	100	78,539	100	115,974	100

Table C-40. Acres of Verified Change in San Benito County by Cause and Hardwood Cover Type

	Unknown Cause	All Causes
Blue Oak Foothill Pine		
-71 to -100% CC	1	1
-16 to -40% CC	9	9
Total	9	9
Blue Oak Woodland		
-71 to -100% CC	2	2
-41 to -70% CC	11	11
-16 to -40% CC	33	33
Total	46	46
Coastal Oak Woodland		
-16 to -40% CC	37	37
Total	37	37
Montane Hardwood		
-16 to -40% CC	1	1
Total	1	1
Valley Foothill Riparian		
-16 to -40% CC	2	2
Total	2	2
All Hardwood	96	96

Table C-41. Acres of Verified Change in San Benito County by Cause and Shrub/Chaparral Cover Type

	Unknown Cause	All Causes
Chamise - Redshank Chaparral		
Shrub/Grass Decrease > 15 %	9	9
Total	9	9
Undetermined Shrub/Chaparral		
Shrub/Grass Decrease > 15 %	53	53
Total	53	53
All Shrub/Chaparral	62	62

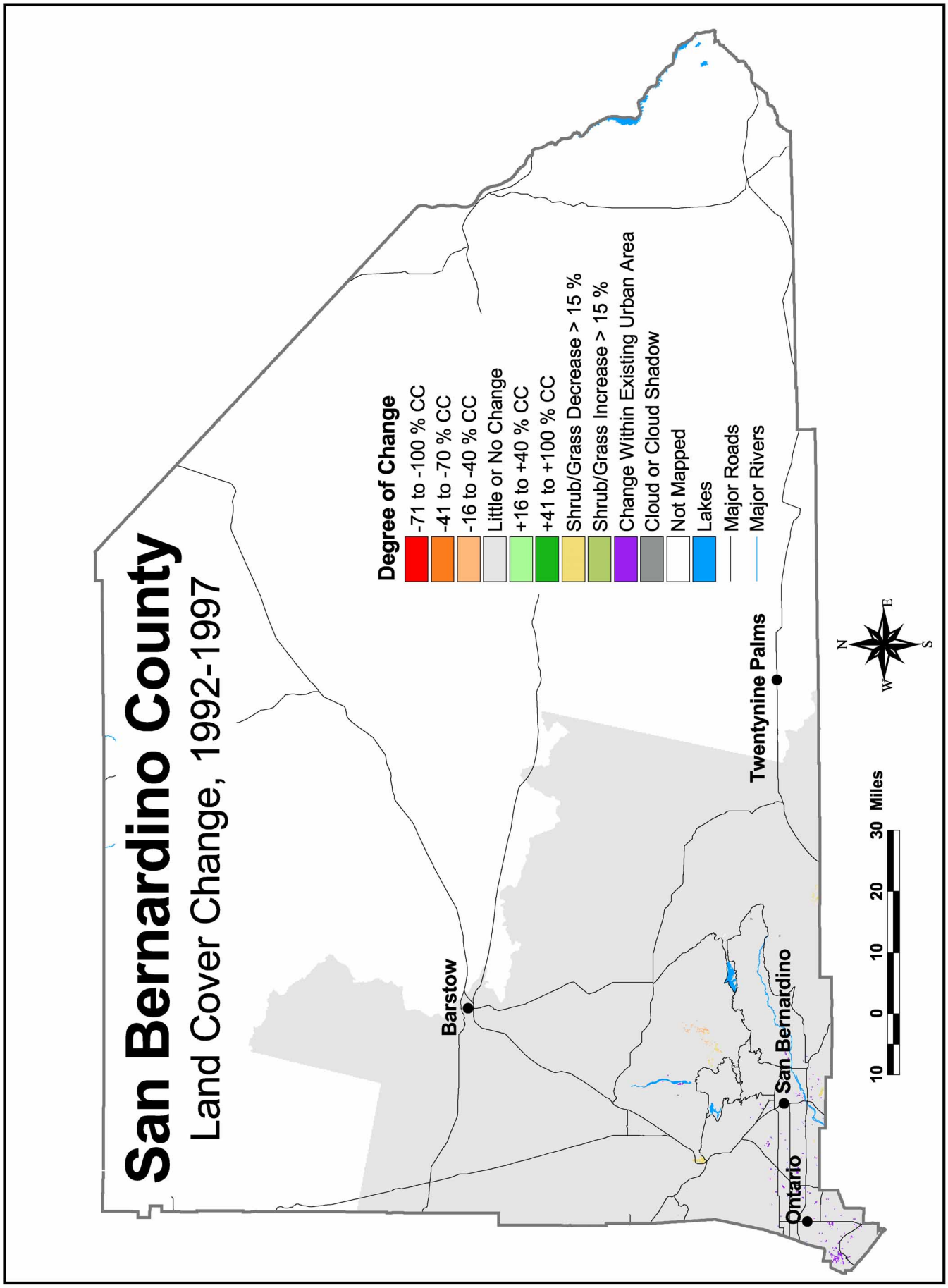

San Bernardino County
Land Cover Change, 1992-1997
Degree of Change
-71 to -100 % CC
-41 to -70 % CC
-16 to -40 % CC
Little or No Change
+16 to +40 % CC
+41 to +100 % CC
Shrub/Grass Decrease > 15 %
Shrub/Grass Increase > 15 %
Change Within Existing Urban Area
Cloud or Cloud Shadow
Not Mapped
Lakes
Major Roads
Major Rivers
Barstow
Twentynine Palms
San Bernardino
Ontario
N
E
S
W
10 0 10 20 30 Miles

Table C-42. Acres of Classified Change in San Bernardino County by Lifeform Type and Owner Class

	Forest Service											
	Conifer		Hardwood		Grass/ Forb		Non-Forested Other		Shrub/ Chaparral		Forest Service Total	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
-16 to -40% CC	926	0	26	0							952	0
+15 to -15% CC (little or no change)	229,732	100	15,251	100	1,468	96	8,934	99	206,188	99	461,572	99
+16 to +40% CC												
Shrub/Grass Decrease > 15%					33	2			1,394	1	1,427	0
Shrub/Grass Increase > 15%									5	0	5	0
Non-Vegetation Change					31	2	47	1			78	0
Cloud or Cloud Shadow	163	0									163	0
Total	230,822	100	15,276	100	1,532	100	8,981	100	207,586	100	464,197	100

	Other Public											
	Conifer		Hardwood		Grass/ Forb		Non-Forested Other		Shrub/ Chaparral		Other Public Total	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
-16 to -40% CC	42	0	2	0							44	0
+15 to -15% CC (little or no change)	37,108	100	3,197	100	9,719	100	28,282	100	1,411,639	100	1,489,944	100
+16 to +40% CC			3	0							3	0
Shrub/Grass Decrease > 15%									258	0	258	0
Shrub/Grass Increase > 15%												
Non-Vegetation Change							100	0			100	0
Cloud or Cloud Shadow												
Total	37,150	100	3,201	100	9,719	100	28,381	100	1,411,897	100	1,490,348	100

	Private											
	Conifer		Hardwood		Grass/ Forb		Non-Forested Other		Shrub/ Chaparral		Private Total	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
-16 to -40% CC			2	0							2	0
+15 to -15% CC (little or no change)	79,542	100	10,098	100	16,849	100	411,162	99	1,064,919	100	1,582,569	100
+16 to +40% CC												
Shrub/Grass Decrease > 15%									693	0	693	0
Shrub/Grass Increase > 15%					12	0			39	0	52	0
Non-Vegetation Change					64	0	4,095	1	36	0	4,195	0
Cloud or Cloud Shadow							21	0			21	0
Total	79,542	100	10,100	100	16,926	100	415,278	100	1,065,686	100	1,587,532	100

	All Owners											
	Conifer		Hardwood		Grass/ Forb		Non-Forested Other		Shrub/ Chaparral		All Owners Total	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
-16 to -40% CC	967	0	30	0							998	0
+15 to -15% CC (little or no change)	346,382	100	28,545	100	28,036	100	448,377	99	2,682,745	100	3,534,085	100
+16 to +40% CC			3	0							3	0
Shrub/Grass Decrease > 15%					33	0			2,345	0	2,378	0
Shrub/Grass Increase > 15%					12	0			44	0	56	0
Non-Vegetation Change					95	0	4,242	1	36	0	4,373	0
Cloud or Cloud Shadow	163	0					21	0			184	0
Total	347,513	100	28,578	100	28,176	100	452,640	100	2,685,170	100	3,542,077	100

Table C-43. Acres of Classified Change in San Bernardino County by Hardwood Cover Type and Owner Class

	Forest Service		Other Public		Private		All Owners	
	Acres	%	Acres	%	Acres	%	Acres	%
Coastal Oak Woodland								
+15 to -15% CC (little or no change)					11	0	11	0
Total					11	0	11	0
Desert Riparian								
+15 to -15% CC (little or no change)			1,362	43	3,795	38	5,157	18
Total			1,362	43	3,795	38	5,157	18
Montane Hardwood								
-16 to -40% CC	26	0	2	0	2	0	30	0
+15 to -15% CC (little or no change)	13,988	92	552	17	5,083	50	19,622	69
+15 to +40% CC			3	0			3	0
Total	14,013	92	557	17	5,085	50	19,655	69
Montane Riparian								
+15 to -15% CC (little or no change)	1,263	8	1,283	40	1,201	12	3,747	13
Total	1,263	8	1,283	40	1,201	12	3,747	13
Valley Foothill Riparian								
+15 to -15% CC (little or no change)					8	0	8	0
Total					8	0	8	0
All Hardwoods	15,276	100	3,201	100	10,100	100	28,578	100

Table C-44. Acres of Classified Change in San Bernardino County by Conifer Cover Type and Owner Class

	Forest Service		Other Public		Private		All Owners	
	Acres	%	Acres	%	Acres	%	Acres	%
Closed Cone Pine - Cypress								
+15 to -15% CC (little or no change)	88	0			6	0	94	0
Total	88	0			6	0	94	0
Jeffrey Pine								
-16 to -40% CC	100	0	42	0			141	0
+15 to -15% CC (little or no change)	14,219	6	20,560	55	31,890	40	66,668	19
Total	14,318	6	20,602	55	31,890	40	66,810	19
Montane Hardwoods Conifer								
-16 to -40% CC	3	0					3	0
+15 to -15% CC (little or no change)	13,633	6	5	0	1,607	2	15,245	4
Total	13,636	6	5	0	1,607	2	15,247	4
Pinyon - Juniper								
-16 to -40% CC	824	0					824	0
+15 to -15% CC (little or no change)	47,406	21	14,800	40	7,773	10	69,978	20
Total	48,230	21	14,800	40	7,773	10	70,802	20
Ponderosa Pine								
+15 to -15% CC (little or no change)	34,813	15	173	0	9,007	11	43,994	13
Cloud or Cloud Shadow	22	0					22	0
Total	34,836	15	173	0	9,007	11	44,016	13
Subalpine Conifer								
+15 to -15% CC (little or no change)	5,913	3					5,913	2
Cloud or Cloud Shadow	12	0					12	0
Total	5,925	3					5,925	2
Sierran Mixed Conifer								
+15 to -15% CC (little or no change)	113,660	49	1,570	4	29,260	37	144,490	42
Cloud or Cloud Shadow	130	0					130	0
Total	113,790	49	1,570	4	29,260	37	144,619	42
All Conifer	230,822	100	37,150	100	79,542	100	347,513	100

Table C-45. Acres of Classified Change in San Bernardino 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)	63	0					63	0
Total	63	0					63	0
Alkali Scrub								
+15 to -15 % CC (Little or No Change)			115,297	8	139,228	13	254,525	9
Total			115,297	8	139,228	13	254,525	9
Chamise - Redshank Chaparral								
Shrub/Grass Decrease > 15 %	152	0			316	0	469	0
+15 to -15 % CC (Little or No Change)	23,428	11	2,506	0	21,347	2	47,281	2
Shrub/Grass Increase > 15 %					20	0	20	0
Total	23,581	11	2,506	0	21,683	2	47,770	2
Coastal Scrub								
Shrub/Grass Decrease > 15 %	203	0			8	0	210	0
+15 to -15 % CC (Little or No Change)	16,865	8	754	0	5,691	1	23,310	1
Shrub/Grass Increase > 15 %	5	0					5	0
Total	17,072	8	754	0	5,699	1	23,525	1
Desert Scrub								
+15 to -15 % CC (Little or No Change)	1,305	1	1,048,714	74	533,835	50	1,583,854	59
Shrub/Grass Increase > 15 %					3	0	3	0
Total	1,305	1	1,048,714	74	533,838	50	1,583,857	59
Mixed Chaparral								
Shrub/Grass Decrease > 15 %	654	0	179	0	220	0	1,053	0
+15 to -15 % CC (Little or No Change)	50,985	25	44,796	3	64,046	6	159,828	6
Total	51,639	25	44,975	3	64,266	6	160,880	6
Montane Chaparral								
Shrub/Grass Decrease > 15 %	370	0	72	0	44	0	485	0
+15 to -15 % CC (Little or No Change)	107,038	52	3,109	0	18,835	2	128,981	5
Total	107,408	52	3,180	0	18,878	2	129,466	5
Sagebrush								
Shrub/Grass Decrease > 15 %	16	0				0	16	0
+15 to -15 % CC (Little or No Change)	6,391	3	186	0	2,742	0	9,319	0
Non-Vegetation Change					19	0	19	0
Total	6,407	3	186	0	2,761	0	9,353	0
Undetermined Shrub/Chaparral								
Shrub/Grass Decrease > 15 %			7	0	106	0	113	0
+15 to -15 % CC (Little or No Change)	112	0	196,278	14	279,195	26	475,585	18
Shrub/Grass Increase > 15 %					16	0	16	0
Non-Vegetation Change					17	0	17	0
Total	112	0	196,285	14	279,334	26	475,731	18
All Shrub/Chaparral	207,586	100	1,411,897	100	1,065,686	100	2,685,170	100

Table C-46. Acres of Verified Change in San Bernardino County by Cause and Hardwood Cover Type

	Wildfire	Unknown Cause	All Causes
Montane Hardwood			
-16 to -40% CC	25	6	30
+16 to +40% CC		3	3
Total	25	8	33
All Hardwood	25	8	33

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

	Wildfire	All Causes
Jeffrey Pine		
-16 to -40% CC	141	141
Total	141	141
Montane Hardwoods Conifer		
-16 to -40% CC	3	3
Total	3	3
Pinyon - Juniper		
-16 to -40% CC	824	824
Total	824	824
All Conifer	967	967

Table C-48. Acres of Verified Change in San Bernardino County by Cause and Shrub/Chaparral Cover Type

	Wildfire	Regener-ation	Unknown Cause	All Causes
Chamise - Redshank Chaparral				
Shrub/Grass Decrease > 15 %	469			469
Shrub/Grass Increase > 15 %			20	20
Total	469		20	489
Coastal Scrub				
Shrub/Grass Decrease > 15 %	204		6	210
Shrub/Grass Increase > 15 %		5		5
Total	204	5	6	215
Desert Scrub				
Shrub/Grass Increase > 15 %			3	3
Total			3	3
Mixed Chaparral				
Shrub/Grass Decrease > 15 %	1,041		12	1,053
Total	1,041		12	1,053
Montane Chaparral				
Shrub/Grass Decrease > 15 %	482		3	485
Total	482		3	485
Sagebrush				
Shrub/Grass Decrease > 15 %	16			16
Non-Vegetation Change			19	19
Total	16		19	35
Undetermined Shrub/Chaparral				
Shrub/Grass Decrease > 15 %	41		72	113
Shrub/Grass Increase > 15 %			16	16
Non-Vegetation Change			17	17
Total	41		105	146
All Shrub/Chaparral	2,251	5	169	2,424

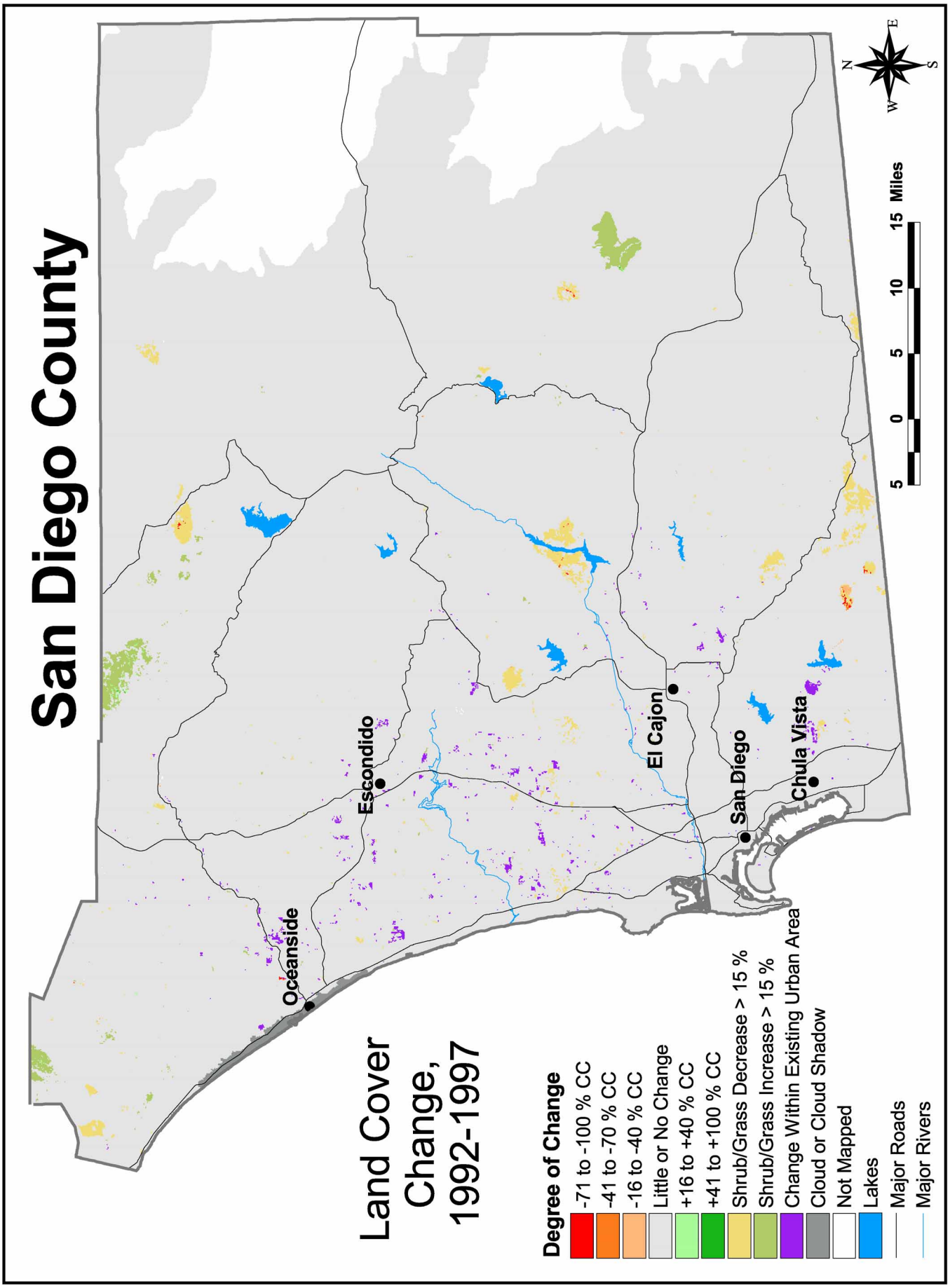

San Diego County
Land Cover Change, 1992-1997
Oceanside
Escondido
El Cajon
San Diego
Chula Vista
N
S
E
W
5 0 5 10 15 Miles
Degree of Change
-71 to -100 % CC
-41 to -70 % CC
-16 to -40 % CC
Little or No Change
+16 to +40 % CC
+41 to +100 % CC
Shrub/Grass Decrease > 15 %
Shrub/Grass Increase > 15 %
Change Within Existing Urban Area
Cloud or Cloud Shadow
Not Mapped
Lakes
Major Roads
Major Rivers

Table C-49. Acres of Classified Change in San Diego County by Lifeform Type and Owner Class

	Forest Service											
	Conifer		Hardwood		Grass/ Forb		Non-Forested Other		Shrub/ Chaparral		Forest Service Total	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
-71 to -100% CC			53	0							53	0
-41 to -70% CC			3	0							3	0
-16 to -40% CC			50	0							50	0
+15 to -15% CC (little or no change)	17,211	98	14,055	99	6,770	100	3,392	100	229,334	96	270,761	96
+16 to +40% CC	340	2	75	1							415	0
+41 to +100% CC			18	0							18	0
Shrub/Grass Decrease > 15%									2,712	1	2,712	1
Shrub/Grass Increase > 15%									7,161	3	7,161	3
Cloud or Cloud Shadow												
Non-Vegetation Change							1	0			1	0
Total	17,551	100	14,253	100	6,770	100	3,393	100	239,207	100	281,174	100

	Other Public											
	Conifer		Hardwood		Grass/ Forb		Non-Forested Other		Shrub/ Chaparral		Other Public Total	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
-71 to -100% CC	120	0	8	0							128	0
-41 to -70% CC	69	0	1	0							70	0
-16 to -40% CC	296	1	61	0							358	0
+15 to -15% CC (little or no change)	53,819	99	22,330	99	54,660	95	41,261	95	670,758	98	842,828	98
+16 to +40% CC	17	0	34	0							50	0
+41 to +100% CC	6	0									6	0
Shrub/Grass Decrease > 15%					897	2			7,567	1	8,464	1
Shrub/Grass Increase > 15%					488	1			4,412	1	4,899	1
Cloud or Cloud Shadow			33	0	1,702	3	1,569	4	845	0	4,149	0
Non-Vegetation Change							391	1			391	0
Total	54,327	100	22,467	100	57,746	100	43,221	100	683,582	100	861,343	100

	Private											
	Conifer		Hardwood		Grass/ Forb		Non-Forested Other		Shrub/ Chaparral		Private Total	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
-71 to -100% CC	16	0	63	0							79	0
-41 to -70% CC	15	0	18	0							33	0
-16 to -40% CC	39	0	171	0							210	0
+15 to -15% CC (little or no change)	26,421	100	68,174	100	120,240	100	482,719	98	582,390	98	1,279,944	99
+16 to +40% CC	27	0	17	0							44	0
+41 to +100% CC												
Shrub/Grass Decrease > 15%					170	0			8,150	1	8,321	1
Shrub/Grass Increase > 15%					370	0			1,371	0	1,741	0
Cloud or Cloud Shadow							2,064	0	40	0	2,104	0
Non-Vegetation Change							6,881	1	37	0	6,918	1
Total	26,517	100	68,444	100	120,780	100	491,664	100	591,988	100	1,299,393	100

Table C-49. Acres of Classified Change in San Diego County by Lifeform Type and Owner Class (cont.)

	All Owners											
	Conifer		Hardwood		Grass/ Forb		Non-Forested Other		Shrub/ Chaparral		All Owners Total	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
-71 to -100% CC	137	0	124	0							260	0
-41 to -70% CC	84	0	22	0							106	0
-16 to -40% CC	335	0	283	0							617	0
+15 to -15% CC (little or no change)	97,451	99	104,559	99	181,670	98	527,371	98	1,482,482	98	2,393,534	98
+16 to +40% CC	383	0	126	0							509	0
+41 to +100% CC	6	0	18	0							23	0
Shrub/Grass Decrease > 15%					1,067	1			18,430	1	19,497	1
Shrub/Grass Increase > 15%					857	0			12,943	1	13,801	1
Cloud or Cloud Shadow			33	0	1,702	1	3,633	1	885	0	6,253	0
Non-Vegetation Change			0	0			7,274	1	37	0	7,310	0
Total	98,395	100	105,164	100	185,297	100	538,278	100	1,514,776	100	2,441,910	100

Table C-50. Acres of Classified Change in San Diego County by Hardwood Cover Type and Owner Class

	Forest Service		Other Public		Private		All Owners	
	Acres	%	Acres	%	Acres	%	Acres	%
Coastal Oak Woodland	11,277	79	16,711	74	64,075	94	92,063	88
-71 to -100% CC	52	0	8	0	34	0	94	0
-41 to -70% CC			1	0	3	0	3	0
-16 to -40% CC	46	0	57	0	158	0	261	0
+16 to +40% CC	46	0	27	0	17	0	91	0
+41 to +100% CC	8	0					8	0
Total	11,428	80	16,804	75	64,287	94	92,518	88
Montane Hardwood								
-71 to -100% CC	1	0			5	0	6	0
-41 to -70% CC	3	0			4	0	7	0
-16 to -40% CC	4	0			6	0	10	0
+15 to -15% CC (little or no change)	2,778	19	4,092	18	4,014	6	10,884	10
+16 to +40% CC	29	0	6	0			35	0
+41 to +100% CC	10	0					10	0
Total	2,825	20	4,099	18	4,029	6	10,952	10
Montane Riparian								
-16 to -40% CC			4	0			4	0
+15 to -15% CC (little or no change)			614	3	15	0	629	1
Total			618	3	15	0	633	1
Valley Foothill Riparian								
-71 to -100% CC					24	0	24	0
-41 to -70% CC					12	0	12	0
-16 to -40% CC					8	0	8	0
+15 to -15% CC (little or no change)			914	4	71	0	985	1
Cloud or Cloud Shadow			33	0			33	0
Total			947	4	114	0	1,060	1
All Hardwood	14,253	100	22,467	100	68,444	100	105,164	100

Table C-51. Acres of Classified Change in San Diego County by Conifer Cover Type and Owner Class

	Forest Service		Other Public		Private		All Owners	
	Acres	%	Acres	%	Acres	%	Acres	%
Juniper								
+15 to -15% CC (little or no change)			1	0			1	0
Total			1	0			1	0
Closed Cone Pine - Cypress								
-71 to -100% CC			120	0	16	0	137	0
-41 to -70% CC			69	0	12	0	81	0
-16 to -40% CC			296	1	39	0	335	0
+15 to -15% CC (little or no change)	107	1	4,428	8	1,971	7	6,505	7
Total	107	1	4,913	9	2,037	8	7,057	7
Jeffrey Pine								
+15 to -15% CC (little or no change)	7423	42	31,250	58	4,403	17	43,077	44
+16 to +40% CC	13	0	17	0	1	0	30	0
+41 to +100% CC			6	0			6	0
Total	7,436	42	31,273	58	4,404	17	43,113	44
Montane Hardwoods Conifer								
+15 to -15% CC (little or no change)	6,185	35	8,402	15	7,996	30	22,583	23
+16 to +40% CC	312	2			16	0	329	0
Total	6,498	37	8,402	15	8,013	30	22,912	23
Pinyon - Juniper								
+15 to -15% CC (little or no change)			15	0			15	0
Total			15	0			15	0
Ponderosa Pine								
+15 to -15% CC (little or no change)			2,636	5	24	0	2,659	3
Total			2,636	5	24	0	2,659	3
Sierran Mixed Conifer								
-41 to -70% CC					3	0	3	0
+15 to -15% CC (little or no change)	3,496	20	7,087	13	12,028	45	22,611	23
+16 to +40% CC	15	0			10	0	24	0
Total	3,510	20	7,087	13	12,040	45	22,638	23
All Conifer	17,551	100	54,327	100	26,517	100	98,395	100

Table C-52. Acres of Classified Change in San Diego County by Shrub/Chaparral Cover Type and Owner Class

	Forest Service		Other Public		Private		All Owners	
	Acres	%	Acres	%	Acres	%	Acres	%
Chamise - Redshank Chaparral								
Shrub/Grass Decrease > 15 %	1,409	1	520	0	742	0	2,671	0
+15 to -15 % CC (Little or No Change)	72,639	30	62,870	9	69,401	12	204,910	14
Shrub/Grass Increase > 15 %	5,130	2	108	0	352	0	5,589	0
Total	79,177	33	63,498	9	70,495	12	213,170	14
Coastal Scrub								
Shrub/Grass Decrease > 15 %	114	0	243	0	188	0	545	0
+15 to -15 % CC (Little or No Change)	18,076	8	6,717	1	13,171	2	37,964	3
Shrub/Grass Increase > 15 %	22	0	9	0	3	0	34	0
Total	18,211	8	6,970	1	13,362	2	38,542	3
Desert Scrub								
+15 to -15 % CC (Little or No Change)			14	0	1,393	0	1,407	0
Total			14	0	1,393	0	1,407	0
Desert Succulent Scrub								
+15 to -15 % CC (Little or No Change)			238	0	320	0	558	0
Total			238	0	320	0	558	0
Desert Wash								
+15 to -15 % CC (Little or No Change)			1,138	0			1,138	0
Total			1,138	0			1,138	0
Mixed Chaparral								
Shrub/Grass Decrease > 15 %	1,026	0	2,006	0	629	0	3,660	0
+15 to -15 % CC (Little or No Change)	35,847	15	177,237	26	106,691	18	319,775	21
Shrub/Grass Increase > 15 %	146	0	995	0	549	0	1,690	0
Total	37,019	15	180,237	26	107,869	18	325,125	21
Montane Chaparral								
Shrub/Grass Decrease > 15 %	164	0	742	0	942	0	1,848	0
+15 to -15 % CC (Little or No Change)	101,755	43	69,005	10	101,580	17	272,340	18
Shrub/Grass Increase > 15 %	1,863	1	2,189	0	98	0	4,149	0
Total	103,782	43	71,935	11	102,620	17	278,337	18
Sagebrush								
Shrub/Grass Decrease > 15 %					12	0	12	0
+15 to -15 % CC (Little or No Change)	1,004	0	519	0	4,042	1	5,565	0
Total	1,004	0	519	0	4,055	1	5,577	0
Undetermined Shrub/Chaparral								
Shrub/Grass Decrease > 15 %			4,056	1	5,638	1	9,694	1
+15 to -15 % CC (Little or No Change)	13	0	353,022	52	285,791	48	638,826	42
Shrub/Grass Increase > 15 %			1,111	0	370	0	1,481	0
Cloud or Cloud Shadow			845	0	40	0	885	0
Non-Vegetation Change					37	0	37	0
Total	13	0	359,034	53	291,875	49	650,923	43
All Shrub/Chaparral	239,207	100	683,582	100	591,988	100	1,514,776	100

Table C-53. Acres of Verified Change in San Diego County by Cause and Hardwood Cover Type

	Wildfire	Regeneration	Unknown Cause	All Causes
Coastal Oak Woodland				
-71 to -100% CC	91		3	94
-41 to -70% CC	2		1	3
-16 to -40% CC	188		73	261
+16 to +40% CC		48	43	91
+41 to +100% CC		8		8
Total	280	55	120	456
Montane Hardwood				
-71 to -100% CC	6			6
-41 to -70% CC	7			7
-16 to -40% CC	10			10
+16 to +40% CC		35		35
+41 to +100% CC		10		10
Total	23	46		69
Montane Riparian				
-16 to -40% CC			4	4
Total			4	4
Valley Foothill Riparian				
-71 to -100% CC			24	24
-41 to -70% CC			12	12
-16 to -40% CC			8	8
Total			43	43
All Hardwood	303	101	167	572

Table C-54. Acres of Verified Change in San Diego County by Cause and Conifer Cover Type

	Wildfire	Regeneration	Unknown Cause	All Causes
Closed Cone Pine - Cypress				
-71 to -100% CC	137			137
-41 to -70% CC	81			81
-16 to -40% CC	306		29	335
Total	523		29	552
Jeffrey Pine				
+16 to +40% CC		30		30
+41 to +100% CC		6		6
Total		36		36
Montane Hardwoods Conifer				
+16 to +40% CC		329		329
Total		329		329
Sierran Mixed Conifer				
-41 to -70% CC			3	3
+16 to +40% CC		24		24
Total		24	3	27
All Conifer	523	389	32	944

Table C-55. Acres of Verified Change in San Diego County by Cause and Shrub/Chaparral Cover Type

	Wildfire	Development	Regeneration	Unknown Cause	All Causes
Chamise - Redshank Chaparral					
Shrub/Grass Decrease > 15 %	2,629			42	2,671
Shrub/Grass Increase > 15 %			5,531	58	5,589
Total	2,629		5,531	101	8,260
Coastal Scrub					
Shrub/Grass Decrease > 15 %	505			40	545
Shrub/Grass Increase > 15 %			22	12	34
Total	505		22	52	578
Mixed Chaparral					
Shrub/Grass Decrease > 15 %	3,501			159	3,660
Shrub/Grass Increase > 15 %			1,518	172	1,690
Total	3,501		1,518	332	5,350
Montane Chaparral					
Shrub/Grass Decrease > 15 %	1,760			88	1,848
Shrub/Grass Increase > 15 %			4,022	128	4,149
Total	1,760		4,022	216	5,997
Sagebrush					
Shrub/Grass Decrease > 15 %	9			3	12
Total	9			3	12
Undetermined Shrub/Chaparral					
Shrub/Grass Decrease > 15 %	7,358	1,177		1,160	9,694
Shrub/Grass Increase > 15 %			899	582	1,481
Non-Vegetation Change				37	37
Total	7,358	1,177	899	1,778	11,212
All Shrub/Chaparral	15,761	1,177	11,991	2,481	31,410

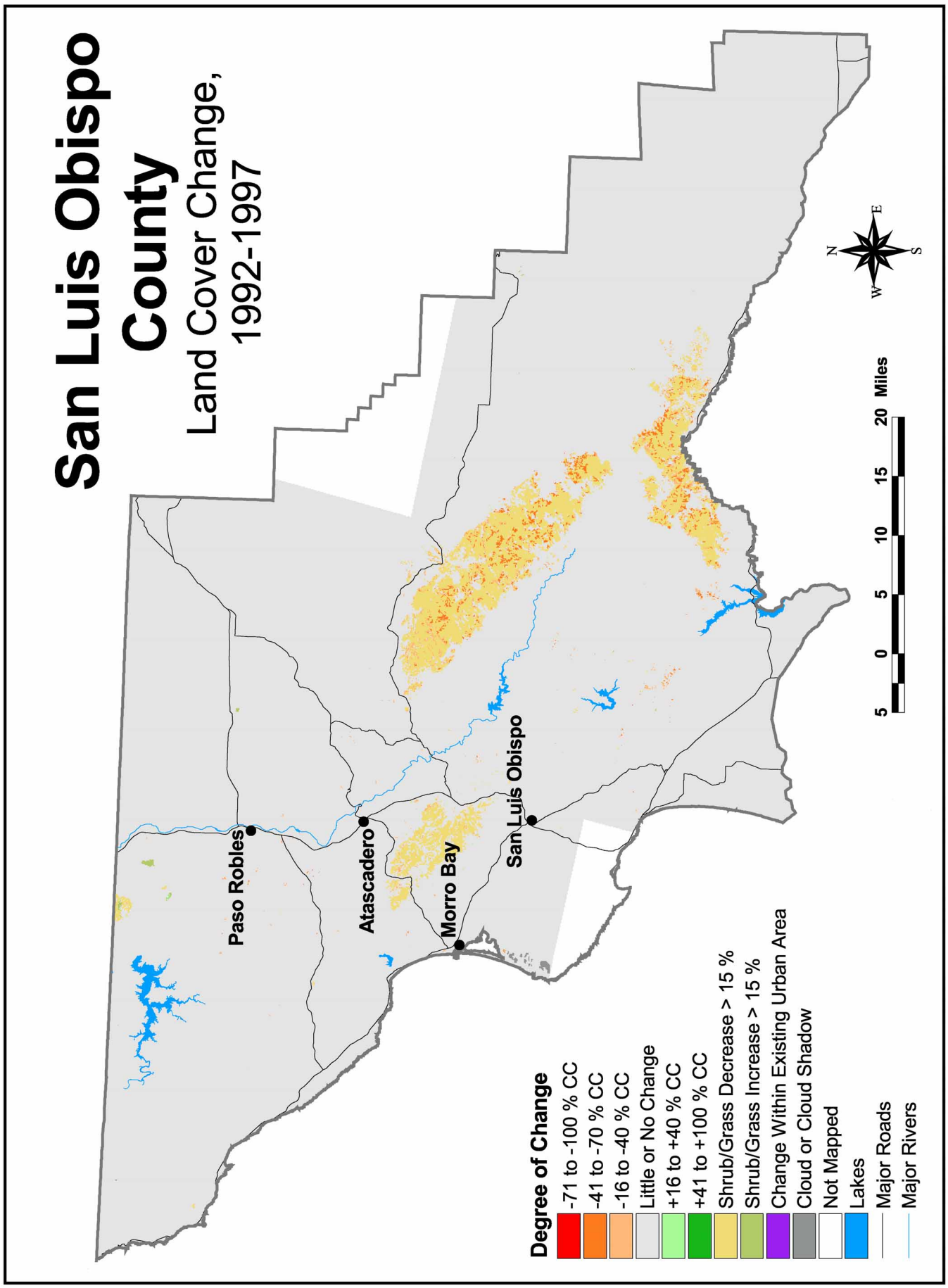

San Luis Obispo County
Land Cover Change, 1992-1997
Paso Robles
Atascadero
Morro Bay
San Luis Obispo
N
E
S
W
5 0 5 10 15 20 Miles
Degree of Change
-71 to -100 % CC
-41 to -70 % CC
-16 to -40 % CC
Little or No Change
+16 to +40 % CC
+41 to +100 % CC
Shrub/Grass Decrease > 15 %
Shrub/Grass Increase > 15 %
Change Within Existing Urban Area
Cloud or Cloud Shadow
Not Mapped
Lakes
Major Roads
Major Rivers

Table C-56. Acres of Classified Change in San Luis Obispo County by Lifeform Type and Owner Class

	Forest Service											
	Conifer		Hardwood		Grass/ Forb		Non-Forested Other		Shrub/ Chaparral		Forest Service Total	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
-41 to -70% CC	1,241	54	5,602	10							6,843	4
-16 to -40% CC	96	4	5,988	11							6,084	3
+15 to -15% CC (little or no change)	946	41	42,121	78	3,284	93	206	100	56,560	44	103,118	55
+16 to +40% CC			2	0							2	0
Shrub/Grass Decrease > 15%					251	7			72,094	56	72,345	38
Shrub/Grass Increase > 15%					3	0			3	0	6	0
Non-Vegetation Change												
Cloud or Cloud Shadow												
Total	2,284	100	53,712	100	3,538	100	206	100	128,657	100	188,397	100

	Other Public											
	Conifer		Hardwood		Grass/ Forb		Non-Forested Other		Shrub/ Chaparral		Other Public Total	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
-41 to -70% CC			309	1							309	0
-16 to -40% CC			361	1							361	0
+15 to -15% CC (little or no change)	56	100	41,102	98	71,378	98	32,884	100	34,061	94	179,480	97
+16 to +40% CC			66	0							66	0
Shrub/Grass Decrease > 15%					1,254	2			1,779	5	3,033	2
Shrub/Grass Increase > 15%					410	1			1	0	411	0
Non-Vegetation Change							24	0			24	0
Cloud or Cloud Shadow			191	0	148	0	84	0	248	1	671	0
Total	56	100	42,029	100	73,190	100	32,991	100	36,089	100	184,354	100

	Private											
	Conifer		Hardwood		Grass/ Forb		Non-Forested Other		Shrub/ Chaparral		Private Total	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
-41 to -70% CC			1,144	0							1,144	0
-16 to -40% CC			3,613	1							3,613	0
+15 to -15% CC (little or no change)	1,706	100	427,623	99	806,928	100	211,840	100	185,714	94	1,633,810	99
+16 to +40% CC			53	0							53	0
Shrub/Grass Decrease > 15%					466	0			12,617	6	13,084	1
Shrub/Grass Increase > 15%					109	0			1	0	110	0
Non-Vegetation Change					67	0	23	0			90	0
Cloud or Cloud Shadow			36	0	20	0	8	0	25	0	89	0
Total	1,706	100	432,469	100	807,591	100	211,871	100	198,357	100	1,651,993	100

Table C-56. Acres of Classified Change in San Luis Obispo County by Lifeform Type and Owner Class (cont.)

	All Owners											
	Conifer		Hardwood		Grass/ Forb		Non-Forested Other		Shrub/ Chaparral		All Owners Total	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
-41 to -70% CC	1,241	31	7,054	1							8,296	0
-16 to -40% CC	96	2	9,962	2							10,058	0
+15 to -15% CC (little or no change)	2,708	67	510,846	97	881,590	100	244,929	100	276,335	76	1,916,408	95
+16 to +40% CC			121	0							121	0
Shrub/Grass Decrease > 15%					1,971	0			86,490	24	88,461	4
Shrub/Grass Increase > 15%					522	0			5	0	527	0
Non-Vegetation Change					67	0	47	0			114	0
Cloud or Cloud Shadow			227	0	169	0	92	0	273	0	760	0
Total	4,046	100	528,210	100	884,318	100	245,068	100	363,103	100	2,024,744	100

Table C-57. Acres of Classified Change in San Luis Obispo County by Hardwood Cover Type and Owner Class

	Forest Service		Other Public		Private		All Owners	
	Acres	%	Acres	%	Acres	%	Acres	%
Blue Oak Foothill Pine								
-41 to -70% CC	371	1	3	0	12	0	386	0
-16 to -40% CC	311	1	15	0	314	0	640	0
+15 to -15% CC (little or no change)	437	1	4,011	10	50,948	12	55,396	10
+16 to +40% CC					6	0	6	0
Cloud or Cloud Shadow			30	0	8	0	38	0
Total	1,119	2	4,059	10	51,287	12	56,465	11
Blue Oak Woodland								
-41 to -70% CC	4,616	9	181	0	871	0	5,668	1
-16 to -40% CC	4,925	9	272	1	2,270	1	7,467	1
+15 to -15% CC (little or no change)	18,019	34	27,495	65	170,091	39	215,605	41
+16 to +40% CC			66	0	26	0	92	0
Cloud or Cloud Shadow			135	0	20	0	154	0
Total	27,560	51	28,149	67	173,277	40	228,985	43
Coastal Oak Woodland								
-41 to -70% CC	602	1	119	0	253	0	974	0
-16 to -40% CC	702	1	70	0	987	0	1,759	0
+15 to -15% CC (little or no change)	23,167	43	9,117	22	198,809	46	231,092	44
+16 to +40% CC	2	0			22	0	23	0
Cloud or Cloud Shadow			24	0	8	0	32	0
Total	24,473	46	9,329	22	200,078	46	233,881	44
Montane Hardwood								
-41 to -70% CC	1	0	6	0	5	0	12	0
-16 to -40% CC			3	0	10	0	13	0
+15 to -15% CC (little or no change)	1	0	436	1	4,252	1	4,688	1
+16 to +40% CC							0	0
Cloud or Cloud Shadow			3	0			3	0
Total	2	0	448	1	4,267	1	4,716	1
Valley Oak Woodland								
-16 to -40% CC	49	0			34	0	83	0
-41 to -70% CC	11	0			4	0	15	0
+15 to -15% CC (little or no change)	498	1	39	0	3,521	1	4,058	1
Total	558	1	39	0	3,558	1	4,155	1
Valley Foothill Riparian								
+15 to -15% CC (little or no change)			5	0	2	0	8	0
Total			5	0	2	0	8	0
All Hardwood	53,712	100	42,029	100	432,469	100	528,210	100

Table C-58. Acres of Classified Change in San Luis Obispo County by Conifer Cover Type and Owner Class

	Forest Service		Other Public		Private		All Owners	
	Acres	%	Acres	%	Acres	%	Acres	%
Juniper								
+15 to -15% CC (little or no change)			25	44	4	0	29	1
Total			25	44	4	0	29	1
Closed Cone Pine - Cypress								
+15 to -15% CC (little or no change)	838	37	27	48	918	54	1,782	44
Total	838	37	27	48	918	54	1,782	44
Montane Hardwoods Conifer								
-41 to -70% CC	1,241	54					1,241	31
-16 to -40% CC	96	4					96	2
+15 to -15% CC (little or no change)	108	5	5	8	294	17	407	10
Total	1,446	63	5	8	294	17	1,744	43
Ponderosa Pine								
+15 to -15% CC (little or no change)					490	29	490	12
Total					490	29	490	12
All Conifer	2,284	100	56	100	1,706	100	4,046	100

Table C-59. Acres of Classified Change in San Luis Obispo County by Shrub/Chaparral Cover Type and Owner Class

	Forest Service		Other Public		Private		All Owners	
	Acres	%	Acres	%	Acres	%	Acres	%
Alkali Scrub								
+15 to -15 % CC (Little or No Change)			1	0	46	0	47	0
Total			1	0	46	0	47	0
Chamise - Redshank Chaparral								
Shrub/Grass Decrease > 15 %	13,359	10	5	0	660	0	14,025	4
+15 to -15 % CC (Little or No Change)	4,889	4	114	0	1,751	1	6,755	2
Total	18,248	14	119	0	2,412	1	20,779	6
Coastal Scrub								
Shrub/Grass Decrease > 15 %	2,953	2	2	0	508	0	3,463	1
+15 to -15 % CC (Little or No Change)	3,017	2	23	0	2,168	1	5,208	1
Total	5,970	5	24	0	2,676	1	8,671	2
Mixed Chaparral								
Shrub/Grass Decrease > 15 %	2,922	2	2	0	16	0	2,940	1
+15 to -15 % CC (Little or No Change)	1,659	1	140	0	576	0	2,375	1
Total	4,581	4	142	0	592	0	5,315	1
Montane Chaparral								
Shrub/Grass Decrease > 15 %	52,700	41	45	0	4,241	2	56,986	16
+15 to -15 % CC (Little or No Change)	46,897	36	41	0	7,872	4	54,809	15
Shrub/Grass Increase > 15 %	3	0					3	0
Cloud or Cloud Shadow			19	0			19	0
Total	99,600	77	104	0	12,112	6	111,817	31
Undetermined Shrub/Chaparral								
Shrub/Grass Decrease > 15 %	159	0	1,724	5	7,192	4	9,076	2
+15 to -15 % CC (Little or No Change)	98	0	33,743	94	173,300	87	207,142	57
Shrub/Grass Increase > 15 %			1	0	1	0	2	0
Cloud or Cloud Shadow			229	1	25	0	254	0
Total	257	0	35,698	99	180,519	91	216,474	60
All Shrub/Chaparral	128,657	100	36,089	100	198,357	100	363,103	100

Table C-60. Acres of Verified Change in San Luis Obispo County by Cause and Hardwood Cover Type

	Wildfire	Prescribed Burn	Unknown Cause	All Causes
Blue Oak Foothill Pine				
-41 to -70% CC	386			386
-16 to -40% CC	609		31	640
+16 to +40% CC			6	6
Total	994		37	1,031
Blue Oak Woodland				
-41 to -70% CC	5,553	58	57	5,668
-16 to -40% CC	7,128	106	234	7,467
+16 to +40% CC			92	92
Total	12,681	164	382	13,227
Coastal Oak Woodland				
-41 to -70% CC	843	33	98	974
-16 to -40% CC	1,246	168	344	1,759
+16 to +40% CC			23	23
Total	2,089	201	466	2,756
Montane Hardwood				
-41 to -70% CC	11		1	12
-16 to -40% CC	12			13
+16 to +40% CC				
Total	23		2	25
Valley Oak Woodland				
-41 to -70% CC	11		4	15
-16 to -40% CC	65		18	83
Total	76		21	97
All Hardwood	15,864	365	907	17,136

Table C-61. Acres of Verified Change in San Luis Obispo County by Cause and Conifer Cover Type

	Wildfire	All Causes
Montane Hardwoods Conifer		
-41 to -70% CC	1,241	1,241
-16 to -40% CC	96	96
Total	1,338	1,338
All Conifer	1,338	1,338

Table C-62. Acres of Verified Change in San Luis Obispo County by Cause and Shrub/Chaparral Cover Type

	Wildfire	Prescribed Burn	Unknown Cause	All Causes
Chamise - Redshank Chaparral				
Shrub/Grass Decrease > 15 %	14,025			14,025
Total	14,025			14,025
Coastal Scrub				
Shrub/Grass Decrease > 15 %	3,449		14	3,463
Total	3,449		14	3,463
Mixed Chaparral				
Shrub/Grass Decrease > 15 %	2,940			2,940
Total	2,940			2,940
Montane Chaparral				
Shrub/Grass Decrease > 15 %	56,942		45	56,986
Shrub/Grass Increase > 15 %			3	3
Total	56,942		48	56,989
Undetermined Shrub/Chaparral				
Shrub/Grass Decrease > 15 %	8,842	64	170	9,076
Shrub/Grass Increase > 15 %			2	2
Total	8,842	64	172	9,078
All Shrub/Chaparral	86,197	64	234	86,495

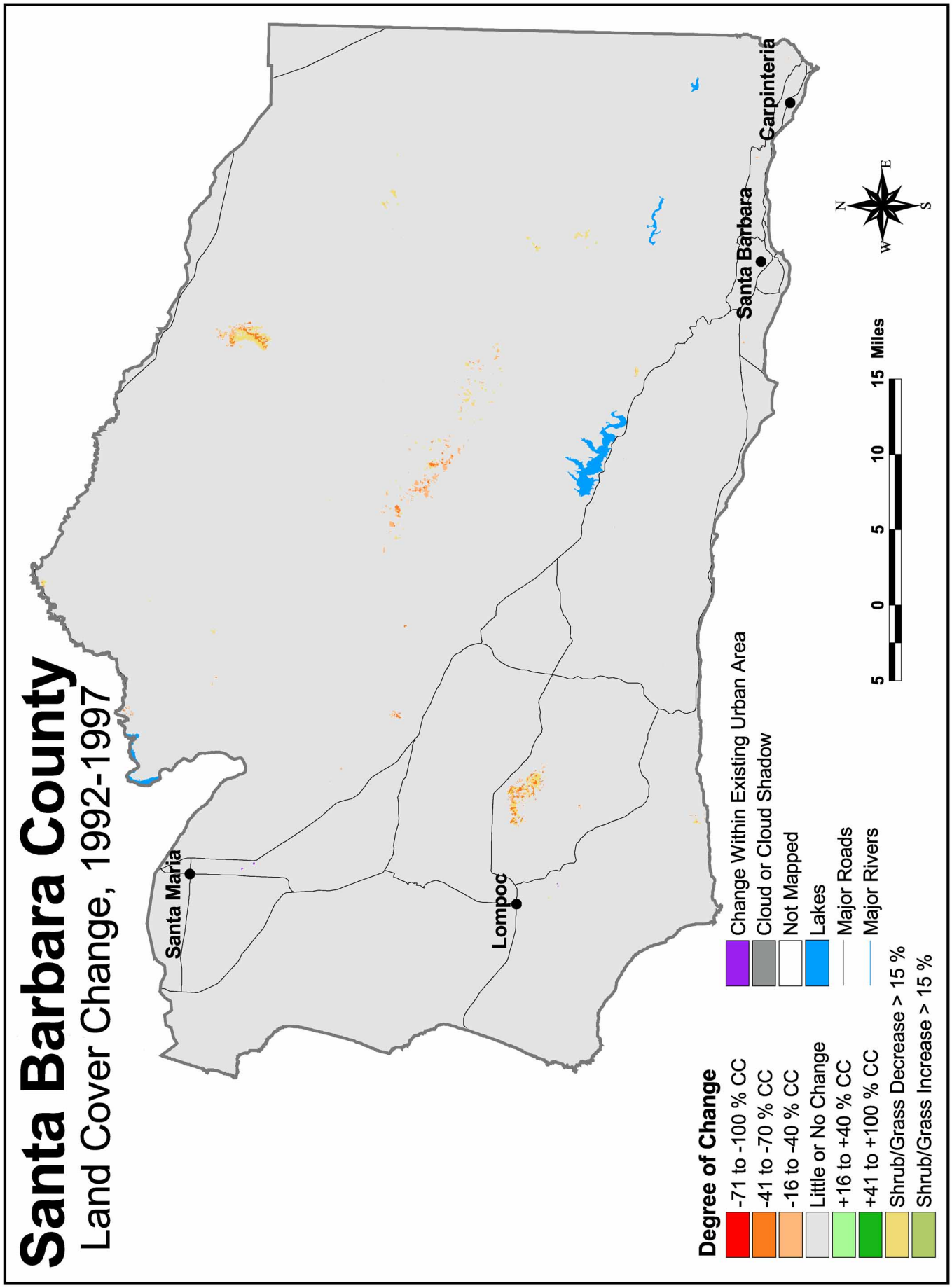

Santa Barbara County
Land Cover Change, 1992-1997
Santa Maria
Lompoc
Santa Barbara
Carpinteria
Degree of Change
-71 to -100 % CC
-41 to -70 % CC
-16 to -40 % CC
Little or No Change
+16 to +40 % CC
+41 to +100 % CC
Shrub/Grass Decrease > 15 %
Shrub/Grass Increase > 15 %
Change Within Existing Urban Area
Cloud or Cloud Shadow
Not Mapped
Lakes
Major Roads
Major Rivers
5 0 5 10 15 Miles
N
E
S
W

Table C-63. Acres of Classified Change in Santa Barbara County by Lifeform Type and Owner Class

	Forest Service											
	Conifer		Hardwood		Grass/ Forb		Non-Forested Other		Shrub/ Chaparral		Forest Service Total	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
-41 to -70% CC	213	0	207	0							421	0
-16 to -40% CC	849	2	234	0							1,084	0
+15 to -15% CC (little or no change)	48,014	98	67,428	99	10,631	100	2,881	100	498,643	100	627,597	99
Shrub/Grass Decrease > 15%									1,825	0	1,826	0
Shrub/Grass Increase > 15%					1	0					1	0
Non-Vegetation Change												
Total	49,076	100	67,869	100	10,632	100	2,881	100	500,469	100	630,928	100

	Other Public											
	Conifer		Hardwood		Grass/ Forb		Non-Forested Other		Shrub/ Chaparral		Other Public Total	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
-41 to -70% CC												
-16 to -40% CC												
+15 to -15% CC (little or no change)	3	100	55,080	100	18,762	100	23,107	100	35,718	100	132,670	100
Shrub/Grass Decrease > 15%												
Shrub/Grass Increase > 15%					4	0					4	0
Non-Vegetation Change												
Total	3	100	55,080	100	18,766	100	23,107	100	35,718	100	132,674	100

	Private											
	Conifer		Hardwood		Grass/ Forb		Non-Forested Other		Shrub/ Chaparral		Private Total	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
-41 to -70% CC	2	0	724	0							727	0
-16 to -40% CC	9	1	568	0							577	0
+15 to -15% CC (little or no change)	1,066	99	263,490	100	199,626	100	196,924	100	208,217	100	869,323	100
Shrub/Grass Decrease > 15%					21	0			938	0	959	0
Shrub/Grass Increase > 15%					2	0					2	0
Non-Vegetation Change					52	0	38	0			90	0
Total	1,077	100	264,783	100	199,701	100	196,962	100	209,155	100	871,678	100

	All Owners											
	Conifer		Hardwood		Grass/ Forb		Non-Forested Other		Shrub/ Chaparral		All Owners Total	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
-41 to -70% CC	216	0	932	0							1,147	0
-16 to -40% CC	858	2	802	0							1,660	0
+15 to -15% CC (little or no change)	49,083	98	385,998	100	229,019	100	222,912	100	742,579	100	1,629,590	100
Shrub/Grass Decrease > 15%					22	0			2,763	0	2,784	0
Shrub/Grass Increase > 15%					7	0					7	0
Non-Vegetation Change					52	0	38	0			90	0
Total	50,156	100	387,732	100	229,100	100	222,950	100	745,341	100	1,635,279	100

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

	Forest Service		Other Public		Private		All Owners	
	Acres	%	Acres	%	Acres	%	Acres	%
Blue Oak Foothill Pine								
+15 to -15% CC (little or no change)	86	0			1,537	1	1,623	0
Total	86	0			1,537	1	1,623	0
Blue Oak Woodland								
-41 to -70% CC	4	0			377	0	382	0
-16 to -40% CC	15	0			330	0	345	0
+15 to -15% CC (little or no change)	13,736	20	31,681	58	118,433	45	163,849	42
Total	13,755	20	31,681	58	119,140	45	164,576	42
Coastal Oak Woodland								
-41 to -70% CC	6	0			331	0	336	0
-16 to -40% CC	40	0			194	0	234	0
+15 to -15% CC (little or no change)	28,411	42	20,868	38	127,648	48	176,927	46
Total	28,456	42	20,868	38	128,173	48	177,497	46
Montane Hardwood								
-41 to -70% CC	197	0			1	0	198	0
-16 to -40% CC	180	0			5	0	185	0
+15 to -15% CC (little or no change)	25,177	37	1,921	3	5,144	2	32,241	8
Total	25,554	38	1,921	3	5,149	2	32,624	8
Montane Riparian								
+15 to -15% CC (little or no change)					4	0	4	0
Total					4	0	4	0
Valley Oak Woodland								
-41 to -70% CC					16	0	16	0
-16 to -40% CC					39	0	39	0
+15 to -15% CC (little or no change)	19	0	568	1	10,724	4	11,311	3
Total	19	0	568	1	10,779	4	11,366	3
Valley Foothill Riparian								
+15 to -15% CC (little or no change)			42	0	1	0	42	0
Total			42	0	1	0	42	0
All Hardwood	67,869	100	55,080	100	264,783	100	387,732	100

Table C-65. Acres of Classified Change in Santa Barbara County by Conifer Cover Type and Owner Class

	Forest Service		Other Public		Private		All Owners	
	Acres	%	Acres	%	Acres	%	Acres	%
Jeffrey Pine								
+15 to -15% CC (little or no change)	206	0					206	0
Total	206	0					206	0
Montane Hardwoods Conifer								
-41 to -70% CC	213	0			2	0	216	0
-16 to -40% CC	770	2			9	1	779	2
+15 to -15% CC (little or no change)	17,721	36			873	81	18,594	37
Total	18,704	38			884	82	19,588	39
Pinyon - Juniper								
+15 to -15% CC (little or no change)	27,608	56	3	93	193	18	27,804	55
Total	27,608	56	3	93	193	18	27,804	55
Sierran Mixed Conifer								
-16 to -40% CC	79	0					79	0
+15 to -15% CC (little or no change)	2,479	5					2,479	5
Total	2,558	5					2,558	5
All Conifer	49,076	100	3	100	1,077	100	50,156	100

Table C-66. Acres of Classified Change in Santa Barbara County by Shrub/Chaparral Cover Type and Owner Class

	Forest Service		Other Public		Private		All Owners	
	Acres	%	Acres	%	Acres	%	Acres	%
Chamise - Redshank Chaparral								
Shrub/Grass Decrease > 15 %	67	0					67	0
+15 to -15 % CC (Little or No Change)	25,448	5	3	0	1,712	1	27,163	4
Total	25,515	5	3	0	1,712	1	27,230	4
Coastal Scrub								
Shrub/Grass Decrease > 15 %	64	0					64	0
+15 to -15 % CC (Little or No Change)	77,374	15	59	0	5,246	3	82,679	11
Total	77,438	15	59	0	5,246	3	82,743	11
Desert Scrub								
Shrub/Grass Decrease > 15 %	894	0					894	0
+15 to -15 % CC (Little or No Change)	42,804	9			160	0	42,964	6
Total	43,698	9			160	0	43,858	6
Mixed Chaparral								
Shrub/Grass Decrease > 15 %	14	0					14	0
+15 to -15 % CC (Little or No Change)	8,980	2	30	0	4,393	2	13,403	2
Total	8,994	2	30	0	4,393	2	13,417	2
Montane Chaparral								
Shrub/Grass Decrease > 15 %	772	0					802	0
+15 to -15 % CC (Little or No Change)	342,616	68	81	0	27,829	13	370,527	50
Total	343,389	69	81	0	27,859	13	371,328	50
Sagebrush								
+15 to -15 % CC (Little or No Change)	857	0	4	0	54	0	915	0
Total	857	0	4	0	54	0	915	0
Undetermined Shrub/Chaparral								
Shrub/Grass Decrease > 15 %	14	0			908	0	922	0
+15 to -15 % CC (Little or No Change)	564	0	35,541	100	168,823	81	204,928	27
Total	578	0	35,541	100	169,731	81	205,850	28
All Shrub/Chaparral	500,469	100	35,718	100	209,155	100	745,341	100

Table C-67. Acres of Verified Change in Santa Barbara County by Cause and Hardwood Cover Type

	Wildfire	Unknown Cause	All Causes
Blue Oak Woodland			
-41 to -70% CC	279	103	382
-16 to -40% CC	237	108	345
Total	516	211	727
Coastal Oak Woodland			
-41 to -70% CC	334	2	336
-16 to -40% CC	212	21	234
Total	546	24	570
Montane Hardwood			
-41 to -70% CC	195	3	198
-16 to -40% CC	174	11	185
Total	369	14	383
Valley Oak Woodland			
-41 to -70% CC		16	16
-16 to -40% CC		39	39
Total		55	55
All Hardwood	1,432	303	1,734

Table C-68. Acres of Verified Change in Santa Barbara County by Cause and Conifer Cover Type

	Wildfire	All Causes
Montane Hardwoods Conifer		
-41 to -70% CC	216	216
-16 to -40% CC	779	779
Total	994	994
Sierran Mixed Conifer		
-16 to -40% CC	79	79
Total	79	79
All Conifer	1,073	1,073

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

	Wildfire	Unknown Cause	All Causes
Chamise - Redshank Chaparral			
Shrub/Grass Decrease > 15 %	50	17	67
Total	50	17	67
Coastal Scrub			
Shrub/Grass Decrease > 15 %	44	20	64
Total	44	20	64
Desert Scrub			
Shrub/Grass Decrease > 15 %	794	100	894
Total	794	100	894
Mixed Chaparral			
Shrub/Grass Decrease > 15 %	12	2	14
Total	12	2	14
Montane Chaparral			
Shrub/Grass Decrease > 15 %	655	147	802
Total	655	147	802
Undetermined Shrub/Chaparral			
Shrub/Grass Decrease > 15 %	849	73	922
Total	849	73	922
All Shrub/Chaparral	2,404	358	2,763

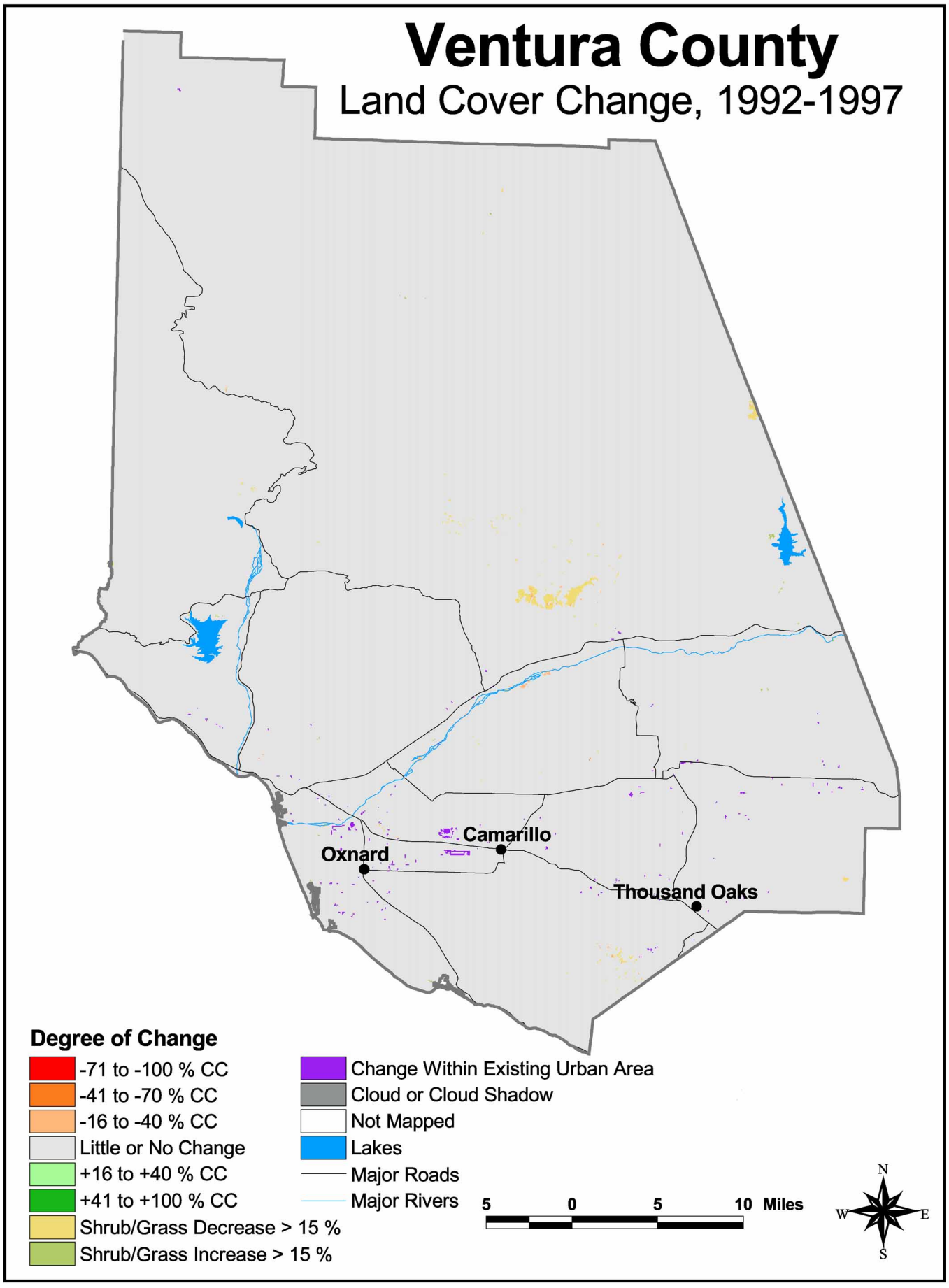

Ventura County
Land Cover Change, 1992-1997
Camarillo
Oxnard
Thousand Oaks
Degree of Change
-71 to -100 % CC
-41 to -70 % CC
-16 to -40 % CC
Little or No Change
+16 to +40 % CC
+41 to +100 % CC
Shrub/Grass Decrease > 15 %
Shrub/Grass Increase > 15 %
Change Within Existing Urban Area
Cloud or Cloud Shadow
Not Mapped
Lakes
Major Roads
Major Rivers
5 0 5 10 Miles
N
W
E
S

Table C-70. Acres of Classified Change in Ventura County by Lifeform Type and Owner Class

	Forest Service											
	Conifer		Hardwood		Grass/ Forb		Non-Forested Other		Shrub/ Chaparral		All Owners Total	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
-41 to -70% CC												
-16 to -40% CC	6	0	58	0							64	0
+15 to -15% CC (little or no change)	202,043	100	26,012	100	4,333	99	10,213	100	320,888	100	563,489	100
Shrub/Grass Decrease > 15%					24	1			1,431	0	1,455	0
Shrub/Grass Increase > 15%									41	0	41	0
Non-Vegetation Change												
Total	202,049	100	26,070	100	4,357	100	10,213	100	322,360	100	565,049	100

	Other Public											
	Conifer		Hardwood		Grass/ Forb		Non-Forested Other		Shrub/ Chaparral		Other Public Total	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
-41 to -70% CC												
-16 to -40% CC			23	0							23	0
+15 to -15% CC (little or no change)	71	100	5,497	100	11,835	100	2,318	99	16,119	99	35,840	99
Shrub/Grass Decrease > 15%									125	1	125	0
Shrub/Grass Increase > 15%									13	0	13	0
Non-Vegetation Change							25	1			25	0
Total	71	100	5,520	100	11,835	100	2,342	100	16,256	100	36,025	100

	Private											
	Conifer		Hardwood		Grass/ Forb		Non-Forested Other		Shrub/ Chaparral		Private Total	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
-41 to -70% CC			10	0							10	0
-16 to -40% CC			219	0							219	0
+15 to -15% CC (little or no change)	11,919	100	56,747	100	255,127	100	60,446	98	191,169	100	575,409	100
Shrub/Grass Decrease > 15%					67	0			664	0	731	0
Shrub/Grass Increase > 15%					21	0			78	0	99	0
Non-Vegetation Change							1,169	2			1,169	0
Total	11,920	100	56,976	100	255,215	100	61,615	100	191,910	100	577,636	100

	All Owners											
	Conifer		Hardwood		Grass/ Forb		Non-Forested Other		Shrub/ Chaparral		All Owners Total	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
-41 to -70% CC			10	0							10	0
-16 to -40% CC	7	0	300	0							307	0
+15 to -15% CC (little or no change)	214,033	100	88,257	100	271,295	100	72,977	98	528,177	100	1,174,738	100
Shrub/Grass Decrease > 15%					91	0			2,219	0	2,310	0
Shrub/Grass Increase > 15%					21	0			131	0	153	0
Non-Vegetation Change							1,193	2			1,193	0
Total	214,040	100	88,567	100	271,407	100	74,170	100	530,527	100	1,178,710	100

Table C-71. Acres of Classified Change in Ventura County by Hardwood Cover Type and Owner Class

	Forest Service		Other Public		Private		All Owners	
	Acres	%	Acres	%	Acres	%	Acres	%
Blue Oak Woodland								
-41 to -70% CC					2	0	2	0
-16 to -40% CC					30	0	31	0
+15 to -15% CC (little or no change)	7	0	1,261	23	17,582	31	18,850	21
Total	7	0	1,261	23	17,615	31	18,883	21
Coastal Oak Woodland								
-41 to -70% CC					3	0	3	0
-16 to -40% CC	44	0	14	0	92	0	150	0
+15 to -15% CC (little or no change)	11,897	46	1,166	21	21,526	38	34,589	39
Total	11,940	46	1,181	21	21,621	38	34,741	39
Montane Hardwood								
-41 to -70% CC					5	0	5	0
-16 to -40% CC	14	0	9	0	97	0	120	0
+15 to -15% CC (little or no change)	14,109	54	2,767	50	16,749	29	33,625	38
Total	14,124	54	2,776	50	16,850	30	33,749	38
Montane Riparian								
+15 to -15% CC (little or no change)					2	0	2	0
Total					2	0	2	0
Valley Oak Woodland								
+15 to -15% CC (little or no change)			301	5	885	2	1,186	1
Total			301	5	885	2	1,186	1
Valley Foothill Riparian								
+15 to -15% CC (little or no change)			2	0	4	0	6	0
Total			2	0	4	0	6	0
All Hardwood	26,070	100	5,520	100	56,976	100	88,567	100

Table C-72. Acres of Classified Change in Ventura County by Conifer Cover Type and Owner Class

	Forest Service		Other Public		Private		All Owners	
	Acres	%	Acres	%	Acres	%	Acres	%
Closed Cone Pine - Cypress								
+15 to -15% CC (little or no change)	144	0			27	0	171	0
Total	144	0			27	0	171	0
Jeffrey Pine								
+15 to -15% CC (little or no change)	35,136	17	1	2	1,282	11	36,420	17
Total	35,136	17	1	2	1,282	11	36,420	17
Montane Hardwoods Conifer								
-16 to -40% CC	6	0					6	0
+15 to -15% CC (little or no change)	12,842	6			167	1	13,010	6
Total	12,848	6			168	1	13,016	6
Pinyon - Juniper								
+15 to -15% CC (little or no change)	133,518	66	70	98	10,213	86	143,801	67
Total	133,518	66	70	98	10,213	86	143,801	67
Sierran Mixed Conifer								
+15 to -15% CC (little or no change)	20,402	10			230	2	20,632	10
Total	20,402	10			230	2	20,632	10
All Conifer	202,049	100	71	100	11,920	100	214,040	100

Table C-73. Acres of Classified Change in Ventura County by Shrub/Chaparral Cover Type and Owner Class

	Forest Service		Other Public		Private		All Owners	
	Acres	%	Acres	%	Acres	%	Acres	%
Chamise - Redshank Chaparral								
Shrub/Grass Decrease > 15 %	22	0	12	0	6	0	39	0
+15 to -15 % CC (Little or No Change)	13,759	4	39	0	731	0	14,529	3
Total	13,781	4	51	0	736	0	14,568	3
Coastal Scrub								
Shrub/Grass Decrease > 15 %	28	0			20	0	48	0
+15 to -15 % CC (Little or No Change)	41,165	13	25	0	7,665	4	48,854	9
Shrub/Grass Increase > 15 %	34	0			18	0	52	0
Total	41,227	13	25	0	7,702	4	48,954	9
Desert Scrub								
+15 to -15 % CC (Little or No Change)	19,635	6	4	0	736	0	20,375	4
Total	19,635	6	4	0	736	0	20,375	4
Mixed Chaparral								
Shrub/Grass Decrease > 15 %	20	0					20	0
+15 to -15 % CC (Little or No Change)	8,473	3			1,839	1	10,312	2
Total	8,493	3			1,839	1	10,331	2
Montane Chaparral								
Shrub/Grass Decrease > 15 %	1,329	0	6	0	385	0	1,719	0
+15 to -15 % CC (Little or No Change)	229,718	71	71	0	11,451	6	241,240	45
Shrub/Grass Increase > 15 %	7	0			1	0	8	0
Total	231,054	72	77	0	11,837	6	242,968	46
Sagebrush								
+15 to -15 % CC (Little or No Change)	6,677	2	1	0	3,912	2	10,590	2
Total	6,677	2	1	0	3,912	2	10,590	2
Undetermined Shrub/Chaparral								
Shrub/Grass Decrease > 15 %	34	0	106	1	253	0	393	0
+15 to -15 % CC (Little or No Change)	1,461	0	15,980	98	164,836	86	182,276	34
Shrub/Grass Increase > 15 %			13	0	59	0	72	0
Total	1,494	0	16,098	99	165,148	86	182,741	34
All Shrub/Chaparral	322,360	100	16,256	100	191,910	100	530,527	100

Table C-74. Acres of Verified Change in Ventura County by Cause and Hardwood Cover Type

	Wildfire	Unknown Cause	All Causes
Blue Oak Woodland			
-41 to -70% CC		2	2
-16 to -40% CC		31	31
Total		33	33
Coastal Oak Woodland			
-41 to -70% CC		3	3
-16 to -40% CC	56	94	150
Total	56	97	153
Montane Hardwood			
-41 to -70% CC		5	5
-16 to -40% CC	11	108	120
Total	11	113	124
All Hardwood	67	243	310

Table C-75. Acres of Verified Change in Ventura County by Cause and Conifer Cover Type

	Unknown Cause	All Causes
Montane Hardwoods Conifer		
-16 to -40% CC	6	6
Total	6	6
All Conifer	6	6

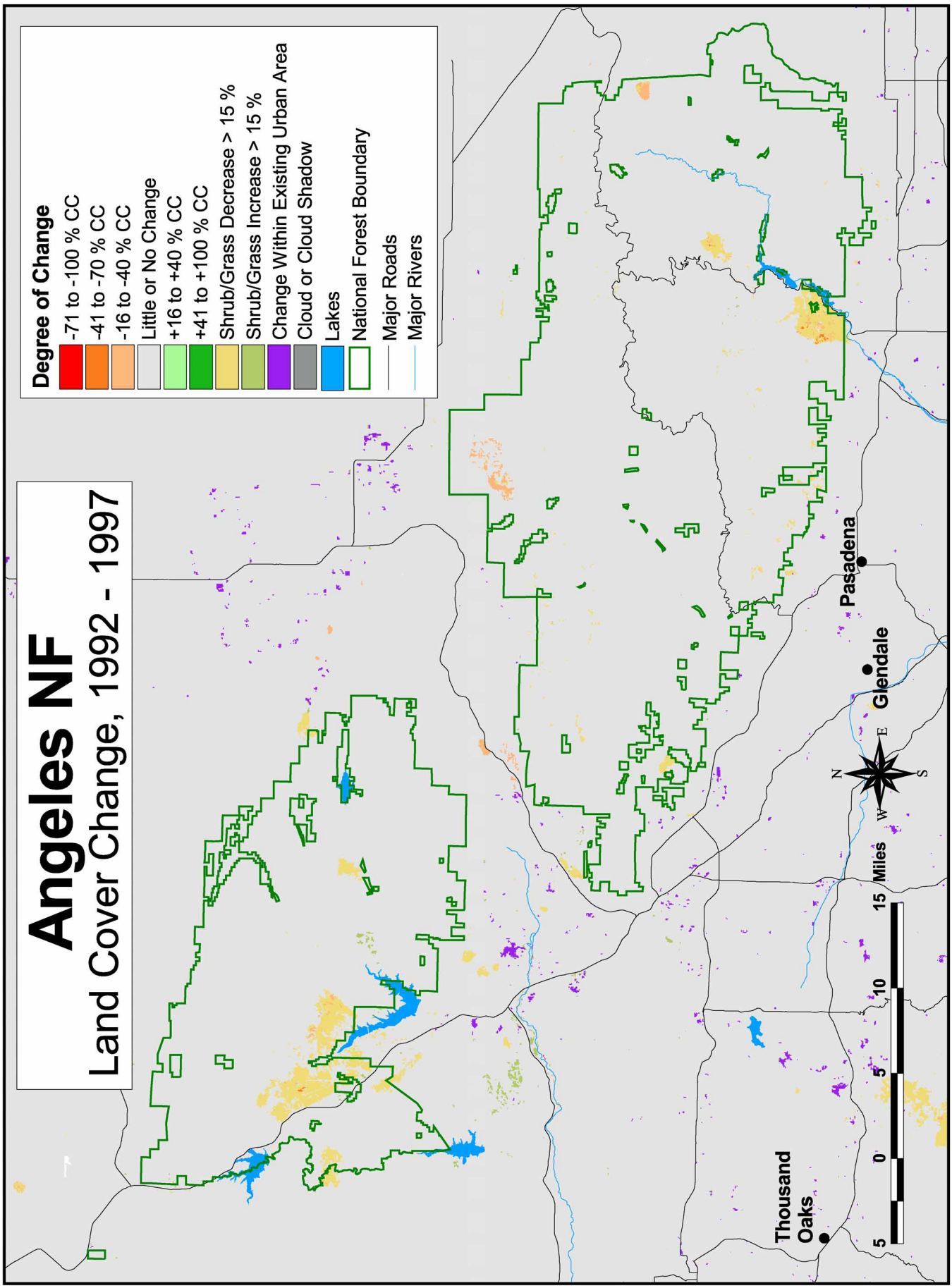
Table C-76. Acres of Verified Change in Ventura County by Cause and Shrub/Chaparral Cover Type

	Wildfire	Unknown Cause	All Causes
Chamise - Redshank Chaparral			
Shrub/Grass Decrease > 15 %	22	18	39
Total	22	18	39
Coastal Scrub			
Shrub/Grass Decrease > 15 %	2	46	48
Shrub/Grass Increase > 15 %		52	52
Total	2	98	100
Mixed Chaparral			
Shrub/Grass Decrease > 15 %	0	19	20
Total	0	19	20
Montane Chaparral			
Shrub/Grass Decrease > 15 %	1,497	223	1,719
Shrub/Grass Increase > 15 %		8	8
Total	1,497	231	1,727
Undetermined Shrub/Chaparral			
Shrub/Grass Decrease > 15 %	14	379	393
Shrub/Grass Increase > 15 %		72	72
Total	14	451	465
All Shrub/Chaparral	1,534	816	2,350

Appendix G

National Forest Maps and Tables

Contents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Degree of Change
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-41 to -70 % CC
-16 to -40 % CC
Little or No Change
+16 to +40 % CC
+41 to +100 % CC
Shrub/Grass Decrease > 15 %
Shrub/Grass Increase > 15 %
Change Within Existing Urban Area
Cloud or Cloud Shadow
Lakes
National Forest Boundary
Major Roads
Major Rivers
Pasadena
Glendale
Thousand Oaks
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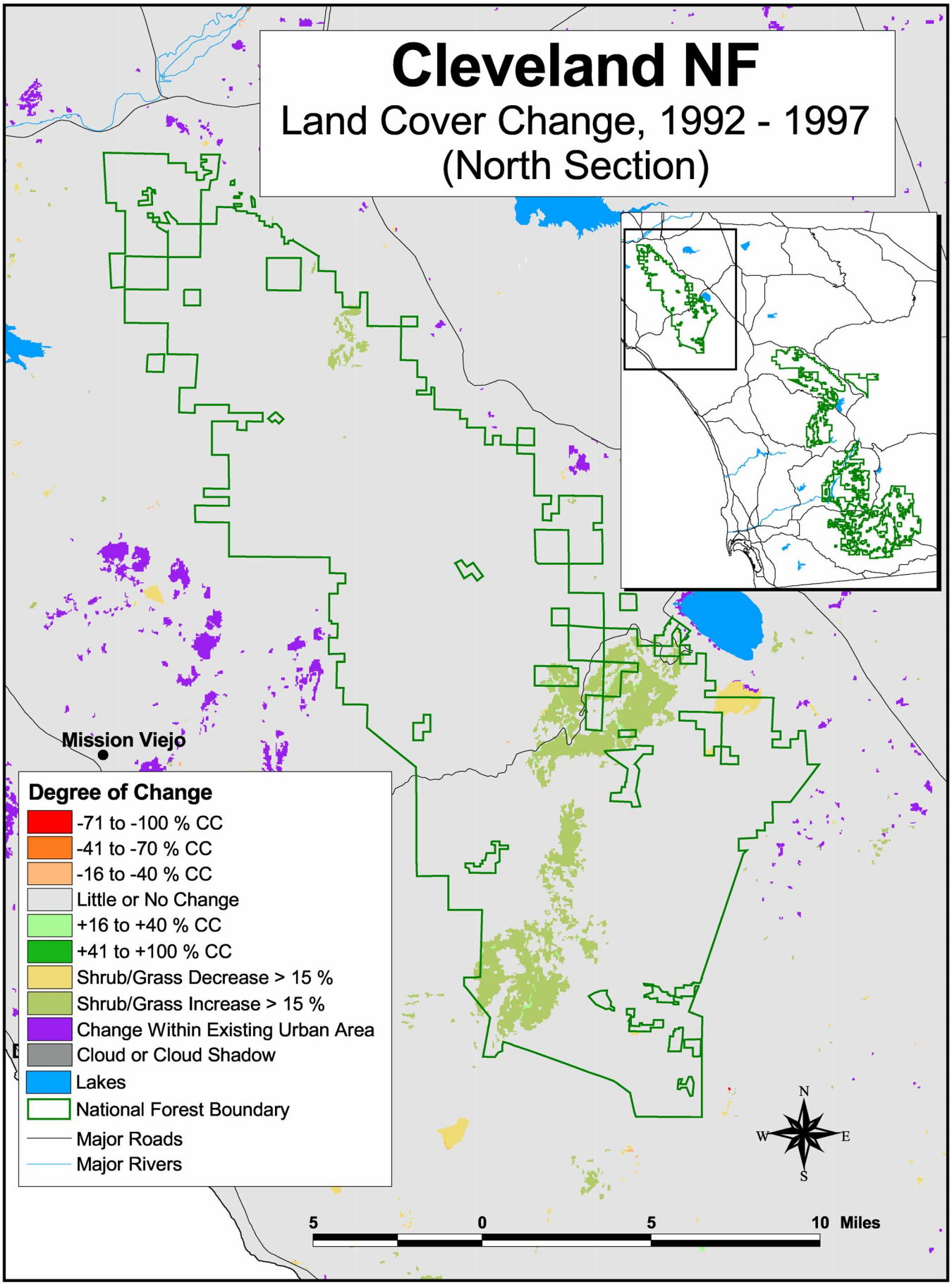
E
S
W
15
10
5
0
5
Miles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(North Section)
Mission Viejo
Degree of Change
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-16 to -40 % CC
Little or No Change
+16 to +40 % CC
+41 to +100 % CC
Shrub/Grass Decrease > 15 %
Shrub/Grass Increase > 15 %
Change Within Existing Urban Area
Cloud or Cloud Shadow
Lakes
National Forest Boundary
Major Roads
Major Rivers
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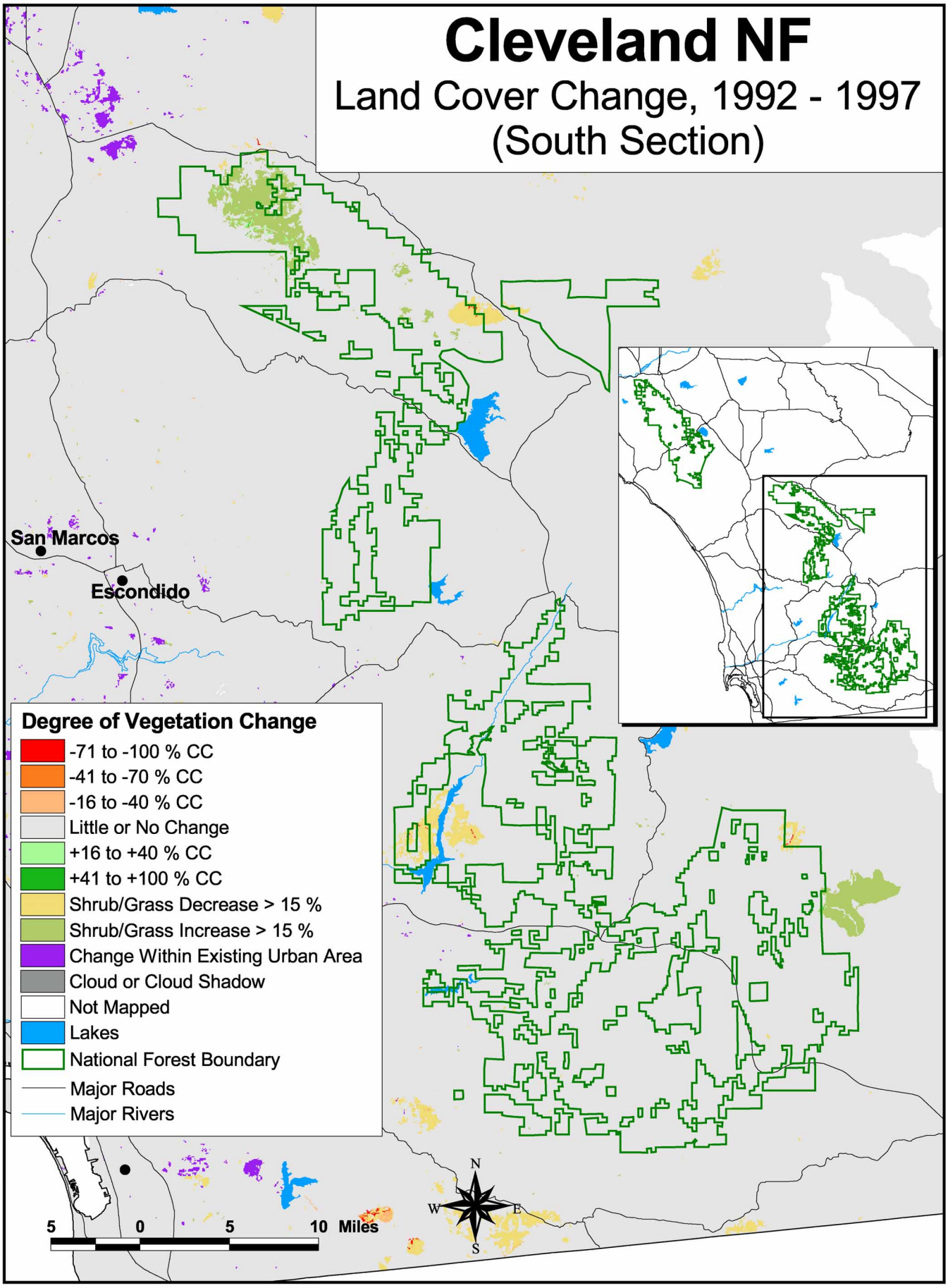
10 Miles


Cleveland NF
Land Cover Change, 1992 - 1997
(South Section)
San Marcos
Escondido
Degree of Vegetation Change
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-41 to -70 % CC
-16 to -40 % CC
Little or No Change
+16 to +40 % CC
+41 to +100 % CC
Shrub/Grass Decrease > 15 %
Shrub/Grass Increase > 15 %
Change Within Existing Urban Area
Cloud or Cloud Shadow
Not Mapped
Lakes
National Forest Boundary
Major Roads
Major Rivers
5 0 5 10 Miles
N
W
E
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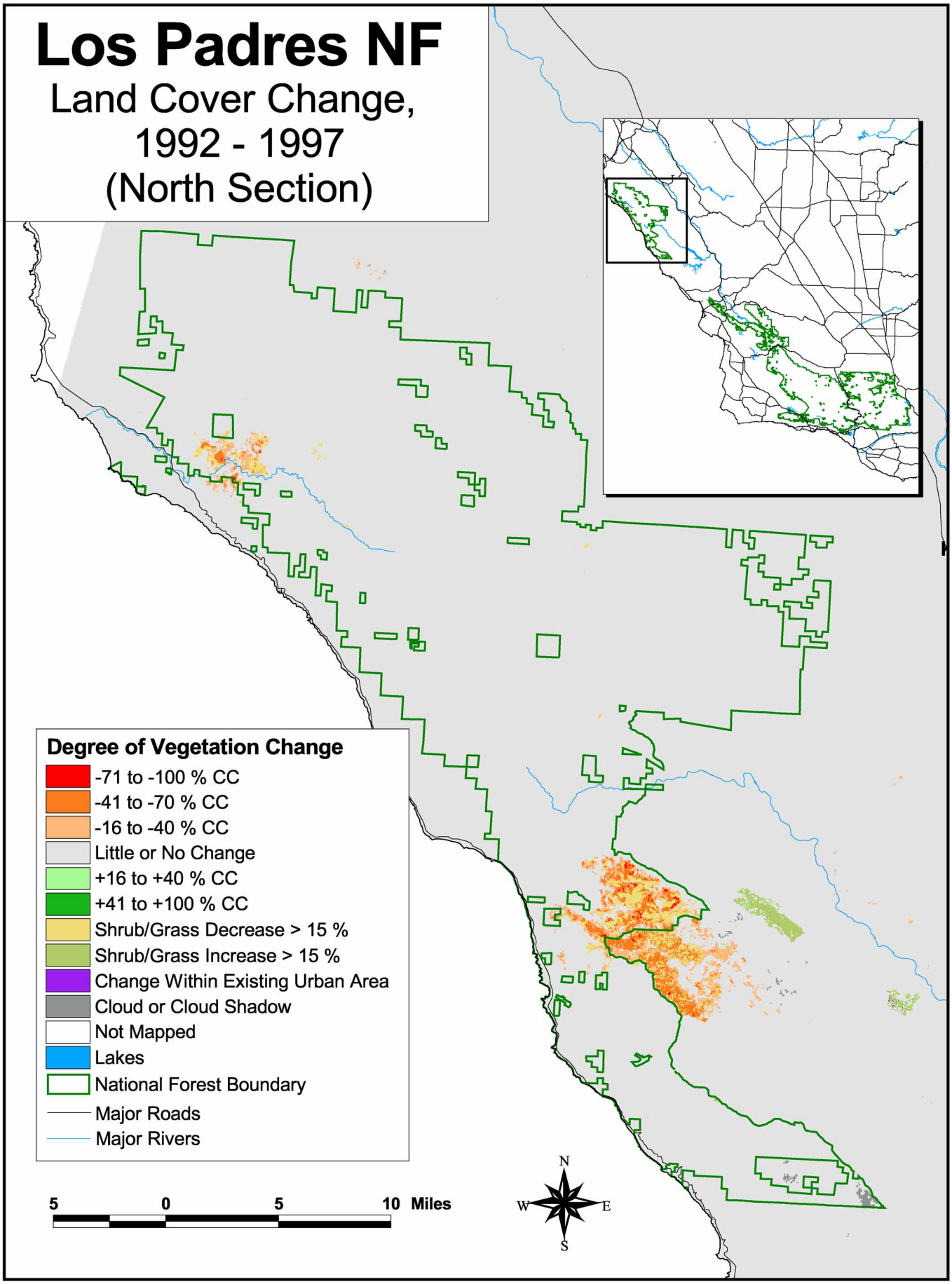
Los Padres NF
Land Cover Change,
1992 - 1997
(North Section)
Degree of Vegetation Change
-71 to -100 % CC
-41 to -70 % CC
-16 to -40 % CC
Little or No Change
+16 to +40 % CC
+41 to +100 % CC
Shrub/Grass Decrease > 15 %
Shrub/Grass Increase > 15 %
Change Within Existing Urban Area
Cloud or Cloud Shadow
Not Mapped
Lakes
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5 0 5 10 Miles
N
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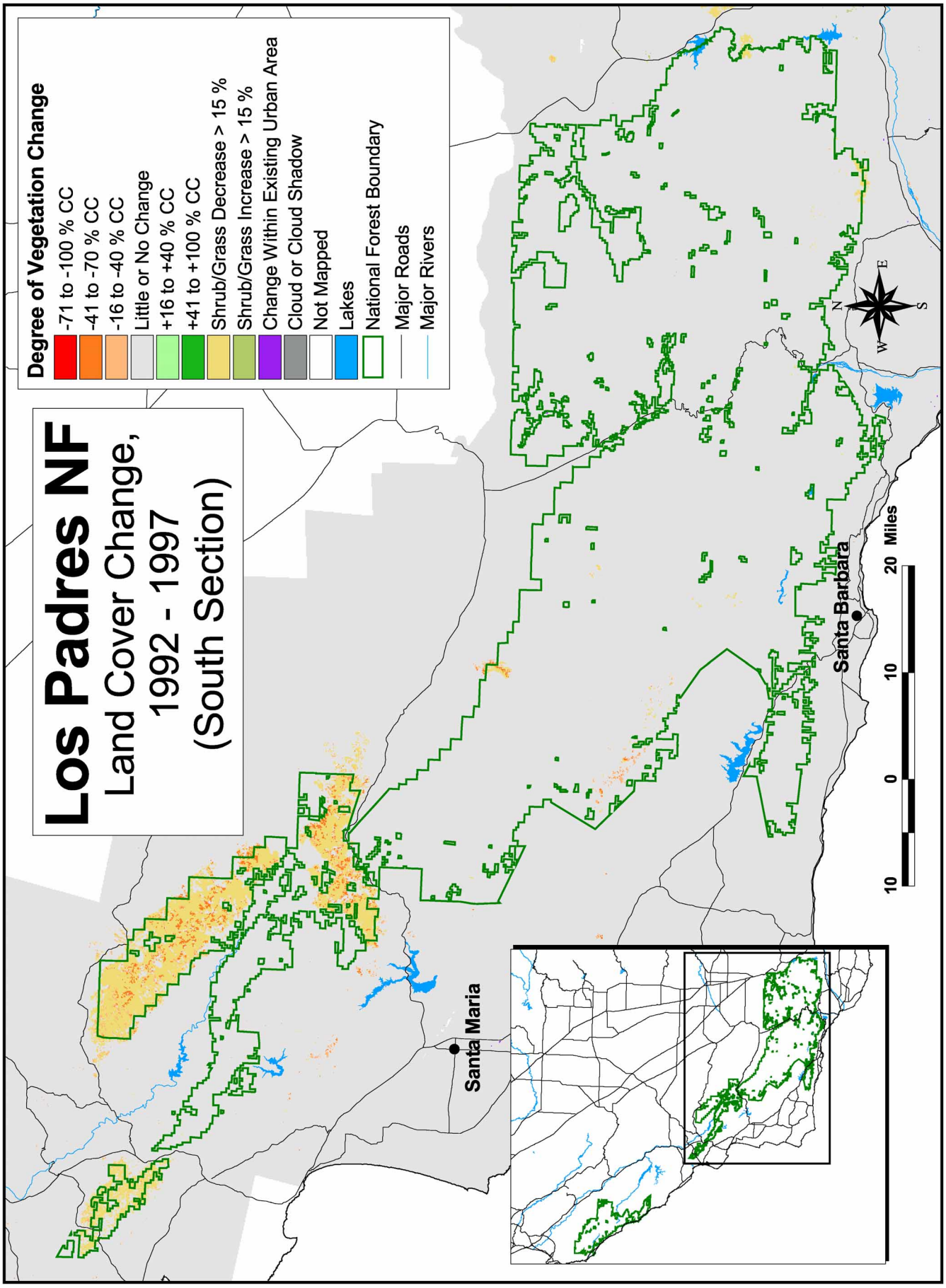
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Land Cover Change,
1992 - 1997
(South Section)
Degree of Vegetation Change
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-41 to -70 % CC
-16 to -40 % CC
Little or No Change
+16 to +40 % CC
+41 to +100 % CC
Shrub/Grass Decrease > 15 %
Shrub/Grass Increase > 15 %
Change Within Existing Urban Area
Cloud or Cloud Shadow
Not Mapped
Lakes
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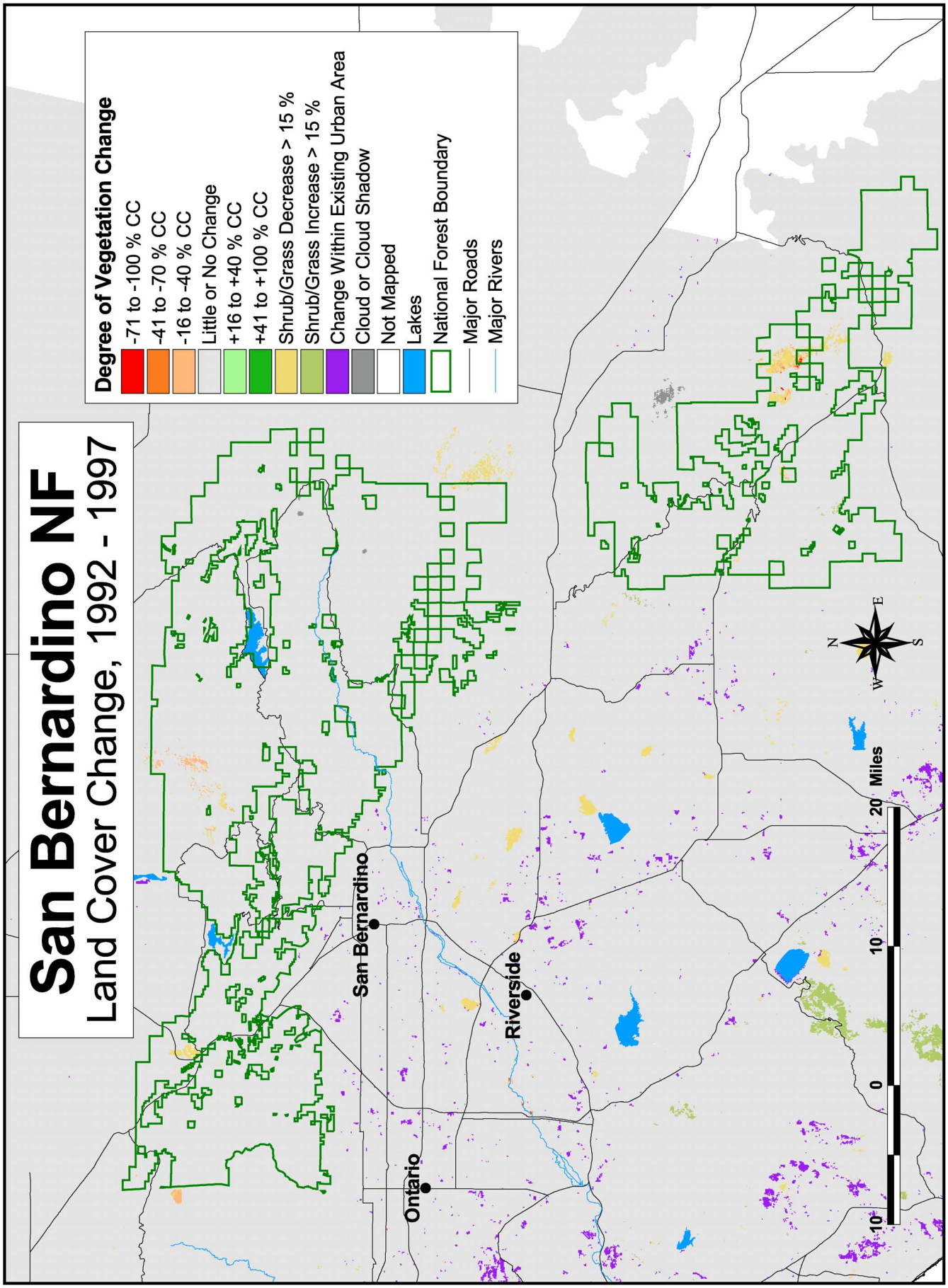
Major Roads
Major Rivers
N
E
S
W
Santa Barbara
Santa Maria
10
0
10
20 Miles


San Bernardino NF
Land Cover Change, 1992 - 1997
Degree of Vegetation Change
-71 to -100 % CC
-41 to -70 % CC
-16 to -40 % CC
Little or No Change
+16 to +40 % CC
+41 to +100 % CC
Shrub/Grass Decrease > 15 %
Shrub/Grass Increase > 15 %
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San Bernardino
Riverside
Ontario
N
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-10
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10
20
Miles

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

	Angeles		Cleveland		Los Padres		San Bernardino		All Forests	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
Conifer										
-71 to -100% CC					191	0	34	0	225	0
-41 to -70% CC					2,576	1	60	0	2,636	0
-16 to -40% CC	1,397	1	5	0	2,324	1	1,363	0	5,088	1
+15 to -15% CC (little or no change)	121,909	99	19,938	98	349,377	99	271,176	99	762,400	99
+16 to +40% CC			362	2	3	0			365	0
Cloud or Cloud Shadow							163	0	163	0
Total	123,306	100	20,305	100	354,471	100	272,796	100	770,877	100
Grass/Forbes										
Shrub/Grass Decrease > 15%	174	8	1	0	274	1	33	1	483	1
+15 to -15% CC (little or no change)	2,089	92	7,345	100	29,217	99	3,058	98	41,709	99
Shrub/Grass Increase > 15%					4	0			4	0
Non-Vegetation Change							31	1	31	0
Total	2,263	100	7,346	100	29,496	100	3,122	100	42,227	100
Hardwood										
-71 to -100% CC			53	0	4	0	21	0	78	0
-41 to -70% CC	112	0	3	0	7,009	3	8	0	7,133	2
-16 to -40% CC	497	1	56	0	7,803	3	162	1	8,517	3
+15 to -15% CC (little or no change)	60,558	99	21,749	99	216,231	94	22,771	99	321,309	95
+16 to +40% CC			202	1	5	0	2	0	209	0
+41 to +100% CC			18	0					18	0
Total	61,167	100	22,080	100	231,053	100	22,965	100	337,264	100
Non-Forested Other										
+15 to -15% CC (little or no change)	7,256	100	3,712	100	15,046	100	10,602	100	36,616	100
Non-Vegetation Change	7	0	1	0			51	0	59	0
Total	7,262	100	3,713	100	15,046	100	10,654	100	36,675	100
Shrub/Chaparral										
Shrub/Grass Decrease > 15%	15,426	3	3,085	1	78,875	7	4,225	1	101,611	4
+15 to -15% CC (little or no change)	448,159	97	338,449	94	1,052,787	93	352,150	99	2,191,545	95
Shrub/Grass Increase > 15%	366	0	17,691	5	59	0	177	0	18,293	1
Cloud or Cloud Shadow					292	0			292	0
Total	463,951	100	359,226	100	1,132,012	100	356,552	100	2,311,741	100
All Lifeforms	657,949		412,670		1,762,077		666,089		3,498,785	

Table F-2. Acres of Classified Hardwood Change by CALVEG Type and National Forest

	Angeles		Cleveland		Los Padres		San Bernardino		All Forests	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
Bigcone Douglas - Fir										
-41 to -70% CC					7	9			7	1
-16 to -40% CC					35	44	10	1	45	4
+15 to -15% CC (little or no change)	399	100			38	47	662	99	1,099	96
Total	399	100			80	100	672	100	1,151	100
Gray Pine										
-41 to -70% CC					371	31			371	22
-16 to -40% CC					307	26			307	19
+15 to -15% CC (little or no change)	454	100			518	43			972	59
Total	454	100			1,196	100			1,651	100
Live Oak - Madrone										
-71 to -100% CC					4	0			4	0
-41 to -70% CC					956	2			956	2
-16 to -40% CC					1,027	2			1,027	2
+15 to -15% CC (little or no change)					54,646	96			54,646	96
Total					56,633	100			56,633	100
Coast Live Oak										
-71 to -100% CC			52	0					52	0
-41 to -70% CC	83	1			669	1			752	1
-16 to -40% CC	323	4	51	0	883	1	13	1	1,271	1
+15 to -15% CC (little or no change)	8,660	96	16,070	98	67,887	98	1,047	99	93,663	98
+16 to +40% CC			170	1	2	0	2	0	174	0
+41 to +100% CC			8	0					8	0
Total	9,066	100	16,350	100	69,441	100	1,063	100	95,919	100
Canyon Live Oak										
-41 to -70% CC	29	0			190	0			219	0
-16 to -40% CC	172	0			159	0	39	0	370	0
+15 to -15% CC (little or no change)	48,521	100	2,893	100	41,302	99	13,335	100	106,051	99
Total	48,722	100	2,893	100	41,651	100	13,373	100	106,640	100
Blue Oak										
-41 to -70% CC					4,609	11			4,609	10
-16 to -40% CC					4,935	11			4,935	11
+15 to -15% CC (little or no change)	336	100			34,283	78			34,618	78
Total	336	100			43,827	100			44,162	100
California Black Oak										
-71 to -100% CC			1	0			21	0	22	0
-41 to -70% CC			3	0			8	0	11	0
-16 to -40% CC			4	0			101	2	105	1
+15 to -15% CC (little or no change)	993	100	2,783	98	263	100	6,442	98	10,482	98
+16 to +40% CC			32	1					32	0
+41 to +100% CC			10	0					10	0
Total	993	100	2,833	100	263	100	6,572	100	10,662	100
Valley Oak										
-41 to -70% CC					11	2			11	2
-16 to -40% CC					49	8			49	8
+15 to -15% CC (little or no change)	16	100			515	90			531	90
Total	16	100			575	100			591	100

Table F-2. Acres of Classified Hardwood Change by CALVEG Type and National Forest (cont.)

	Angeles		Cleveland		Los Padres		San Bernardino		All Forests	
Engelmann Oak										
+15 to -15% CC (little or no change)			3	100					3	100
Total			3	100					3	100
Tanoak - Madrone										
-41 to -70% CC					160	1			160	1
-16 to -40% CC					351	2			351	2
+15 to -15% CC (little or no change)					14,948	97			14,948	97
+16 to +40% CC					3	0			3	0
Total					15,462	100			15,462	100
California Bay										
+15 to -15% CC (little or no change)					149	100			149	100
Total					149	100			149	100
Black Walnut										
+15 to -15% CC (little or no change)	30	100							30	100
Total	30	100							30	100
Willow - Alder										
-16 to -40% CC	2	0							2	0
+15 to -15% CC (little or no change)	1,146	100			1	100	1,286	100	2,432	100
Total	1,147	100			1	100	1,286	100	2,434	100
Undetermined Hardwood										
-41 to -70% CC					35	2			35	2
-16 to -40% CC					58	3			58	3
+15 to -15% CC (little or no change)	3	100			1,681	95			1,684	95
Total	3	100			1,775	100			1,777	100
All Hardwood	61,167		22,080		231,053		22,965		337,264	

Table F-3. Acres of Classified Conifer Change by CALVEG Type and National Forest

	Angeles		Cleveland		Los Padres		San Bernardino		All Forests	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
Santa Lucia Fir										
+15 to -15% CC (little or no change)					335	100			335	100
Total					335	100			335	100
Pacific Douglas - Fir										
+15 to -15% CC (little or no change)					1,215	100			1,215	100
Total					1,215	100			1,215	100
Bigcone Douglas - Fir										
-41 to -70% CC					48	0			48	0
-16 to -40% CC	66	0	5	0	355	3	28	0	455	1
+15 to -15% CC (little or no change)	42,655	100	7,064	96	13,518	97	14,999	100	78,235	99
+16 to +40% CC			324	4					324	0
Total	42,721	100	7,393	100	13,921	100	15,027	100	79,062	100
Eastside Pine										
+15 to -15% CC (little or no change)							34,813	100	34,813	100
Cloud or Cloud Shadow							22	0	22	0
Total							34,836	100	34,836	100
Jeffrey Pine										
-16 to -40% CC	209	5					100	1	310	0
+15 to -15% CC (little or no change)	4,316	95	7,423	100	41,917	100	13,712	99	67,368	100
+16 to +40% CC			13	0					13	0
Total	4,525	100	7,436	100	41,917	100	13,812	100	67,690	100
Knobcone Pine										
+15 to -15% CC (little or no change)					982	100	88	100	1,070	100
Total					982	100	88	100	1,070	100
Cuyamaca Cypress										
+15 to -15% CC (little or no change)			54	100					54	100
Total			54	100					54	100
Mixed Conifer - Fir										
-16 to -40% CC	86	0			79	0	1	0	167	0
+15 to -15% CC (little or no change)	44,944	100	3,496	100	35,073	100	28,294	100	111,807	100
+16 to +40% CC			15	0					15	0
Cloud or Cloud Shadow							121	0	121	0
Total	45,030	100	3,510	100	35,153	100	28,417	100	112,109	100
Mixed Conifer - Pine										
-71 to -100% CC							28	0	28	0
-41 to -70% CC							32	0	32	0
+15 to -15% CC (little or no change)	11,402	99					105,466	100	116,869	100
-16 to -40% CC	90	1					196	0	287	0
Cloud or Cloud Shadow							8	0	8	0
Total	11,493	100					105,731	100	117,223	100
Tecate Cypress										
+15 to -15% CC (little or no change)			53	100					53	100
Total			53	100					53	100

Table F-3. Acres of Classified Conifer Change by CALVEG Type and National Forest (cont.)

	Angeles		Cleveland		Los Padres		San Bernardino		All Forests	
Coulter Pine										
-71 to -100% CC					187	0	6	0	193	0
-41 to -70% CC					2,338	5	16	0	2,354	4
-16 to -40% CC					1,323	3	11	0	1,334	2
+15 to -15% CC (little or no change)	562	100	1,848	99	42,569	92	9,491	100	54,470	93
+16 to +40% CC			11	1					11	0
Total	562	100	1,858	100	46,416	100	9,524	100	58,361	100
Singleleaf Pinyon Pine										
-41 to -70% CC							12	0	12	0
-16 to -40% CC	945	5					1,026	2	1,970	1
+15 to -15% CC (little or no change)	17,968	95			196,714	100	56,403	98	271,085	99
Total	18,912	100			196,714	100	57,441	100	273,067	100
Limber Pine										
+15 to -15% CC (little or no change)					235	100			235	100
Total					235	100			235	100
Ponderosa Pine										
-41 to -70% CC					80	1			80	1
-16 to -40% CC					274	3			274	3
+15 to -15% CC (little or no change)					9,964	97			9,964	97
Total					10,318	100			10,318	100
Fourneedle Pinyon Pine										
+15 to -15% CC (little or no change)							299	100	299	100
Total							299	100	299	100
Redwood										
-71 to -100% CC					4	0			4	0
-41 to -70% CC					110	2			110	2
-16 to -40% CC					293	4			293	4
+15 to -15% CC (little or no change)					6,602	94			6,602	94
+16 to +40% CC					3	0			3	0
Total					7,012	100			7,012	100
Subalpine Conifers										
+15 to -15% CC (little or no change)							5,965	100	5,965	100
Cloud or Cloud Shadow							12	0	12	0
Total							5,976	100	5,976	100
Undetermined Conifer										
+15 to -15% CC (little or no change)	64	100			252	100	1,647	100	1,962	100
Total	64	100			252	100	1,647	100	1,962	100
All Conifer	123,306		20,305		354,471		272,796		770,877	

Table F-4. Acres of Classified Shrub/Chaparral Change by CALVEG Type and National Forest

	Angeles		Cleveland		Los Padres		San Bernardino		All Forests	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
Cushion Plant										
+15 to -15% CC (little or no change)							63	100	63	100
Total							63	100	63	100
Basin Sagebrush										
Shrub/Grass Decrease > 15%							19	0	19	0
+15 to -15% CC (little or no change)	802	100	1,004	100	8,003	100	10,008	100	19,818	100
Total	802	100	1,004	100	8,003	100	10,027	100	19,837	100
Chamise										
Shrub/Grass Decrease > 15%	1,902	4	511	1	13,620	18	154	0	16,188	7
+15 to -15% CC (little or no change)	49,504	96	75,961	97	60,815	82	42,218	99	228,497	93
Shrub/Grass Increase > 15%	89	0	1,927	2			59	0	2,075	1
Total	51,495	100	78,399	100	74,435	100	42,431	100	246,760	100
Ceanothus Mixed Chaparral										
Shrub/Grass Decrease > 15%					2	0			2	0
+15 to -15% CC (little or no change)					3,088	100			3,088	100
Total					3,090	100			3,090	100
Southern Mixed Chaparral										
Shrub/Grass Decrease > 15%			917	4					917	4
+15 to -15% CC (little or no change)			20,482	96					20,482	96
Shrub/Grass Increase > 15%			1	0					1	0
Total			21,399	100					21,399	100
Sumac Shrub										
+15 to -15% CC (little or no change)			1	100	75	100	7	100	83	100
Total			1	100	75	100	7	100	83	100
Lower Montane Mixed Chaparral										
Shrub/Grass Decrease > 15%	11,889	4	348	0	58,012	7	1,173	1	71,422	5
+15 to -15% CC (little or no change)	311,816	96	162,296	95	744,153	93	111,337	99	1,329,601	94
Shrub/Grass Increase > 15%	71	0	8,764	5	22	0			8,857	1
Cloud or Cloud Shadow					292	0			292	0
Total	323,775	100	171,407	100	802,479	100	112,510	100	1,410,172	100
Redshank Chaparral										
Shrub/Grass Decrease > 15%			957	3			1,677	3	2,634	3
+15 to -15% CC (little or no change)			22,396	75			53,944	97	76,341	89
Shrub/Grass Increase > 15%			6,527	22			101	0	6,628	8
Total			29,880	100			55,723	100	85,603	100
Scrub Oak										
Shrub/Grass Decrease > 15%			113	1	2,987	15	38	5	3,137	7
+15 to -15% CC (little or no change)			21,235	98	16,680	85	777	94	38,692	92
Shrub/Grass Increase > 15%			392	2			11	1	402	1
Total			21,741	100	19,666	100	825	100	42,231	100
Tucker Scrub Oak										
Shrub/Grass Decrease > 15%					894	1			894	1
+15 to -15% CC (little or no change)					65,738	99			65,738	99
Total					66,632	100			66,632	100

Table F-4. Acres of Classified Shrub/Chaparral Change by CALVEG Type and National Forest (cont.)

	Angeles		Cleveland		Los Padres		San Bernardino		All Forests	
Montane Mixed Chaparral										
Shrub/Grass Decrease > 15%	133	1	27	0	30	0	43	0	233	0
+15 to -15% CC (little or no change)	16,802	99	6,108	99	17,737	100	32,613	100	73,260	100
Shrub/Grass Increase > 15%			58	1					58	0
Total	16,935	100	6,193	100	17,767	100	32,656	100	73,550	100
Semi-Desert Chaparral										
Shrub/Grass Decrease > 15%	167	1					913	1	1,079	1
+15 to -15% CC (little or no change)	25,623	99					71,848	99	97,471	99
Shrub/Grass Increase > 15%	3	0					1	0	4	0
Total	25,793	100					72,762	100	98,554	100
Mixed Desert Shrub										
+15 to -15% CC (little or no change)							7,827	100	7,827	100
Total							7,827	100	7,827	100
Buckwheat - White Sage										
Shrub/Grass Decrease > 15%	553	3	79	0	211	0	209	1	1,052	1
+15 to -15% CC (little or no change)	21,153	97	16,617	99	76,504	100	18,853	99	133,125	99
Shrub/Grass Increase > 15%	143	1	19	0	12	0			174	0
Total	21,849	100	16,715	100	76,726	100	19,061	100	134,351	100
California Sagebrush										
Shrub/Grass Decrease > 15%	776	3	133	1	2,936	5			3,846	4
+15 to -15% CC (little or no change)	21,838	96	12,322	99	56,825	95	2,350	100	93,335	96
Shrub/Grass Increase > 15%	58	0	4	0	23	0	5	0	89	0
Total	22,672	100	12,459	100	59,784	100	2,354	100	97,269	100
Undetermined Shrub/Chaparral										
Shrub/Grass Decrease > 15%	6	1			183	5			188	4
+15 to -15% CC (little or no change)	622	99	28	100	3,170	94	305	100	4,125	96
Shrub/Grass Increase > 15%	2	0			3	0			5	0
Total	631	100	28	100	3,355	100	305	100	4,319	100
All Shrub/Chaparral	463,951		359,226		1,132,012		356,552		2,311,741	

Table F-5. Acres of Verified Change in the Angeles National Forest by Cause and Hardwood CALVEG Type

	Wildfire	Prescription Burn	Unknown Cause	All Causes
Coast Live Oak				
-41 to -70% CC	83			83
-16 to -40% CC	320	3		323
Total	403	3		406
Canyon Live Oak				
-41 to -70% CC	29			29
-16 to -40% CC	163		9	172
Total	192		9	201
Willow - Alder				
-16 to -40% CC			2	2
Total			2	2
All Hardwood	595	3	11	609

Table F-6. Acres of Verified Change in the Angeles National Forest by Cause and Conifer CALVEG Type

	Wildfire	Mortality	All Causes
Bigcone Douglas - Fir			
-16 to -40% CC	66		66
Total	66		66
Jeffrey Pine			
-16 to -40% CC		209	209
Total		209	209
Mixed Conifer - Fir			
-16 to -40% CC		86	86
Total		86	86
Mixed Conifer - Pine			
-16 to -40% CC	27	64	90
Total	27	64	90
Singleleaf Pinyon Pine			
-16 to -40% CC	945		945
Total	945		945
All Conifer	1,038	359	1,397

Table F-7. Acres of Verified Change in the Angeles National Forest by Cause and Shrub/Chaparral CALVEG Type

	Wildfire	Mortality	Prescription Burn	Unknown Cause	All Causes
Chamise					
Shrub/Grass Decrease > 15 %	1856		0	46	1,902
Shrub/Grass Increase > 15 %				89	89
Total	1856		0	135	1,992
Lower Montane Mixed Chaparral					
Shrub/Grass Decrease > 15 %	11,018		19	852	11,889
Shrub/Grass Increase > 15 %				71	71
Total	11,018		19	923	11,960
Montane Mixed Chaparral					
Shrub/Grass Decrease > 15 %		80		54	133
Total		80		54	133
Semi-Desert Chaparral					
Shrub/Grass Decrease > 15 %	129			37	167
Shrub/Grass Increase > 15 %				3	3
Total	129			40	169
Buckwheat - White Sage					
Shrub/Grass Decrease > 15 %	553			0	553
Shrub/Grass Increase > 15 %				143	143
Total	553			143	696
California Sagebrush					
Shrub/Grass Decrease > 15 %	654		4	117	776
Shrub/Grass Increase > 15 %				58	58
Total	654		4	175	834
Unverified Shrub/Chaparral					
Shrub/Grass Decrease > 15 %	2		2	1	6
Shrub/Grass Increase > 15 %				2	2
Total	2		2	4	8
All Shrub/Chaparral	14,213	80	26	1,473	15,792

Table F-8. Acres of Verified Change in the Cleveland National Forest by Cause and Hardwood CALVEG Type

	Wildfire	Regeneration	Unknown Cause	All Causes
Coast Live Oak				
-71 to -100% CC	52			52
-16 to -40% CC	49		3	51
+16 to +40% CC		170		170
+41 to +100% CC		8		8
Total	100	178	3	280
California Black Oak				
-71 to -100% CC	1			1
-41 to -70% CC	3			3
+16 to +40% CC		32		32
+41 to +100% CC		10		10
Total	8	42		50
All Hardwood	108	219	3	330

Table F-9. Acres of Verified Change in the Cleveland National Forest by Cause and Conifer CALVEG Type

	Wildfire	Regeneration	All Causes
Bigcone Douglas - Fir			
-16 to -40% CC	5		5
+16 to +40% CC		324	324
Total	5	324	329
Jeffrey Pine			
+16 to +40% CC		13	13
Total		13	13
Mixed Conifer - Fir			
+16 to +40% CC		15	15
Total		15	15
Coulter Pine			
+16 to +40% CC		11	11
Total		11	11
All Conifer	5	362	368

Table F-10. Acres of Verified Change in the Cleveland National Forest by Cause and Shrub/Chaparral CALVEG Type

	Wildfire	Development	Regeneration	Unknown Cause	All Causes
Chamise					
Shrub/Grass Decrease > 15 %	507			5	511
Shrub/Grass Increase > 15 %			1,901	26	1,927
Total	507		1,901	30	2,438
Southern Mixed Chaparral					
Shrub/Grass Decrease > 15 %	909			8	917
Shrub/Grass Increase > 15 %				1	1
Total	909			9	917
Lower Montane Mixed Chaparral					
Shrub/Grass Decrease > 15 %	318	5		25	348
Shrub/Grass Increase > 15 %			8,753	11	8,764
Total	318	5	8,753	36	9,111
Redshank Chaparral					
Shrub/Grass Decrease > 15 %	957				957
Shrub/Grass Increase > 15 %			6,518	10	6,527
Total	957		6,518	10	7,484
Scrub Oak					
Shrub/Grass Decrease > 15 %	112			2	113
Shrub/Grass Increase > 15 %			385	7	392
Total	112		385	8	505
Lower Montane Mixed Chaparral					
Shrub/Grass Decrease > 15 %	27				27
Shrub/Grass Increase > 15 %			43	15	58
Total	27		43	15	85
Buckwheat - White Sage					
Shrub/Grass Decrease > 15 %	79	0			79
Shrub/Grass Increase > 15 %			19		19
Total	79	0	19		99
California Sagebrush					
Shrub/Grass Decrease > 15 %	131			2	133
Shrub/Grass Increase > 15 %			4		4
Total	131		4	2	137
All Shrub/Chaparral	3,039	6	17,623	110	20,776

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

	Wildfire	Unknown Cause	All Causes
Bigcone Douglas - Fir			
-41 to -70% CC	7		7
-16 to -40% CC	35		35
Total	42		42
Gray Pine			
-41 to -70% CC	371		371
-16 to -40% CC	307		307
Total	678		678
Live Oak - Madrone			
-71 to -100% CC	4		4
-41 to -70% CC	956		956
-16 to -40% CC	1,027		1,027
Total	1,987		1,987
Coast Live Oak			
-41 to -70% CC	658	11	669
-16 to -40% CC	832	51	883
+16 to +40% CC		2	2
Total	1,490	64	1,554
Canyon Live Oak			
-41 to -70% CC	187	3	190
-16 to -40% CC	148	11	159
Total	335	14	349
Blue Oak			
-41 to -70% CC	4,609		4,609
-16 to -40% CC	4,935		4,935
Total	9,544		9,544
Valley Oak			
-41 to -70% CC	11		11
-16 to -40% CC	49		49
Total	60		60
Tanoak - Madrone			
-41 to -70% CC	160		160
-16 to -40% CC	351		351
+16 to +40% CC		3	3
Total	511	3	514
Undetermined Hardwood			
-41 to -70% CC	35		35
-16 to -40% CC	57	1	58
Total	92	1	93
All Hardwood	14,739	82	14,821

Table F-12. Acres of Verified Change in the Los Padres National Forest by Cause and Conifer CALVEG Type

	Wildfire	Unknown Cause	All Causes
Bigcone Douglas - Fir			
-41 to -70% CC	48		48
-16 to -40% CC	349	6	355
Total	397	6	403
Mixed Conifer - Fir			
-16 to -40% CC	79		79
Total	79		79
Coulter Pine			
-71 to -100% CC	187		187
-41 to -70% CC	2,338		2,338
-16 to -40% CC	1,320	3	1,323
Total	3,844	3	3,847
Ponderosa Pine			
-41 to -70% CC	80		80
-16 to -40% CC	271	3	274
Total	351	3	355
Redwood			
-71 to -100% CC	4		4
-41 to -70% CC	110		110
-16 to -40% CC	293		293
+16 to +40% CC		3	3
Total	406	3	409
All Conifer	5,079	15	5,093

Table F-13. Acres of Verified Change in the Los Padres National Forest by Cause and Shrub/Chaparral CALVEG Type

	Wildfire	Unknown Cause	All Causes
Chamise			
Shrub/Grass Decrease > 15 %	13,593	28	13,620
Total	13,593	28	13,620
Ceanothus Mixed Chaparral			
Shrub/Grass Decrease > 15 %		2	2
Total		2	2
Lower Montane Mixed Chaparral			
Shrub/Grass Decrease > 15 %	57,532	480	58,012
Shrub/Grass Increase > 15 %		22	22
Total	57,532	502	58,034
Scrub Oak			
Shrub/Grass Decrease > 15 %	2,966	21	2,987
Total	2,966	21	2,987
Tucker Scrub Oak			
Shrub/Grass Decrease > 15 %	794	100	894
Total	794	100	894
Montane Mixed Chaparral			
Shrub/Grass Decrease > 15 %	0	29	30
Total	0	29	30
Buckwheat - White Sage			
Shrub/Grass Decrease > 15 %	175	36	211
Shrub/Grass Increase > 15 %		12	12
Total	175	48	223
California Sagebrush			
Shrub/Grass Decrease > 15 %	2,911	25	2,936
Shrub/Grass Increase > 15 %		23	23
Total	2,911	48	2,959
Undetermined Shrub/Chaparral			
Shrub/Grass Decrease > 15 %	172	11	183
Shrub/Grass Increase > 15 %		3	3
Total	172	13	185
All Shrub/Chaparral	78,143	791	78,934

Table F-14. Acres of Verified Change in the San Bernardino National Forest by Cause and Hardwood CALVEG Type

	Wildfire	Unknown Cause	All Causes
Bigcone Douglas - Fir			
-16 to -40% CC	10		10
Total	10		10
Coast Live Oak			
-16 to -40% CC	13		13
+16 to +40% CC		2	2
Total	13	2	16
Canyon Live Oak			
-16 to -40% CC	33	6	39
Total	33	6	39
California Black Oak			
-71 to -100% CC	21		21
-41 to -70% CC	8		8
-16 to -40% CC	101		101
Total	130		130
All Hardwood	186	8	194

Table F-15. Acres of Verified Change in the San Bernardino National Forest by Cause and Conifer CALVEG Type

	Wildfire	All Causes
Bigcone Douglas - Fir		
-16 to -40% CC	28	28
Total	28	28
Jeffrey Pine		
-16 to -40% CC	100	100
Total	100	100
Mixed Conifer - Fir		
-16 to -40% CC	1	1
Total	1	1
Mixed Conifer - Pine		
-71 to -100% CC	28	28
-41 to -70% CC	32	32
-16 to -40% CC	196	196
Total	256	256
Coulter Pine		
-71 to -100% CC	6	6
-41 to -70% CC	16	16
-16 to -40% CC	11	11
Total	33	33
Singleleaf Pinyon Pine		
-41 to -70% CC	12	12
-16 to -40% CC	1,026	1,026
Total	1,038	1,038
All Conifer	1,456	1,456

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

	Wildfire	Regeneration	Unknown Cause	All Causes
Basin Sagebrush				
Shrub/Grass Decrease > 15 %	19			19
Total	19			19
Chamise				
Shrub/Grass Decrease > 15 %	154			154
Shrub/Grass Increase > 15 %			59	59
Total	154		59	213
Lower Montane Mixed Chaparral				
Shrub/Grass Decrease > 15 %	1,126		48	1,173
Total	1,126		48	1,173
Redshank Chaparral				
Shrub/Grass Decrease > 15 %	1,677			1,677
Shrub/Grass Increase > 15 %			101	101
Total	1,677		101	1,778
Scrub Oak				
Shrub/Grass Decrease > 15 %	38			38
Shrub/Grass Increase > 15 %			11	11
Total	38		11	48
Montane Mixed Chaparral				
Shrub/Grass Decrease > 15 %	41		3	43
Total	41		3	43
Semi-Desert Chaparral				
Shrub/Grass Decrease > 15 %	913			913
Shrub/Grass Increase > 15 %			1	1
Total	913		1	914
Buckwheat - White Sage				
Shrub/Grass Decrease > 15 %	203		6	209
Total	203		6	209
California Sagebrush				
Shrub/Grass Increase > 15 %		5		5
Total		5		5
All Shrub/Chaparral	4,169	5	229	4,402