4.3 Development of a GIS Wildland Fire Susceptibility Map for Riverside County

As part of this study, a Geographic Information Systems coverage was developed for Riverside County that used vegetation, weather, slope and proximity to urbanization to estimate the relative susceptibility zones in a digital format (Figure 4-2). The GIS mapping is generally accurate to 1:100,000. The susceptibility zones are represented at 1:250,000 on Plate 4-1, and summarized on Figure 4-3. The zones on Plate 4-1 are defined as:

- Very High
- High
- Moderate
- Low
- Very Low
- None

One use of this map would be to restrict roofing material based on relative hazard. For example, "Type A" materials should be required in Very High, High and Moderate zones, while "Type B" materials can be required in Low, Very Low and None susceptibility zones. In addition, defense zones can be increased based on increasing fire hazard susceptibility. Plate 4-1 should replace existing maps (such as the CDF map described in 4.4.2), as Plate 4-1 provides a more accurate and complete hazard assessment for Riverside County.

Fire hazard potential was determined by evaluating vegetation density and type, slope, and their relation to urbanization. Vegetation data were obtained from the California Gap Analysis Project (CGAP) at the University of California Santa Barbara. These data consist of land coverage and vegetation information for the State of California, including canopy dominant species, canopy density, presence of regional endemic species, and inclusion of wetland habitats (Table 4-3). All reference and attribute information for this dataset may be found at this website:

http://www.biogeog.ucsb.edu/projects/gap/data/meta/landcovdd.html#section1

CGAP vegetation data were evaluated by identifying the primary, secondary and tertiary vegetation community types for each digital polygon and then rating the potential fire hazard based on fuel loading (Table 4-3), in accordance with the HUD Study System (1973) and the Bates Bill Process (AB337, 1992). These methods are described below.

Initial assignments of fuel hazard ratings for grasslands, shrublands, and woodlands consisted of light, medium, and heavy, respectively. The ratings were then normalized based on the primary, secondary and tertiary types of vegetation communities. Some data were further modified based on degree of urbanization and angles of slope (0-40%, 41-60%, and over

60%). Increasing slope increases fire spreading potential. Modifications to the initial fuel hazard ratings produced seven fire hazard potential ratings of none, very low, low, moderate-low, moderate, high, and very high (Table 4-3).

Insert Figure 4-2: Flow Chart Illustrating GIS Fire Hazard Mapping Methodology

Insert Figure 4-3: Wildland Fire Susceptibility Map

Table 4-3: Rating Systems Used for Development of GIS Map

VEGETATION DATA, LISTING BY CALIFORNIA GAP ANALYSIS PROJECT U.C. SANTA BARBARA	HUD* Study System	Bates* Bill Process	Wildfire Potential	Wildfire Potential Rating
URBAN OR BUILT-UP LAND	0	0	low	2
AGRICULTURAL LAND	0	0	low	2
ORCHARDS AND VINEYARDS	0	0	low	2
PERMANENTLY-FLOODED LACUSTRINE HABITAT	0	0	none	0
SANDY AREAS OTHER THAN BEACHES	0	0	none	0
BARE EXPOSED ROCK	0	0	none	0
STRIP MINES, QUARRIES AND GRAVEL PITS	0	0	none	0
DESERT DUNES	0	0	none	0
VENTURAN COASTAL SAGE SCRUB	8	2	high	4
VENTURAN COASTAL SAGE SCRUB	8	2	high	4
DIEGAN COASTAL SAGE SCRUB	8	2	high	4
RIVERSIDEAN SAGE SCRUB	8	2	high	4
SONORAN CREOSOTE BUSH SCRUB	8	2	low	2
SONORAN DESERT MIXED SCRUB	8	2	low	2
MOJAVE CREOSOTE BUSH SCRUB	8	2	low	2
MOJAVE MIXED WOODY SCRUB	8	2	low	2
MOJAVE MIXED STEPPE	8	2	moderate-low	3
MOJAVE MIXED WOODY AND SUCCULENT SCRUB	8	2	low	2
BLACKBUSH SCRUB	8	2	low	2
BIG SAGEBRUSH SCRUB	8	2	low	2
DESERT SALTBUSH SCRUB	8	2	low	2
SOUTHERN MIXED CHAPARRAL	8	2	high	4
CHAMISE CHAPARRAL(CHAMISAL)	8	2	high	4
REDSHANK CHAPARRAL	8	2	high	4
SEMI-DESERT CHAPARRAL	8	2	high	4
MIXED MONTANE CHAPARRAL	8	2	high	4
MONTANE CEANOTHUS CHAPARRALS	8	2	high	4
BUCK BRUSH CHAPARRAL	8	2	high	4
HOARY-LEAFED CHAPARRAL	8	2	high	4
BIG POD CHAPARRAL	8	2	high	4
SCRUB OAK CHAPARRAL	8	2	high	4
INTERIOR LIVE OAK CHAPARRAL	8	2	high	4
UPPER SONORAN MANZANITA CHAPARRAL	8	2	high	4
COASTAL SAGE-CHAPPARAL SCRUB	8	2	high	4
VALLEY NEEDLEGRASS GRASSLAND	1	1	very high	5
NON-NATIVE GRASSLAND	1	1	very high	5
ALKALI PLAYA	0	0	very low	1

VEGETATION DATA, LISTING BY CALIFORNIA GAP ANALYSIS PROJECT U.C. SANTA BARBARA	HUD* Study System	Bates* Bill Process	Wildfire Potential	Wildfire Potential Rating
COASTAL AND VALLEY FRESHWATER MARSH	1	2	low	2
SOUTHERN COAST LIVE OAK RIPARIAN FOREST	16	3	moderate-low	2
SOUTHERN COTTONWOOD-WILLOW RIPARIAN	16	3	moderate-low	2
DESERT DRY WASH WOODLAND	16	3	low	2
SOUTHERN SYCAMORE-ALDER RIPARIAN	16	3	low	2
MULE FAT SCRUB	8	2	moderate	3
COAST LIVE OAK WOODLAND	16	3	moderate-high	3
DENSE ENGELMANN OAK WOODLAND	16	3	moderate-high	3
MOJAVEAN PINYON AND JUNIPER WOODLANDS	16	3	moderate-high	4
PENINSULAR PINYON AND JUNIPER WOODLANDS	16	3	moderate-high	4
COAST LIVE OAK FOREST	16	3	moderate-high	4
CANYON LIVE OAK FOREST	16	3	moderate-high	4
COULTER PINE FOREST	16	3	high	4
BIGCONE SPRUCE-CANYON OAK FOREST	16	3	high	4
WESTSIDE PONDEROSA PINE FOREST	16	3	high	4
SIERRAN MIXED CONIFER FOREST	16	3	high	4
JEFFREY PINE-FIR FOREST	16	3	high	4
SOUTHERN CALIFORNIA WHITE FIR FOREST	16	3	high	4
SOUTHERN CALIFORNIA SUBALPINE FOREST	16	3	high	4
No secondary or tertiary type	0	0	NA	0

*: descriptions of the rating systems are summarized in the sections below, additional detail may be found at: http://www.prefire.ucfpl.ucop.edu

4.3.1 HUD Study System

As a result of concerns about fire hazards in California, in April of 1973 the California Department of Forestry and Fire Protection (CDF) published a study funded by the Department of Housing and Urban Development (HUD) under agreement with the Governor's Office of Planning and Research. As is often true, it came as a response to a disaster; in this case the September and October 1970 wildfires which burned more than 580,000 acres in 773 fires. The HUD study uses fuel loading, fire weather, and slope as rating factors.

Fuel loading includes three classes of vegetation based on U.S. Geological Survey (USGS) life forms. These types can easily be determined from USGS maps, and thus a fairly accurate determination of fuels can be made without undertaking a major vegetation mapping project. The vegetative types are considered accurate to the nearest acre.