Environmental Setting Technical Paper
Glenn County General Plan
VOLUME III

Submitted to:
Glenn County Planning Department

Submitted by:
QUAD Consultants

In Association With:
Brown-Buntin Associates, Inc.
Dowling Associates

January 1993

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ENVIRONMENTAL SETTING

1.0 INTRODUCTION

This document contains background information compiled for the Glenn County General Plan. It describes the existing conditions which apply to all the subject areas to be addressed in the Plan, and also served as the "environmental setting" portion of the Environmental Impact Report prepared for the General Plan. This document is organized to correspond to the major subject headings for issue papers to be prepared for the General Plan: Natural Resources, Public Safety, and Community Development (which includes an economic profile of Glenn County). There is also a section describing the relationship of other plans adopted by the County and other agencies to the General Plan.

Glenn County, California, is located in the northern Sacramento Valley and the eastern foothills and mountains of the Coast Range, approximately 80 miles north of the City of Sacramento, as shown on Figure 1-1. The county encompasses approximately 1,317 square miles and extends from the Sacramento River west to the Coast Range. Located in Glenn County are the cities of Willows and Orland and the unincorporated communities of Hamilton City, Ord Bend, Artois, Elk Creek, Butte City, West Orland, and Glenn, and numerous other small settlements.

Portions of this document were excerpted from the Environmental Resources and Energy Technologies-Draft Environmental Setting document prepared for Crawford Multari & Starr by Fugro-McClelland (West) Inc., for the Energy Element of the Glenn County General Plan. Maps provided by the same source are so credited in addition to the primary source.

2.0 NATURAL RESOURCES

2.1 EARTH

2.1.1 Topography

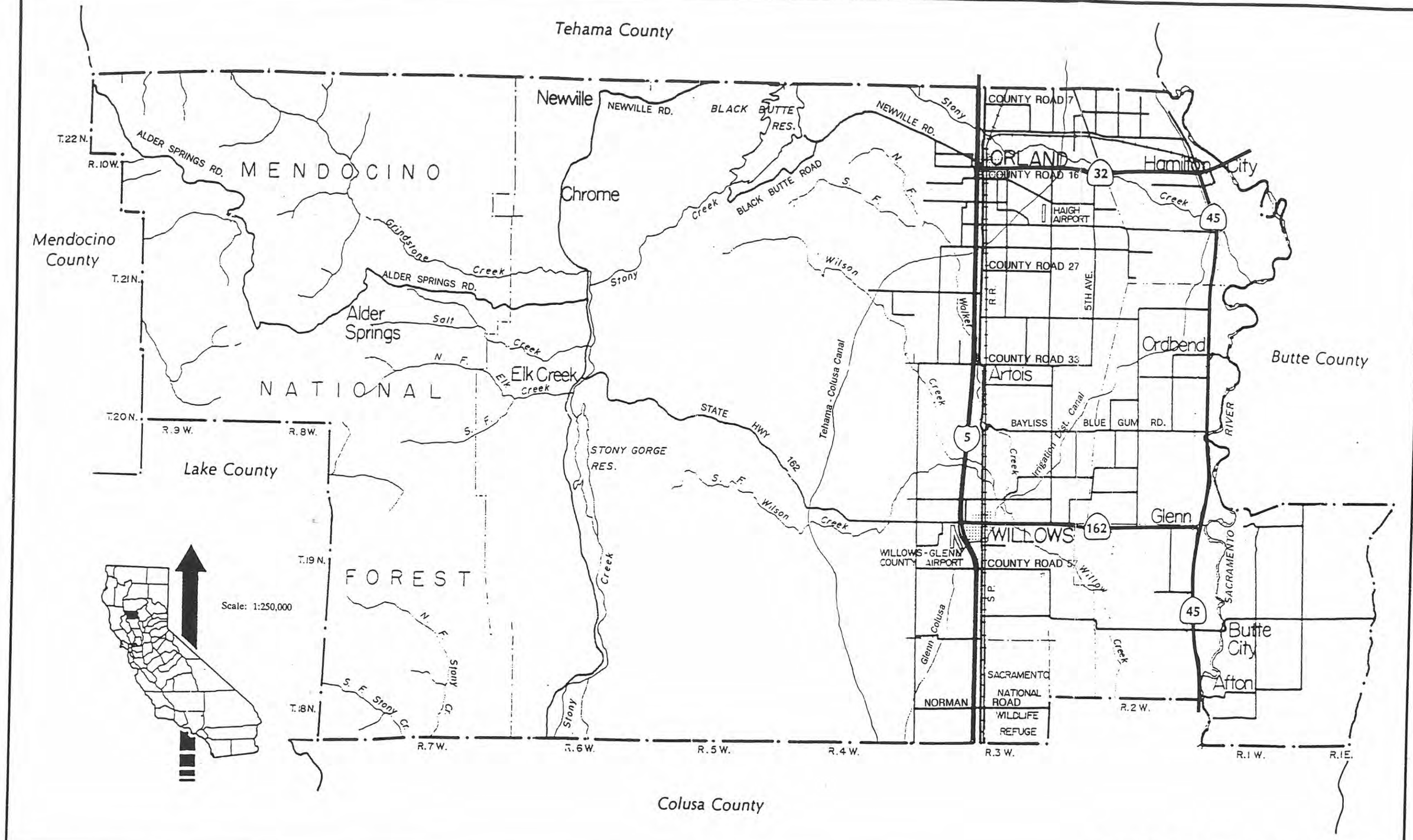
Glenn County topography is typified by steeper terrain in the western portion of the county trending down to relatively flat features along its eastern boundary. Two major geologic provinces exist within the county and have a major influence on the county's topography. They are the Sacramento Valley which generally characterizes the eastern third of the county, and the Coast Range which dominates the western two-thirds.

The Sacramento Valley consists of nearly level terraces, smooth alluvial fans, narrow flood plains and water filled basins. Elevation ranges from approximately 100 feet above mean sea level (MSL) at the Sacramento River to approximately 300 feet above MSL at the western edge of the Valley, west of Interstate 5. A small portion of southeastern Glenn County, in the vicinity of Butte City, is located east of the Sacramento River. This is essentially an area of level flood plains and basins with little discernible slope. (Department of Water Resources, Sacramento Valley Bulletin 118-6, 1978).

West of the Valley province is the Coast Range, which can be further subdivided into the rolling terrain of the Coast Range foothills which increase in elevation from the easterly edge of the Valley to approximately 2,000 feet, and the mountainous Coast Range which rises to an elevation of almost 7,500 feet above MSL at Black Butte Mountain. The foothills consist of smooth, rolling to steep hills and narrow valleys with distinct areas of south to north drainage. Much of the mountainous region to the west of the foothills ranges above 6,000 feet and includes a portion of the crest of the Coast Range. (Glenn County Planning Department, Conservation Management Element, 1986).

2.1.2 Geology

Glenn County is located within portions of two California geomorphic provinces: the Coast Range and the Great Valley. Each province has a distinctly



Source: Crawford Multari & Starr and Fugro-McClelland West Inc.

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GLENN COUNTY PHYSICAL FEATURES

Figure 1-1

different geologic history which, coupled with local climatic conditions, has resulted in a wide variation of geologic conditions within the county.

Similar to the county's terrain, rock types can be broadly divided into three different units which increase in age from east to west (Figures 2-1 and 2-2). In the east, geologic materials consist primarily of unconsolidated Pleistocene and Recent sediments (Qal) including alluvial fan deposits, stream channel deposits of the Sacramento River and inland basin deposits. Exposed at the lower elevations of the foothills are Tertiary sediments, primarily consisting of Pliocene sediments with some continental volcanics. At the higher foothill elevations, exposed outcrops are Cretaceous and Jurassic marine and non-marine sedimentary rocks, while the western mountainous region of the county is formed mainly of deformed Jurassic marine sediments and volcanics (J.Robinson, 1991) (Fugro-McClelland (West) Inc., 1991).

2.1.3 Soils

The soil types in Glenn County can be divided into five general land categories (USDA, 1986) which are determined by physiographic position, soil texture, soil profile, and slope. These land categories include:

- **Mountain Soils.** The soils in the mountains are shallow to deep, well drained to excessively drained, and mostly steep to very steep.

- **Soils of the Foothills.** In the foothills the soils formed mainly in material from hard, unaltered sedimentary rock of the Knoxville formation, and of other formations of the Cretaceous period, and from poorly consolidated siltstone of the Tehama formation.

- **Soils of Older Alluvial Fans and Low Terraces.** Soils of older and low terraces are well drained to somewhat poorly drained and are mostly moderately permeable to very slowly permeable.

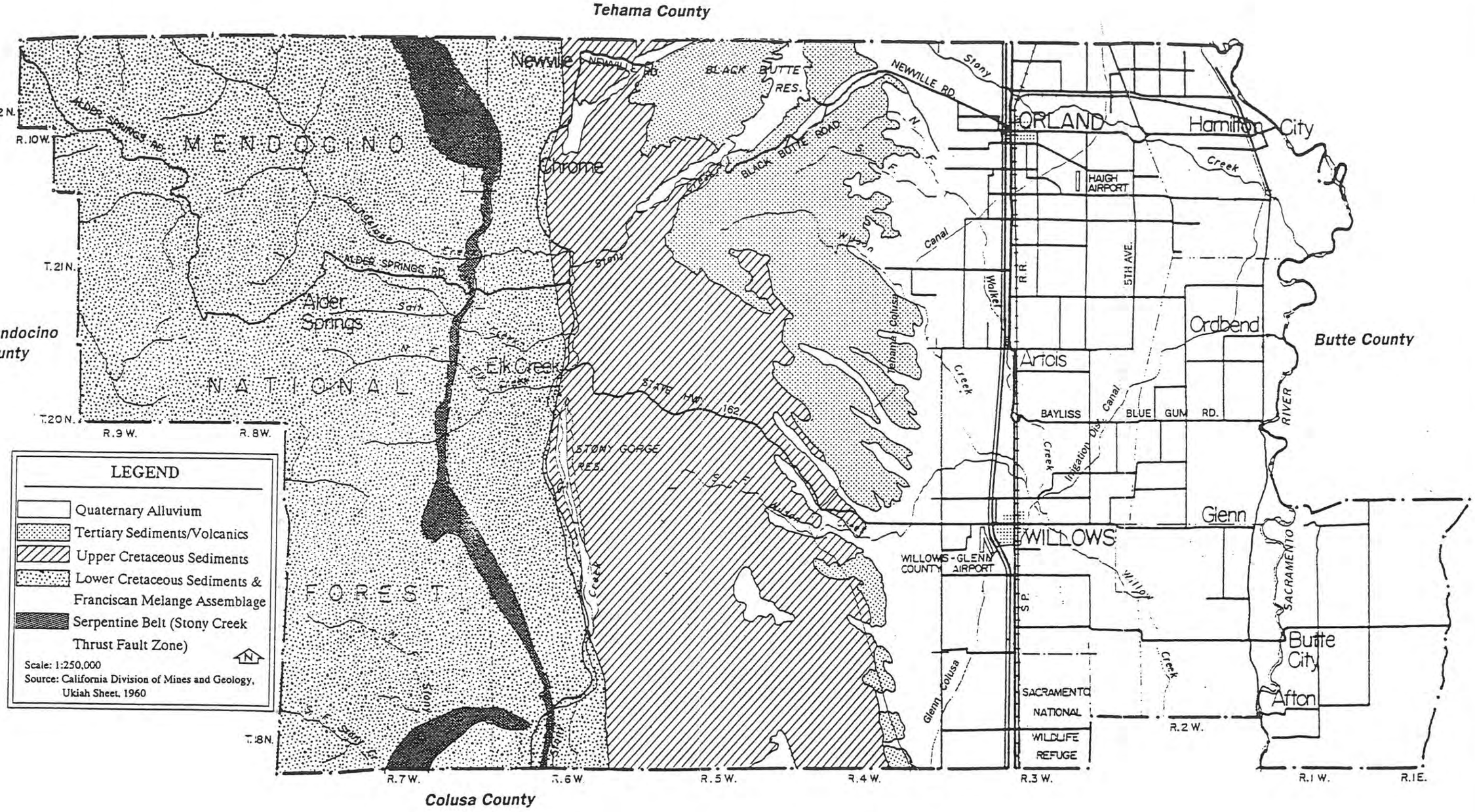
- **Basin Soils.** The soils of the basins are in the southwestern part of the county. Soils of the basins are characteristically fine textured and poorly drained. Slopes are nearly level, and runoff is very slow.

- **Soils of the More Recent Alluvial Fans and Flood Plains.** Most of the soils on the more recent alluvial fans and flood plains of the county are along Stony Creek and the Sacramento River. The soils generally consist of shallow to deep, well-drained to excessively-drained gravelly and non-gravelly stratified material (Fugro-McClelland (West) Inc., 1991).

2.1.4 Agricultural Resources

Agriculture is the most extensive land use in Glenn County and the most significant component of the county's economy. Two-thirds of Glenn County's 1,317 square miles are comprised of agricultural croplands and pasture. Croplands are found in the areas of prime agricultural soil in the eastern third of the county along the floodplain of the Sacramento River. In 1989, there were approximately 229,400 acres of irrigated land in the county (State of California Department of Water Resources, Northern District, Glenn County Agricultural Water Use 1989). Grazing lands are found primarily in the central foothills and to the west in the Glenn County portion of the Coast Range. Livestock grazing also occurs in the Mendocino National Forest. The land that is now devoted to agriculture in the county was historically covered by native grasslands and riparian forest.

The California Department of Conservation's Farmland Mapping and Monitoring Program (FMMP) maintains inventories of important farmland within California. Table 2-1 shows the 1988 FMMP inventory of land within Glenn County, and Figure 2-3 shows the approximate locations of such important farmlands. Owners of much of the County's agricultural land currently take advantage of the property tax advantages offered by the Williamson Act (California Land Conservation Act), which reduces such taxes on qualifying agricultural land in exchange for a commitment from the landowner to not develop the land with uses other than those compatible with and supportive of agriculture. Figure 2-4 shows the general location of lands under Williamson Act contract.



Source: Crawford Multari & Starr and Fugro-McClelland West Inc.

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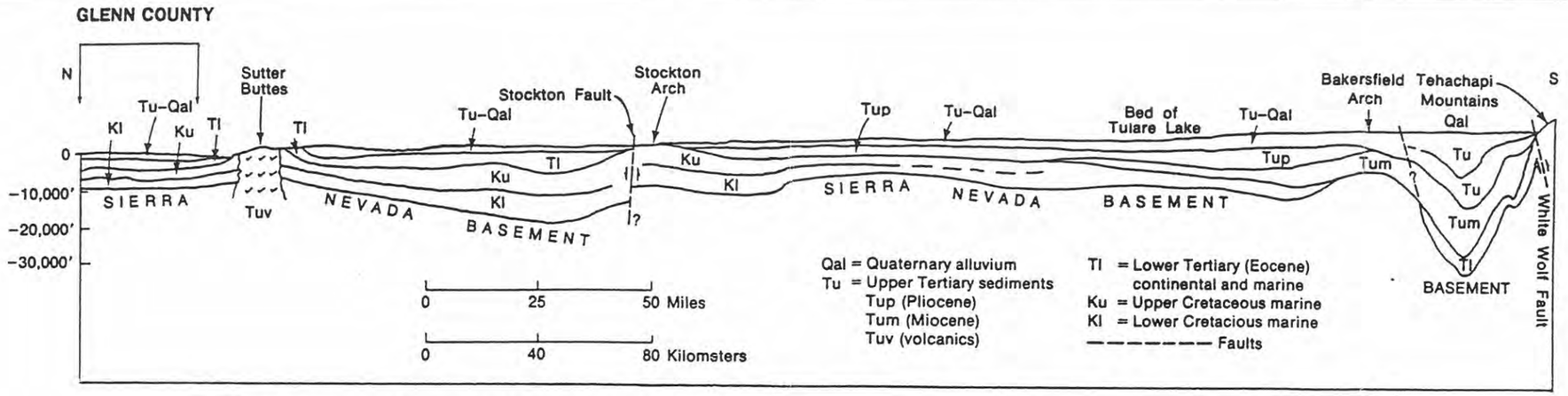
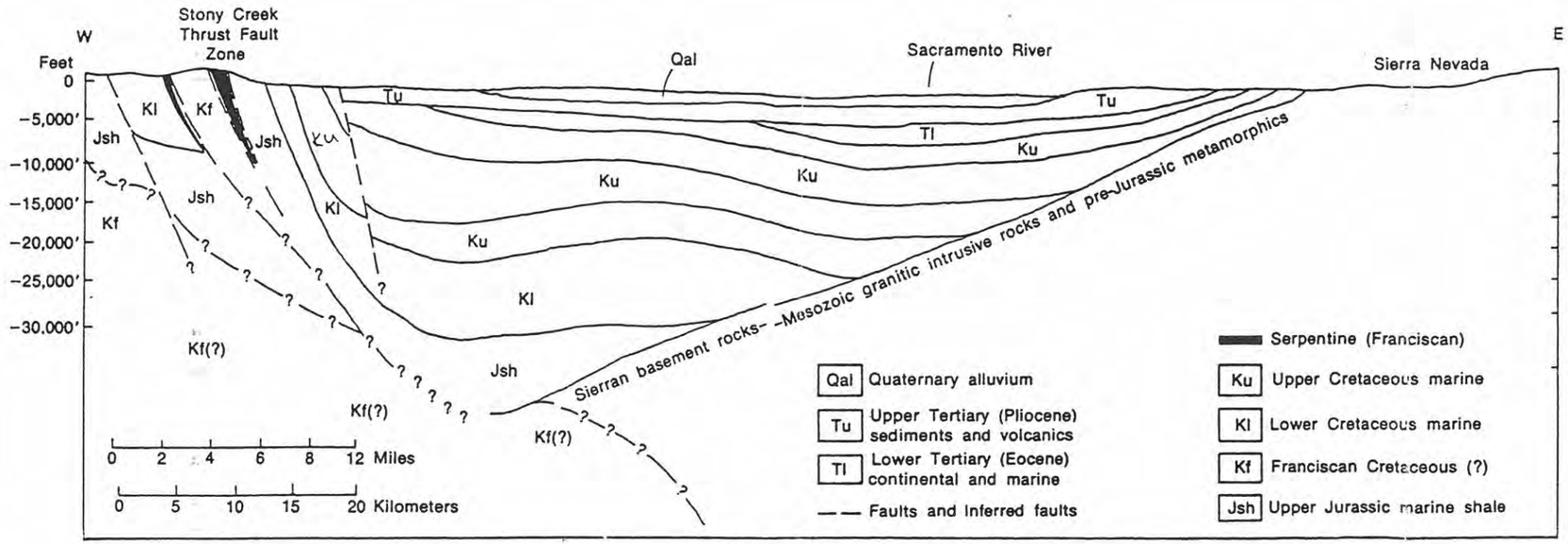
GENERALIZED GEOLOGIC MAP OF GLENN COUNTY

Figure 2-1



North-south diagrammatic section of the Great Valley. (Sources: California Division of Mines and Geology and Sacramento Geological Society)



East-west diagrammatic section of the Sacramento Valley (latitude 39°N). (Sources: California Division of Mines and Geology and Sacramento Geological Society)

Source: Crawford Multari & Starr and Fugro-McClelland West Inc.

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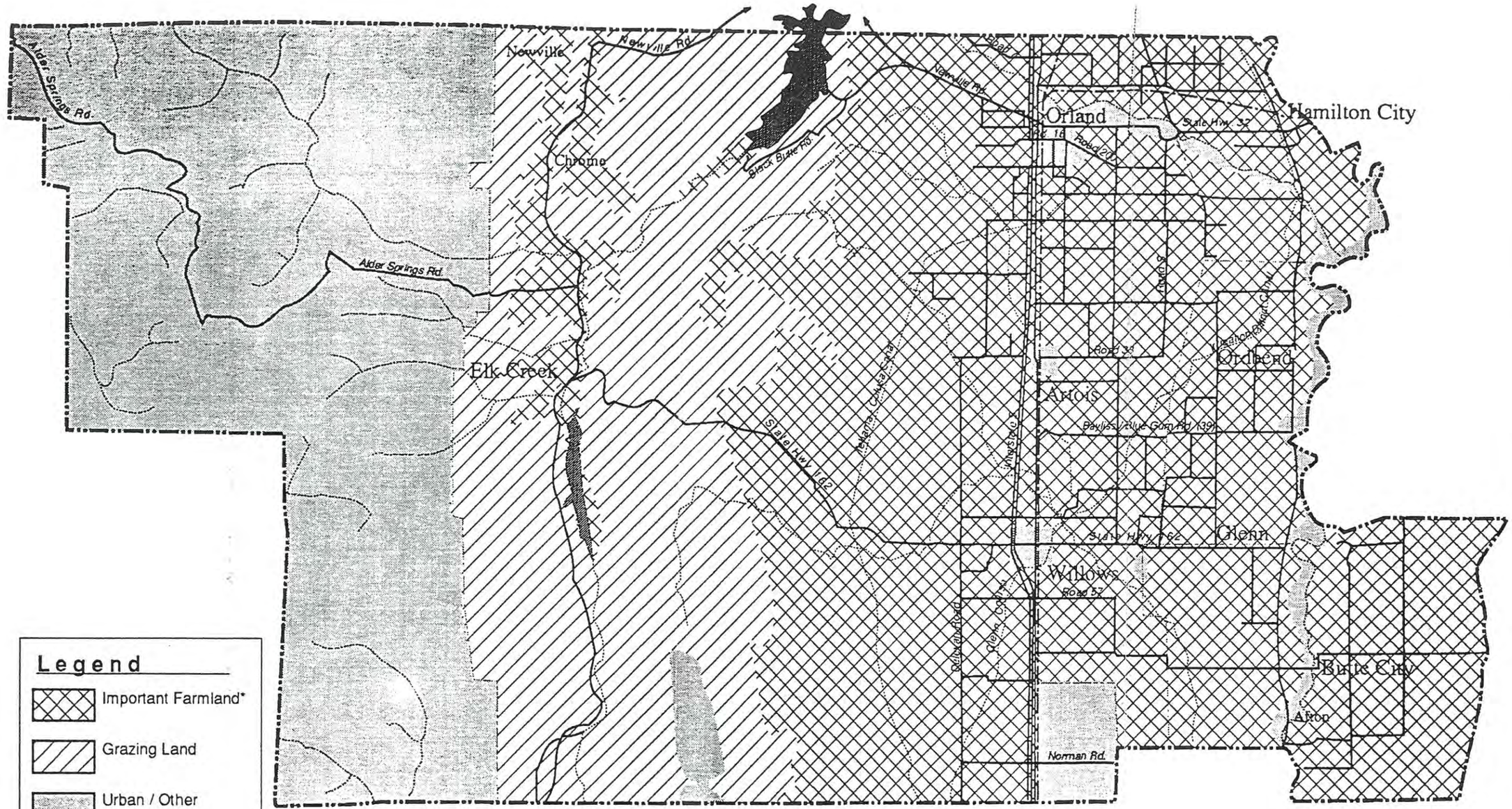
Geologic Cross Sections in the Vicinity of Glenn County

Figure 2-2



*Important Farmland includes: Prime Farmland, Farmland of Statewide Importance, Unique Farmland, and Farmland of Local Importance.

Source: Crawford Multari & Starr and Fugro-McClelland West Inc.

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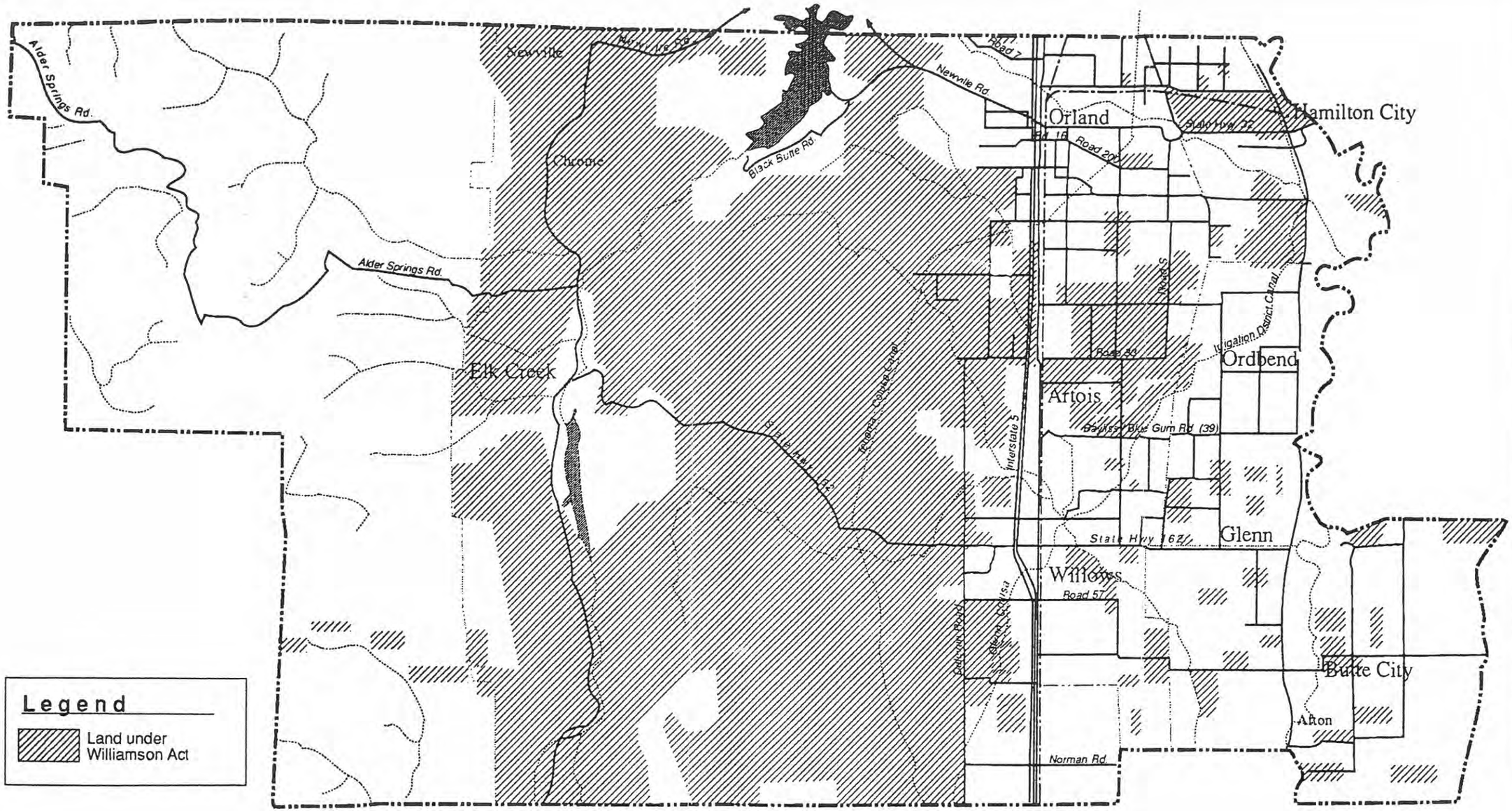
GLENN COUNTY IMPORTANT FARMLANDS

Figure 2-3

Glenn County, CA



Source: Crawford Multari & Starr and Fugro-McClelland West Inc.

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GLENN COUNTY WILLIAMSON ACT LANDS

Figure 2-4

Glenn County, CA

TABLE 2-1
AGRICULTURAL LANDS IN GLENN COUNTY - 1988

Land Use Category	Acres
Prime Farmland	173,565
Farmland of Statewide Importance	91,185
Unique Farmland	12,080
Farmland of Local Importance	136,186
Grazing Land	173,509
Urban Built-Up Land	5,190
Other Lands	253,587
Water Area	4,226
TOTAL	849,528

Source: Department of Conservation, Farmland Mapping and Monitoring Program, 1988.

Prime farmland has the best combination of physical and chemical characteristics for crop production. Farmland of statewide importance is not as productive as prime soil, though it still has supported crop production for at least the three preceding years. Unique farmland ranks below prime and statewide important farmlands, though it is still capable of producing "high economic value crops" such as olives, avocados, or grapes. Finally, farmland of local importance ranks below the other three, yet "may be important to the local economy due to its productivity" (Department of Conservation, Important Farmland Map Categories).

In general, rice is grown on the heavier, less porous soils that are found in the southern part of the county; almonds, prunes, and walnuts on well drained soils in various areas. Olives and other tree crops can be grown on more limited soils, including gravelly soil types, with low volume/controlled irrigation; alfalfa for hay can be grown on a variety of soils with proper management of irrigation and variety selection. Wheat is a rotation crop on irrigated lands used also for sugar beets, corn,

beets, and alfalfa. (Pers. comm., Bob Sailsberry, University of California Cooperative Extension, July 15, 1991.)

The Glenn County Department of Agriculture publishes information on annual agricultural production within the county. Table 2-2 shows the past ten year production acreage for the most important crops in the county. Table 2-3 shows the valuation of agricultural production for the same period.

With the exception of range land acreage, rice is by far the largest crop in both production acreage and valuation. In 1990, rice accounted for more than one-fourth of total agricultural value generated in the county. Almonds, prunes, and alfalfa hay are also large cash crops; each accounted for more than $10 million in value in 1990. It is important to note that both agricultural production and its value vary significantly from year to year. This can be due to a variety of factors including climatic variations, rainfall, and market conditions.

2.2 CLIMATE

Glenn County is located within the west central portion of the Sacramento Valley Air Basin (see Figure 2-5). The Sacramento Valley Air Basin is characterized by mountain ranges to the north, east, and west. Surrounding topography greatly influences wind patterns in Glenn County. Ventilation is commonly inadequate due to calm winds and continual temperature inversions. The combination of inversions, light winds, and constrictive topography results in air being trapped horizontally and vertically during much of the year.

The County's climate is generally Mediterranean with hot dry summers and moderate to cool wet winters. Average daily maximum temperatures range from the mid-fifties in January to the high nineties in July, and average daily minimum temperatures range from the mid-thirties in January to the mid-sixties in July. Nearly 90 percent of the County's annual rainfall occurs between November and April, usually from frontal systems from the west. During the winter, snowfall in the valley is infrequent and only in trace amounts. Totals increase to the west, reaching 4 to 8 inches on the lower slopes of the mountains. Normal annual precipitation across the county varies widely, from 15 inches in the southeast to as much as 50 or 60 inches at the highest elevations (Elford, 1961). On the valley floor, the City of Willows receives approximately 17.7 inches per year.

TABLE 2-2
GLENN COUNTY - ACREAGE IN AGRICULTURAL PRODUCTION

COMMODITY	1981	1982	1983	1984	1985	1986	1987	1989	1990
FIELD CROPS									
Barley	7,144	7,355	5,000	4,500	6,250	5,000	4,000	3,527	2,369
Beans	8,777	8,287	699	7,703	3,737	6,838	9,370	6,307	6,187
Corn	8,771	7,152	5,000	7,800	8,100	6,000	5,500	7,366	7,085
Hay - Alfalfa	15,000	16,500	16,500	16,500	16,500	18,150	18,150	18,150	17,095
Hay - Other	3,000	2,700	1,890	1,500	1,250	1,350	1,250	1,150	977
Pasture - Irrigated	22,000	22,000	22,000	22,000	19,500	16,575	16,575	16,575	16,575
Range	240,000	240,000	240,000	240,000	240,000	240,000	240,000	240,000	240,000
Rice Paddy	89,000	79,500	56,000	65,124	63,364	59,335	59,818	69,470	62,919
Safflower	3,598	1,775	1,740	1,574	NA	NA	NA	NA	NA
Silage	3,000	3,125	3,000	3,000	3,000	3,000	3,000	3,000	3,000
Grain - Sorghum	3,422	3,887	2,000	2,700	3,500	2,000	1,500	2,088	1,600
Sugar Beets	6,400	6,500	4,748	6,733	7,606	7,844	9,515	8,933	9,598
Wheat	44,776	28,735	22,000	25,000	38,000	30,000	27,000	28,845	33,376
Miscellaneous	NA	1,183	650	859	2,593	3,525	2,735	2,940	2,050
TOTALS	454,888	428,699	381,227	404,993	413,400	399,617	398,413	408,351	402,831
SEED CROPS									
Alfalfa	NA	NA	NA	1,107	1,155	NA	500	482	612
Beans	NA	NA	NA	2,173	1,940	1,562	2,354	2,783	2,584
Clover	2,115	2,489	2,730	4,004	4,327	4,687	5,293	4,207	3,991
Rice	NA	2,581	2,012	2,125	1,100	1,897	1,473	1,972	2,195
Safflower	NA	NA	NA	NA	NA	NA	NA	300	NA
Sudan	NA	350	475	NA	NA	NA	NA	958	NA
Sunflower	1,945	2,456	3,469	3,793	7,114	5,672	1,883	1,860	2,266
Vine Crops	2,045	1,328	1,895	2,179	1,743	1,655	2,399	1,813	1,999
Wheat	NA	NA	NA	1,459	NA	NA	NA	835	838
Other Seed	8,574	3,785	6,780	1,951	1,297	829	881	622	1,632
TOTALS	14,679	12,989	17,361	18,791	18,676	16,302	14,783	15,832	16,117

COMMODITY	1981	1982	1983	1984	1985	1986	1987	1989	1990
FRUIT AND NUT CROPS									
Almonds	8,856	9,083	10,240	11,766	12,004	14,299	14,368	14,599	14,659
Citrus	NA	950	930	938	906	912	920	889	900
Olives	1,692	1,753	1,769	1,774	1,835	1,796	1,800	2,150	2,150
Prunes	4,580	4,688	4,862	5,042	5,278	5,805	6,408	7,108	7,229
Walnuts	4,292	4,473	4,565	4,585	4,656	5,765	5,773	5,470	5,681
Misc. Fruits & Nuts	NA	989	1,328	1,310	1,543	1,261	1,448	1,781	1,377
TOTALS	19,420	21,936	23,694	25,415	26,222	29,838	30,717	31,997	31,996
FOREST PRODUCTS									
Timber (1,000 bd. ft.)	NA	18,517	8,786	24,658	41,284	33,557	33,801	29,200	36,947
Firewood (cords)	NA	3,414	3,062	1,166	967	770	2,211	531	3,402
Christmas Trees	NA	2,100	3,351	6,608	3,944	1,002	2,423	600	3,558
TOTALS	NA	24,031	15,199	32,432	46,195	35,329	38,435	30,331	43,907

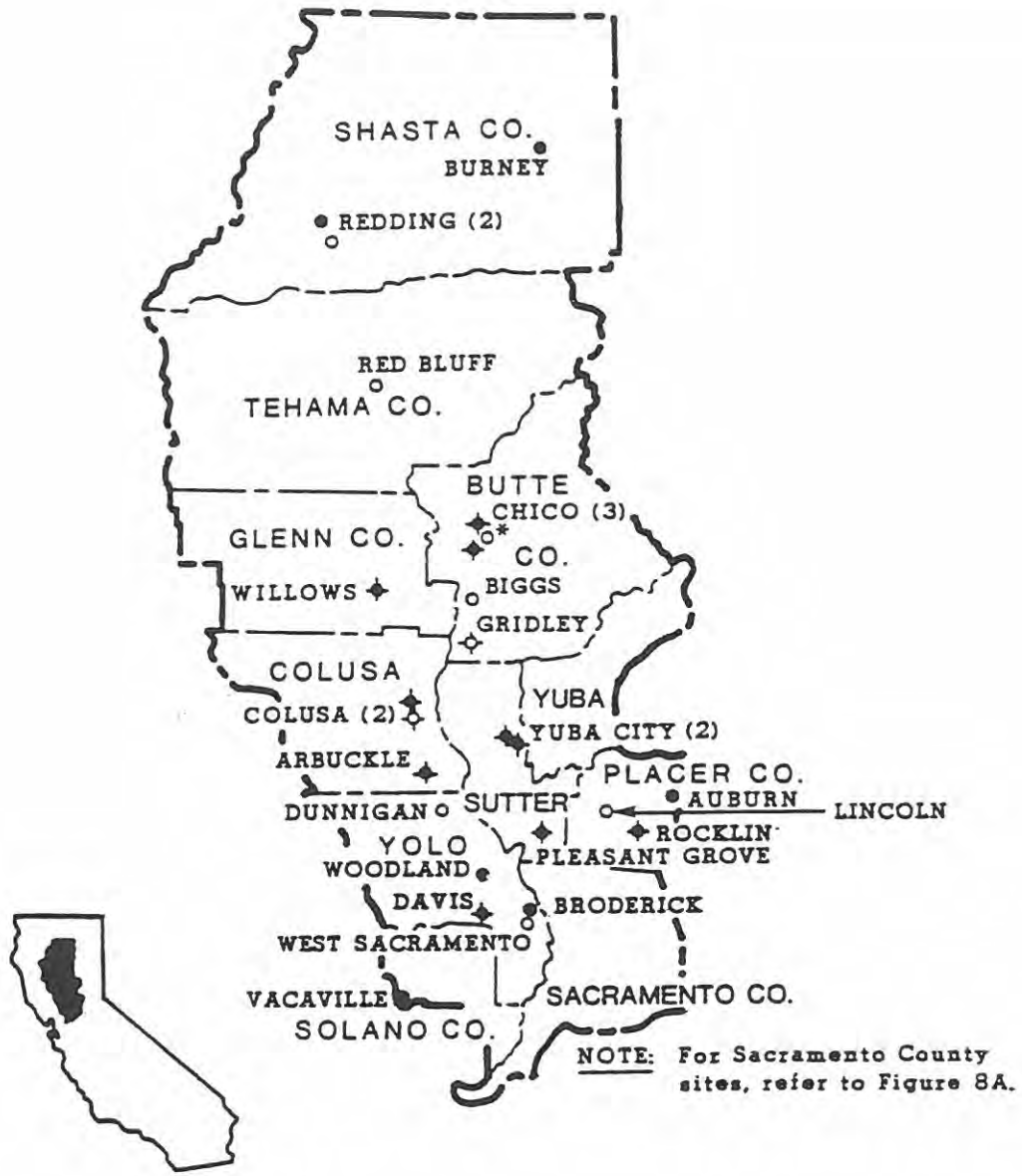
Source: Glenn County Department of Agriculture. Annual Crop and Livestock Report for years 1981 - 1990.

TABLE 2-3
TOTAL VALUE OF AGRICULTURAL PRODUCTION
(1,000s of dollars)

COMMODITY	1981	1982	1983	1984	1985	1986	1987	1989	1990
FIELD CROPS									
Barley	$907	$672	$313	$335	$743	$326	$187	$406	$108
Beans	$3,735	$2,178	$514	$2,524	$1,648	$3,249	$3,658	$4,457	$2,844
Corn	$3,765	$2,613	$2,489	$3,216	$2,955	$1,859	$1,872	$3,418	$3,033
Hay - Alfalfa	$7,875	$10,395	$8,085	$9,677	$9,587	$9,257	$8,848	$10,618	$12,223
Hay - Other	$330	$486	$258	$225	$203	$162	$141	$201	$147
Pasture - Irrigated	$3,080	$2,640	$2,860	$2,640	$2,145	$1,658	$1,823	$1,989	$2,785
Range	$1,440	$1,440	$1,440	$1,440	$1,200	$1,200	$1,200	$1,200	$1,440
Rice Paddy	$66,984	$40,680	$34,313	$37,365	$36,657	$31,566	$30,986	$58,522	$50,634
Safflower	$897	$337	$316	$281	NA	NA	NA	NA	NA
Silage	$1,650	$1,238	$1,404	$1,458	$1,800	$1,200	$1,388	$1,950	$1,728
Grain - Sorghum	$605	$764	$486	$537	$790	$327	$284	$576	$335
Sugar Beets	$4,242	$4,936	$3,353	$5,487	$5,036	$5,110	$8,380	$9,916	$8,228
Wheat	$11,089	$6,663	$3,819	$5,154	$8,565	$4,908	$4,976	$8,359	$7,128
Miscellaneous	$2,529	$2,678	$2,036	$2,956	$3,242	$960	$3,873	$1,202	$929
TOTALS	$109,128	$77,720	$61,686	$73,295	$74,571	$61,782	$67,616	$102,814	$91,562
SEED CROPS									
Alfalfa	NA	NA	NA	$281	$274	NA	$200	$121	$261
Beans	NA	NA	NA	$833	$1,068	$1,133	$1,077	$1,766	$1,419
Clover	$1,161	$1,400	$1,586	$1,728	$2,131	$2,472	$2,841	$1,669	$1,177
Rice	NA	$1,528	$1,371	$1,275	$652	$1,323	$1,027	$1,692	$1,976
Safflower	NA	NA	NA	NA	NA	NA	NA	$90	NA
Sudan	NA	$135	$132	NA	NA	NA	NA	$342	NA
Sunflower	$1,517	$1,095	$2,867	$2,726	$3,927	$5,210	$1,489	$1,423	$1,501
Vine Crops	$1,217	$1,063	$1,246	$1,994	$1,515	$1,454	$3,010	$1,616	$1,418
Wheat	NA	NA	NA	$334	NA	NA	NA	$376	$402
Other Seed	$4,958	$2,807	$2,231	$294	$179	$268	$241	$124	$356
TOTALS	$8,853	$8,028	$9,433	$9,465	$9,746	$11,860	$9,885	$9,219	$8,510
FRUIT AND NUT CROPS									
Almonds	$8,369	$7,417	$5,290	$11,601	$7,439	$17,156	$18,746	$12,425	$16,205
Citrus	NA	$1,044	$1,622	$2,659	$714	$1,954	$1,567	$2,024	$871
Olives	$2,519	$2,958	$2,074	$3,234	$3,700	$3,175	$3,961	$5,762	$3,562
Prunes	$7,708	$6,487	$8,414	$8,874	$7,488	$9,136	$16,038	$18,729	$13,913
Walnuts	$5,219	$6,139	$2,843	$3,553	$4,381	$4,312	$6,314	$7,188	$5,611
Misc. Fruits & Nuts	$418	$1,389	$1,102	$2,069	$1,495	$3,163	$1,992	$2,107	$2,479
TOTALS	$24,233	$25,434	$21,345	$31,990	$25,217	$38,896	$48,618	$48,640	$43,439

COMMODITY	1981	1982	1983	1984	1985	1986	1987	1989	1990
FOREST PRODUCTS									
Timber	NA	$3,145	$875	$1,887	$4,312	$2,421	$3,056	$4,672	$4,853
Firewood	NA	$171	$153	$58	$48	$42	$122	$35	$204
Christmas Trees	NA	$11	$16	$33	$24	$5	$19	$5	$36
TOTALS	NA	$3,327	$1044	$1,978	$4,384	$2,468	$3,197	$4,712	$5,093
LIVESTOCK									
Cattle/Calves	$11,829	$9,396	$9,442	$8,207	$7,912	$7,638	$9,265	$12,351	$12,888
Sheep/Lambs	$2,002	$1,886	$1,702	$1,378	$1,922	$1,293	$1,335	$1,110	$893
Hogs/Pigs	$310	$279	$160	$126	$76	$108	$127	$142	$160
TOTALS	$14,141	$11,561	$11,304	$9,711	$9,910	$9,039	$10,727	$13,603	$13,941
Livestock and Poultry Products (includes wool, milk)	$27,839	$27,105	$24,247	$22,543	$24,056	$24,277	$23,221	$26,336	$27,624
TOTALS	$27,839	$27,105	$24,247	$22,543	$24,056	$24,277	$23,221	$26,336	$27,624

Source: Glenn County Department of Agriculture. Annual Crop and Livestock Report for years 1981 - 1990.



Source: California Air Resources Board

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Sacramento Valley Air Basin

Figure 2-5

The predominant seasonal surface wind flow patterns for California and Glenn County are shown in Appendix A. Wind directions and speeds reflect the channeling effect of the Coast Range on the west, with the Sierra Nevada on the east and the Cascade Range on the north. Wind flow direction in the county varies seasonally, but the predominant wind flow in the county is from the south-southeast and can be described as generally light over the entire area with an annual average wind speed of about eight m.p.h. (California/Oregon Transmission Project DEIR, 1986) (Fugro-McClelland (West) Inc., 1991).

2.3 WATER RESOURCES

2.3.1 Surface Flows

Glenn County is drained chiefly by Stony Creek, Willow Creek, Walker Creek and the Sacramento River. Stony Creek flows from the mountainous uplands, through the foothills, and enters the Sacramento Valley just west of the Orland Buttes. It runs southwesterly into the Sacramento River about five miles southeast of Hamilton City. Draining foothill areas west of Stony Creek are Willow and Walker Creeks. Most northerly is Walker Creek which flows southeasterly, joining Willow Creek east of Willows. Willow Creek continues into Colusa County, eventually entering the Colusa Basin Drain. The Sacramento River, which is the chief source of surface irrigation water in the county, flows southward through the center of the Sacramento Valley, joins the San Joaquin River in the Delta, and then flows into the San Francisco Bay and the Pacific Ocean. Other streams draining Glenn County include Wilson Creek, French Creek, Logan Creek and Hunter Creek.

Two major canals also traverse the county. The Glenn-Colusa Canal crosses the county starting at the Sacramento River north of Hamilton City and running southwest, passing just east of Willows before heading south into western Colusa County. The other primary irrigation canal in the county, the Tehama-Colusa Canal, begins at the Red Bluff diversion dam and trends southward through the county, eventually terminating near Dunnigan in Yolo County.

The total surface water diversions for Glenn County in 1989 were 691,000 acre-feet (af), including 543,900 af from the Central Valley Project, 75,900 af from the Black Butte Reservoir and 71,500 af from other sources developed locally. Except for 24,000 af utilized for wildlife refuges, all of this water was used for agricultural purposes (State of California Department of Water Resources, Northern District, 1989 Water Budget, Glenn County).

- **Reservoirs**

Stony Gorge Reservoir is located in west-central Glenn County and was constructed by the Federal Bureau of Reclamation in 1928, mainly for irrigation purposes. The dam is 868 feet long, 140 feet high, and has 50,000 af of storage capacity. The electrical generating facilities at Stony Gorge Reservoir were retrofitted to the dam structure, and include two steel penstocks and two horizontally mounted turbines. Support facilities include a switchyard, access roads and a transmission line.

The power generating facilities of the Black Butte Hydroelectric project are in Tehama County, though Black Butte Reservoir itself extends south into Glenn County and is part of the Stony Gorge system (water from Stony Gorge Reservoir flows into Black Butte Reservoir). The Army Corps of Engineers constructed the earthen dam in 1964. The dam measures 2,970 feet across at its crest and rises 140 feet above the original stream channel. The dam can impound 160,000 af of water when full.

The hydroelectric generating facilities include a 567-foot long concrete-lined penstock, 12 feet in diameter, and a single vertically mounted turbine. Support facilities include a powerhouse, switchyard, access roads, and transmission lines that connect the facility to the PG&E grid.

All of the facilities described above are operated for the City of Santa Clara by the Orland Unit Water User's Association. The Association also operates and maintains Stony Gorge Dam and East Park Dam (which is located upstream from Stony Gorge Reservoir in Colusa County). The Association controls water releases from East Park and Stony Gorge Reservoirs, which then flow northward into Black Butte Reservoir. The Association then makes requests to the Bureau of Reclamation for releases from Black Butte Reservoir for the Association's irrigation needs (Fugro-McClelland (West) Inc., 1991).

2.3.2 Groundwater

The eastern portion of Glenn County overlies the 5,000 square mile Sacramento Valley Groundwater Basin, which extends from Red Bluff south to the Sacramento-San Joaquin Delta, to the North Coast Range on the west, and east to the Sierra Nevada and Cascade Ranges. A thick sequence of sedimentary materials underlying the valley floor contain fresh groundwater to a depth of about 400' near Orland in the northern portion of the county and 800' to 1200' in the Colusa Basin south of Willows (DWR, Bulletin 118-6, August, 1978, Figure 18). The average well yields 800 gallons per minute. Groundwater pumping for irrigation occurs primarily in the area south and east of Orland and north of Willows (DWR, Plate 1, Irrigated Lands Sacramento Valley, 1970). The greatest amount of natural recharge in the valley occurs in the Stony Creek area of southern Glenn County (DWR, p.67). Groundwater levels were lowered as a result of low rainfall during the late 1980s, but have rebounded following the March 1991 rains (Pers. comm., Glen Pearson, DWR, 7/5/91).

The State Department of Water Resources monitors groundwater conditions, including semi-annual measurements of 79 wells for water level in Glenn County (Glenn County General Plan Conservation Management Element, p 37). Groundwater pumping in 1989 totaled 238,400 af, of which 230,100 af were applied to agriculture and 8,300 af to municipal and industrial uses (State of California Department of Water Resources, Northern District, 1989 Water Budget, Glenn County). Additional domestic water is supplied from private wells, which are not monitored.

2.4 BIOLOGICAL RESOURCES

As described in Section 2.1.1, Topography, Glenn County extends from high elevations (+7,000 feet) in the east slope of the North Coast Range to the low elevations in the broad flat alluvial plain of the Sacramento Valley. As a result of such major changes in elevation, Glenn County includes a great variety of climatic, soils and geographic conditions which, in turn, influence the distribution, variety, and abundance of the plant and animal species within the county.

2.4.1 Vegetation

Glenn County contains seven major vegetation associations, which support a diverse array of plant and animal species. Figure 2-6 shows the major vegetation associations in the county. The following descriptions of the vegetation associations and predominant species within each association are based on findings reported by Kuchler (1988), Holland (1986), and Arend (1967). The acreage of the cover types is based on previous County estimates (County of Glenn 1985, 1987).

- **Blue Oak-Digger Pine Woodlands**

  The Blue Oak-Digger Pine community occupies about 174,700 acres (21.7 percent) of the county. This plant community is located in the central portion of the county in the lowest foothill elevations, immediately between the chaparral on the higher slopes and the grasslands/agricultural lands on the valley floor. The plant community is characterized by medium tall, dense-to-open broad-leaved deciduous forest mixed with needle-leaved evergreens. The community typically transitions from relatively dense canopy cover to a savanna situation where grasslands dominate the groundcover. The dominant species are blue oak and digger pine intermixed with California buckeye, toyon, buckbrush, common manzanita, whiteleaf manzanita, Valley oaks, interior live oak, coffeeberry, and poison oak.

- **Coast Range Montane Forest**

  Coast Range Montane Forest (Pine-Fir-Chaparral) covers about 105,210 acres (12.5 percent) of the county on the eastern slope of the North Coast Range within the Mendocino National Forest. This plant community is located in the higher elevations, and is characterized by tall, dense-to-moderately open, needle-leaved evergreen forest with occasional patches of broad-leafed evergreen shrubs. Dominant forest species include white fir, red fir, yellow pine, Douglas fir, ponderosa pine, incense cedar, and black oak. Typical evergreen shrubs include pinemat manzanita, greenleaf manzanita, and mountain whitethorn.

- **Chamise Chaparral and Northern Mixed Chaparral**

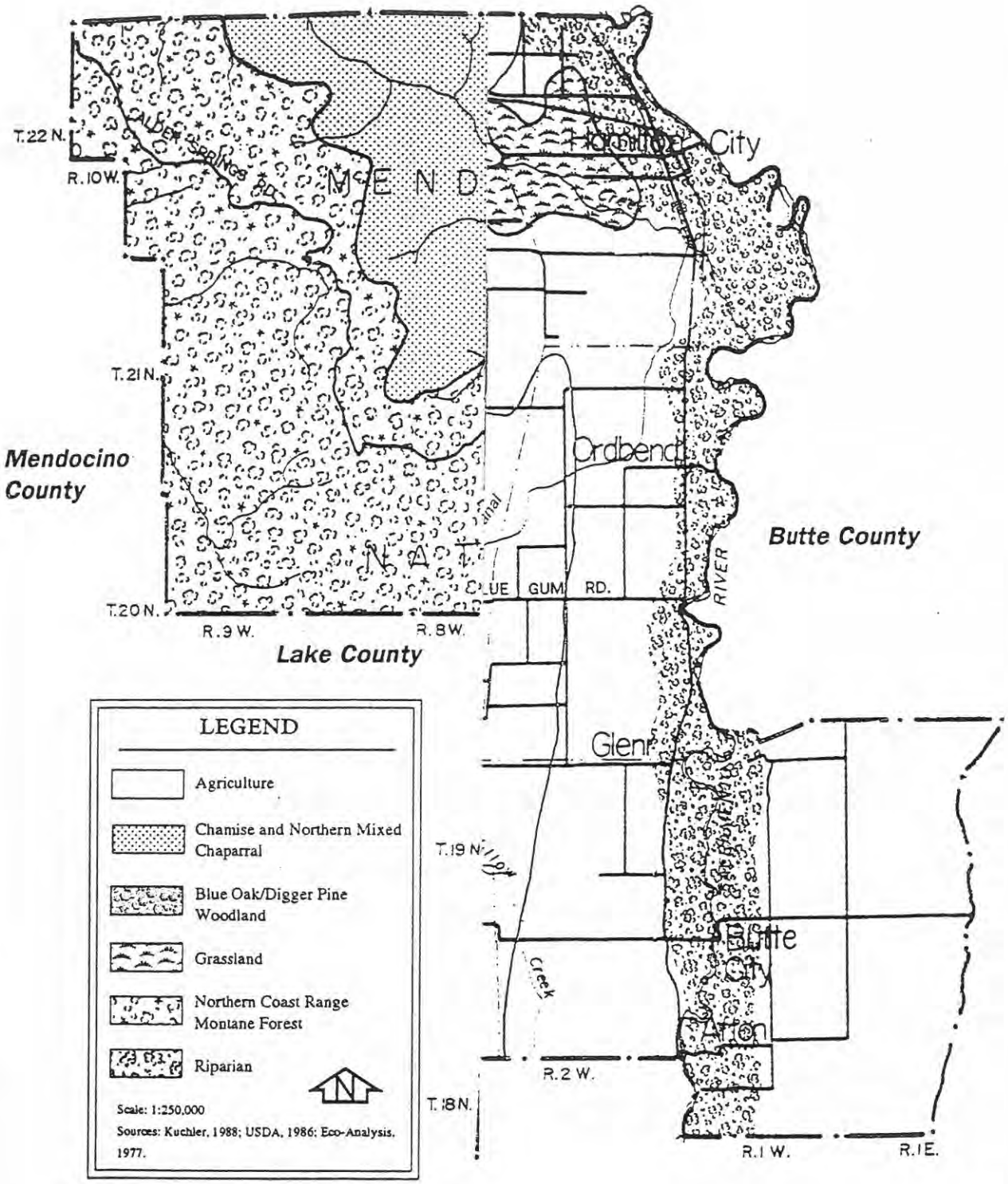
Chamise Chaparral and Northern Mixed Chaparral occupy approximately 84,447 acres or 10.5 percent of the land in Glenn County. The Chamise Chaparral dominates in the lower elevations, while the Northern Mixed Chaparral dominates at higher elevations (Gilgert, Pers. comm., 1991). The chaparral communities typically intergrade with the Coast Range Montane Forest in the higher elevations and the Blue Oak-Digger Pine Woodlands in lower elevations of the east slope. These communities form dense stands of needle-leaved and broad-leaved evergreen sclerophyll shrubs ranging in height from 3 to 10 feet. Typical species include chamise, several manzanita species, including eastwood, bigberry and whiteleaf manzanita, buckbrush, chaparral whitethorn, redbud, toyon, California buckeye, interior live oak and mountain-mahogany.

- **Grasslands**

Grassland communities cover approximately 63,103 acres (7.5 percent) of the county, typically in the lowest valley elevations. Formerly, these lands were dominated by perennial native grasses, but have largely been replaced with non-native annual species since European settlement. Two major grassland communities are the non-native grassland and the valley needlegrass community described below:

Non-Native Grassland Community. Composed principally of introduced perennial and annual grasses, including wild oats, soft chess, red brome, ripgut brome, fescue, cheat grass, ryegrass, and other herbaceous vegetation, such as storksbill, filaree, California poppy, and lupine.

Valley Needlegrass Grassland Community. A relict community (i.e., left over from a previous ecological system) dominated by the perennial, tussock-forming speargrass found on fine-textured soils that are moist or waterlogged in winter, but very dry in summer (Holland 1986). Native species commonly associated with this community include needlegrass, yarrow, blow-wives, mountain dandelion, golden brodiaea,



Note: This vegetation map provides a generalized understa location within Glenn County. It should be noted that and other isolated communities do occur along Coun expressed on the above map is based on the literature a more intensive mapping effort beyond the scope of t show all of these vegetative cover types.

Source: Crawford Multari & Starr and Fugro-McClelland West Inc.

QUAD

Figure 2-6

soap plant, melic grass, plantain, bluegrass, nodding stipa grass, as well as a number of introduced species, such as wild oats and brome grasses.

- **Riparian Communities**

Riparian communities formerly occupied extensive stands within the county; however, current acreage estimates are about 2,280 acres, principally along the Sacramento River and Willow and Walker Creeks (County of Glenn Land Use Element, 1985). Four particularly important riparian communities in Glenn County have been identified by the California Department of Fish and Game (1991). These include:

Great Valley Willow Scrub. An open to dense, broadleafed, winter-deciduous streamside thicket community. Dense stands have little understory and are dominated by Pacific willow, arroyo willow, sandbar willow, black willow, wild grape, and shrub-sized Fremont cottonwood. In open thickets, grass understories can develop. This community is generally situated in the lowest flood plain elevations and is subjected to considerable scour during flood stages which impairs the succession to woodland.

Great Valley Cottonwood Riparian Forest. A dense, broadleafed, winter deciduous forest community. It is dominated by Fremont cottonwood and Goodding willow. Associated canopy and understory vegetation include California box elder, Oregon ash, buttonbush, wild grape, and several willow species (Pacific, arroyo, black, and sandbar). This community is typically a transitional community between the Great Valley Willow Scrub community at lower elevations and the Great Valley Mixed Riparian Forest community at higher elevations.

Great Valley Mixed Riparian Forest. A tall, broadleafed riparian forest community with a closed canopy composed of winter-deciduous species. Typical canopy species include California box elder, Fremont cottonwood, western sycamore, Hind's walnut, Goodding willow, and Pacific willow. These forest are generally very dense, resulting in a

shade-tolerant understory typically composed of buttonbush, shrub Oregon ash, wild grape, and poison oak.

Great Valley Valley Oak Riparian Forest. The highest elevational element of the riparian complex, this community intergrades with typically upland communities at the margins of the floodplain. This community is composed of medium-to-tall broadleafed, winter-deciduous species and is dominated by the Valley oak. Associated understory vegetation includes sycamore, Oregon ash, Hind's walnut, California rose, wild grape, poison oak, blackberry, and greenbriar (Fugro-McClelland (West) Inc., 1991).

- **Wetlands**

Wetlands comprise approximately 4,278 acres of Glenn County, and include marshes, ponds, fringes of small lakes, sloughs, and swamps (County of Glenn, 1985). The largest wetland assemblages occur within the Sacramento River floodplain, including the managed wetlands of the Sacramento National Wildlife Refuge (Figure 2-7). Wetlands may also be found in areas with suitable soil and hydrologic conditions.

The U.S. Soil Conservation Service (SCS) has identified 25 soil series, involving 93 specific soil mapping units, in Glenn County that display hydric characteristics. These soils are typically found in soil associations of the drainage basins (Willows-Capay, Willows-Plaza-Castro and Landlow-Stockton) found primarily in the southeast portion of the county; soils of older alluvial fans and low terraces (Arbuckle-Kimball-Hillgate, Hillgate-Arbuckle-Artois, Tehama-Plaza, Myers-Hillgate and Zamora-Marvin Associates) found through the eastern two-thirds of the county along creek drainages; and soils of the more recent alluvial fans and floodplain (Wyo-Jacinto, Cortina-Orland and Columbus Associates) also found throughout the eastern two-thirds of the county (U.S. Department of Agriculture, 1968).

Hydric soils are saturated over long periods and support hydrophytic (wetland) vegetation under saturated conditions. Many of the lands underlain

with hydric soils have been drained or managed for rice production. A typical wetland community in Glenn County is the *Coastal and Valley Freshwater Marsh*, which is typically found in floodplain areas and dominated by cattails, tules, sedges, umbrella sedges, scour rushes, and smartweed.

In addition to wetlands, vernal pools are found in various portions of the county (Gilgert, Pers. comm., 1991). Vernal pools are herbaceous communities that develop in ground depressions that fill with water from winter rains. The depressions have restricted soil percolation due to impervious materials (clay) underlying them. Because runoff and percolation are impaired, water is retained for prolonged periods until evaporated in the spring. As evaporation proceeds, concentric rings of vegetation, corresponding to residual soil moisture, remain. Typically, vernal pool communities in Glenn County would include the following:

Northern Hardpan Vernal Pool. These vernal pools are found on old, acidic, iron-silica (Fe-Si) cemented soils. Typical vegetation includes brook spike-primrose, annual hairgrass, double-horn downingia, cuspidate downingia, flat-face downingia, inch-high rush, Fremont's goldfield, white meadowfoam, northern mudwort, white-head navarretia, paintbrush owl's-clover, Sacramento mesamint, dwarf wholly-heads, corn speedwell, slender popcorn flower, and coast popcorn flower.

Northern Claypan Vernal Pool. These vernal pools are underlain with old, circum-neutral, silica-cemented hardpan soils. Typical species associated with this community include fine-branch popcorn flower, smooth spike-primrose, spreading alkali-weed, Hoover's downingia, California coyote-thistle, smooth goldfields, coast goldfields, tiny mouse-tail, Douglas' mesamint, and purslane speedwell.

Fill activities within "waters of the United States" (e.g., lakes, rivers, oceans, wetlands and sometimes vernal pools) are regulated under Section 404 of the Federal Clean Water Act (33 USC 1344) and administered by the U.S. Army Corps of Engineers. The Corps requires project-specific jurisdictional

wetland determinations for the processing of permits involving the discharge of fill material into wetlands (Fugro-McClelland (West) Inc., 1991).

- **Mendocino National Forest**

The Mendocino National Forest encompasses portions of Glenn, Mendocino, Tehama, Lake, and Colusa counties. Present management plans provide for an annual timber sale of approximately 85.5 million board feet from the Forest (including lands in other counties). Until recently, annual harvests have averaged about 84 million board feet. The new plan will likely reduce this amount to approximately 20 to 25 million board feet as a result of plans to protect the northern spotted owl. Some areas will be off-limits to harvest and other areas will be restricted (Pers. comm., Dick English, August 1991.)

A Land and Resource Management Plan for the Mendocino National Forest is currently being developed and is scheduled for completion in early 1992. This Plan will incorporate new requirements for the management of the northern spotted owl resulting from the Federal listing of the spotted owl as a threatened species under the Endangered Species Act of 1973. This plan is expected to provide for an annual timber sale program of approximately 20 to 25 million board feet.

Within the Forest, which encompasses portions of the six counties mentioned above, there are 471,916 acres capable of producing commercial timber crops at acceptable growth rates, as determined by the Forest Service. Of this total, 99,890 acres within the Yolla Bolly-Middle Eel and Snow Mountain wildernesses and the Middle Fork of the Eel River Wild and Scenic River corridor are unavailable for timber harvest. Another 28,593 acres are considered unsuitable for timber production without irreversible soil and watershed damage, or due to the lack of reasonable assurance that the lands can be adequately reported following final harvest. Concerns for uses such as recreation, visual resources, wildlife habitat, and stream and riparian zones further reduce the area considered suitable for timber harvesting. The three major forest types occurring on the suitable lands include mixed conifer,

conifer-hardwood, and red fir. Currently, 17 firms hold 42 timber sale contracts with the Forest Service (Pers. comm., Dick English, August 1991).

2.4.2 Wildlife

The variety of vegetative cover types in the county provide habitat for many different types of wildlife. The types of animal species commonly associated with each of the vegetation associations were determined from a variety of sources (Faber et al. 1989; Herbold and Moyle 1989; Mayer and Laudenslayer 1988; Jones & Stokes Associates 1987; U.S. Department of Agriculture 1986, and Arend 1967) and are listed in Appendix B.

Of particular significance is the large expanse of deer range located in western Glenn County and the winter waterfowl habitat located within and surrounding the Sacramento National Wildlife Refuge. Three major deer herds are located in the area, the Clear Lake Deer Herd, the Alder Springs Deer Herd, and the East Park Capay Deer Herd. The Alder Springs and East Park Capay herds are the principal herds within Glenn County and include resident and migratory Columbia blacktail and California mule deer. The migratory deer spend summers at high elevations in the North Coast Range and migrate to lower elevations in the winter. Critical summer and winter range, migration routes, and fawning areas are illustrated on Figure 2-7.

The winter waterfowl habitat of the Sacramento National Wildlife Refuge is administered by the U.S. Fish and Wildlife Service (USFWS), encompassing over 10,000 acres and providing winter migratory habitat for over one million birds at the peak of migration (December-January). Over 200 species of birds have been recorded in the refuge, including 26 species of waterfowl and 20 species of shorebirds. The most abundant waterfowl include pintail, mallard, pigeon, snow geese, white-fronted geese, and cackling geese (U.S. Fish and Wildlife Service, 1981) (Fugro-McClelland (West) Inc., 1991).

Within the Mendocino National Forest, the Forest Service maintains a habitat management program, the main objective of which is to maintain or enhance viable populations of fish and wildlife species. To ensure that viable populations of all

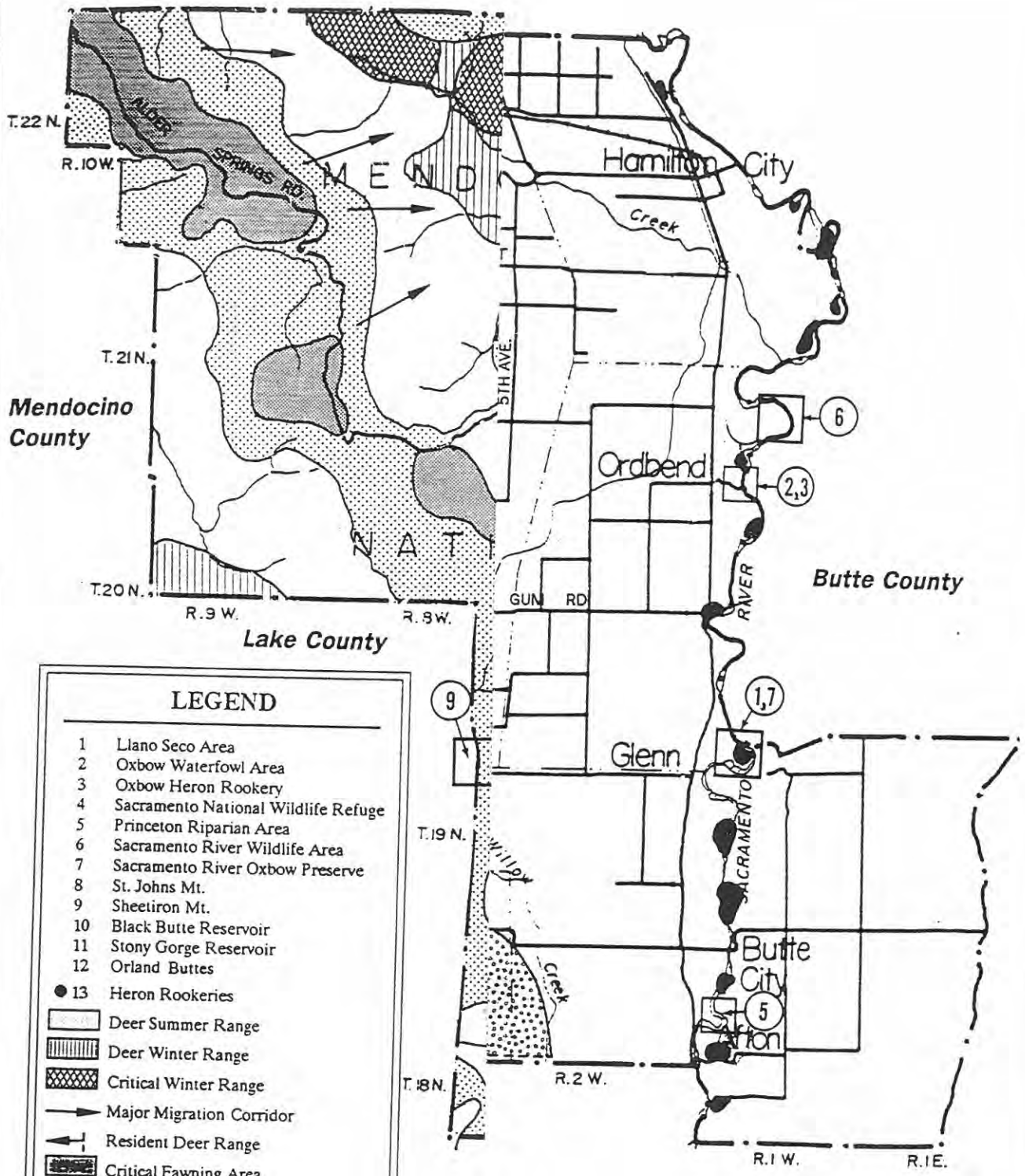
species are maintained, several species have been selected as "management indicator species" (MIS) to function as barometers for wildlife communities. These include species designated as Sensitive by the Forest Service, species of local interest, and species listed as Threatened or Endangered by either the Federal or State government. These include the bald eagle, peregrine falcon, and spotted owl (Threatened/Endangered); fisher, goshawk and marten(sensitive), black-tailed deer, douglas tree squirrel and western gray squirrel (harvest); tule elk (special interest); and acorn woodpecker, pileated woodpecker, and California thrasher (maintenance).

The establishment of Habitat Conservation Areas (HCAs) within the Mendocino National Forest will provide large tracts of existing and future habitat for fishers, goshawks, martens, and northern spotted owls. These species are distributed throughout the Forest in older mature stands of conifers characterized by a multi-layered canopy and abundant snags and downed logs. The Forest is in the process of developing Management Prescriptions and Forest-wide Standards and Guidelines to direct management of these species (Pers. comm., Dick English, August 1991).

- **Fishery Resources**

  The major aquatic resources found in Glenn County include the Sacramento River, Stony Creek, Wilson Creek, Willow Creek, Grindstone Creek, Elk Creek, Black Butte Reservoir, and Stony Gorge Reservoir. Drainages within the county are segments of the Central Valley subsystem of the Sacramento-San Joaquin drainage system (Moyle 1976). These resources include a variety of aquatic habitat types, including high altitude streams, rivers, reservoirs, sloughs, farm ponds, and marshes. Of the estimated 79 fish species that inhabit the subsystem, 47 are native and 32 were introduced.

  High elevation streams along the east slope of the North Coast Range are occupied by species adapted to the cool, swift-moving, highly oxygenated waters. Such species include rainbow trout, brook trout, riffle sculpin, and speckled dace. Foothill streams generally flow in winter, but are intermittent in the summer. California roach are the typical native species of these streams due to their tolerance of low oxygen and high water temperatures; however, green sunfish and fathead minnows can also be found and, in winter,



Source: Crawford Multari & Starr and Fugro-McClelland West Inc.

QUAD

Figure 2-7

Sacramento suckers, squawfish, and other minnows may spawn and oversummer in pools. The rivers and sloughs contain the widest variety of species, including resident and anadromous species.

Typical native anadromous species include Pacific lamprey, white sturgeon, chinook salmon, and steelhead trout. Resident native species include Sacramento blackfish, hardhead, hitch, Sacramento squawfish, California roach, Sacramento sucker, and Sacramento perch. Significant introduced species include threadfin and American shad, brown trout, carp, golden shiner, fathead minnow, channel catfish, black bullhead, mosquitofish, striped bass, black crappie, white crappie, green sunfish, bluegill, smallmouth bass, and largemouth bass. The principal reservoirs in the county, Black Butte and Stony Gorge, provide a typical warm water fishery including largemouth bass, smallmouth bass, white crappie, black crappie, channel catfish, striped bass, bluegill, carp, and Sacramento squawfish. The California Department of Fish and Game supplements the fishery with planted stocks (Fugro-McClelland (West) Inc., 1991).

- **Sensitive Species**

The Federal Endangered Species Act of 1973 (50 CFR 17) provides legal protection, and requires definition of critical habitat and development of recovery plans for, plant and animal species in danger of extinction. California has a parallel mandate in the California Endangered Species Act of 1984 and the California Native Plant Protection Act of 1977. These laws regulate the process of determining which plant and animal species are endangered or threatened. In addition, the Federal Endangered Species Act requires federal agencies to make a finding on all federal actions, including the approval by an federal agency of a public or private action (such as the issuance of a Section 10/404 permit), as to the potential to jeopardize the continued existence of any listed species potentially impacted by the action. Species listed by the State are not necessarily protected by the federal protection agencies. Under the State laws, the California Department of Fish and Game is empowered to review projects for their potential impacts to listed species and their habitats.

In addition to formal endangered and threatened listings by the federal and State governments are the listing of species of special interest due to their limited distribution, declining populations, diminishing habitat, or unusual scientific, recreational, or educational value. These species are not afforded the same legal protection as listed species, but may be added to official lists in the future. There are two general categories of special interest species: 1) candidates for official federal or state listing as threatened or endangered; and 2) species that are not candidates, but which have been unofficially identified as a species of special interest by private conservation organizations or local governments.

Federal candidate species are assigned to one of two categories depending on current knowledge about the species and its biological importance for listing. Federal Category 1 candidate species (FC1) include those for which the USFWS currently has compiled substantial information on biological vulnerability and threats, to support proposing to list the species as endangered or threatened. Federal Category 2 candidates (FC2) include species for which sufficient information is available to indicate possible listings, but for which additional data on vulnerability and threats are required. The state also maintains lists for Candidate-Endangered Species (SCE) and State Candidate-Threatened Species (SCT).

The California Department of Fish and Game (DFG) RareFind database (1991) was queried to identify sensitive species that currently or historically were reported in Glenn County. These data were supplemented with information contained in DFG's *Areas of Special Biological Importance - Glenn County, California* (1979), which delineated historic yellow-billed cuckoo habitat, and mapping of spotted owl habitat within the southwestern section of Glenn County in the Mendocino National Forest (U.S. Department of Agriculture 1986). Table 2-4 summarizes the sensitive species reported in Glenn County (Fugro-McClelland (West) Inc., 1991).

- **Important Biological Resource Areas**

Important biological resource areas within Glenn County were determined through an examination of previous mapping and inventory studies (California Department of Fish and Game 1979; California Natural Areas Coordinating Council 1982; U.S. Fish and Wildlife Service 1980; Holland 1978; Perry and Perry 1983; County of Glenn 1985, 1987; California Department of Fish and Game 1991). The important biological resource areas are summarized in Table 2-5, and illustrated in Figure 2-7 (Fugro-McClelland (West) Inc., 1991).

- **North Central Valley Wildlife Management Area**

The USFWS has released a draft Environmental Assessment for the proposed North Central Valley Wildlife Management Area, a component of the North American Waterfowl Management Plan's Central Valley Habitat Joint Venture. The proposed wildlife management area encompasses portions of Tehama, Butte, Glenn, Colusa, Yolo, Solano, Contra Costa, and San Joaquin counties. This proposal involves a combination of fee title and conservation easement acquisitions of USFWS and CDFG.

The purpose of the proposed acquisition program is to preserve important remaining wetland habitat for migratory waterfowl and other wetland-dependent wildlife and plants. Suitable area which are restored to wetlands would also be preserved for the same purpose. According to the Environmental Assessment, "The net result of this wetland preservation and restoration program would be to enhance the quality and quantity of habitat available to waterfowl and other wetland dependent wildlife and thereby provide for increased populations".

No fee title land acquisition, but easements of 7,000 acres are proposed in Glenn County; 750 acres of existing wetlands and 6,250 acres of restored wetlands are also identified for purchase from "willing sellers" under this poposal.

TABLE 2-4
SENSITIVE SPECIES REPORTED IN GLENN COUNTY

COMMON NAME	SCIENTIFIC NAME	STATUS
Insects		
Valley Elderberry Longhorn Beetle	Desmocerus californicus dimorphus	FT
Amphibians and Reptiles		
California Tiger Salamander	Ambystoma tigrinum californiense	CSC, FC-2
Giant Garter Snake	Thamnophis couchii gigas	ST, FC-2
Birds		
Great Blue Heron	Ardea herodias	SA
Great Egret	Casmerodius albus	SA
Osprey	Pandion haliaetus	CSC
Bald Eagle	Haliaeetus leucocephalus	SE, FE
Northern Goshawk	Accipiter gentilis	ST, FC-3C
Spotted Owl	Strix occidentalis	FT
Swainson's Hawk	Buteo swainsoni	ST, FC-3
Western Yellow-billed Cuckoo	Coccyzus americanus occidentalis	SE, FC-3B
Bank Swallow	Riparia riparia	ST
Tricolored Blackbird	Agelaius tircolor	FC-2
Mammals		
Pacific Fisher	Martes pennanti pacifica	CSC

COMMON NAME	SCIENTIFIC NAME	STATUS
Plants		
Caper-fruited Tropidocarpum	Tropidocarpum capparideum	FC-2
Drymaria-like Dwarf Flax	Hesperolinon drymariodes	FC-2
California Hibiscus	Hibiscus californicus	FC-2
Brandegee's Eriastrum	Eriastrum brandegeae	FC-2
Plaskett Meadows Linanthus	Linanthus harknessii condensatus	FC-2
Dimorphic Snapdragon	Antirrhinum subcordatum	FC-3C
Indian Valley Broadiaea	Brodiaea coronaria rosea	SE, FC-2
Adobe Lily	Fritilaria pluriflora	FC-2
Diamond-petaled California Poppy	Eschscholzia rhombipetala	FC-2
Ahart's Paronychia	Paronychia ahartii	FC-2
Veiny Monardella	Monardella douglassii venosa	FC-2
Shippee Meadowfoam	Limnanthes floccosa californica	SE, FC-1

Note:
FE - Federal Endangered Species
FT - Federal Threatened Species
FC - Federal Candidate Species
CSC - California Species of Special Concern
SE - State Endangered Species
ST - State Threatened Species
SA - State Special Animal

TABLE 2-5
IMPORTANT BIOLOGICAL AREAS IN GLENN COUNTY

AREAS OF SPECIAL IMPORTANCE	SITE NO.	DESCRIPTION
Llano Seco Area	1	The Llano Seco area is a 2,700 acre tract of riparian, valley oak, and freshwater marsh habitat located along the Sacramento River
Oxbow Waterfowl Area	2	The Oxbow Waterfowl Area is a publicly and privately held tract of 1,600 acres of mature river flood plain located along the Sacramento River from Chico Landing to above Ord Ferry. The area contains riparian and freshwater marsh habitat.
Oxbow Heron Rookery	3	The Oxbow Heron Rookery is a 399 acre, privately owned parcel of riparian land used as a rookery for great blue herons and common egrets.
Sacramento NWR	4	See text.
Princeton Riparian Woodland	5	The Princeton Riparian Woodland is a 150 acre tract of riparian forest dominant by cottonwood, sycamore, and valley oak. It is owned by the State of California and private parties.
Sacramento River Wildlife Area	6	The Sacramento River Wildlife Area is a riparian association with wet meadows which is administered by the California Department of Fish and Game. It is composed of 3 units along the Sacramento River from just south of Golden State Island into Tehama County.
Sacramento River Oxbow Preserve	7	The Sacramento River Oxbow Preserve is a 94 acre tract of dense riparian forest held by the Nature Conservancy.
St. John's Mountain	8	St. John's Mountain and Snow Mountain area contain numerous montane vegetation communities including alpine meadow, alpine marsh, Douglas fir forest, yellow pine forest, and chaparral.
Sheetiron Mountain	9	Sheetiron Mountain is a mixed conifer forest with a great variety of plants, including a red fir stand, yellow pine, Douglas fir, and stands of Brewers oak.
Black Butte Reservoir	10	Black Butte Lake is a 160,000 acre-foot flood control and hydropower reservoir operated by the U.S. Army Corps of Engineers. The lake provides a warm water fishery, camping, and a wildlife area.
Stony Gorge Reservoir	11	Stony Gorge Lake is a 50,000 acre-foot water supply and hydropower facility constructed in 1928 by the U.S. Bureau of Reclamation. It is currently operated by the Orland Unit Water Users Association. It offers a warm water fishery, however, lands surrounding the lake are privately held and in agricultural production.
Orland Buttes	12	Orland Buttes are unique geologic features which rise approximately 500 feet above the valley flood and extend 6 miles in a north-south direction. Associated vegetation is grazed grassland and blue oak savannah.

SEE FIGURE 2-7 FOR THE LOCATIONS OF THE SITES NUMBERED ABOVE.

2.5 MINERAL AND ENERGY RESOURCES

Notable mineral resources in Glenn County include natural gas and construction grade aggregate material (Glenn County Conservation Management Element, 1987). In addition, published reports indicate past attempts to exploit deposits of chromite, molybdenite and copper (CDMG, 1929). Primary areas for gravel extraction occur along Stony Creek and the Sacramento River, although there are other pockets of gravel scattered throughout the county. Figure 2-8 shows the location of sand and gravel operations within the county.

Several gas fields contribute to a significant quantity of natural gas production in Glenn County. Of these, the Malton-Black Butte field located on the border with Tehama County in eastern Glenn County, and the Willows-Beehive Bend field located in southeastern Glenn County account for nearly 80 percent of total gas production in the county. Figure 2-9 shows the known gas fields within Glenn County. No oil or geothermal resources have been discovered in the county.

The Energy Facility Siting in Glenn County-Working Paper (June 1991) prepared by Crawford Multari & Starr concludes that it is likely that natural gas production will continue in Glenn County for at least the next twenty years. No public information exists regarding planned or proposed facilities.

Mining in Glenn County was primarily related to the extraction of strategic minerals during World Wars I and II. The extraction of chrome and manganese essentially ended in the late 1940s with the loss of government demand and subsidies (Fugro-McClelland (West) Inc., 1991).

2.6 CULTURAL RESOURCES

To document the cultural resources of Glenn County, a comprehensive record search was conducted of the archaeological maps and files maintained by the California Archaeological Inventory Information Center at California State University, Chico.

2.6.1 Definition of an Archaeological Site

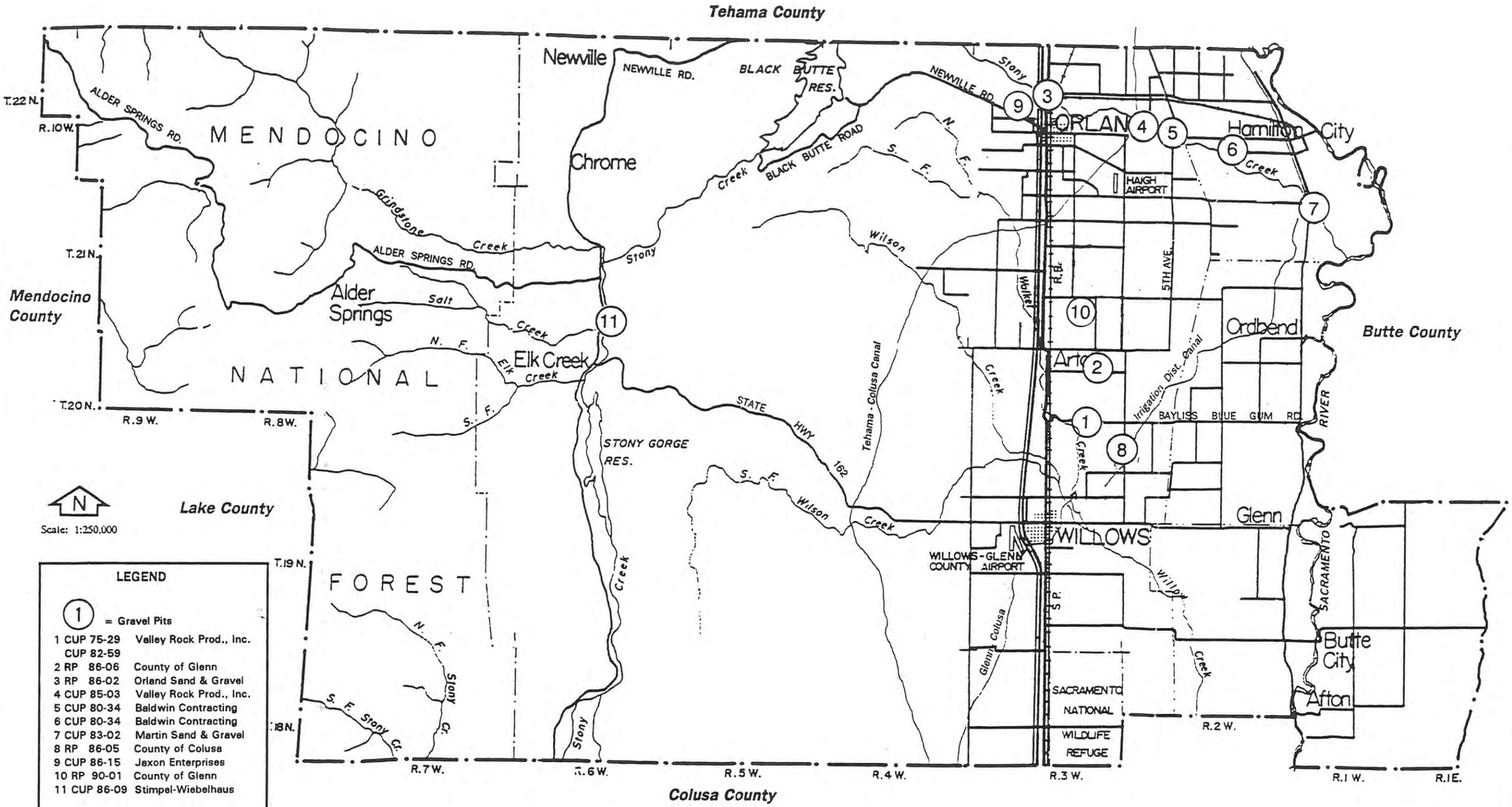
Archaeological sites are places where human activity has measurably altered the earth. Archaeological deposits that predate Spanish colonization are the only source of information about the historical development of Native Californian societies. Archaeological sites formed during and after the Spanish colonization of California can usually be easily distinguished from sites occupied prehistorically. Historic settlements frequently contain iron artifacts, pottery, porcelain, glass, coal, and other materials not used in the region before Spanish contact.

Below the surface of most prehistoric archaeological sites are clusters of burned rocks that are the remains of hearths and ovens. Animal remains and artifacts that are products of prehistoric domestic and ceremonial life can also be found. Soil disconformities caused by the excavation of post holes and pots associated with structures, ovens, storage facilities, and burials also are present at most archaeological sites. Because such physical remains are the products of organized human life, data on the distribution of hearths, ovens, house depressions, storage facilities, manufacturing areas, deposits of food refuse, and other artifacts can be used to reconstruct the organization of human societies which existed in the past.

2.6.2 Glenn County Record Search Results

The exact location of cultural resource sites is generally not disclosed because of the sensitivity of such sites to vandalism. Therefore, such locations are not presented in this document. Instead, a description and quantification of site types and the general environmental associations of cultural resources known to exist within the county is presented.

The archaeological record search revealed that a total of 464 sites have been recorded in Glenn County. Of those sites, there were 164 villages, 92 campsites, 90 lithic scatters, 104 historic sites, 11 quarries, and 3 rock shelters. The location and environmental context of the sites vary, based on the following four general environmental zones which are described from east to west across the county:



N

Scale: 1:250,000

LEGEND

(1) = Gravel Pits

1	CUP 75-29 CUP 82-59	Valley Rock Prod., Inc.
2	RP 86-06	County of Glenn
3	RP 86-02	Orland Sand & Gravel
4	CUP 85-03	Valley Rock Prod., Inc.
5	CUP 80-34	Baldwin Contracting
6	CUP 80-34	Baldwin Contracting
7	CUP 83-02	Martin Sand & Gravel
8	RP 86-05	County of Colusa
9	CUP 86-15	Jaxon Enterprises
10	RP 90-01	County of Glenn
11	CUP 86-09	Stimpel-Wiebelhaus

CUP = Conditional Use Permit
RP = Reclamation Plan

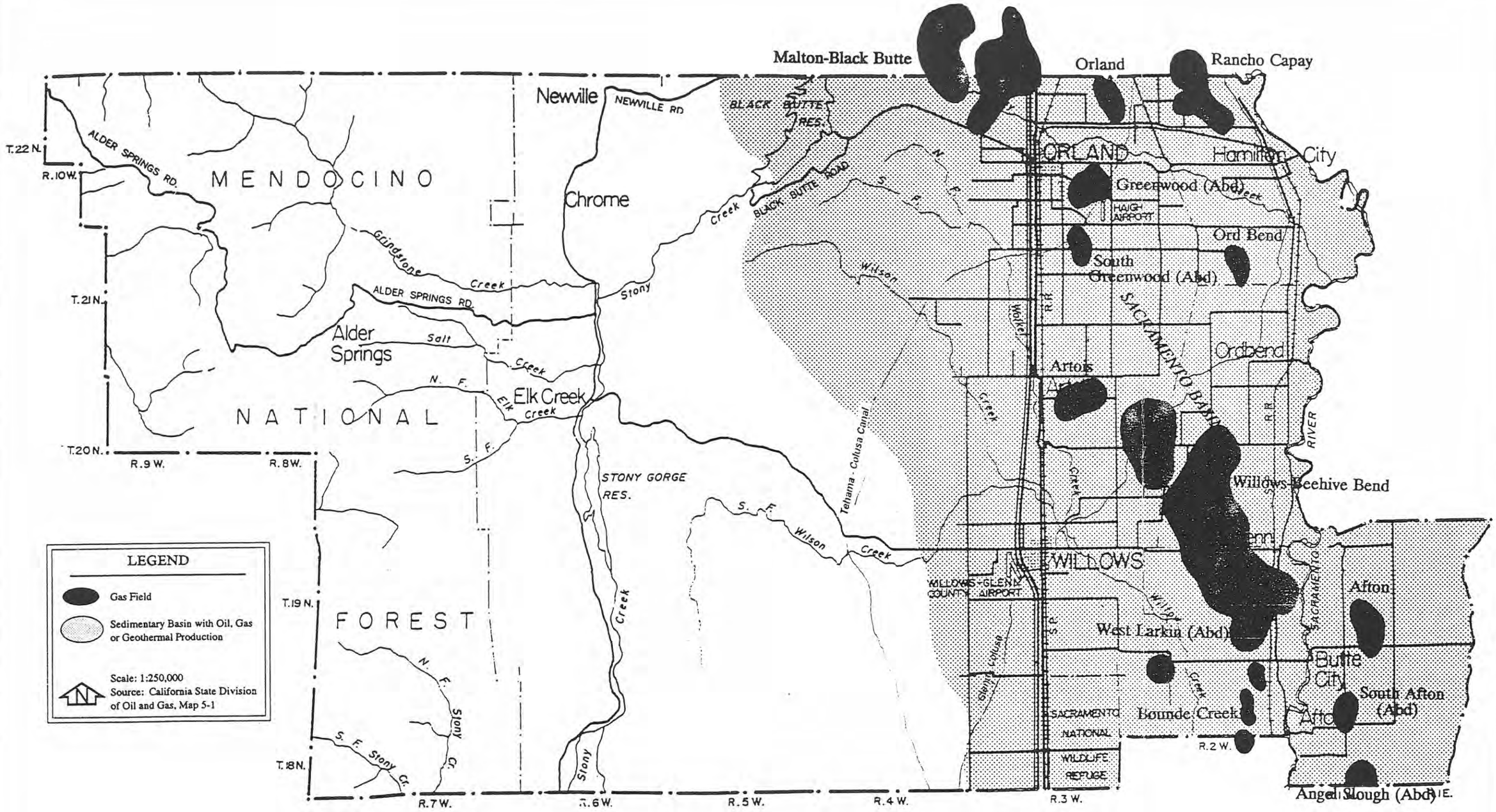
Source: Glenn County Planning Department 1991

Source: Crawford Multari & Starr and Fugro-McClelland West Inc.

QUAD

SAND AND GRAVEL OPERATIONS IN GLENN COUNTY

Figure 2-8



Source: Crawford Multari & Starr and Fugro-McClelland West Inc.

NATURAL GAS FIELDS IN GLENN COUNTY

Figure 2-9

- Riverine Zone
- Valley Zone (between the river and the foothills)
- Foothill Zone
- Coast Range Zone

The Riverine Zone includes the Sacramento River and surrounding natural levees and floodplains. Within this zone, most sites are villages typically located on raised areas adjacent to the river. The Valley Zone generally lies between the Sacramento River and the foothills. Within this zone most recorded sites are smaller villages or campsites located along the seasonal streams, and historic sites such as homesteads.

The Foothill Zone has the highest density of sites, including historic ranching and homesteading sites, prehistoric villages, and task sites, most of which are close to water sources. The Coast Range Zone has a lower density of sites, with most sites located on ridge tops, along streams, and on mid-slope flats.

Within the Mendocino National Forest, two cultural resource overviews were conducted during the 1980s. A forest-wide study of the history, prehistory, and contemporary concerns of the Native American Indian was completed in 1982. A second study, focusing on the identification of areas of importance to Native Americans, was completed for a portion of the Forest in 1984 (Fugro-McClelland (West) Inc., 1991).

2.7 ANALYSIS OF ISSUES, OPPORTUNITIES AND CONSTRAINTS

As described in this Chapter, natural resources are relatively abundant in Glenn County, due to its location and geographic diversity. Important resources include the following:

- Surface and ground water of good quantity and quality;

- Timber on both public and private lands;

- Soils which support a variety of crops and agricultural operations;
- Natural gas, hydroelectric and aggregate resources;
- The natural environment, including vegetation types and habitat which support a diversity of wildlife, including sensitive species; and
- Great scenic beauty and variety.

These natural resources have to date provided the basis of Glenn County's economy, and their importance cannot be overestimated. Environmental considerations and outside political actions which affect the use of these natural resources may have a profound effect on the economy and lifestyles of the residents of Glenn County. The policy decisions and choices that are made during the General Plan revision process, involving land use and development patterns and protection of resources, will reflect the level of importance assigned to these resources at the local level. Other policy decisions made at the State and federal levels and imposed on Glenn County will affect local resources as well, and the way the County chooses to accommodate these decisions is also part of this process.

Some factors to be considered in the General Plan revision process include:

Timber

- The impact on the timber industry, the local economy, and County revenues of anticipated reductions in timber harvesting to protect critical habitat for the northern spotted owl and to reflect changes in forest management practices.
- The potential benefits in terms of preserving and enhancing timber resources over the long term.

Water

- The potential for changes in State and federal legislation and regulations regarding agricultural water delivery to reduce irrigation water availability, thus impacting local agricultural production.

- The opportunities and drawbacks associated with the potential sale of agricultural water for urban use.

- The effect on land use patterns if marginal agricultural areas can no longer be productively farmed.

Agriculture

- The importance of Glenn County agricultural resources to the local economy, the State and the nation.

- The potential to balance environmental concerns (water, wildlife, use of agricultural chemicals, air quality) with the benefits associated with agricultural production (production of food and fiber, employment, farm life and values, wildlife habitat).

- The ability to protect agricultural resources through soil conservation, ground water protection, preservation of air quality, wise use of water resources, defining appropriate boundaries for urban development, and making the appropriate provisions for wildlife protection.

- The difficulties associated with continued participation in the Williamson Act program, if property tax subventions to the County by the State are not increased.

Biological Resources

- The effects of increased protection of sensitive wildlife and plant habitat and wetlands by State and federal agencies, which can impact urban development,

agricultural practices, timber harvesting, extraction of mineral resources, and construction of flood control facilities.

- The effects of increasing the amount of protected habitat in the county, which may reduce availability of land for other uses, including agriculture and urban development.

- The potential benefits of assuring that valuable habitat (including riparian habitat and wetlands) is protected, including enhanced air and water quality, scenic quality, abundance of wildlife for fishing, hunting and observation, and attractiveness of Glenn County as a tourist destination.

Mineral and Energy Resources

- The importance of mineral and energy resources to the local economy, the State and the nation, and the recognition that these resources are finite.

- The potential to protect resource extraction areas from encroachment by incompatible uses to assure that their extraction will not conflict with established uses and communities, and to assure their future reclamation and restoration to a natural appearance.

Cultural Resources

- The potential for the General Plan to provide policy guidelines regarding site-specific surveys for construction projects which encounter artifacts or human remains.

3.0 PUBLIC SAFETY

3.1 LAW ENFORCEMENT

The Glenn County Sheriff's Office provides law enforcement services within unincorporated areas of the county. The two incorporated cities within the county, Willows and Orland, are served by the Willows and Orland Police Departments,

respectively. The California Highway Patrol polices State Highways 162, 45, and 32, Interstate Route 5, and all unincorporated county roadways. (Pers. comm., Diane Millard, Willows Police Department, July 1991.)

The Glenn County Sheriff's Office currently has twenty-six sworn and one non-sworn officers. Other personnel include ten administrative staff, twenty-two correctional staff, and one food manager. The main Sheriff's station is located at 543 West Oak Street in downtown Willows with two substations located in Orland and in Hamilton City. The Office maintains twenty-one vehicles - twelve marked patrol, six unmarked patrol, and three utilized for jail-related transportation, along with two boats. Services provided include citizen and property protection, enforcement, administration, and a Narcotic Task Force. In addition to providing its own dispatch services, the Sheriff's Office renders these services to both Willows and Orland Police Departments primarily during the evening and early morning hours. The Sheriff acts as the County Coroner investigating all deaths occurring in the county. (Pers. comm., Undersheriff Harvey Lewis, Glenn County Sheriff Department, July 24, 1991.)

The existing allocation of "field officers" to population is approximately 17 to 14,050 or 1.2 officers per one thousand people. However, there are currently two vacancies. According to the Sheriff's Department, it is unlikely that these positions will be filled in the foreseeable future due to budgeting constraints. The Department's personnel also serve as backup to the forces of the two incorporated cities, further eroding compliance with the above ratio. The optimum national ratio standard is one officer per 1,000 people.

Within the Mendocino National Forest, the Forest Service has shared law enforcement responsibilities with local law enforcement agencies. The jurisdiction of the Forest Service includes misdemeanor resource codes, felony narcotics, arson, property theft, and public protection when life or property are threatened. Serious law enforcement problems within the Forest include drug and alcohol related crimes, vandalism and property theft, timber trespass, marijuana cultivation and public and employee safety. The Forest Service currently maintains a Cooperative Law Enforcement Agreement with the Glenn County Sheriff's Office.

3.2 FIRE HAZARDS AND FIRE PROTECTION

Fire protection in Glenn County is provided by twelve individual fire districts which include the cities of Willows and Orland (see Figure 3-1 in the *Public Safety Issue Paper*). On a seasonal basis, protection is also provided by the California Department of Forestry (CDF) in the unincorporated foothill and rural areas. In the areas covered by the CDF that are also served by a fire district, both respond to fires during the fire season (approximately May 1 to November 1). (Pers. comm., Mike Terwilliger, CDF, July 12, 1991.) Funding for the fire districts is provided entirely by Glenn County.

The U.S. Forest Service is responsible for wildland fire protection within the Mendocino National Forest boundary. The Forest Service has an agreement with CDF to provide protection to private in-holdings within the National Forest. Both agencies respond to fires around the forest perimeter. There are presently six to eight fire engines in the Forest, depending on the time of the year. The number of engines will be reduced to four in the future. From 1981 through 1990 there were fourteen major fires in the National Forest. An average of 54 fires burned an average of 9,504 acres each year. One-third of the fires were human-caused, but were responsible for only 9 percent of the acreage burned. The Forest experienced an unprecedented number of lightning-caused fires in 1987, which burned areas outside of the Forest boundaries as well. The Forest Service utilizes prescribed burning in non-wilderness areas to prevent fuel buildup and has adopted policies regarding fire management within the Forest.

The Willows Fire District is the only district in the county with full-time paid personnel. The Fire Chief and four staff are employed by the City of Willows to provide continuous coverage. The force consists of a 40-member volunteer company. In 1990 the Willows District responded to 391 calls, including 26 alarms and structure fires, 15 grass or wildland fires, and 116 medical aid calls. The Willows Fire District also provides dispatching for the City of Willows, the Willows rural area, Codora Fire District in Glenn County, and the Glenn Colusa (including Butte City), Hamilton-Bayliss, Ord, Artois, Kanawha, and Elk Creek Fire Districts (Pers. comm., B. Mallory, Fire Chief, City of Willows Fire Department, July 15, 1991).

The Orland Rural Fire District and the City of Orland are responsible for providing fire protection to the City of Orland and Orland rural area, and also provide dispatching for Hamilton City and the Capay Fire District. The District and the City both provide equipment and materials. Manpower is provided by the Orland Volunteer Fire Department, which is staffed by 50 volunteer fire fighters. Fire fighting equipment includes a Chief's truck, rescue vehicle, four fire trucks, and one tanker. (Pers. comm., A. Calonico, City Manager, Orland, Dec. 1992).

With increasing liability exposure and fire hazard from structures rather than grass fires, as well as medical emergencies, extensive training for volunteers is required, and the City of Orland may establish a task force to study possible alternatives.

The CDF has responsibility for fire protection in the area between U.S. Forest Service lands on the west to the high voltage transmission lines on the east. In addition to responding to approximately ten grass fires per season, CDF staff reviews construction proposals and may provide guidance on fire flow requirements, hydrants and street widths.

3.3 GEOLOGIC HAZARDS

3.3.1 Seismicity

Glenn County is in a relatively inactive seismic area when compared to other portions of California such as the San Francisco Bay area and the Los Angeles Basin. There are no Alquist-Priolo Special Studies Zones within the county (Hart, 1988). Such zones highlight active faults that have a potential for ground surface rupture. During the past 100 years, the county has experienced only minor earthquakes within its boundaries and secondary impacts from earthquakes centered out of the area. Projections of future impacts are low to moderate (Glenn County Safety Element, 1974). (See Figure 4-4 in the *Public Safety Issue Paper* for a diagram showing earthquake recurrence intervals in Glenn County.)

3.3.2 Other Geologic Constraints and Hazards

Geologic hazards in Glenn County include the potential for landslides, subsidence, erosion and soil expansion. The distribution of these hazards is shown in the Glenn County Safety Element (1974). The extent of the potential hazards is summarized as follows:

Landslides.

The areas of highest apparent landslide potential in the county generally correlate with relief. Those areas having the highest potential occur in the mountainous western portion of the county, while lower potential areas occur in the lower relief eastern portion of the county. (See figure 4-2 in the *Public Safety Issue Paper* for a diagram showing landslide potential.)

Subsidence.

Known and potential subsidence areas occur in the eastern portion of the county where extensive groundwater withdrawals have occurred. Extraction of natural gas from reservoirs located in these same areas can also contribute to local subsidence of the land surface. (See Figure 4-3 in the *Public Safety Issue Paper* for a diagram showing potential subsidence areas.)

Erosion.

Erosion may be expected in Glenn County where protective vegetation is removed by construction, fire or cultivation. Factors that contribute to erosion include topography, rainfall, and soil type. Similar to landsliding potential, erosion hazard in the county is highest in the western mountain region and lowest in the eastern valley region. (See Figure 4-1 in the *Public Safety Issue Paper* for a diagram showing erosion potential.)

Expansive Soils.

Most of Glenn County has expansive soils. Areas of low expansion potential occur in a small area between Orland and Hamilton City and along the Sacramento River. The remainder of the valley and foothill areas is classified as having high expansion potential. The western portion of the county is classified as having moderate expansion potential (Fugro-McClelland (West) Inc., 1991). (See Figure 4-5 in the *Public Safety Issue Paper* for a diagram showing the location of expansive soils.)

3.4 AIR QUALITY

3.4.1. Management of the Airshed and Pollutants of Importance

Air pollution control is administered in California by the federal, State, and local governments. Both the federal and State agencies (the U.S. Environmental Protection Agency and the California Air Resources Board) have established ambient air quality standards, based on consideration of the health and welfare of the general public. Locally, the Glenn County Air Pollution Control District (APCD) is responsible for the planning and maintenance/attainment of these standards. The pollutants relevant to Glenn County for which standards have been established are summarized below.

Ozone.

Ozone is a highly reactive secondary gas pollutant that is toxic, colorless and has a pungent odor. Ozone is photochemically produced through complex chemical reactions of certain hydrocarbons and oxides of nitrogen (primary pollutants) in the presence of sunlight and temperatures above 78°F. In high concentrations, ozone and other photochemical oxidants can cause respiratory irritation and inhibit vegetation growth.

Oxides of nitrogen (NO_X) are of primary concern in Glenn County. High combustion temperatures in motor vehicle engines and industrial operations cause the formation of NO_X by combining nitrogen and oxygen.

It is the essential component in the production of photochemical smog. NO_X is a key receptor of ultraviolet light which initiates the reactions that produce smog in the Sacramento Valley Air Basin.

Particulates

Atmospheric particulates or total suspended particulates (TSP) are solid matter that are suspended in the atmosphere. These TSPs are a mixture of natural and man-made materials such as soil particles, organic compounds, sulfates, aerosols, and nitrates. The National Primary Standards for TSP were formerly 75 micrograms per cubic meter for annual geometric mean and 260 micrograms per cubic meter for any 24-hour period.

The PM_{10} standards refer to particulate matter equal to or less than 10 microns in diameter. This material cannot be adequately filtered by the human respiratory system. Inhaled atmospheric particulate can harm humans by directly injuring the respiratory tract and lungs, or by the reactive gases which were absorbed by the inhaled particulate. Suspended particulates also scatter and absorb sunlight, producing haze and reducing visibility.

3.4.2 Clean Air Legislation and Air Quality Standards

Air quality standards for Glenn County are set by both the federal government, through the Environmental Protection Agency (EPA), and by the State government, through the California Air Resources Board (CARB). California air quality standards have been consistently more stringent than federal air quality standards.

Even with the recently passed and signed Federal Clean Air Act of 1990 (FCAA), Glenn County has never exceeded federal air quality standards, including the standards for ozone and PM_{10}. Because of this, the EPA has labeled Glenn County as an area of "Prevention of Significant Deterioration" (PSD).

In 1988, the California Clean Air Act (CCAA) was passed. The act contains guidelines for the attainment of air quality goals that are much more stringent than the federal standards. The CCAA expands the authority of both the CARB and the

local Air Quality Management Districts (AQMDs), especially where a district has been found to be in "nonattainment" of state air quality standards. The CARB will regulate statewide sources of pollutants such as mobile sources and fuels, consumer products, paints and coatings, etc. The local districts will regulate sources within their districts such as stationary sources, indirect sources, agricultural sources, etc. Glenn County and the counties of the Northern Sacramento Valley (Butte, Colusa, Shasta, Sutter, Tehama and Yuba) have prepared and submitted to the State an Attainment Plan. This plan is described in Section 5.5.

Glenn County has been designated as "nonattainment" for exceedances of State ozone standards. As shown in Appendix C, the State one-hour ozone standard is 0.09 ppm (parts per million, by volume), not to be exceeded. Glenn County has also been designated as "nonattainment" for exceedances of State PM_{10} standards. The State's 24-hour PM_{10} standard is 50 $\mu g/m^3$, not to be exceeded (Turek, 1991).

3.4.3 Baseline Air Quality

Generalized Description and Attainment Status

Generally, air quality in Glenn County is better than that required by federal standards. Glenn County's designation as a PSD zone is due mainly to two factors: the small number of urban-style pollution sources (motor vehicle traffic and industry) and insufficient air quality data from the EPA. The two factors are interrelated for PSD designated areas.

While Glenn County may not be subject to many of the air quality problems of urban areas, the county does experience rural-type pollution (dust and smoke) and pollution transport. Such problems stem from the county's agricultural economy which necessitates land cultivation and agricultural waste burning, and the prevailing wind patterns that transport pollutants from the Sacramento Metropolitan Area to the northern Sacramento Valley Air Basin.

Agricultural activities generate large quantities of dust, also known as PM_{10}. PM_{10} consists of very small particles in the atmosphere resulting from many kinds of dust and fume-producing industrial and agricultural operations,

from combustion, and from atmospheric photochemical reactions. Natural erosion processes also introduce particulates into the atmosphere; wind-raised dust is one such particulate source. Glenn County presently falls within the federal PM_{10} standard, while exceeding that of the State. The "nonattainment" status for the State PM_{10} standard is due to exceedances that occur mainly during the fall and spring. Probable sources are the agricultural burning of field crops and orchard waste, cultivating and harvesting of crops, and driving on unpaved roads. Since these activities occur year-round, there are PM_{10} exceedances year-round.

Wildfire can be a major contributor to air quality degradation. Mendocino County Forest Management activities which have the potential to degrade air quality include prescribed burning, vehicle use, and operation of equipment. Prescribed burning is conducted in accordance with Glenn County APCD regulations regarding timing and acreage.

Glenn County has been designated as "attainment" for State Air Quality Standards for nitrogen dioxide, sulfur dioxide, sulfates and lead; and "unclassified" for carbon monoxide, hydrogen sulfide, and visibility-reducing particulates.

Because the formation of ozone requires Volatile Organic Compounds (VOCs), Oxides of Nitrogen (NOX), and sunlight (heat), exceedances of ozone standards occur mainly during the warmer months of May through October. However, the transport of ozone and/or its precursors from the Broader Sacramento Area to the upper Sacramento Valley adds to the upper valley's ozone problem. Such transport events occurred on at least 57 of the 63 days when the ozone standard was exceeded during 1986 through 1988 in the Upper Sacramento Valley (Turek, 1991).

As a result, in August, 1990, the ARB added the "Overwhelming" classification to describe transport contributions from the Broader Sacramento Area to the Upper Sacramento Valley on certain days. In summary, the ARB staff has recommended that the Broader Sacramento Area's transport be

classified as "Overwhelming" on some days, "Significant" on some other days, and "Inconsequential" on others.

No California ozone standard exceedance (> = 10ppm) trend appears discernible. The number of California ozone exceedances varies annually. Further hindering this analysis, ARB removed ozone monitors from some northern Sacramento Valley counties during 1987-1988. Increasing numbers of ozone exceedances seem to occur near Sutter County, but a lack of monitors makes this a speculative conclusion. The dramatic downturn of California ozone exceedances during the 1989 season throughout the Northern Sacramento Valley Air Basin may indicate reduced ozone precursor emissions in this area. However, cooler summer temperatures may not make 1989 a representative year.

Air Quality Monitoring.

The California Air Resources Board (ARB) operates the only currently recognized air quality monitoring station in Glenn County, located on Villa Avenue in the City of Willows. The Willows station monitors particulate matter (PM_{10}), coefficient of haze (COH) and light scatter (visibility). The APCD recently purchased an ozone monitor which has been operated by APCD staff since mid-1990, which has recently been recognized as an official Air Resources Board ozone monitoring station.

Table 2-6 shows the number of times State and federal air quality standards were exceeded in Glenn County over the past five years, according to the limited data available from the Willows monitoring station. As shown in Table 2-6, the county does not show any significant trends in either improving or declining air quality (Fugro-McClelland (West) Inc., 1991).

3.5 HYDROLOGY

3.5.1 Water Quality

Water quality in the Colusa Basin is influenced by several factors, including rainfall patterns, quality of irrigation water supply, crop acreages, crop cultural practices (especially rice pesticide regulation and water recirculation), district water management (especially reuse), and soil characteristics (State of California Department of Water Resources [DWR], Colusa Basin Appraisal, 1990). The Colusa Basin is just over one million acres of valley floor and foothill lands in the southwest part of the Sacramento Valley, including portions of Glenn, Colusa and Yolo counties. According to the DWR report, water quality in the Basin is generally good to fair because of the excellent quality of the main source, the Sacramento River, and most groundwater supplies are also considered excellent. Water quality concerns have developed at the lower end of the Basin, primarily related to agricultural chemicals. Point sources that drain into the Colusa Basin Drain in Glenn County, influencing water quality in the Drain, include wastewater treatment plant effluent from the City of Willows, and food-processing wastes and cooling water effluent from the Glenn Milk Producers Association.

A "Rice Herbicide Action Plan" was developed by the California Department of Food and Agriculture in 1984, using best management practices to reduce off-site movement of herbicides to the Drain and Sacramento River. This Plan has greatly reduced concentrations of rice herbicides in the Drain and River. According to the DWR report, the careful control and management of these chemicals appears to have eliminated most of the problems associated with their use.

TABLE 2-6
HISTORIC EXCEEDANCES OF AIR QUALITY STANDARDS
FOR SELECTED POLLUTANTS IN GLENN COUNTY

	1984			1985			1986			1987			1988			1989		
(pphm)	≥10[a]	>12[b]	≥20	≥10	>12	≥20	≥10	>12	≥20	≥10	>12	≥20	≥10	>12	≥20	≥10	>12	≥20
OZONE	1[c] 2[d]	0 0	0 0	5 11	0 0	0 0	2 3	0 0	0 0	9 25	0 0	0 0	N.M.[e] N.M.	N.M. N.M.	N.M. N.M.	N.M. N.M.	N.M. N.M.	N.M. N.M.
CARBON MONOXIDE	N.M.			N.M.			N.M.			N.M.			N.M.			N.M.		

	1984				1985				1986				1987				1988				1989			
(µg/cm)	>50[f]	>100	>150[g]	HIGH	>50	>100	>150	HIGH	>50	>100	>150	HIGH	>50	>100	>150	HIGH	>50	>100	>150	HIGH	>50	>100	>150	HIGH
PM-10	N.M.	N.M.	N.M.	N.M.	N.M.	N.M.	N.M.	N.M.	5	0	0	83	18	0	0	99	12	0	0	93	3	0	0	73

Footnotes:

a. ≥10 pphm Exceeds California Standards
b. >12 pphm Exceeds Federal Standards
c. Number of Daily Exceedances for the Year
d. Number of Hourly Exceedances for the Year
e. N.M. = No Monitor
f. >50 µg/cubic meter Exceeds California Standards
g. >150 µg/cubic meter Exceeds Federal Standards

3.5.2. Flooding/Drainage

Some areas of the county adjacent to streams are subject to flooding and deposition of new soil material during heavy rainfall. The largest floodplain consists of a narrow area parallel to the Sacramento River. Dams control the flow of Stony Creek and the Sacramento River, preventing severe flooding. Annual flooding occurs within the levee system that borders the river. Hamilton City is only protected from the Sacramento River by a poorly maintained private levee. Many old meander scars and some oxbow lakes are found in the area.

There are two main basin areas within the county, the Colusa Basin and the Butte Sink, which lies east of the river. Both areas occasionally flood in winter because their terrain is nearly level and the soils are poorly drained. In many places they contain excess salts and alkali and have an intermittent high water table. In large areas, drainage ditches have been constructed and the soils partly reclaimed.

Most of the mountains and foothills drain well, but parts of the intervening valleys drain poorly. The mountain streams have a dendritic, or tree-like, pattern. The Black Butte River, Corbin Creek, and many other streams drain the area west of the crest of the Coast Ranges. These streams flow into the Eel River, one of the major streams draining the northern part of the Coast Ranges.

Small creeks drain the mountains east of the crest of the Coast Range. These creeks empty into Stony Creek, which flows northeast through the foothills into the Sacramento Valley drainage basin. Drainage in the foothills is by intermittent streams that flow only during the wet winter and spring months. Among the minor streams that drain the foothills are French, Hunter, Logan, Walker, Willow and Wilson Creeks. These streams flow east and southward into the Colusa Basin and rarely reach the Sacramento River (Fugro-McClelland (West) Inc., 1991).

Flood hazard areas in Glenn County have been mapped by the Federal Emergency Management Agency (FEMA) on Flood Insurance Rate Maps (FIRM). A composite map of flood hazard areas, based on the FEMA FIRM maps is included in the *Public Safety Issue Paper* as Figure 6-1.

Two storm drain maintenance districts and a County Service Area have been formed in Glenn County to dispose of storm waters. These entities are described below.

Storm Drain Maintenance District #1.

Storm Drain Maintenance District #1 has an independent Board of Directors and staff, and provides service to an area southeast of Orland. The District maintains a natural drain (which runs southeast through the District) as needed.

North Willows County Service Area (formerly Storm Drain Maintenance District #2).

North Willows County Service Area provides service to an area northeast of Willows. This CSA, which is administered by the County Public Works Department, maintains natural drains and a pipeline system with a pump. The CSA has three long-range plans under consideration:

- Diversion of some drainage west of I-5.
- Development of standby power for the pumps.

Storm Drain Maintenance District #3.

Storm Drain Maintenance District #3 is governed by the Board of Supervisors and provides service to an area located between the Kanawha Water District and the Willows Airport. The District is administered by the County Public Works Department, which maintains a natural drain that traverses the area. The water then drains east across the south end of the Willows Airport. The Kanawha Water District cooperates with the District to maintain the drain (Glenn County General Plan, Land Use Element, 1985).

3.6 EXISTING NOISE ENVIRONMENT

The State Noise Element Guidelines require that major noise sources within the county be identified and quantified by preparing generalized noise contours for current and

projected conditions. Significant noise sources in Glenn County include traffic on major roadways and highways, railroad operations, airports, and representative industrial activities and fixed noise sources. Please refer to Appendix D for definitions of acoustical terminology used in this Section.

Noise modeling techniques and noise measurements were used to develop generalized L_{dn} noise contours for the major roadways, railroads and fixed noise sources, where practical, in Glenn County for existing (1991) conditions.

Noise modeling techniques use source-specific data including average levels of activity, hours of operation, seasonal fluctuations, and average levels of noise from source operations. Modeling methods have been developed for a number of environmental noise sources including roadways, railroad line operations, railroad yard operations, industrial plants and airports. Such methods produce reliable results as long as data inputs and assumptions are valid. The modeling methods used closely follow recommendations made by the State Office of Noise Control, and were supplemented where appropriate by field-measured noise level data to account for local conditions. The noise exposure contours are based upon annual average conditions. Because local topography, vegetation or intervening structures may significantly affect noise exposure at a particular location, the noise contours should not be considered site-specific.

A community noise survey was conducted to describe existing noise levels in noise-sensitive areas within Glenn County so that noise level performance standards could be developed to maintain an acceptable noise environment.

3.6.1 Roadways

The Federal Highway Administration (FHWA) Highway Traffic Noise Prediction Model (FHWA-RD-77-108) was used to develop L_{dn} contours for all highways and major roadways in the unincorporated portion of Glenn County. The FHWA Model is the analytical method presently favored for traffic noise prediction by most State and local agencies, including Caltrans. The current version of the model is based upon the California Vehicle Noise (CALVENO) noise emission factors for automobiles, medium trucks, and heavy trucks, with consideration given to vehicle volume, speed, roadway configuration, distance to the receiver and the acoustical characteristics of the site. The FHWA Model

predicts hourly L_{eq} values for free-flowing traffic conditions, and is generally considered to be accurate within 1.5 dB. To predict L_{dn} values, it is necessary to determine the hourly distribution of traffic for a typical 24-hour day and to adjust the traffic volume input data to yield an equivalent hourly traffic volume.

Short-term (15-minute) traffic noise measurements and concurrent traffic counts were conducted for traffic on Interstate 5 and State Routes 162, 45 and 32 (see Figure 3-1) on May 23-24, 1991. The noise measurements were made to evaluate the noise exposure due to traffic on those roadways. The purpose of the traffic noise level measurements was to determine the accuracy of the FHWA model in describing the existing noise environment at the site. Noise measurement results were compared to the FHWA model results by entering the observed traffic volumes, speed and distance as inputs to the FHWA model.

Traffic data representing annual average traffic volumes for existing conditions were obtained from Caltrans and Dowling Associates traffic consultants as summarized in Appendix E. Day/night traffic distribution and truck mix were based upon Caltrans and file data. Using these data and the FHWA methodology, traffic noise levels as defined by L_{dn} were calculated for existing (1990) traffic volumes. Distances from the centerlines of selected roadways to the L_{dn} contours are summarized in Table 3-1. These calculations do not include consideration of shielding caused by local buildings or topographical features, so the distances reported in Table 3-1 are worst-case estimates of noise exposure along roadways in the county.

Existing traffic volumes were not available for all major county roads. However, Figure 3-2, prepared using the FHWA Model, may be used to estimate the distance to the 60 dB L_{dn} contour for projected volumes of arterial traffic. For arterial traffic, the predicted distance to the 60 dB L_{dn} contour is determined by the Average Daily Traffic Volume (ADT) and the posted speed limit. L_{dn} contours derived from Figure 3-2 are only indicators of potential noise conflicts, requiring more detailed analysis to determine traffic noise levels at any given location.

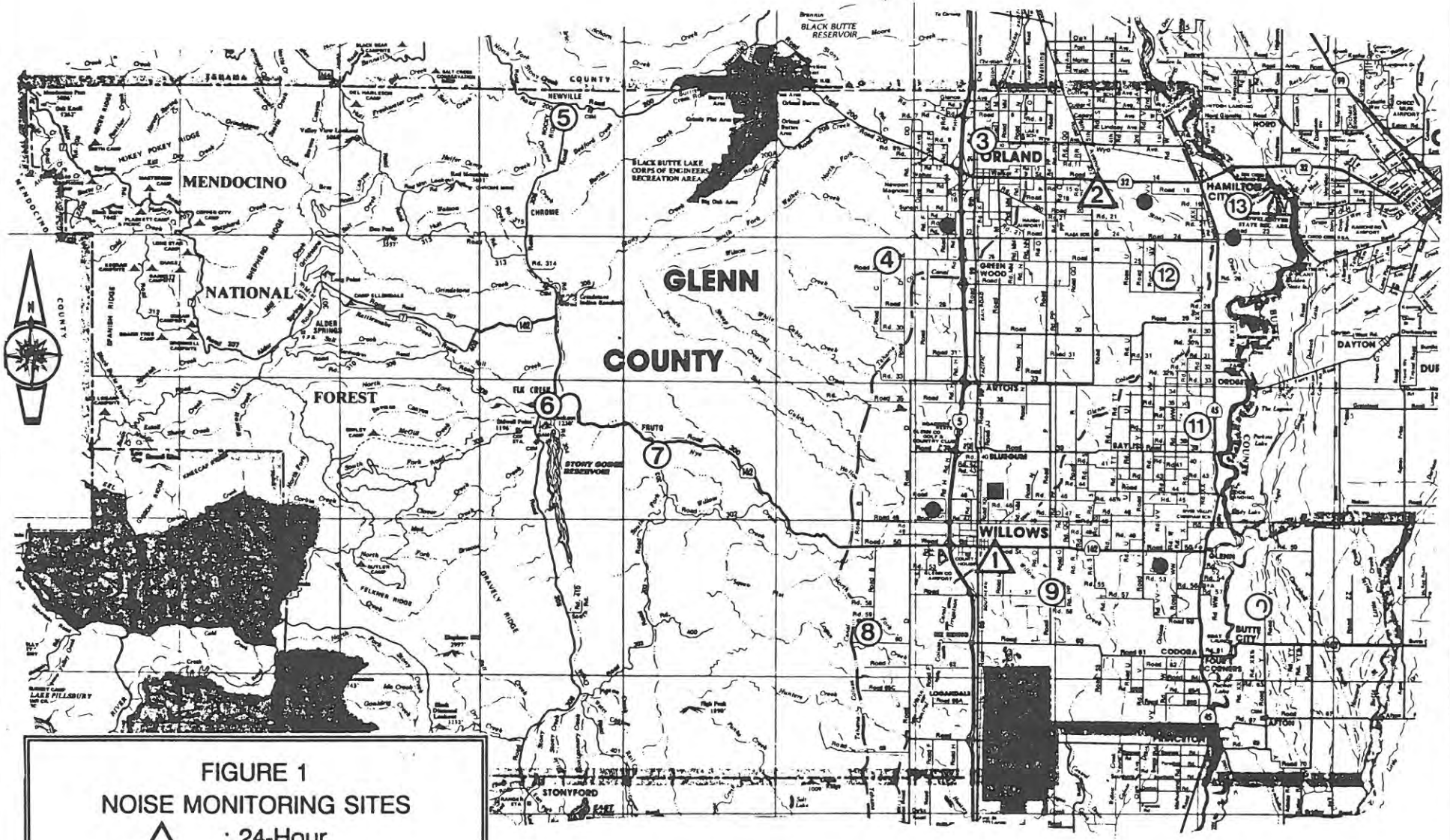


FIGURE 1
NOISE MONITORING SITES

△ : 24-Hour
○ : Short-term
● : Traffic
■ : Railroad

FIGURE 3-1

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Source: Brown-Buntin Associates

TABLE 3-1
TRAFFIC NOISE CONTOUR DATA
DISTANCE (FEET) FROM CENTER OF ROADWAY
TO L_{dn} CONTOURS*

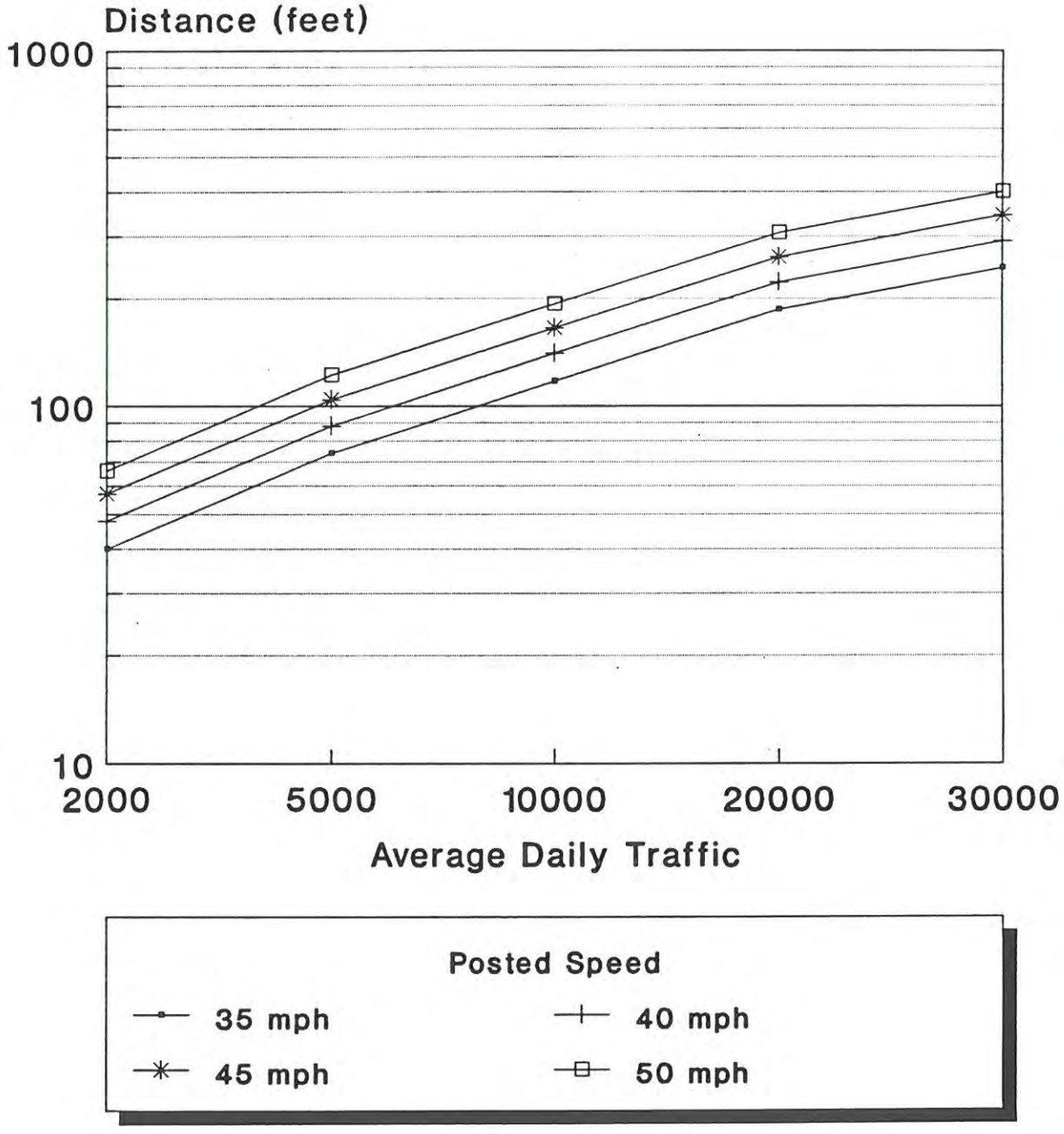
Segment	Description	Existing	
		60 dB	65 dB
Interstate 5:			
1	Colusa County Line to S.R. 162	752	349
2	S.R. 162 to County Road 33	872	405
3	County Road 33 to S.R. 32	766	355
4	S.R. 32 to Tehama County Line	750	348
State Route 32:			
5	I-5 to County Road South	163	75
6	County Road South to S.R. 45 S	212	99
7	S.R. 45 S to Butte County Line	228	106
State Route 45:			
8	Colusa County Line to S.R. 162 E	116	54
9	S.R. 162 E to County Line 56	97	45
10	County Road 56 to S.R. 162 W	97	45
11	S.R. 162 W to County Road 29	101	47
12	County Road 29 to S.R. 32	391	182
State Route 162:			
13	County Road 307 to County Road 306 N	36	17
14	County Road 306 N to County Road 306 S	49	23
15	County Road 306 S to I-5	92	43
16	I-5 to Willows City Limit West	199	92
17	Willows City Limit East to County Road P	101	47
18	County Road P to S.R. 45 N	71	33

Instrumentation included Larson Davis Laboratories (LDL) Models 800B and 700B integrating sound level meters which were calibrated in the field before measurements to ensure measurement accuracy.

Source: Brown-Buntin Associates

FIGURE 3-2

Distance to 60 dB Ldn Contour
Arterial Traffic



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Source: Brown-Buntin Associates

3.6.2 Railroads

Railroad activity in Glenn County includes freight trains on the Southern Pacific Transportation Company (SPTCo) trackage which travels north/south through the county. In addition, there are two spurs from the mainline which service the Holly Sugar Corporation in Hamilton City and the Manville Building Insulation Plant located west of the City of Willows.

SPTCo officials at the SPTCo Northern Train Dispatchers Office report that approximately five operations per day occur on the mainline through the county. The trains are distributed on a random basis throughout the day. Approximately one train per day serves the Holly Sugar Corporation and one train per week uses the Manville Plant spur. There are no reported Amtrak operations through the County.

Railroad noise measurements were conducted within the county on June 5-6, 1991 for a 24-hour period. The measurements were conducted to determine the contribution of SPTCo railroad operations to the area noise environment. The monitoring site was located approximately 50 feet from the centerline of the tracks.

The purpose of the noise level measurements was to determine a typical sound exposure level (SEL) for railroad line operations in the county, accounting for the effects of local topography, climate, travel speed and other factors which may affect noise generation. The data thus derived could then be compared to other file data for railroad operational noise levels to better describe the railroad noise environment as it affects the area noise environment, and an annual average L_{dn} could be calculated. Locomotive noise was the major contributor to railroad noise levels as defined by SEL. At 50 feet from the tracks, the average SEL for freight train operations was observed to be 101.0 dB, and the average maximum (L_{max}) measured sound level was 85.3 dB.

Based upon the noise level data and methods of calculation described in Table 3-2, the L_{dn} at a distance of 50 feet from the railroad track centerline is 65 dB. Predicted distances to the 60 and 65 dB L_{dn} contours are shown in Table 3-2.

TABLE 3-2 RAILROAD NOISE: SOUTHERN PACIFIC TRANSPORTATION COMPANY	
Distance to L_{dn} Contour*	
60 dB	65 dB
108 feet	50 feet

* Instrumentation consisted of a Larson Davis Laboratories (LDL) 700B integrating sound level meter, calibrated before use with an LDL CA250 acoustical calibrator.

To determine the distances to the 60 and 65 dB railroad L_{dn} contours, it was necessary to calculate the L_{dn} for typical freight train operations. This was done using the measured SEL value and above-described number and distribution of daily freight train operations. The L_{dn} contribution may be calculated as follows:

$$L_{dn} = \overline{SEL} + 10 \log N_{eq} - 49.4 \text{ dB, where:}$$

$\overline{SEL}$ is the mean SEL of the event, N_{eq} is the sum of the number of daytime events (7 a.m. to 10 p.m.) per day plus ten times the number of nighttime events (10 p.m. to 7 a.m.) per day, and 49.4 is 10 log the number of seconds per day.

Source: Brown-Buntin Associates

3.6.3 Fixed Noise Sources

The production of noise is a result of many industrial processes, even when the best available noise control technology is applied. Noise exposures within industrial facilities are controlled by Federal and State employee health and safety regulations (OSHA and Cal-OSHA), but exterior noise levels may exceed locally acceptable standards. Commercial, recreational and public service facility activities can also produce noise which affects adjacent sensitive land uses.

The following descriptions of existing fixed noise sources in Glenn County are intended to be representative of the relative noise impacts of such uses, and to identify specific noise sources which should be considered in the review of development proposals.

Glenn Growers Rice Drying Facility:

Rice is one of the major crops produced in Glenn County. Glenn Growers is located in Four Corners, and is one of a number of rice drying industrial facilities within Glenn County. Charles Keeney of Glenn Growers indicated that the plant operates from 8:00 a.m. to 5:00 p.m. five days per week. However, during the period from September 15 to November 1, the plant is in full operation, operating 24 hours per day, seven days per week.

The primary noise sources associated with the Glenn Growers operation, and most grain drying facilities, are elevators, screw conveyors and dryer motors. When the field work was conducted for the Glenn County General Plan, the Glenn Growers facility was not in full operation. However, file data from the PIRMI rice drying plant in Woodland collected during October 1987 indicates that the average noise level of a rice drying operation when the blowers and conveyors are operating is 70.5 dB at a distance of approximately 50 feet from the facility. The projected location to the 50 dB L_{eq} noise level contour associated with rice drying facilities is approximately 100 feet.

Manville Industrial Facility:

The Manville industrial facility, which is located west of the City of Willows, produces home insulation materials. According to Ronald Greenberg of Manville, the facility operates 24 hours per day, 365 days per year. The major noise sources include large fans which are used for manufacturing, truck traffic to and from the site (approximately 70 heavy trucks per day), and the railroad spur which accommodates one train per week.

Using the FHWA model, the L_{dn} associated with the truck traffic to and from the site is 59.3 dB at a distance of 50 feet from the access road. This is based upon an average of 70 heavy trucks per day (140 one-way trips), at an average speed of 35 mph, and a day/night split of 85%/15%.

Noise level data was collected from the Manville plant on May 23, 1991. The average sound level associated with the industrial processing was 57.5 dB at a distance of approximately 750 feet. The primary noise source was blowers. The approximate location of the 50 dB L_{eq} contour for industrial processing at the Manville plant is approximately 1,775 feet.

Holly Sugar Corporation:

The Holly Sugar Corporation is located on East 1st Street in Hamilton City. Discussions with Norman Bates, the factory manager at Holly Sugar Corporation, indicate that the major noise sources are associated with truck traffic, conveyor systems, centrifugal units housed inside on-site buildings, heavy equipment and the train which serves the plant once per day. The Holly Sugar Corporation operates on a seasonal basis, with the peak seasons occurring approximately six months during a year. During peak operations, the plant operates 24 hours per day; during the non-peak seasons, the plant operates eight hours per day.

During the time of the field investigations, there were no evident noise sources associated with the Holly Sugar plant processing. The plant manager did not give an indication on the amount of truck traffic to and from the site, and therefore an L_{dn} value associated with the truck traffic was not calculated.

Although there are no noise level data for the Holly Sugar Corporation, it should be noted that this facility could potentially produce noise levels which could be considered unacceptable at nearby noise sensitive receivers.

Sand and Gravel Operations:

There are numerous rock and sand and gravel operations located in Glenn County. The operations include the Baldwin Contracting Company Stony Creek Sand and Gravel Plant, Valley Rock Products Inc., and Martin Sand and Gravel. These facilities typically operate between the hours of 8:00 a.m. and 5:00 p.m. The primary noise sources associated with sand and gravel operations include truck traffic to and from the site, front loaders, warning beepers, belly scrapers, conveyors, and jaw and cone crushers.

The overall noise level associated with these types of operations will vary based upon the size of the operation. It should be noted that these types of operations are not considered to be compatible with noise sensitive land uses.

Miscellaneous Farming Operations:

Farming operations are common throughout Glenn County, especially on the Valley floor. Some of the more common noise sources associated with farming operations include tractors, harvesting equipment and spray equipment. Examples of noise levels produced by such equipment are shown in Table 3-3.

The noise levels described in Table 3-3 do not include all types of farm equipment, but represent a range of levels which may be expected. A general rule is that a diesel engine will produce noise levels of 75-85 dB at approximately 50 feet. Although farming operations occasionally generate a significant noise level, such levels generally do not last more than a few hours at a given location unless a stationary piece of equipment such as a pump motor (or engine) is involved. It should be noted that nighttime operation of farming equipment adjacent to residential areas may be perceived as annoying, particularly if sleep is disrupted.

TABLE 3-3

TYPICAL NOISE LEVELS
ASSOCIATED WITH FARM EQUIPMENT

Equipment	Distance (feet)	Sound Level, dB
Diesel Wheel Tractor		
-with Disc	150	72-75
-with Furrow	50	69-79
Weed Sprayer (1-cylinder)	50	74-75
Aero Fan 391 Speed Sprayer	200	74-76

Source: Brown-Buntin Associates, Inc.

Airport Noise

There are two airports located within Glenn County, the Willows Glenn County Airport and the Orland Haigh Field Airport.

- Willows Glenn County Airport:

  The Willows Glenn County Airport is a public use airport which is operated by Glenn County. According to the 1990 California Aviation System Plan, there are 56 based aircraft at the airport with a total of 30,000 annual operations. The airport has two runways with headings of 13/31 and 16/34 and runway lengths of 4210 feet and 4506 feet respectively.

  Glenn County adopted a Comprehensive Airport Land Use Plan (CLUP) in May 1990. The CLUP states that there are 49 airplanes and two helicopters based at the Willows Glenn County Airport. There has been virtually no

growth at the airport since 1978. However, the CLUP anticipates that, as the Willows area grows, the number of aircraft will increase. Existing and future (Year 2000) 60 dB CNEL contours were developed by Wadell Engineering for the CLUP. These CNEL contours are shown in Figure 3-3.

- Orland Haigh Field Airport:

The Orland Haigh Field Airport is a public use airport which is operated by Glenn County. According to the 1990 California Aviation System Plan, there are 75 based aircraft at the airport with a total of 20,000 annual operations. The airport has one runway with a heading of 15/33 and a runway length of 5160 feet.

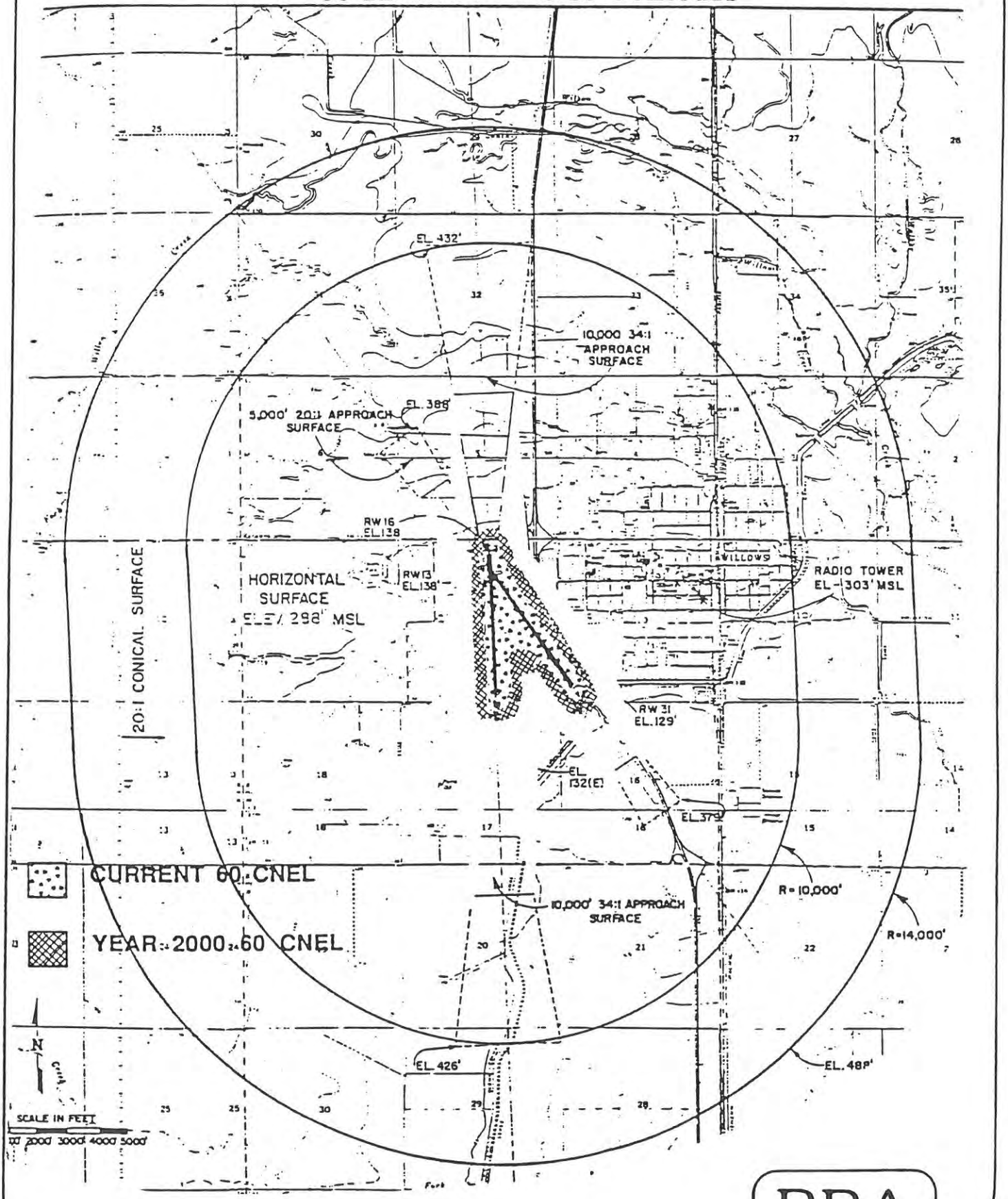
Glenn County adopted a Comprehensive Airport Land Use Plan (CLUP) in February 1991. The CLUP states that in 1988 there were 55 aircraft based at the Orland Haigh Field Airport, with the majority of aircraft being single-engine airplanes. The CLUP forecasts a total of 80 based aircraft at the Orland Haigh Field Airport in the year 2008. Existing (Year 1988) 55 dB CNEL, and future (Year 2008) 55 and 60 dB CNEL contours were developed by Hodges and Shutt for the CLUP. These CNEL contours are shown in Figure 3-4.

- Crop Dusters:

Glenn County staff has expressed concern about the noise associated with crop dusting activities. Aerial application aircraft are frequently used to spray crops or to spread seed or fertilizers. There are many types of fixed or rotary wing aircraft used for aerial application, including aircraft with radial and turbine engines, and 2- or 3-bladed propellers. Most of the noise impacts generated by aerial application aircraft occur as the result of propeller noise and the low altitude at which the aircraft are typically flown. One of the most widely used aerial application aircraft in the Glenn County area is the Grumman Ag Cat.

FIGURE 3-3

Willows Glenn County Airport Current & Year 2000 60 dB CNEL Noise Contours



SOURCE: WADELL ENGINEERING

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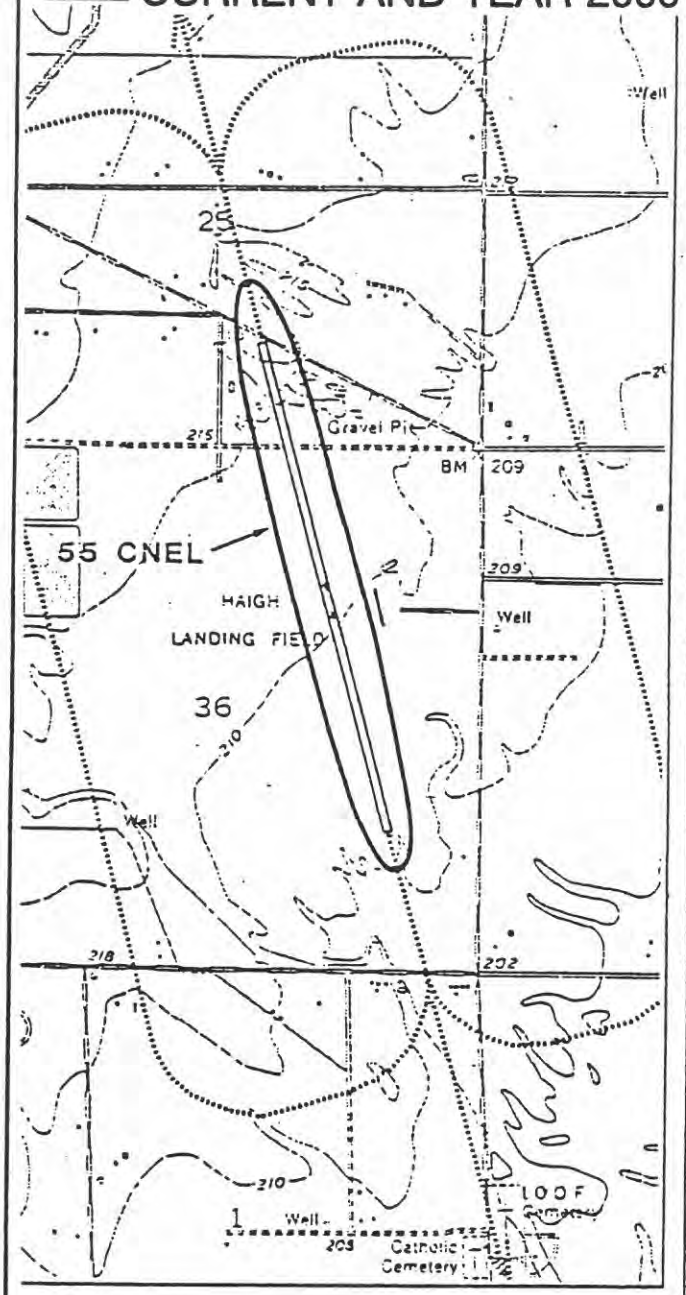
FIGURE 3-4

ORLAND HAIGH FIELD AIRPORT
CURRENT AND YEAR 2000 60 dB CNEL NOISE CONTOURS



SOURCE: HODGES & SHUTT

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To characterize noise impacts associated with aerial application aircraft, file data was utilized which was collected for the Grumman Ag Cat aircraft at Alta Airport in Tulare County. Consultation with aerial application aircraft operators, field observations, and noise measurements indicated that it was not practical, nor representative of perceived noise impacts, to prepare CNEL contours for frequent operations by aerial application aircraft. This is because aerial application operations generally follow the shortest possible route to the application site at a minimal altitude, meaning that there are no typical flight tracks. Typical "ferry" altitudes range from 50 to 150 feet based upon information previously collected from crop dusting companies.

Noise level data collected at the Alta Airport in Tulare County for Ag Cat operations indicate that sideline noise levels at a distance of 1000 feet during departures were about 78 dB L_{max} and 85 dB SEL. Noise levels directly overhead with an estimated altitude of 150 feet were about 103 dB L_{max} and 106 dB SEL.

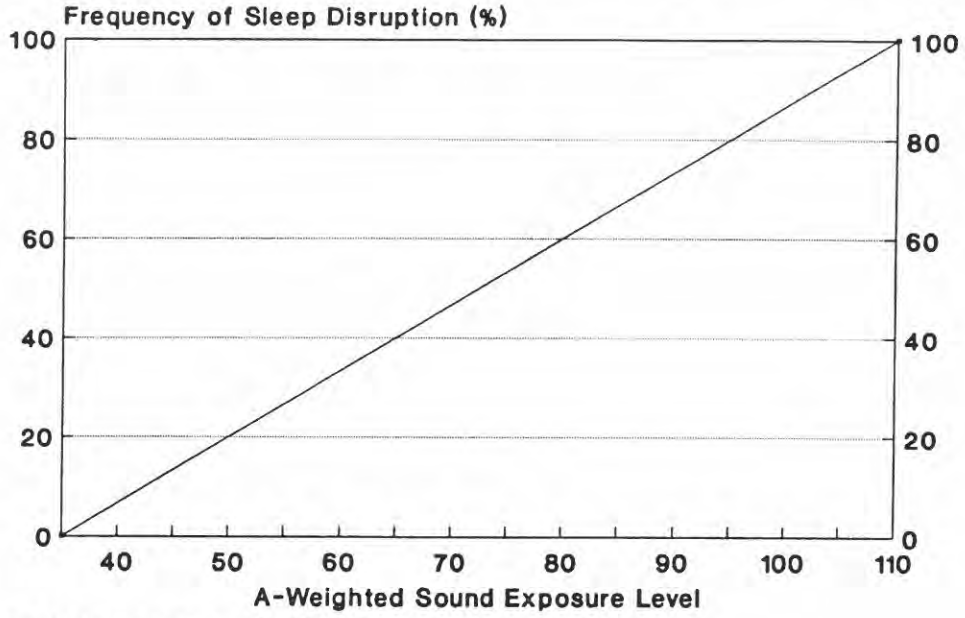
Crop dusting activities generally occur during the early morning hours, when people may be sleeping. Single event noise levels from aircraft arrivals, departures and overflights may cause sleep disturbance at nearby residences. The noise level at which a sleep stage change or interruption occurs is highly individualized. A person's level of sleep is dependent on many factors including fatigue, exhaustion, stress, room temperature, bed comfort and noise level in the room. For these reasons, a single number criterion for the evaluation of sleep interference has not been established.

According to the Noise Effects Handbook published by the National Association of Noise Control Officials, behavioral awakening will most likely occur with noise levels of 70 dB or above. However, duration of the noise exposure, background noise levels and type of sound generated by the source are all important factors.

Criteria pertaining to sleep disturbance are displayed in Figure 3-5. These graphs, which were adapted from a summary and analysis of experimental sleep data as related to noise exposure, show the relationship between

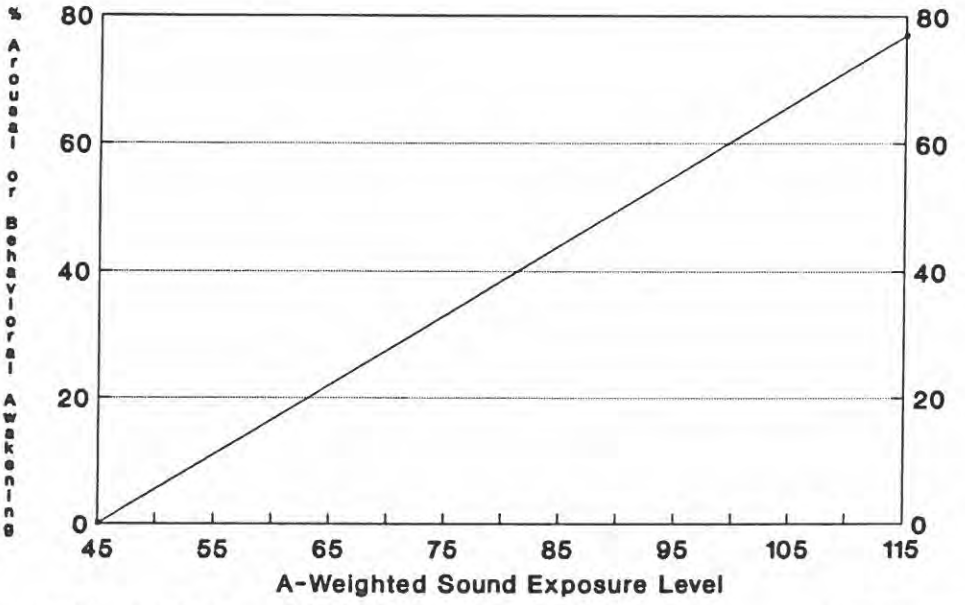
FIGURE 3-5

Probability Of A Noise Induced Sleep Stage Change



Source: NANCO Noise Effects Handbook

Probability Of A Noise Induced Awakening



Source: NANCO Noise Effects Handbook

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frequency of response (disruption or awakening) and the sound level of an intrusive noise.

3.6.4 Community Noise Survey

A community noise survey was conducted to document noise exposure in areas of the county containing noise sensitive land uses. For that purpose, noise sensitive land uses in Glenn County were considered to include residential areas, parks, schools and rural areas. Noise monitoring sites were selected to be representative of typical conditions in the county.

Short-term noise monitoring was conducted on May 23-24, 1991. Each site was monitored three different times during the day and night so that valid estimates of L_{dn} could be prepared. Two long-term noise monitoring sites were established in Glenn County to record day-night statistical trends. The data collected included the L_{eq} and other statistical descriptors. Noise monitoring sites, measured noise levels and estimated L_{dn} values at each site are summarized in Table 3-4. Monitoring sites are shown by Figure 3-1.

The community noise survey results indicate that typical noise levels in noise sensitive areas of Glenn County are in the range of 48 dB to 60 dB L_{dn}. Noise from traffic on local roadways and neighborhood activities is the controlling factor for background noise levels in the majority of the county. However, in the predominantly agricultural areas, farming equipment, crop dusting activities and the sound of crickets during the evening and nighttime hours were major contributors to background noise levels. In general, the areas of the Glenn County which contain noise sensitive uses are relatively quiet.

The 24-hour noise monitoring data in Figure 3-6 show that ambient noise levels reach a minimum during the hours of 1:00 to 5:00 a.m., increasing during the daytime hours as a function of increased traffic and other human activities.

TABLE 3-4

SUMMARY OF MEASURED NOISE LEVELS AND ESTIMATED DAY-NIGHT AVERAGE LEVELS (L_{dn}) IN AREAS CONTAINING NOISE SENSITIVE LAND USES**

Site	Location	Date	Time	Sound Level, dB					
				L_{90}	L_{50}	L_{10}	L_{eq}	L_{max}	Est. L_{dn}
1	*Near Jensen Park	5/23/91	10:0017:	48.0	52.0	56.0	53.5	66.5	
		5/23/91	00	49.0	53.0	57.0	55.0	71.5	
		5/24/91	0:00	39.0	42.0	48.0	45.0	55.5	59.8 dB
2	*Near Roosevelt Avenue	5/23/91	11:00	34.0	39.0	51.0	47.5	65.5	
		5/23/91	18:00	37.0	41.0	51.0	48.0	70.0	
		5/14/91	1:00	30.0	33.0	47.0	42.5	56.0	54.2 dB
3	Spence Park	5/23/91	11:40	41.0	43.0	49.0	47.0	64.0	
		5/23/91	22:00	42.0	45.0	47.0	46.0	61.0	
		5/24/91	11:28	41.0	44.0	48.0	46.0	65.5	52.5 dB
4	Road 25 & Road C	5/23/91	12:17	30.0	34.0	40.0	36.5	47.0	
		5/23/91	22:26	41.0	43.0	44.0	42.5	45.0	
		5/24/91	12:29	30.0	36.0	49.0	54.5	77.0	51.9 dB
5	Road 200 & 306	5/23/91	13:23	26.0	29.0	37.0	51.0	75.0	
		5/23/915/24	22:58	41.0	42.0	43.0	42.5	44.0	
		/91	10:31	26.0	31.0	41.0	52.0	75.0	51.9 dB

TABLE 3-4

SUMMARY OF MEASURED NOISE LEVELS AND ESTIMATED

DAY-NIGHT AVERAGE LEVELS (L_{dn}) IN AREAS

CONTAINING NOISE SENSITIVE LAND USES**

Site	Location	Date	Time	Sound Level, dB					
				L_{90}	L_{50}	L_{10}	L_{eq}	L_{max}	Est. L_{dn}
6	Elk Creek	5/23/91	14:06	36.0	38.0	53.0	52.0	70.0	
		5/23/91	23:21	46.0	47.0	48.0	47.0	48.0	
		5/24/91	9:54	38.0	40.0	53.0	52.5	72.0	58.5 dB
7	Fruto Road & Road 303	5/23/91	15:31	31.0	38.0	45.0	41.5	57.5	
		5/23/91	23:37	40.0	45.0	46.0	45.0	49.0	
		5/24/91	9:28	31.0	35.0	39.0	36.5	51.0	50.9 dB
8	Road B & Road 60	5/23/91	16:10	33.0	40.0	44.0	51.5	74.5	
		5/23/91	23:50	41.0	42.0	43.0	41.5	44.0	
		5/24/91	8:12	34.0	36.0	40.0	38.5	54.5	50.0 dB
9	Road P	5/23/91	11:00	39.0	42.0	51.0	54.3	75.7	
		5/23/91	23:50	46.0	47.0	48.0	47.5	50.5	
		5/24/91	8:12	47.0	49.0	53.0	52.4	67.8	54.1 dB
10	Road 50	5/23/91	11:40	35.0	39.0	56.0	53.2	70.3	
		5/23/91	23:20	43.0	45.0	46.0	46.6	60.0	
		5/24/91	8:40	38.0	41.0	53.0	51.0	64.5	54.4 dB
11	Open Field East of S.R. 45	5/23/91	12:25	35.0	38.0	45.0	41.5	53.0	53.2 dB
	Approximately @ Road 37	5/23/91	22:50	46.0	47.0	48.0	47.2	50.0	
		5/24/91	8:40	34.0	39.0	48.0	44.2	61.0	

TABLE 3-4

SUMMARY OF MEASURED NOISE LEVELS AND ESTIMATED DAY-NIGHT AVERAGE LEVELS (L_{dn}) IN AREAS CONTAINING NOISE SENSITIVE LAND USES**

Site	Location	Date	Time	Sound Level, dB					
				L_{90}	L_{50}	L_{10}	L_{eq}	L_{max}	Est. L_{dn}
12	South of Intersection of Road 24 and Road V.	5/23/91	13:12	28.0	36.0	48.0	42.7	51.0	58.8 dB
		5/23/91	22:20	51.0	53.0	54.0	53.0	55.8	
		5/24/91	9:55	40.0	43.0	48.0	44.9	53.3	
13	4th and Los Robles in Hamilton City	5/23/91	13:35	36.0	39.0	46.0	46.3	63.0	48.7 dB
		5/23/91	22:00	28.0	36.0	41.0	38.9	52.8	
		5/24/92	10:20	42.0	45.0	50.0	50.1	69.0	

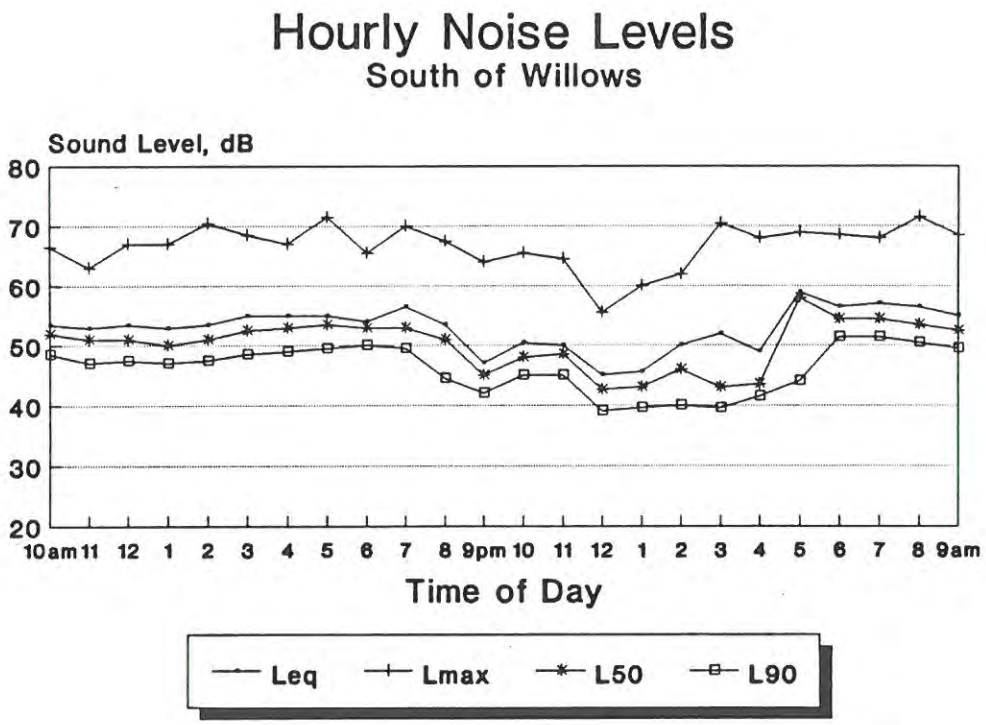
* 24-hour monitoring site

** Community noise monitoring systems were calibrated with acoustical calibrators in the field prior to use. The systems comply with all pertinent requirements of the American National Standards Institute (ANSI) for Type I sound level meters.

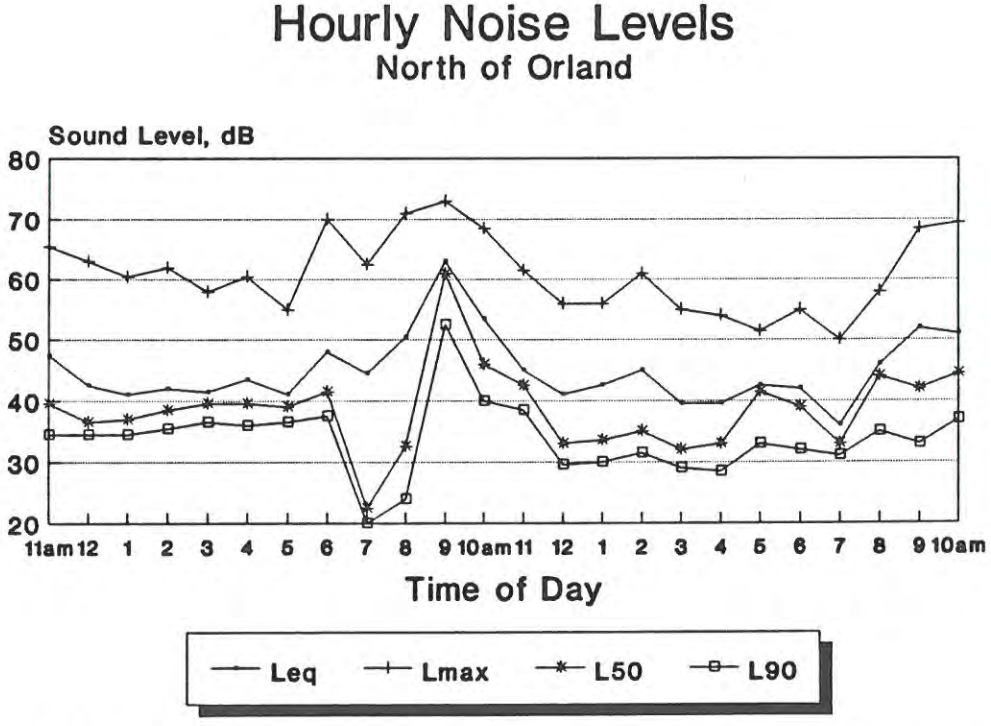
The L_{90} values shown in Table 3-4 represent background noise levels, where there are typically no identifiable local noise sources. The L_{50} values represent median noise levels. The L_{eq} values in Table 3-4 represent the average noise energy during the sample periods, and show the effects of brief noisy periods. The L_{eq} values were the basis of the estimated L_{dn} values. L_{max} values show the maximum noise levels observed during the samples, and were typically due to passing cars, farming equipment or aircraft overflights.

Source: Brown-Buntin Associates

FIGURE 3-6



May 23-24, 1991
Ldn = 59.8 dB



May 23-24, 1991
Ldn = 54.2 dB

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3.7 LIGHT AND GLARE

A nighttime visual survey of the County reveals no unusual sources of light and glare. Noteworthy sources of ambient light include traffic on I-5, high school stadiums when in use, and outdoor lighting of industrial and commercial developments.

3.8 SOLID AND HAZARDOUS WASTE

Solid waste in Glenn County is collected by franchised haulers, with rates set by the Board of Supervisors for the unincorporated area and by the City Councils in the cities of Willows and Orland. There is one sanitary landfill in the county, located on Road 33, west of the community of Artois. The landfill is a 195+ acre site which is leased by the County of Glenn for 50 years. It is a Class III facility (a facility at which protection is provided to water quality from municipal, industrial and agricultural wastes).

The landfill is operated by the County under a Joint Powers Agreement with the cities of Orland and Willows. According to the Glenn County Solid Waste Management Plan (COSWMP),the site has sufficient capacity until 2010, and will be used for grazing when it can no longer be operated as a landfill. No new facilities are planned in the county, and it is anticipated that additional land will be purchased in the immediate vicinity of the existing site for expansion purposes.

There is a small solid waste disposal site near Elk Creek operated by Louisiana Pacific for disposal of sawmill wastes. This site, which has been in operation since 1972, is regulated by waste discharge requirements issued by the Regional Water Quality Control Board. There is also an agricultural waste drying site located at the Orland Haigh Field Airport.

According to the COSWMP, opportunities for resource recovery are limited in Glenn County because most materials must be hauled to locations outside the county. Hazardous waste has been described, quantified and projected in the Glenn County Hazardous Waste Management Plan (CHWMP). There are currently no industries in the county authorized to provide onsite treatment of hazardous wastes, and there are no hazardous waste treatment, storage or disposal facilities located in Glenn County. The Plan

also identifies known contaminated sites within the county. The two major transportation corridors through the county, Interstate 5 and the railroad, as well as the other State highways, are routes for movement of large quantities of hazardous materials.

Two drilling mud disposal sites are located south of Orland in Glenn County which accept spent non-hazardous drilling mud from gas well drilling operations in the region. These disposal sites are regulated by Glenn County through the use permit process and by the Regional Water Quality Control Board. Four injection wells are also located in Glenn County for "production water", which is salt water discharged from gas wells. Injection is permitted only into salt water bearing formations. These wells are regulated by the State of California Division of Oil and Gas and by Glenn County.

3.9 ANALYSIS OF ISSUES, OPPORTUNITIES AND CONSTRAINTS

Facilities and services for protecting public safety in Glenn County have, for the most part, proven satisfactory up to this point. As in other California counties, County revenues available to fund safety-related services have suffered since the passage of Proposition 13 in 1978. The moderate growth rate which the County has experienced since that time (1.57% annually) has not overburdened existing service delivery systems.

New State regulations with which the County must comply, higher expectations of local government by residents, and increasing public environmental concerns may require changes in the County's approach to public protection. The challenge of funding new programs and facilities remains. The General Plan revision process must involve policy decisions regarding the interrelationship and balance between land use and development patterns and the protection of the public health, safety and welfare.

Some factors to be considered in the General Plan revision process include:

Law Enforcement and Public Safety

- If the County continues to grow, greater resources will need to be directed to law enforcement. Although not an absolute constraint, the implications of growth for the County's law enforcement capabilities and its financial resources must be factored into the planning process.

- Future land use planning can attempt to discourage criminal activities by consciously considering the implications for law enforcement of planned development.

- Alternatives to the present, primarily volunteer fire protection service may become necessary as training becomes more complex and as growth occurs.

- The General Plan revision process affords an opportunity to coordinate public safety issues with the U.S. Forest Service for areas adjacent to the Mendocino National Forest.

Geologic Hazards

- If it is assumed that growth is more likely to occur in the eastern valley portion of Glenn County, as compared to the foothill and mountainous areas, the primary geologic hazards which must be addressed are subsidence and expansive soils.

- Areas of potential subsidence may not always be possible to avoid for certain facilities (such as transmission lines or pipelines that must cross such areas). Proposed structures must be designed and constructed to withstand any potential subsidence without danger of failure.

- Expansive soils are common throughout California, and while they present potential structural problems for proposed buildings and other facilities, a variety of standard design and construction methods exists to strengthen structures against the stresses caused by expansive soils.

- Areas of unstable soil that may be subject to landslide obviously are not suitable sites for any land use involving buildings or structures.

- Soil erosion is possible during the site preparation, grading, and revegetation phases of most construction projects, but like subsidence, a variety of standard protective and revegetation measures exists that can minimize erosion from new development.

Air Quality

- The measures that will be necessary to achieve compliance with the California Clean Air Act (e.g. transportation control measures, indirect source review) may require major changes in land use planning in Glenn County as well as the rest of California. The design of such methods to suit the needs of a rural, agricultural county, rather than a metropolitan area, will be imperative.

- The relatively good air quality and visibility existing in Glenn County is an asset worth preserving and protecting. The designation as a nonattainment area for ozone and PM_{10} mandates planning which is responsible to improvement of air quality, and also focuses attention upon a critical quality of life issue which should be addressed in the General Plan.

- Proposed State legislation to reduce rice burning may have a major effect on agricultural practices in Glenn County.

- The issue of NO_x emissions from gas well compressors may need to be addressed as part of the General Plan and/or air quality planning process.

- It is likely that the automobile will continue to be the major form of transportation in Glenn County, given the low population density and rural, agricultural nature of the county. However, the County can take steps in its planning to reduce numbers of automobile trips through careful siting of any new retail and employment centers in proximity to housing and infilling of bypassed land.

Noise

- The relatively quiet noise environment is primarily impacted by traffic, agricultural operations, sand and gravel extraction, and airport noise (particularly crop dusting operations).

- The General Plan (Noise Element) can establish policies and standards which assure that new noise conflicts are not created. This can be accomplished by locating new

"noise sensitive" land uses (e.g. residences, schools, hospitals) away from "noise generating" land uses (e.g. arterial streets, airports, industries), and vice versa.

- It is assumed, based on its recent adoption of Comprehensive Airport Land Use Plans, that the County has an interest in maintaining compatible land uses in the vicinity of the two county airports.

Flooding

- Periodic flooding presents a significant constraint to urban development in Willows and other Valley portions of the county.

- The accuracy of the FEMA flood hazard maps has been questioned by county officials; if areas are designated as flood zones which are not flood prone, the designation places unfair constraints on construction.

- The General Plan can identify and set aside areas for drainage outfalls for urban areas.

- The low priority placed upon construction of flood control facilities in Glenn County (due to low cost/benefit ratios assigned by State agencies) may preclude urban development of some areas of the county.

Solid and Hazardous Waste

- The General Plan should recognize existing solid waste disposal facilities and be consistent with other County solid waste planning efforts.

- While adequate facilities for solid waste disposal exist and currently do not present any constraints, compliance with recent State laws and regulations may prove problematic. Examples include State-imposed resource recovery goals and possible curtailment of septage disposal.

- The General Plan can plan for sites for composting operations near the cities of Willows and Orland and/or in conjunction with the existing landfill.

- Primary local issues with regard to hazardous waste include its transport through the county and disposal of drilling mud.

- Production water injection wells present land use conflicts in proximity to urban areas.

4.0 COMMUNITY DEVELOPMENT

4.1 POPULATION

Since 1980 the population of Glenn County has increased by 18.5 percent, at an annual average rate of 1.57 percent, as shown in Table 4-1. This represents a comparatively modest rate of growth, as compared to the Sacramento region growth rate of 33 percent for the same period. However, the annual growth rate for the last three years has shown a substantial increase compared to the first part of the decade. The two incorporated cities in Glenn County, Willows and Orland, have both experienced 25 percent growth rates over the 10-year period. The population is distributed between the two incorporated cities and the unincorporated area as shown in Table 4-2.

According to the 1990 census, the ethnic composition of Glenn County is 74.4 percent white; .5 percent black; 1.8 percent American Indian, Eskimo and Aleut; 3.1 percent Asian and Pacific Islander; and 20.0 percent Hispanic. There is a significant concentration of Native Americans at the Grindstone Indian Reservation located near Elk Creek.

The 1980 and 1990 population of communities in Glenn County, including the cities of Willows and Orland, and the unincorporated community of Hamilton City, is contained in Table 4-3.

The California State University, Chico Center for Economic Development and Planning has prepared population projections for Glenn County which are shown in Table 4-4. The projected population increase is attributed more heavily to births (natural increase) than to net migration into Glenn County.

TABLE 4-1

GLENN COUNTY POPULATION, 1980-1991

YEAR	TOTAL POPULATION	PERCENT INCREASE %
1980	21,350	
1981	21,750	1.9
1982	22,100	1.6
1983	22,450	1.6
1984	22,600	0.7
1985	22,700	0.4
1986	22,850	0.7
1987	22,900	0.2
1988	23,150	1.1
1989	23,700	2.4
1990	24,550	3.6
1991	25,300	3.1
Total Population Increase, 1980-1991		3,950
Annual Average Increase, 1980-1991		1.57%

Source: Glenn County Profile, 1991.

TABLE 4-2
GLENN COUNTY POPULATION DISTRIBUTION, 1991

JURISDICTION	POPULATION	PERCENT OF TOTAL
Unincorporated Area	14,050	55.5
City of Orland	5,175	20.4
City of Willows	6,100	24.1
Total	**25,325**	**100.0%**

Source: Glenn County Profile, 1991.

TABLE 4-3

POPULATION OF GLENN COUNTY COMMUNITIES 1980-1990

	POPULATION		
JURISDICTION	**1980**	**1990**	**PERCENT CHANGE**
City of Orland	4031	5052	+25.3
City of Willows	4777	5988	+25.4
Hamilton City	1337	1811	+35.5

Source: U.S. Census data, 1980, 1990.

TABLE 4-4

PROJECTED GLENN COUNTY POPULATION, 1990-2005

YEAR	TOTAL POPULATION	PERCENT INCREASE
1990	25,000	
1995	27,100	+8.4
2000	28,800	+6.3
2005	30,400	+5.6
Total Population Increase		**5,400**
Annual Average Increase		**1.35%**

Source: Glenn County Profile, 1991.

4.2 LAND USE

The predominant land uses in Glenn County are agriculture, forests and open space/grazing lands. Land used for farming and grazing purposes totals nearly 500,000 acres, of which approximately half is grazing land in the foothill areas, and half is farming, predominantly on the Valley floor. The mountainous area is primarily forest land, including approximately 200,000 acres within the Mendocino National Forest. Generalized land use for Glenn County is depicted on Figure 4-1.

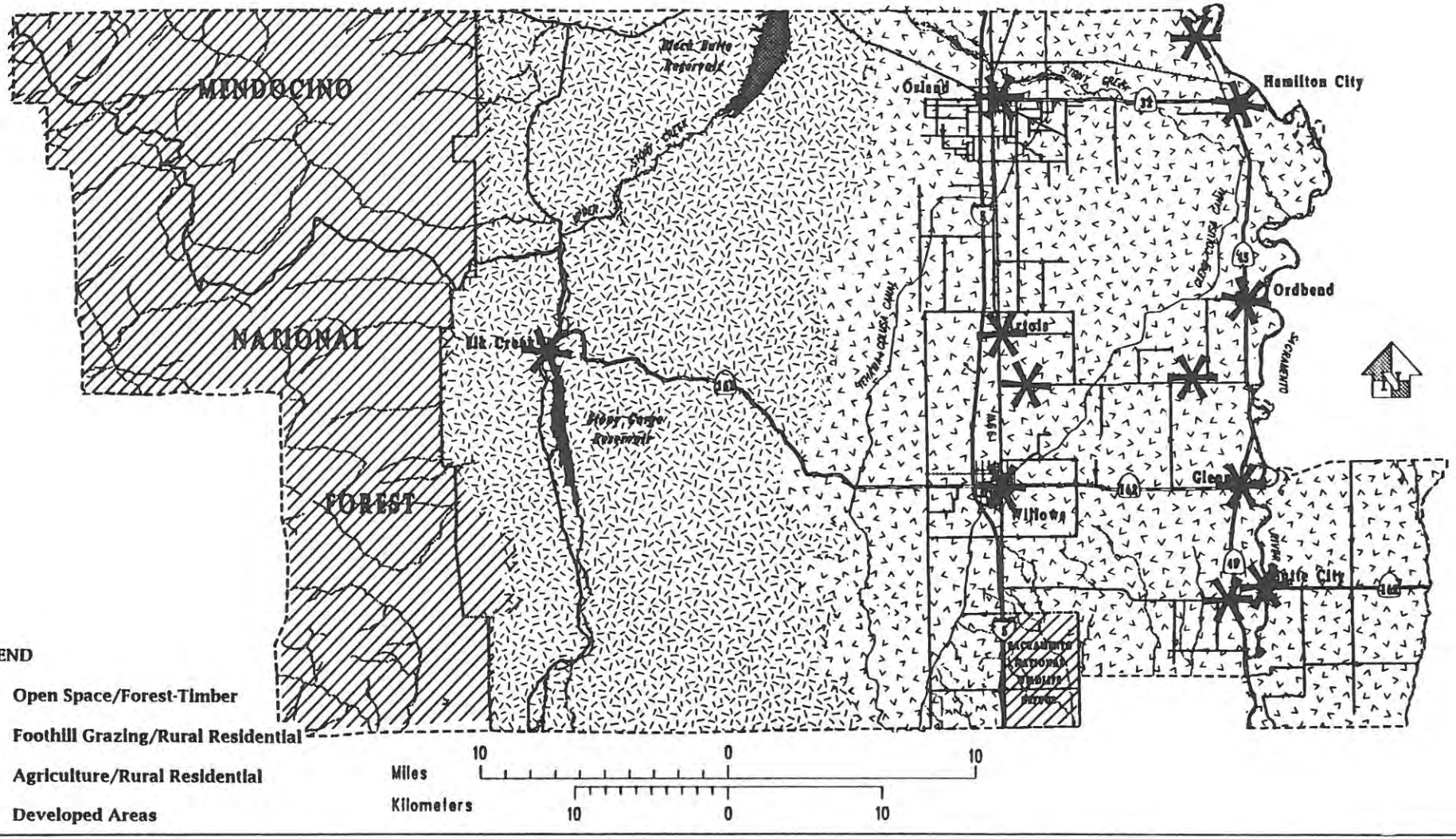
The two incorporated cities in Glenn County, Willows and Orland, are located on the Valley floor. These cities represent the two largest urbanized areas in the county. Land use information has been compiled for the unincorporated communities of Bayliss, Glenn, Ord Bend, Capay, Codora Four Corners, Artois, Hamilton City, Butte City, North Willows, Northeast Willows and West Orland from county records and a field check conducted in June, 1991. Land use in each of these communities is summarized below.

Artois

The community of Artois is located south of Road 33, between Walker Creek and the Southern Pacific Transportation Company (SPTCo) tracks (see Figure 4-2). There are approximately 57 housing units in the community of Artois, of which 7 are mobilehomes. Water service is supplied by the Artois Community Services District, and wastewater disposal is provided by individual septic tanks. An industrial area is located east of the SPTCo tracks, which consists of grain storage and a sawmill. There are a few small commercial uses, a fire station and a post office located in Artois (see Table 4-5).

Bayliss

Bayliss is located at the intersection of Road W and Road 39 (see Figure 4-3). It contains 19 housing units, of which 2 are mobilehomes, and a meeting and training facility for the Volunteer Fire Department (see Table 4-6). Water and wastewater disposal are provided by individual wells and septic tanks, respectively.

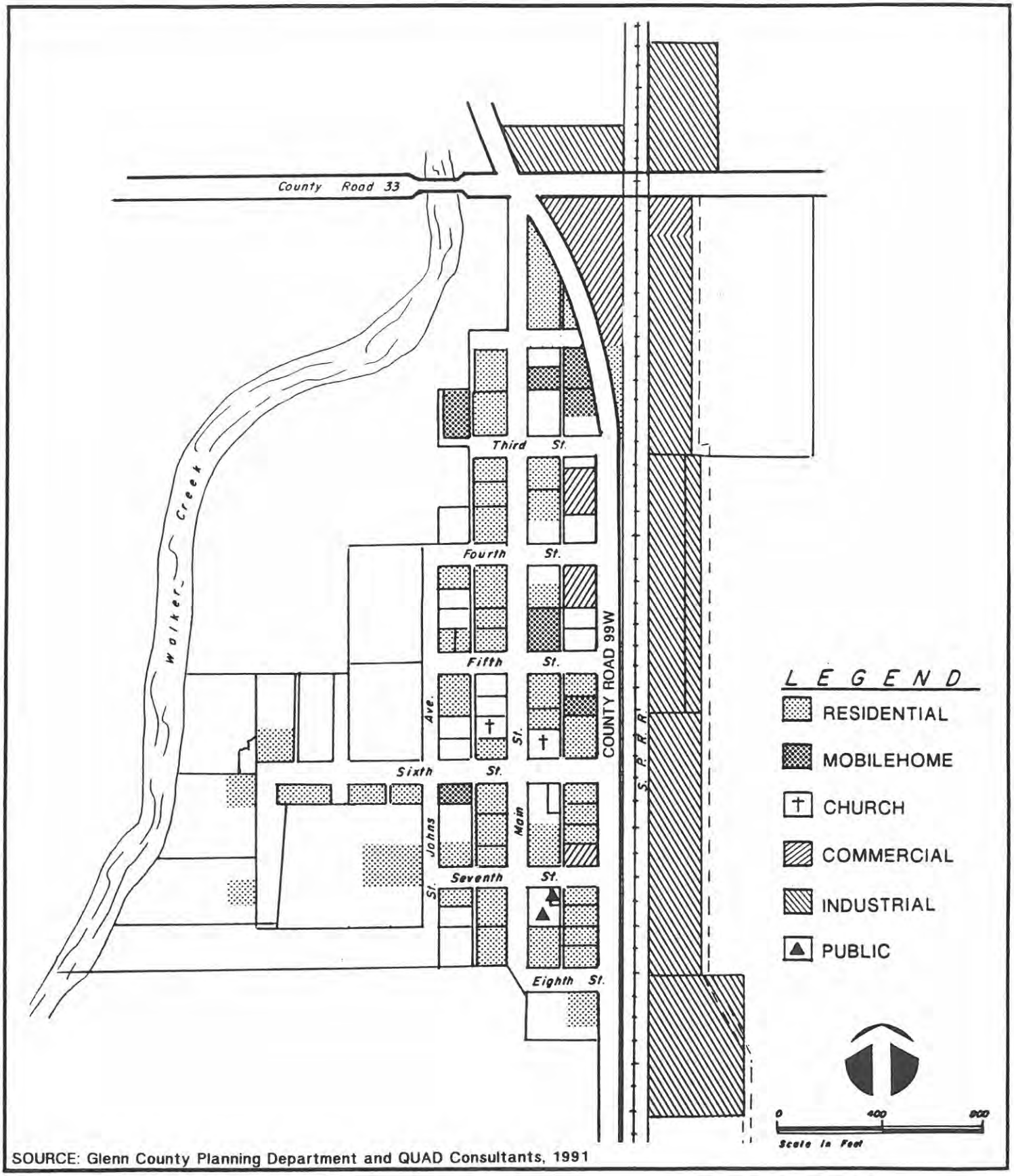


Glenn County

QUAD

Generalized County Land Use

Figure 4-1

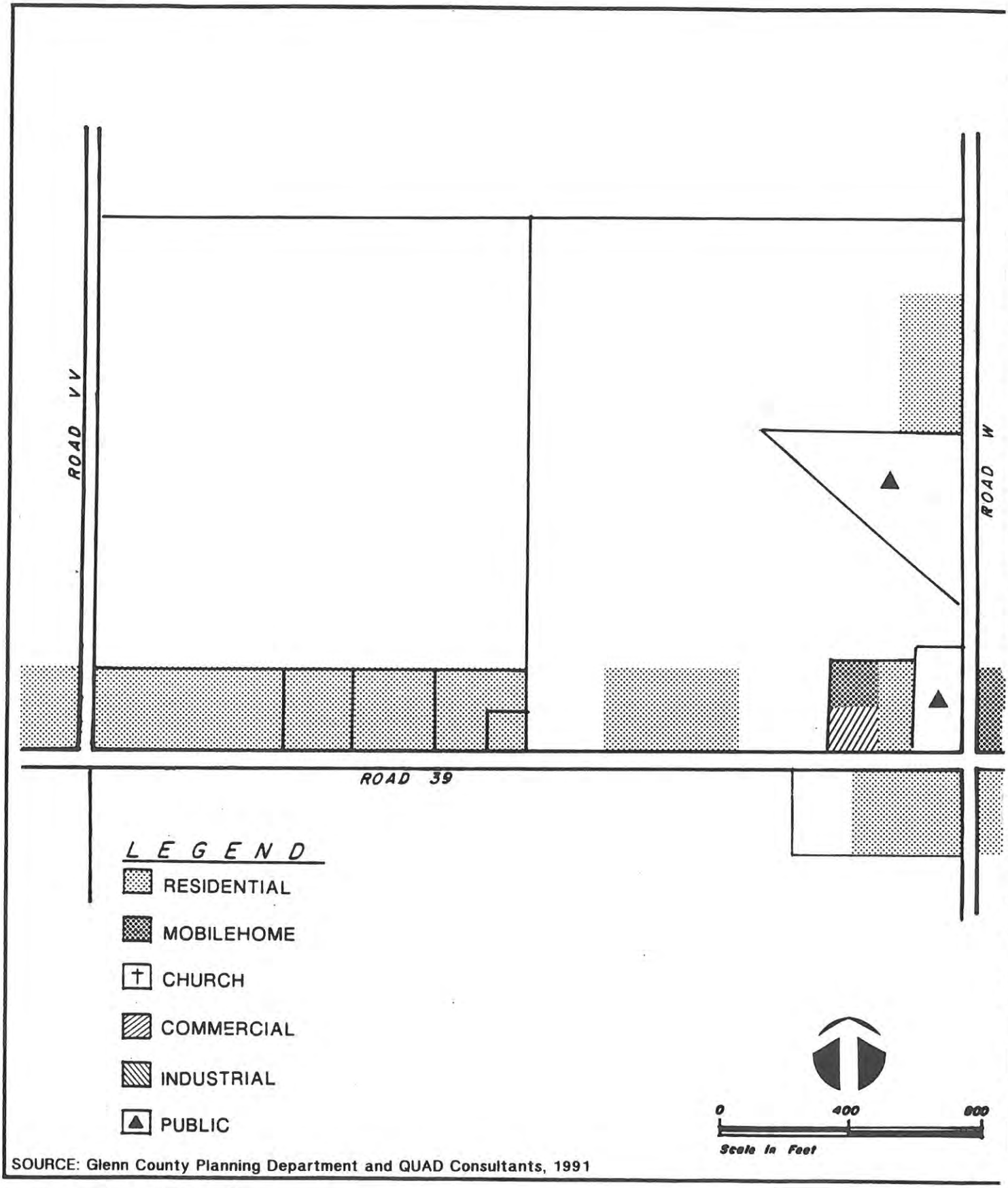


SOURCE: Glenn County Planning Department and QUAD Consultants, 1991

QUAD

ARTOIS EXISTING LAND USE

Figure 4-2



SOURCE: Glenn County Planning Department and QUAD Consultants, 1991

QUAD

BAYLISS EXISTING LAND USE

Figure 4-3

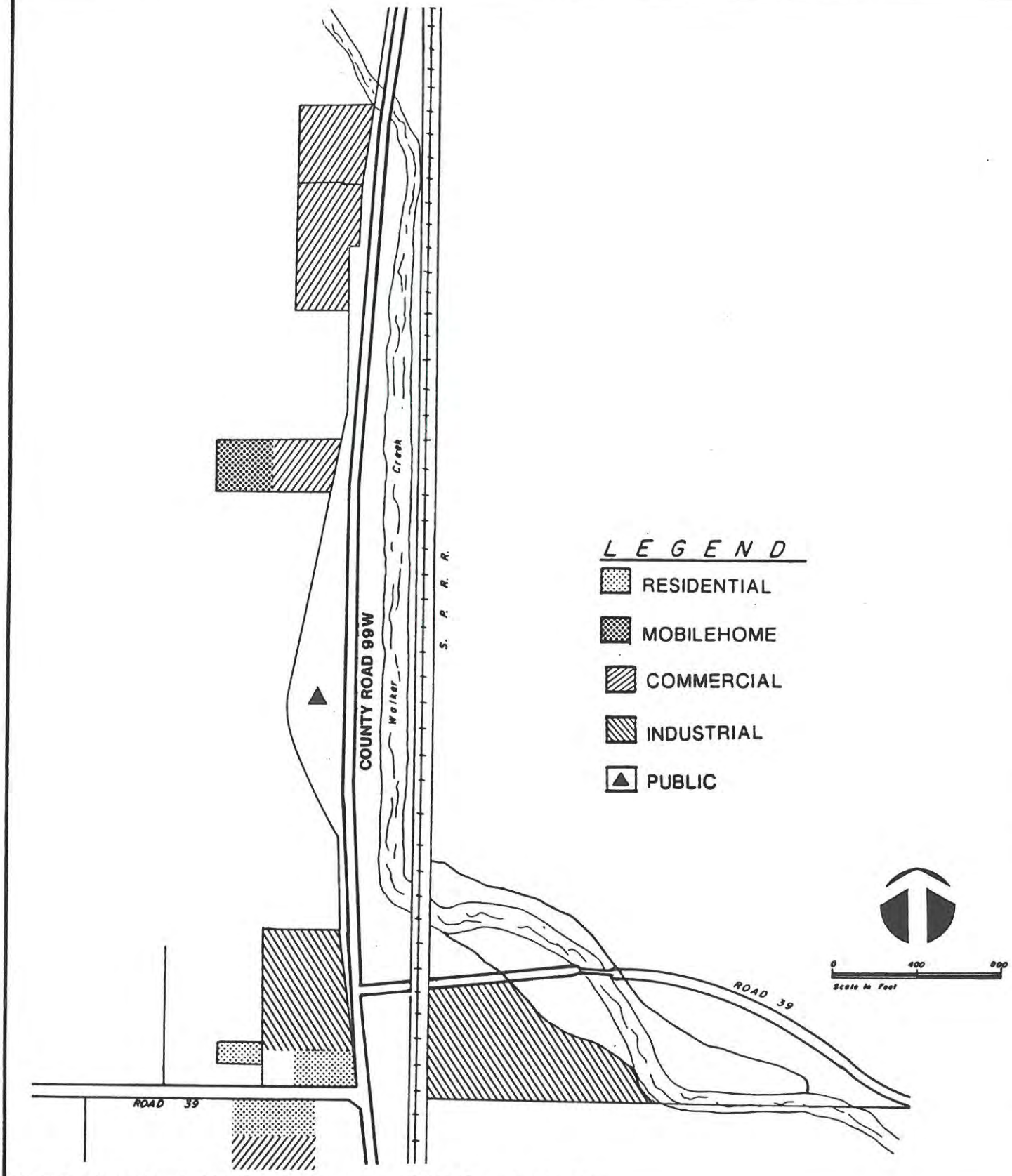
Blue Gum Area

There are 6 single family dwellings and 1 mobilehome in the Blue Gum area, which is located on the west side of old Highway 99, Walker Creek, and the SPTCo tracks (see Figure 4-4). The area also contains highway commercial uses (motel and restaurant) (see Table 4-7). Water and wastewater disposal are provided by individual wells and septic tanks, respectively.

TABLE 4-5
EXISTING LAND USE
COMMUNITY OF ARTOIS

Land Use Category	Acres	Percent
Residential	21.5	44.3
Church	.5	1.0
Commercial	4	8.3
Industrial	22	45.4
Public	.5	1.0
Total	**48.5**	**100.0**

Source: Glenn County Planning Department; QUAD Consultants, 1991.



SOURCE: Glenn County Planning Department and QUAD Consultants, 1991

QUAD

BLUE GUM AREA EXISTING LAND USE

Figure 4-4

TABLE 4-6
EXISTING LAND USE
COMMUNITY OF BAYLISS

Land Use Category	Acres	Percent
Residential	26.2	83.2
Commercial	.5	1.6
Public	4.8	15.2
Total	**31.5**	**100.0**

Source: Glenn County Planning Department; QUAD Consultants, 1991.

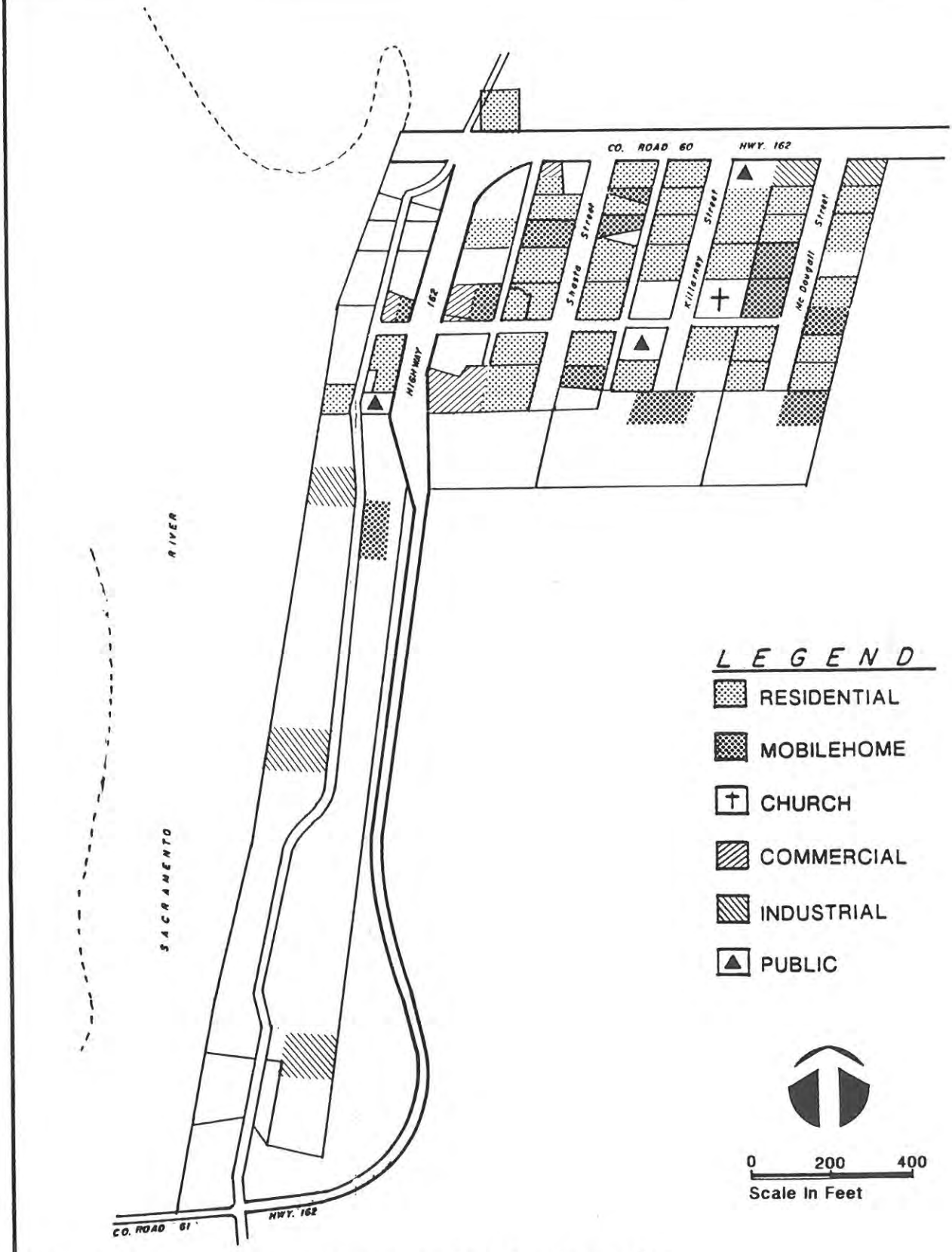
TABLE 4-7
EXISTING LAND USE
BLUE GUM AREA

Land Use Category	Acres	Percent
Residential	4	11.4
Commercial	10	28.6
Industrial	15	42.9
Public	6	17.1
Total	**35**	**100.0**

Source: Glenn County Planning Department; QUAD Consultants, 1991.

Butte City

Butte City is located on the east side of the Sacramento River, south of Highway 162 (see Figure 4-5). There are approximately 46 housing units in Butte City, of which



SOURCE: Glenn County Planning Department and QUAD Consultants, 1991

QUAD

BUTTE CITY
EXISTING LAND USE

Figure 4-5

13 are mobilehomes. Water service is supplied by the Butte City Community Services District, and wastewater disposal is provided by individual septic tanks. There are a few small commercial uses, a fire station and a post office located in Butte City, as well as a County boat ramp on the Sacramento River near the community (see Table 4-8).

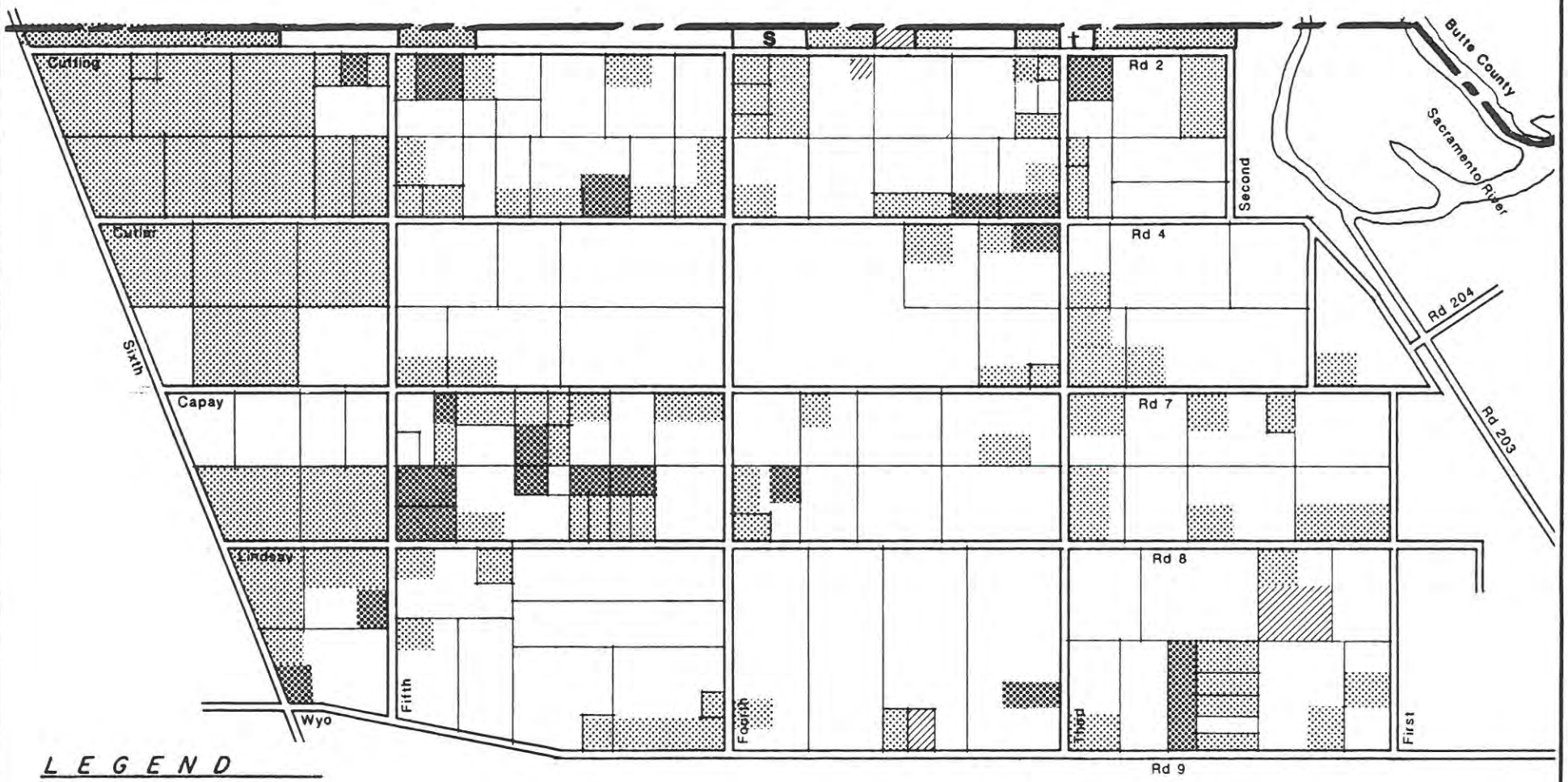
Capay Area

The Capay area is located adjacent to the Sacramento River and the Tehama and Butte County boundaries (see Figure 4-6). There are approximately 131 housing units in the Capay area, of which 19 are mobilehomes. Water is supplied by individual wells, and wastewater disposal is provided by individual septic tanks. Although there are a few small commercial uses, this community is predominantly rural residential (see Table 4-9).

TABLE 4-8
EXISTING LAND USE
COMMUNITY OF BUTTE CITY

Land Use Category	Acres	Percent
Residential	8	78.4
Church	.2	2.0
Commercial	.6	5.9
Industrial	1	9.8
Public	.4	3.9
Total	**10.2**	**100.0**

Source: Glenn County Planning Department; QUAD Consultants, 1991.



SOURCE: Glenn County Planning Department and QUAD Consultants, 1991

Figure

QUAD

CAPAY AREA EXISTING LAND USE

4-6

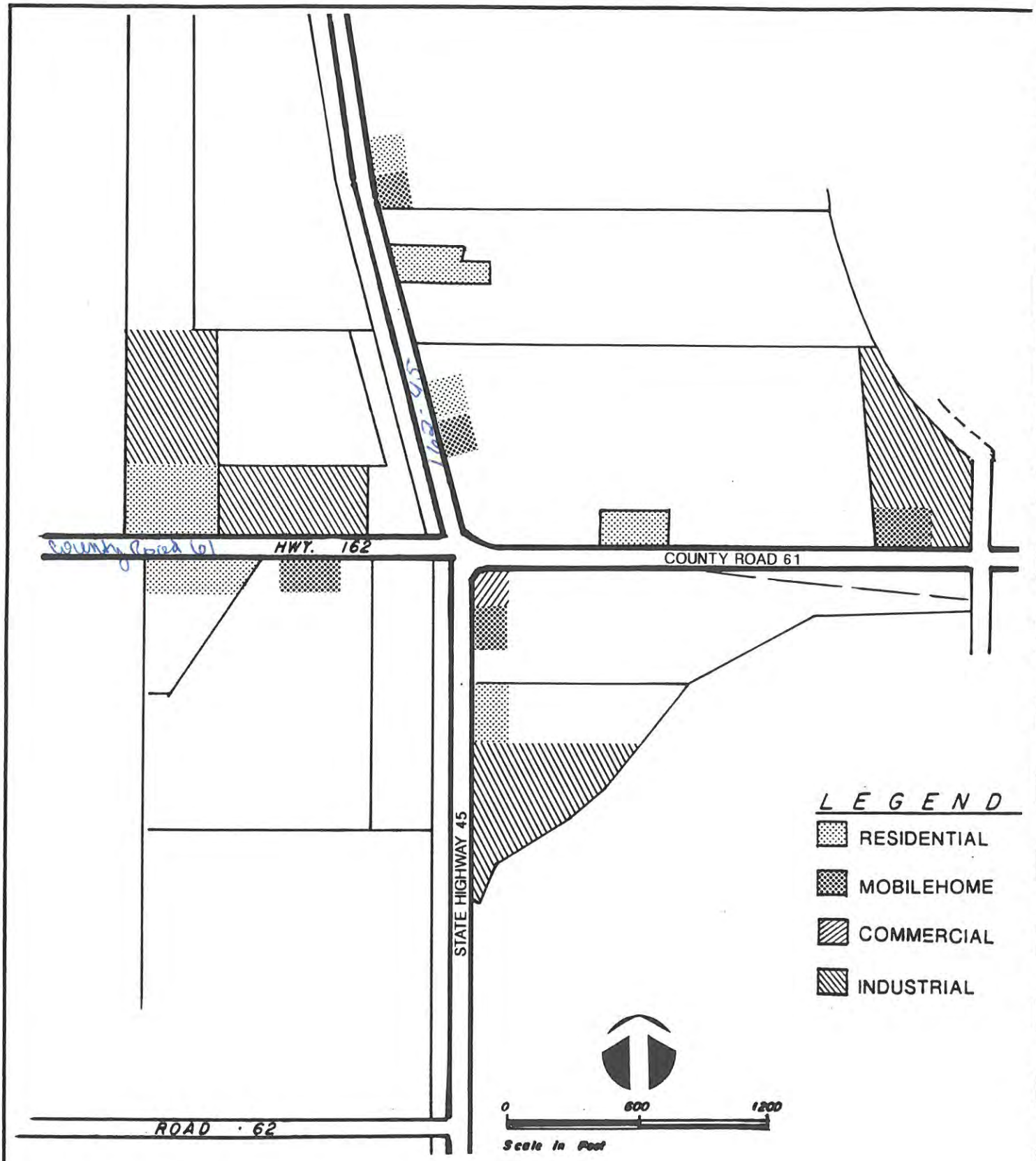
TABLE 4-9
EXISTING LAND USE
CAPAY AREA

Land Use Category	Acres	Percent
Residential	1505	99.6
School	3	.2
Church	1	.1
Commercial	1.5	.1
Total	**1509.5**	**100.0**

Source: Glenn County Planning Department; QUAD Consultants, 1991.

Codora Four Corners

Codora Four Corners is located at the intersection of Road 61 and State Highway 45 (see Figure 4-7). There are 12 housing units in Codora Four Corners, of which 5 are mobilehomes. Water is supplied by individual wells, and wastewater disposal is provided by individual septic tanks. There is one commercial use and four industrial uses in Codora Four Corners (see Table 4-10).



SOURCE: Glenn County Planning Department and QUAD Consultants, 1991

QUAD

CODORA FOUR CORNERS EXISTING LAND USE

Figure 4-7

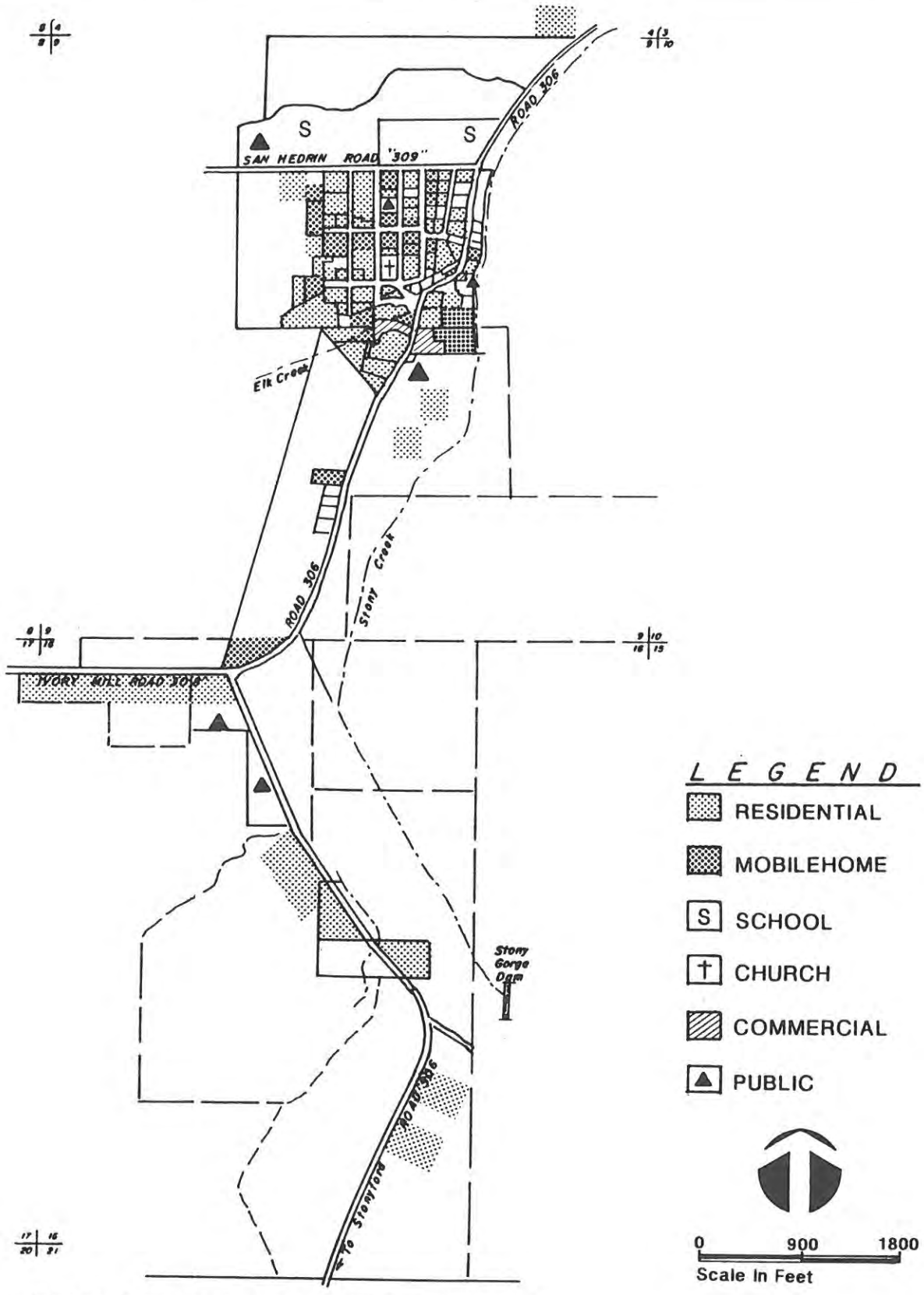
TABLE 4-10
EXISTING LAND USE
COMMUNITY OF CODORA FOUR CORNERS

Land Use Category	Acres	Percent
Residential	14	35.4
Commercial	.5	1.3
Industrial	25	63.3
Total	**39.5**	**100.0**

Source: Glenn County Planning Department; QUAD Consultants, 1991.

Elk Creek

Elk Creek is located near Stony Gorge Reservoir in the foothill area of Glenn County along Road 306 west of Stony Creek (see Figure 4-8). There are approximately 94 housing units in the community of Elk Creek, of which 23 are mobilehomes. Water service is supplied by the Elk Creek Community Services District from the reservoir, and wastewater disposal is provided by individual septic tanks. There is an industrial area owned by Louisiana Pacific Lumber Company and a small commercial area, as well as a post office, fire station, elementary school and high school (see Table 4-11).



SOURCE: Glenn County Planning Department and QUAD Consultants, 1991

QUAD

ELK CREEK
EXISTING LAND USE

Figure
4-8

TABLE 4-11
EXISTING LAND USE
COMMUNITY OF ELK CREEK

Land Use Category	Acres	Percent
Residential	78	71.7
School	15	13.8
Church	.8	.7
Commercial	2	1.8
Public	13	11.9
Total	**108.8**	**100.0**

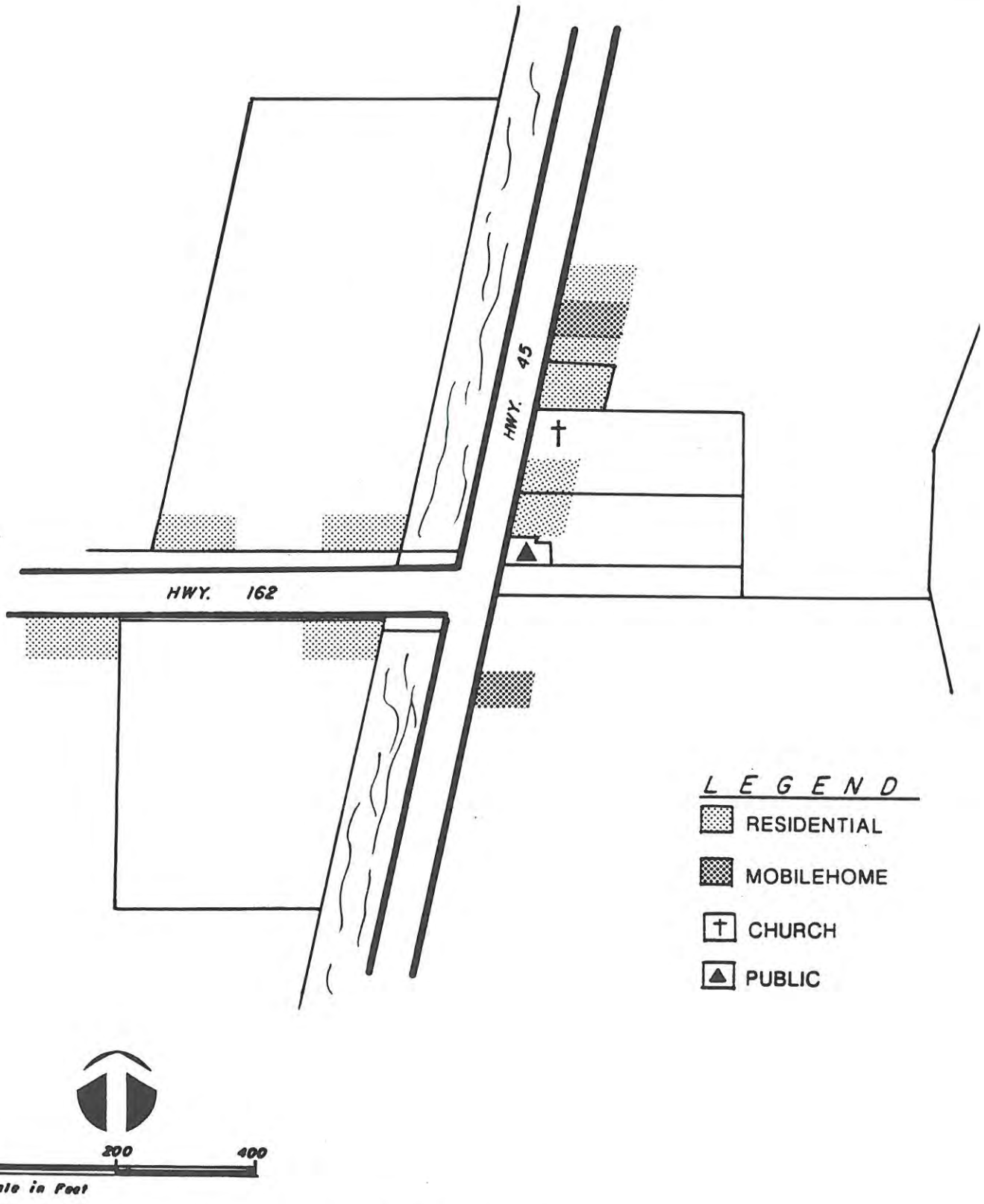
Source: Glenn County Planning Department; QUAD Consultants, 1991.

Glenn

The community of Glenn is located at the intersection of Highway 162 and Highway 45 (see Figure 4-9). There are 13 housing units in the community of Glenn, of which 2 are mobilehomes (see Table 4-12). Water is supplied by individual wells, and wastewater disposal is provided by individual septic tanks.

Hamilton City

Hamilton City is the largest community in Glenn County which is not adjacent to an incorporated city. It is bounded by the Glenn County Irrigation Canal on the west, Highway 32 on the north, Sacramento Avenue on the east and First Street on the South (see Figure 4-10). There are approximately 484 housing units in Hamilton City, of which 113 are mobilehomes. Water is supplied by California Water Service Company, and wastewater treatment is provided by the Hamilton City Community Services District, which operates a sewer treatment plant for the community.

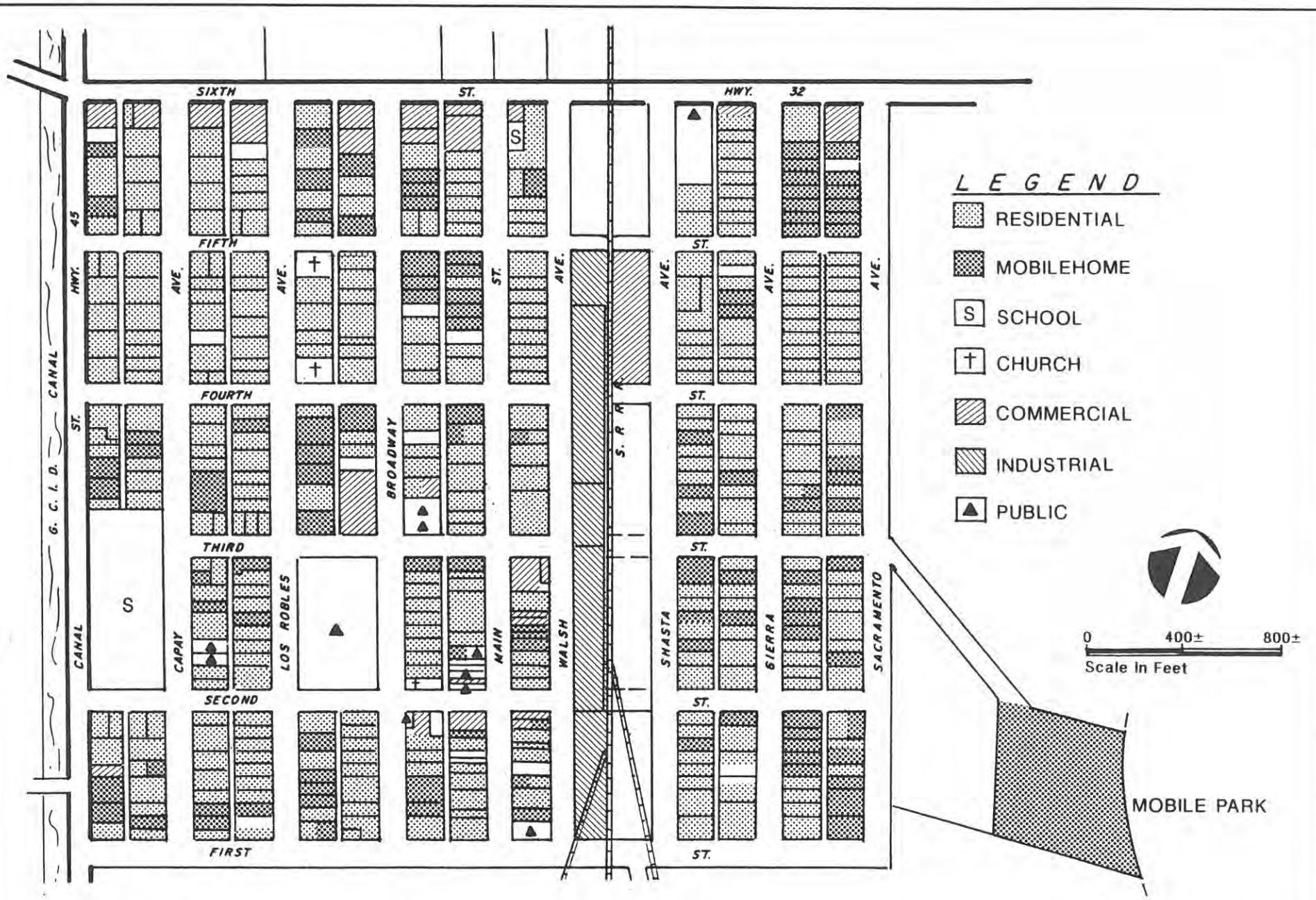


SOURCE: Glenn County Planning Department and QUAD Consultants, 1991

QUAD

GLENN EXISTING LAND USE

Figure 4-9



SOURCE: Glenn County Planning Department and QUAD Consultants, 1991

Figure

QUAD

HAMILTON CITY EXISTING LAND USE

4-10

Industrial land uses in Hamilton City are located adjacent to the SPTCo tracks and include the Sunkist packing plant and the Holly Sugar Plant. There is a central commercial area on Main Street and a highway commercial area along the south side of Highway 32. The community also contains a post office, elementary school, high school, a community hall, a park and a fire station (see Table 4-13).

TABLE 4-12
EXISTING LAND USE
COMMUNITY OF GLENN

Land Use Category	Acres	Percent
Residential	1.2	81.6
Church	.2	13.6
Public	.07	4.8
Total+	**1.47**	**100.0**

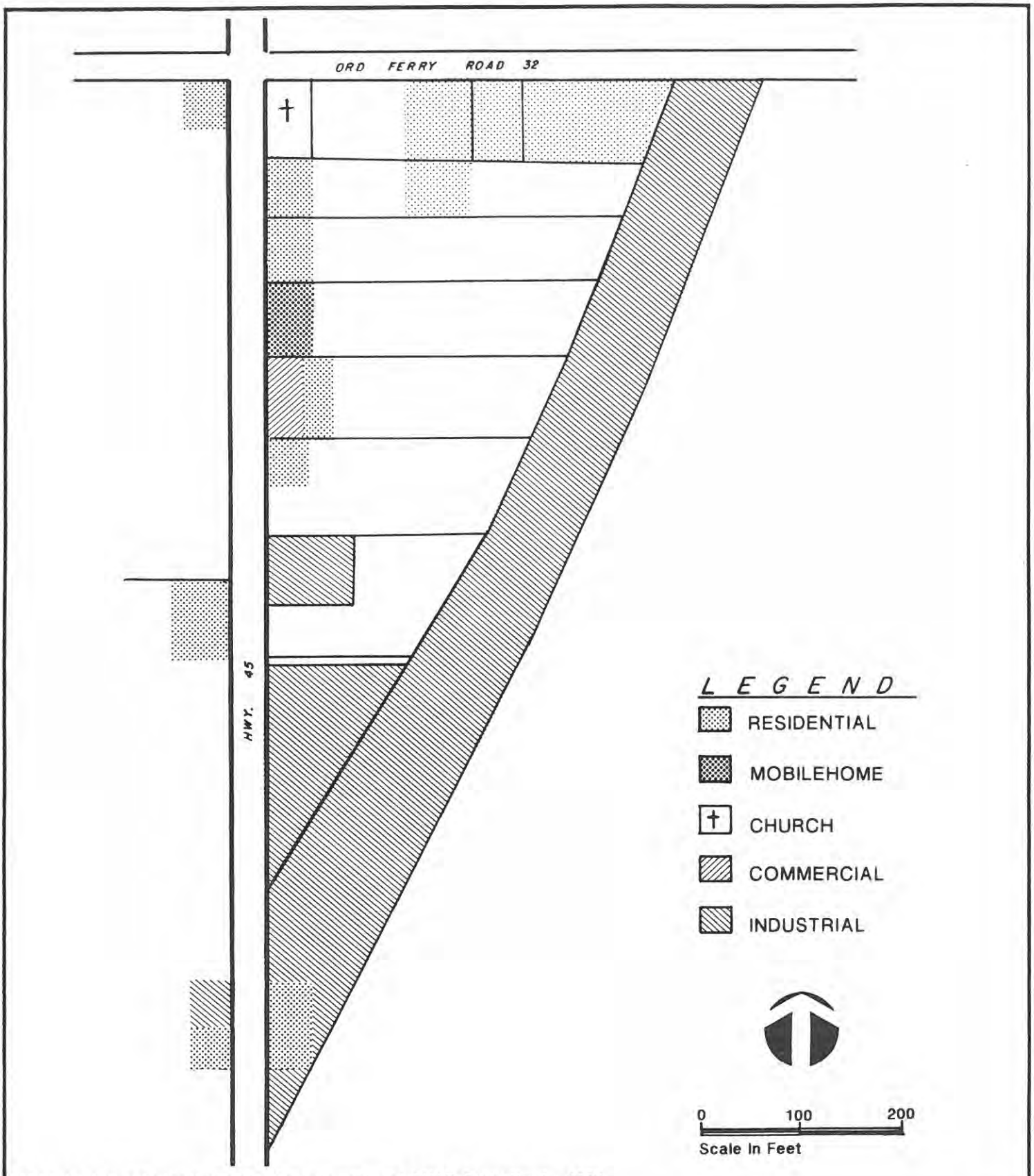
Source: Glenn County Planning Department; QUAD Consultants, 1991.

Ord Bend

Ord Bend is located south of Ord Ferry Road 32, primarily on the east side of Highway 45 (see Figure 4-11). There are 13 housing units, of which 1 is a mobilehome, and a few small commercial uses in Ord Bend (see Table 4-14). Water and wastewater disposal are provided by individual wells and septic tanks, respectively.

North East Willows

North East Willows is an unincorporated area adjacent to the City of Willows, and bounded by Road 49 1/2 on the north, the Glenn-Colusa Canal on the east, Highway 162 on the south and the SPTCo tracks on the west (see Figure 4-12). There are

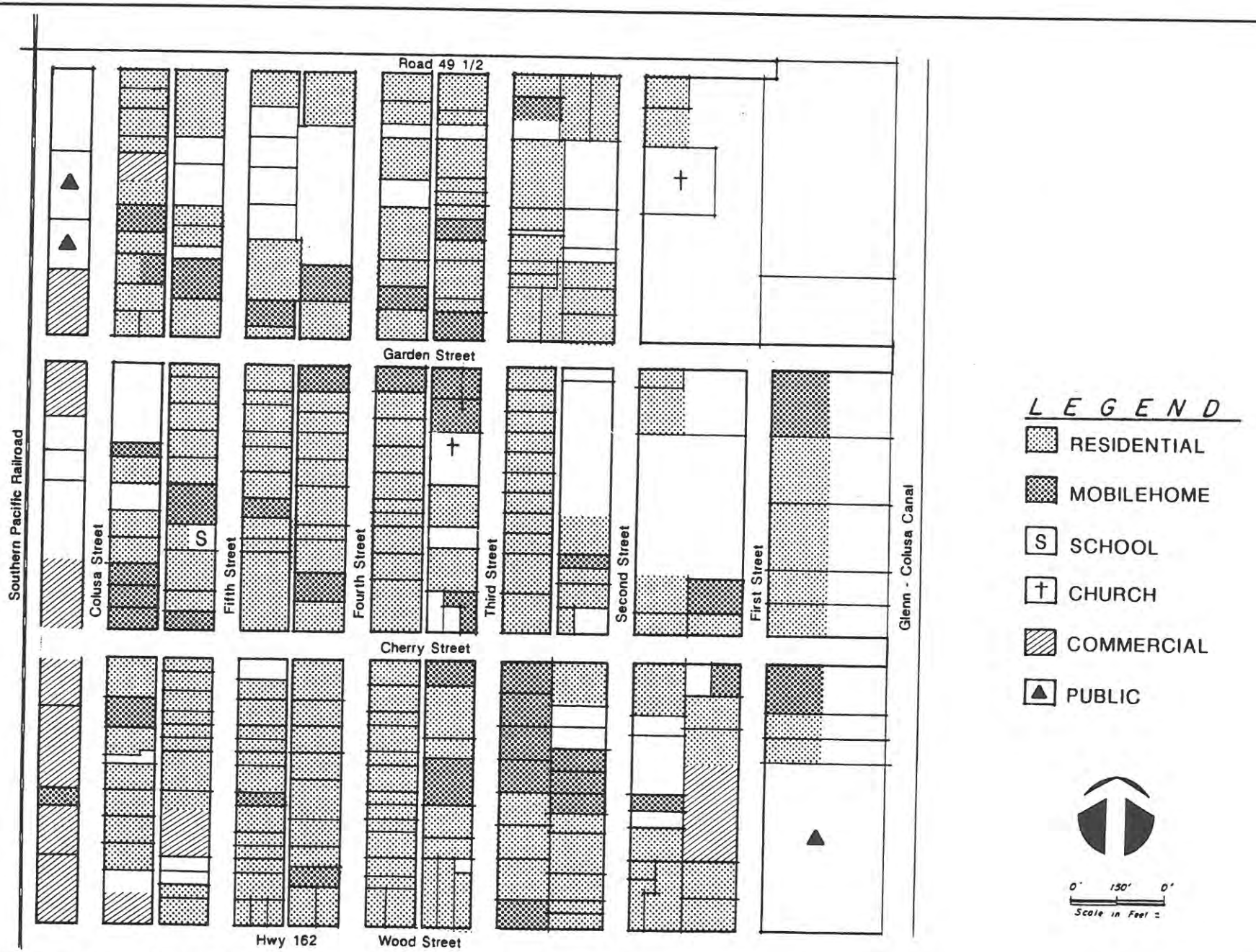


SOURCE: Glenn County Planning Department and QUAD Consultants, 1991

QUAD

ORD BEND EXISTING LAND USE

Figure 4-11



SOURCE: Glenn County Planning Department and QUAD Consultants, 1991

QUAD

NORTH EAST WILLOWS EXISTING LAND USE

Figure 4-12

approximately 261 housing units in this area, of which 44 are mobilehomes, and a few commercial uses located primarily along Colusa Street (see Table 4-15). Water service is supplied by California Water Service Company, and wastewater disposal is provided by Northeast Willows Community Services District, which contracts for sewage disposal with the City of Willows, and individual septic tanks.

TABLE 4-13
EXISTING LAND USE
COMMUNITY OF HAMILTON CITY

Land Use Category	Acres	Percent
Residential	100	74.7
School	5	3.7
Church	.8	.6
Commercial	7.5	5.6
Industrial	7.5	5.6
Public	6	4.5
Mobilehome Park	**7**	**5.2**
Total	**133.8**	**100.0**

Source: Glenn County Planning Department; QUAD Consultants, 1991.

TABLE 4-14
EXISTING LAND USE
COMMUNITY OF ORD BEND

Land Use Category	Acres	Percent
Residential	.78	19.4
Church	.18	4.5
Commercial	.07	1.7
Industrial	3	74.4
Total	**4.03**	**100.0**

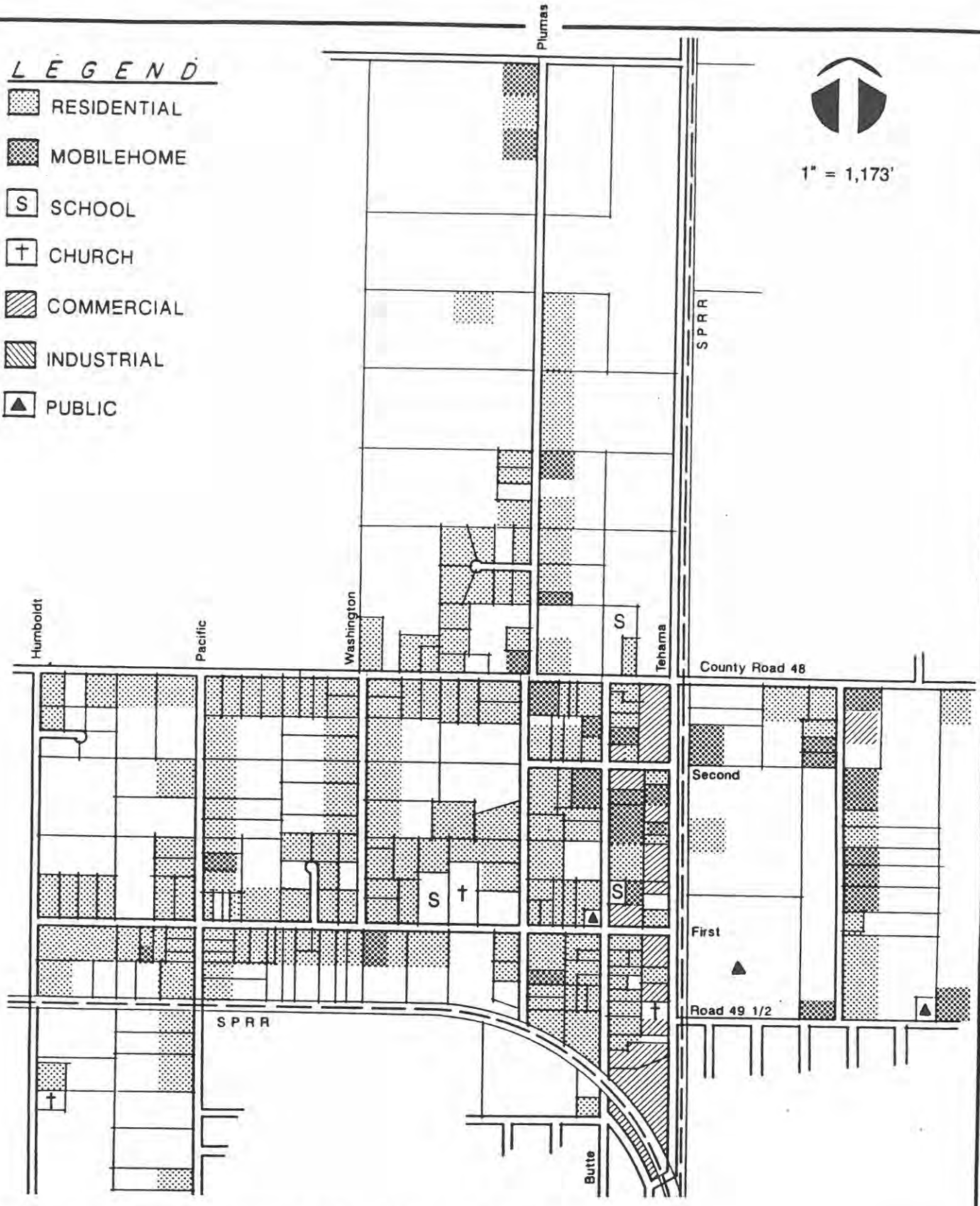
Source: Glenn County Planning Department; QUAD Consultants, 1991.

North Willows Area

North Willows is also adjacent of the City of Willows, and is located north of the SPTCo tracks and Road 49 1/2, south of Road 45. North of Road 48, the area is on the west side of County Road 99W; south of Road 48, it includes area both east and west of County Road 99W (see Figure 4-13). There are approximately 226 housing units in North Willows, of which 56 are mobilehomes. There are also commercial uses in the area, primarily along County Road 99W, as well as three private school facilities (one preschool and two religious school sites) (see Table 4-16). Water is supplied by individual wells, and wastewater disposal is provided by individual septic tanks.

West Orland

West Orland is located adjacent to the City of Orland, west of Interstate 5 and northeast of Road 200 (see Figure 4-14). A specific plan (West Orland Specific Plan) has been adopted for the area by the Board of Supervisors. There are approximately 235 housing units in West Orland, including 33 mobilehomes, as well

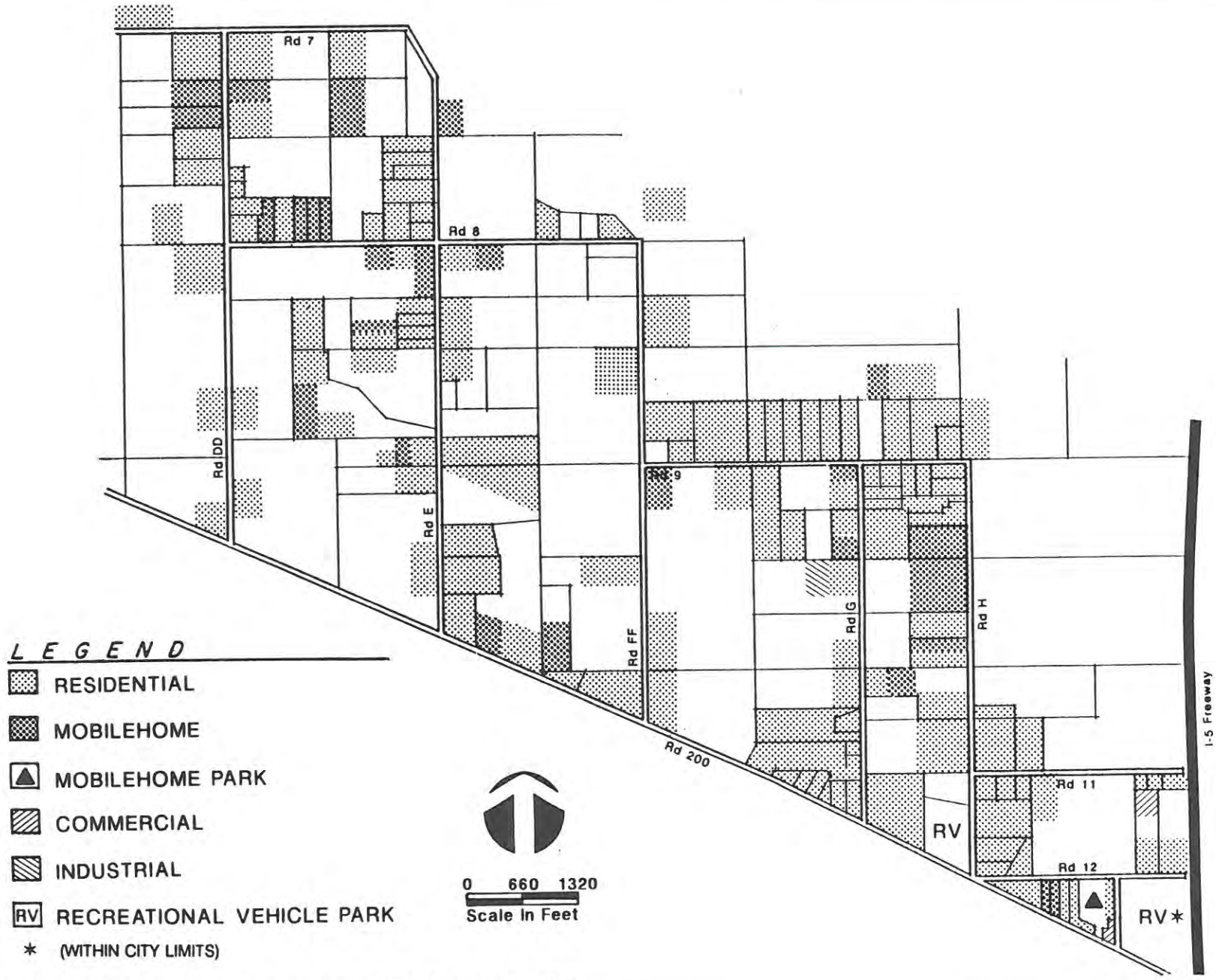


SOURCE: Glenn County Planning Department and QUAD Consultants, 1991

QUAD

NORTH WILLOWS AREA EXISTING LAND USE

Figure 4-13



SOURCE: Glenn County Planning Department and QUAD Consultants, 1991

Figure

QUAD

WEST ORLAND EXISTING LAND USE

4-14

as a few small commercial uses, two recreational vehicle parks and a mobile home park (see Table 4-17). Water service is supplied by Black Butte Water company, and wastewater disposal is provided by individual septic tanks.

TABLE 4-15
EXISTING LAND USE
COMMUNITY OF NORTH EAST WILLOWS

Land Use Category	Acres	Percent
Residential	74	82.1
School	.14	.2
Church	2	2.2
Commercial	7	7.8
Public	7	7.8
Total	**90.14**	**100.0**

Source: Glenn County Planning Department; QUAD Consultants, 1991.

TABLE 4-16
EXISTING LAND USE
NORTH WILLOWS AREA

Land Use Category	Acres	Percent
Residential	264	82.0
School	6	1.8
Church	5	1.6
Commercial	23	7.1
Public	24	7.5
Total	**322**	**100.0**

Source: Glenn County Planning Department; QUAD Consultants, 1991.

TABLE 4-17
EXISTING LAND USE
COMMUNITY OF WEST ORLAND

Land Use Category	Acres	Percent
Residential	546	92.7
Commercial	3	.5
Industrial	3	.5
Mobilehome Park	5	.8
RV Park	32	5.4
Total	**589**	**100.0**

Source: Glenn County Planning Department; QUAD Consultants, 1991.

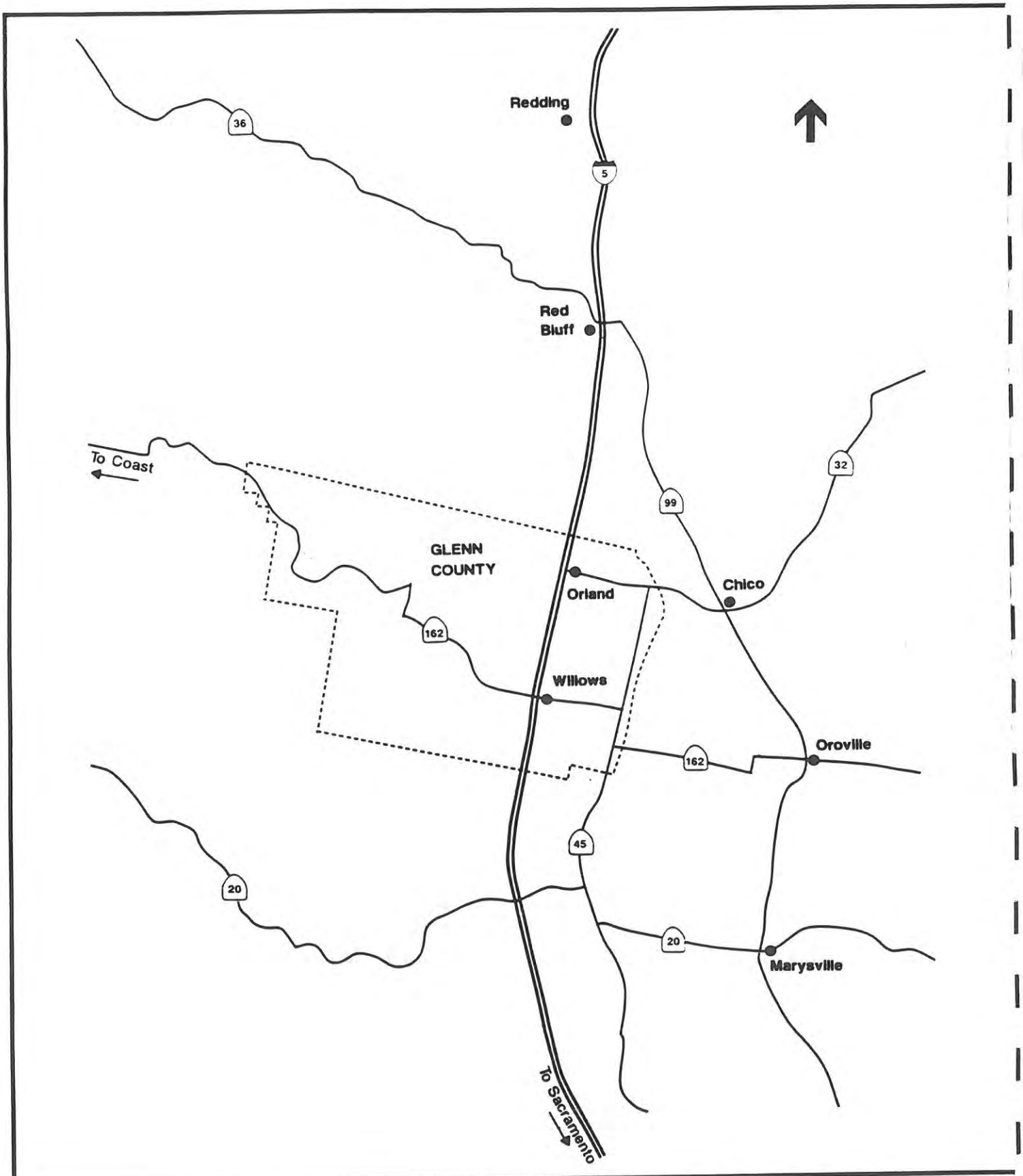
4.3 REGIONAL TRANSPORTATION

Road mileages between either Willows or Orland, the two largest cities in Glenn County, and major cities in the region are as follows:

- Orland - Redding 63 miles
- Orland - Red Bluff 30 miles
- Orland - Chico 21 miles
- Orland - Willows 16 miles
- Willows - Oroville 42 miles
- Willows - Williams 25 miles
- Willows - Sacramento 118 miles

Figure 4-15 shows roads of regional significance serving Glenn County and the adjacent region. All of the roads shown are State Highways, although State Route 162 west of Interstate 5 stops 36 miles before the Mendocino County border and becomes County Road 307. The major north-south road is Interstate 5, which provides the major connection between Glenn County and major cities to the north such as Red Bluff and Redding, and to the south to cities such as Sacramento. East of I-5, Routes 32 and 162 are the major east-west roads. Route 32 provides a connection through Orland to Chico, the closest of the major urban areas of California to Glenn County residents. To the south approximately 16 miles, Highway 162 provides a similar connection to Oroville. The next major east-west road to the south is Highway 20 (approximately 23 miles south of Highway 162), which provides a connection to the Yuba City-Marysville area. Highway 45 is the only major north-south road east of I-5. It serves adjoining land uses as well as providing a connection between State Routes 32, 162, and 20.

State Route 162 is the only State Route west of I-5. The Route originally began at Highway 101 in Mendocino County and continued into Glenn County, but a 70 mile break currently exists (34 miles of which is in Mendocino County and 36 miles in Glenn County). The intermediate mileage is a seasonal road owned and maintained by Mendocino and Glenn Counties. This travel corridor, as shown in Figure 4-15, is the only east-west route between I-5 and Highway 101 between State Routes 20 and 36, a distance of approximately 75 miles.



QUAD

MAJOR INTERCITY ROADS

Figure 4-15

4.3.1 Overall Description of Roads Within Glenn County

The jurisdictions responsible for non-private roads within Glenn County include the County, incorporated cities (Orland, Willows), the State of California, and the U.S. Forest Service. The road system can also be broken down by functional classification and funding category. Table 4-18 shows the breakdown of mileage by these categories. Functional classifications include Principal Arterial, Minor Arterial, Major Collectors, Minor Collectors, and Local Roads. Federal-funding categories are Interstate Highways, Federal-Aid to Primary Roads (FAP), and Federal-Aid to Secondary Roads (FAS). There are no Federal-Aid to Urban roads (FAU) within the county.

A close correspondence exists between the three categories of roads. The State owns and operates all roads that have been classified as arterials. Interstate 5 is the only Major Arterial. All FAP routes, which include the State Routes east of I-5, have been designated Minor Arterials and all FAS routes have been designated Major Collectors. They include one State road section, Highway 162 west of I-5, but otherwise are all County roads. Among the major County roads designated as Major Collectors are the following: nine miles of Road 99, which is located to the east and adjacent to I-5; Road 200, which provides a connection to residential and recreational areas west of Orland, and Road 406-307 (also known as Alder Springs Road), which is a continuation of State Route 162 into the Mendocino National Forest. This latter road section is part of the Forest Highway System and serves as a major route for the transportation of timber.

4.3.2 Traffic Volumes

Table 4-19 presents traffic statistics on State Routes within Glenn County for 1989 as well as a comparison between average annual daily traffic for the years 1986 and 1989. The 1989 traffic volumes are shown graphically in Figures 4-16 through 4-19, and Figure 4-20 shows ten year traffic trends at five selected locations on State Routes. Truck traffic statistics for 1989 are shown in Table 4-20.

For major road sections, the level of service has been calculated based on 1989 peak hour traffic conditions and road characteristics. The results of this analysis are shown in Tables 4-21, 4-22, and 4-23. Table 4-24 presents a description of operating conditions for each level of service for two-lane highways and freeways. Capacity on two-lane roads is a

function of shoulder width, the percent of no-passing zones, the percent of heavy vehicles, peak hour percent, directional distribution of traffic, and terrain. The approximate range of traffic for levels of service on two-lane highways is given below for specified assumptions:

Level of Service Thresholds

A 0 - 2,300 daily vehicles
B 2,300 - 4,600 daily vehicles
C 4,600 - 7,500 daily vehicles
D 7,500 - 12,000 daily vehicles
E 12,000 - 19,300 daily vehicles
F above 19,300 daily vehicles

Assumptions:

- 10 percent of daily traffic peak hour
- 12 percent trucks
- 4-foot shoulder
- level terrain
- 20 percent no passing zones
- 60/40 directional split of traffic

Thresholds for individual sections will vary depending on the actual values for the variables used in calculating the level of service.

Table 4 - 18
Classification of Roads in Glenn County

Road Category	Mileage: Category Breakdown	Mileage: Totals
Principal Arterials (Interstate)		
Interstate 5		29
Minor Arterials (Federal-Aid Primary)		52
State Route 32	10	
State Route 45	24	
State Route 162 (east of I-5)	18	
Major Collectors (Federal-Aid Secondary)		194
State Route 162 (west of I-5)	28	
Road 307 (Forest Highway)	36	
Other County Roads	130	
Minor Collectors (County)		141
Local Roads (County)		791
Paved	628	
Unpaved	163	
U.S. Forest Service Roads		387
Total Roads in County		1,594

Source: Dowling Associates

Table 4-19
Traffic Statistics for State Routes in Glenn County

DESCRIPTION A	DESCRIPTION B	1989 Peak Hour	1989 Average Peak Month Daily Traffic	1989 Average Annual Daily Traffic	1989 Peak Hour Percent	1989 Peak Month Percent	1986 Average Annual Daily Traffic	1986-1989 Average Annual Growth Rate	
HIGHWAY 162									
County Road 307	County Road 306 North	55	390	360	15%	108%	330	3%	
County Road 306 North	County Road 306 South	75	530	500	15%	106%	435	5%	
County Road 306 South	County Road 304	100	730	680	15%	107%	585	5%	*
County Road 304	County Road D	150	1100	1050	14%	105%	850	7%	*
County Road D	County Road F	210	2000	1900	11%	105%	1950	-1%	
County Road F	Jct. Rte. 5 Freeway	250	2650	2500	10%	106%	2600	-1%	
Jct. Rte. 5 Freeway	Willows, Tehama Street	710	8700	7900	9%	110%	6700	6%	*
Willows, Tehama Street	Willows, First Street	470	4800	4300	11%	112%	3175	11%	*
Willows, First Street	Central Irrigation Canal	320	3000	2850	11%	105%	2275	8%	*
Central Irrigation Canal	County Road P	320	3000	2850	11%	105%	2175	9%	*
County Road P	County Road V	210	1900	1850	11%	103%	1750	2%	
County Road V	Glenn,North Jct. Rte 45	190	1750	1700	11%	103%	1675	0%	
Codora,South Jct. Rte 45	Butte City	300	2600	2550	12%	102%	2350	3%	
Butte City	County Road Z	310	2400	2350	13%	102%			
County Road Z	Glenn - Butte County Line	230	1700	1650	14%	103%	1400	6%	*
HIGHWAY 45									
Jct. Rte. 162 East	Jct. Rte. 162 West	100	2200	1800	6%	122%	2000	-3%	
Jct. Rte. 162 West	County Road P39	420	3600	2600	16%	138%	2000	9%	*
County Road P39	County Road 29	300	3150	2350	13%	134%	2100	4%	

Table4-19(Continued)
Traffic Statistics for State Routes in Glenn County

DESCRIPTION A	DESCRIPTION B	1989 Peak Hour	1989 Average Daily Peak Month	1989 Average Annual Daily Traffic	1989 Peak Hour Percent	1989 Peak Month Percent	1986 Average Annual Daily Traffic	1986-1989 Average Annual Growth Rate	
County Road 29	County Road 24	250	3000	2350	11%	128%	1600	4%	
County Road 24	Hamilton City, First Street	190	2850	2300	8%	124%	2000	5%	*
Hamilton City, First Street	Hamilton City, Jct. Rte.32	280	2400	2150	13%	112%	2175	0%	
HIGHWAY 32									
Jct. Rte. 5 Freeway	6th Street-Newville Road	650	7600	7200	9%	106%	9600	-9%	
6th Street-Newville Road	Orland, Sixth Walker Streets	980	11700	10600	9%	110%	10000	2%	
Orland, Sixth Walker Streets	Orland, County Road M	1100	13200	12000	9%	110%	11700	1%	
Orland, County Road M	County Road P	690	8100	7400	9%	109%	7100	1%	
County Road P	Jct. Rte. 45 South	870	8000	7300	12%	110%	6000	7%	*
Jct. Rte. 45 South	Glenn - Butte County Line	1200	11800	10400	12%	113%	8650	6%	*
INTERSTATE 5									
County Road 68 Interch.	County Road 57 Interch.	1700	22000	15900	11%	138%	15000	2%	
County Road 68	Jct. Rte. 162 Interchange	1750	23100	16500	11%	140%	15800	1%	
Jct. Rte. 162	County Road 39 Interchange	2200	29000	20600	11%	141%	18300	4%	
County Road 39	County Road 33	1950	25500	18300	11%	139%	16100	4%	
County Road 33	County Road 27 Interchange	1950	24800	18000	11%	138%	16100	4%	
County Road 27	County Road 16 Interchange	2000	24500	18200	11%	135%	16000	4%	
County Road 16	Jct. Rte. 32 East	2100	24600	18700	11%	132%	16600	4%	
Jct. Rte. 32 East	County Road 7 Interchange	2200	24600	19300	11%	127%	16300	6%	*
County Road 7	Glenn-Tehama County Line	2350	24600	20200	12%	122%	15400	9%	*

Note: Asterisk denotes annual average growth rate of at least five percent.
Source: Traffic Volumes on California State Highways, 1986 and 1989. Calif. Dept. of Transportation.

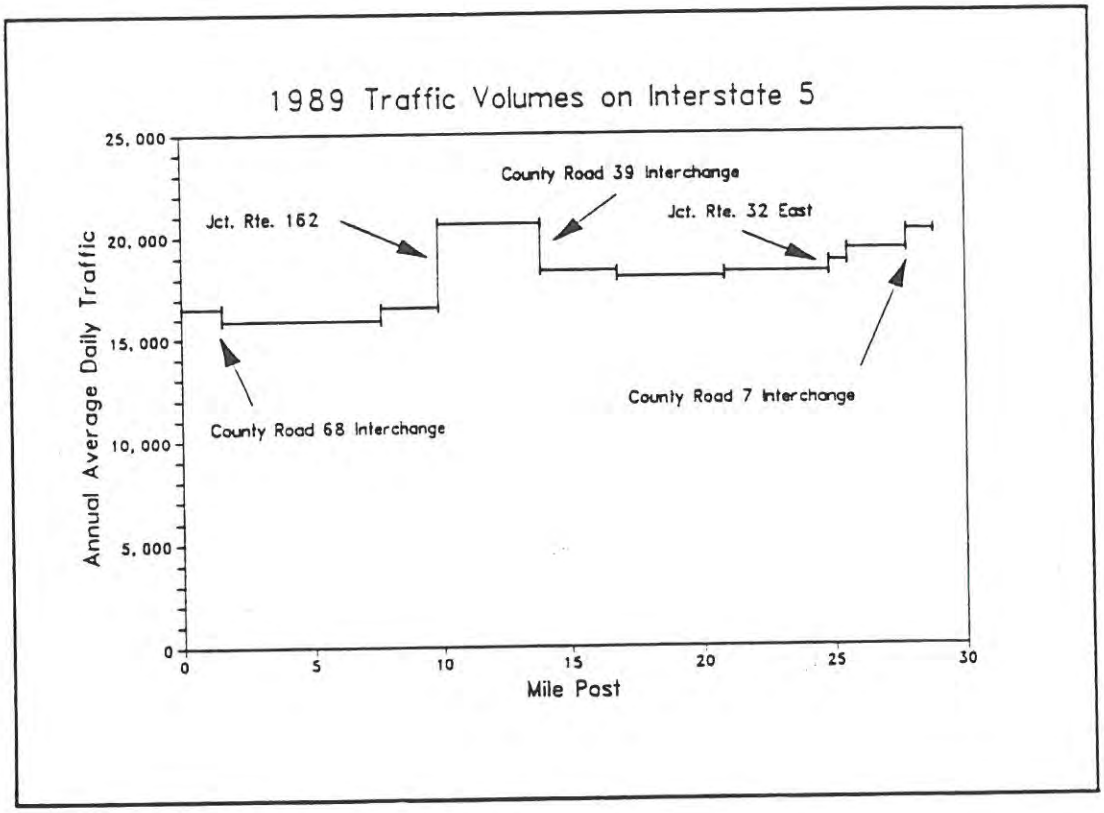


Figure 4-16 1989 I-5 Traffic Volumes

Source: Dowling Associates

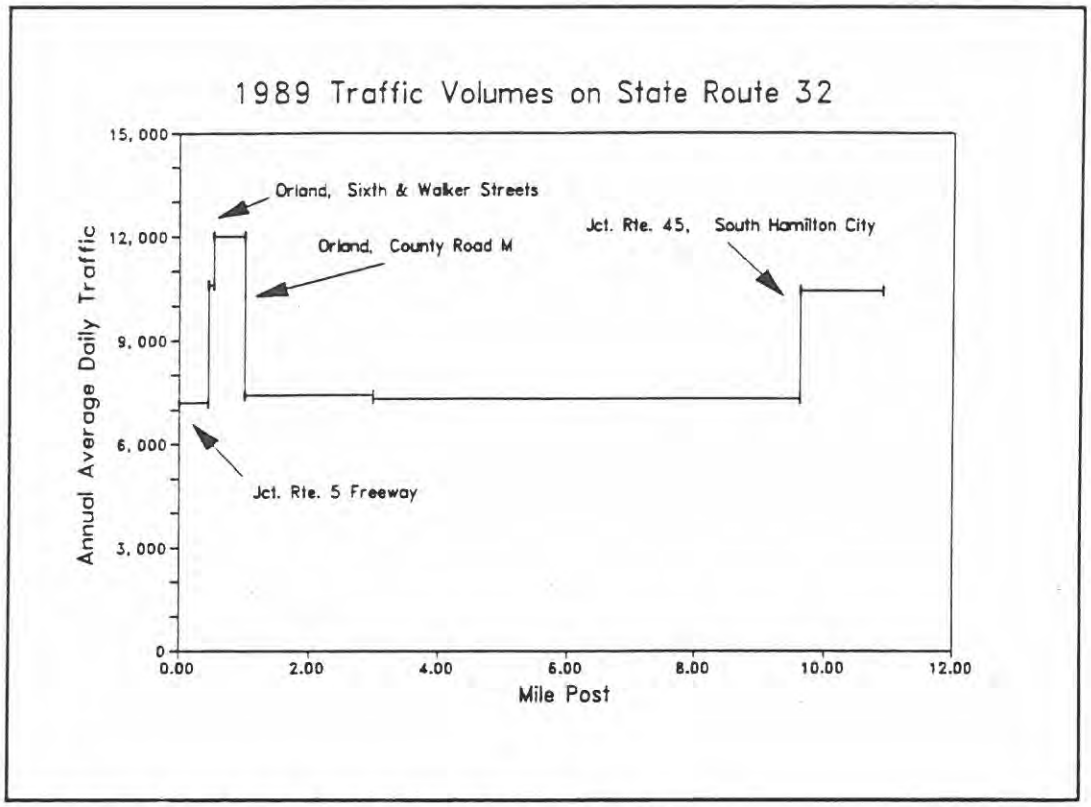


Figure 4-17 1989 State Route 32 Traffic Volumes

Source: Dowling Associates

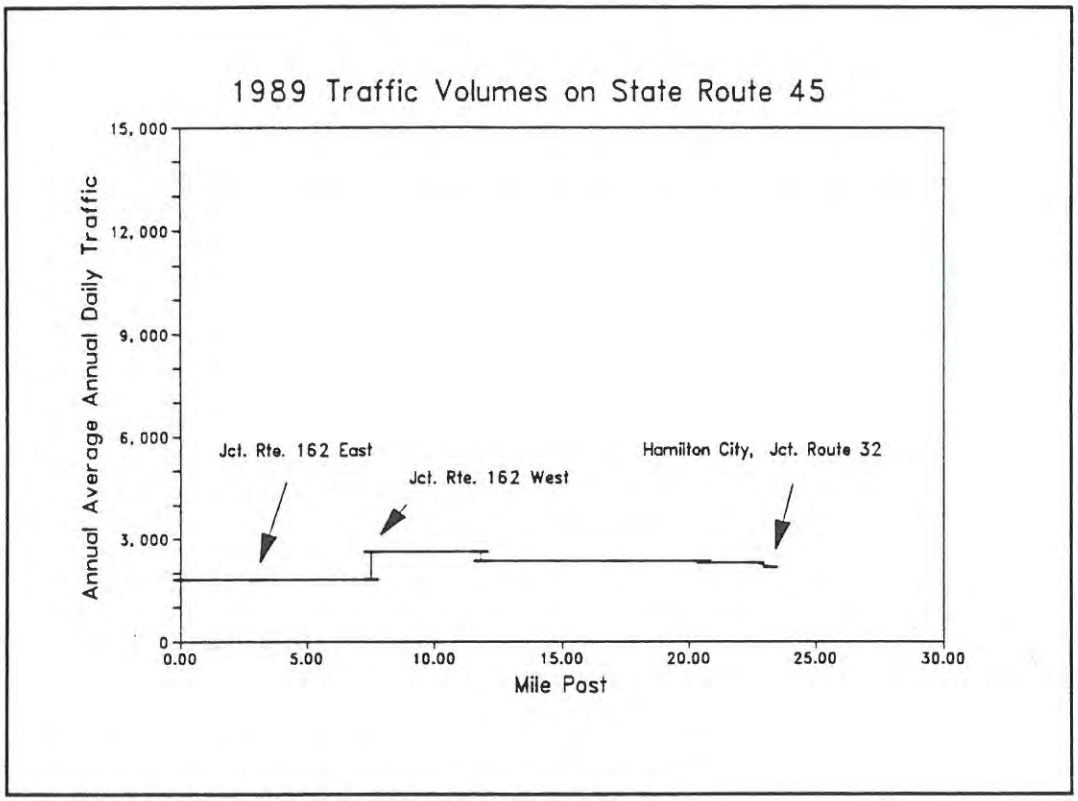


Figure 4-18 1989 State Route 45 Traffic Volumes

Source: Dowling Associates

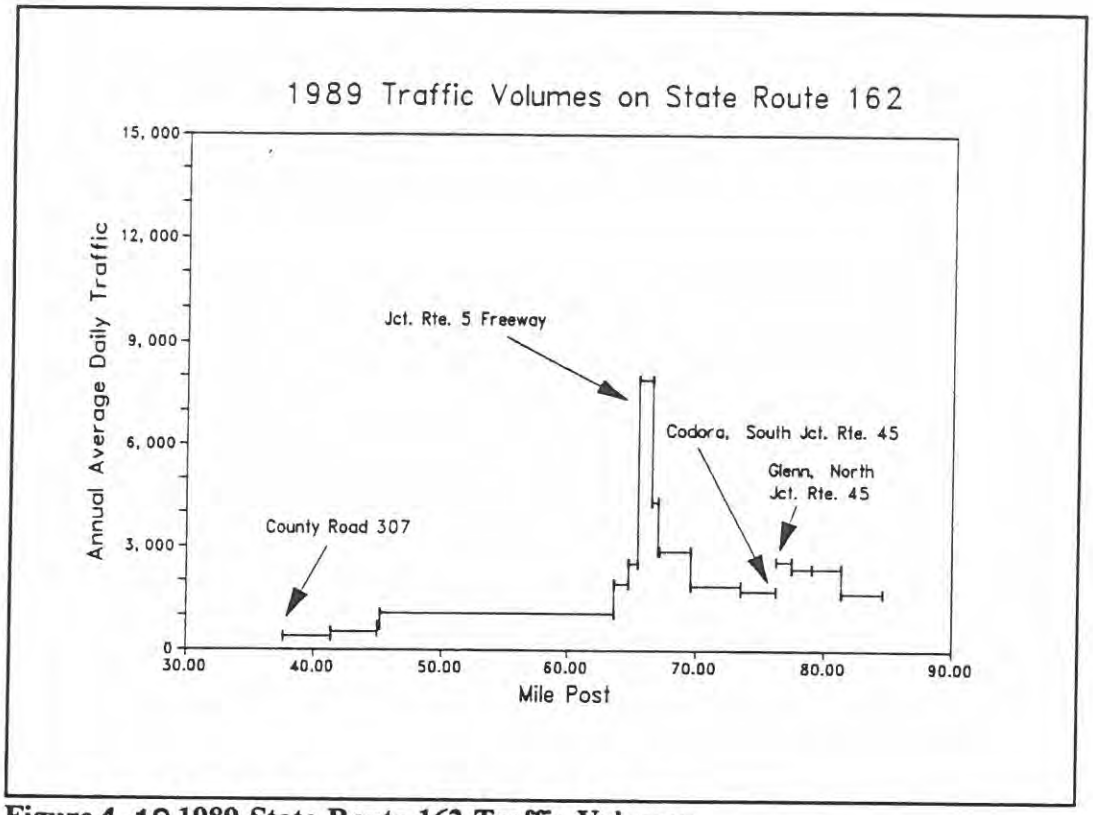


Figure 4 -19 1989 State Route 162 Traffic Volumes

Source: Dowling Assoicates

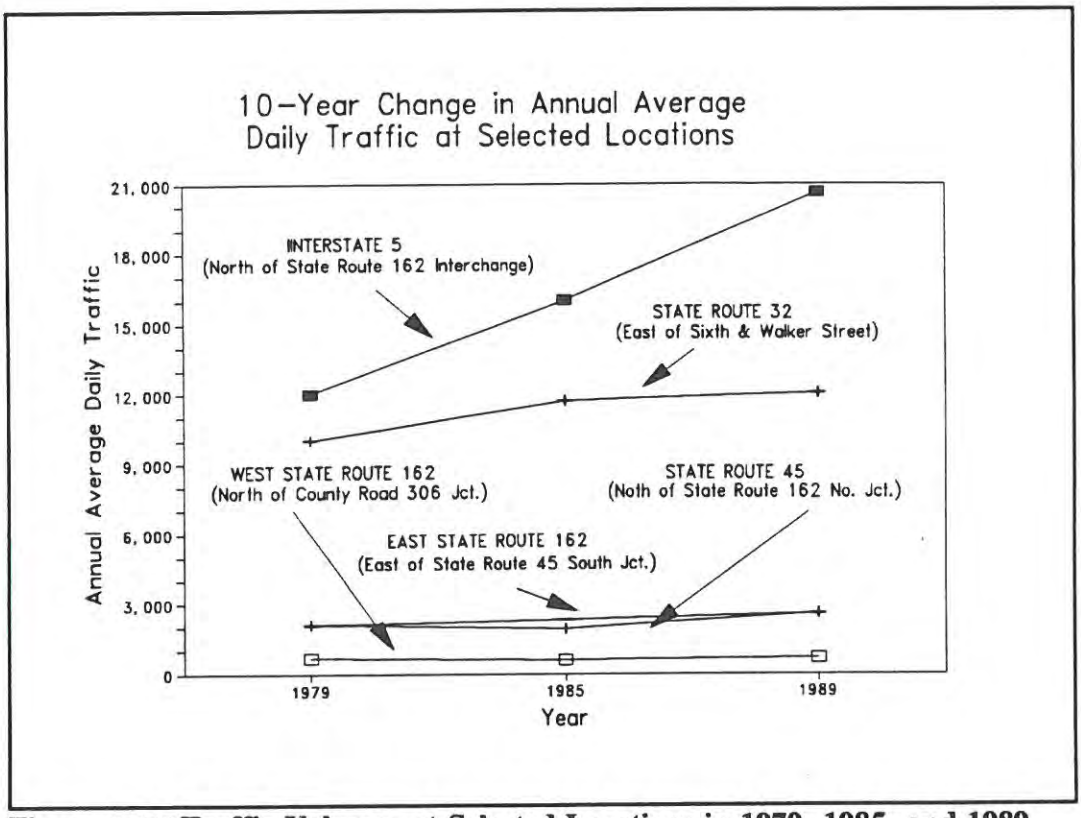


Figure 4-20 Traffic Volumes at Selected Locations in 1979, 1985, and 1989

Source: Dowling Associates

Table 4-20
1989 Truck Traffic Statistics for State Routes

Route	Description A	Post-Mile	Description B	Post-Mile	All Vehicles	Trucks	Percent Trucks	Truck Percent by Axle			
								2 Axles	3 Axles	4 Axles	5+ Axles
I-5	Colusa County	0.00	Jct. Rte 162	9.87	16,500	6,105	37.0%	10.9%	2.5%	2.1%	84.5%
I-5	Jct. Rte 162	9.87	Midpoint	17.70	20,600	7,416	36.0%	11.2%	3.1%	2.4%	83.3%
I-5	Midpoint	17.70	Jct. Rte 32	25.53	18,700	6,171	33.0%	11.2%	3.1%	2.4%	83.3%
I-5	Jct. Rte 32	25.53	Tehama County	28.82	19,300	5,790	30.0%	11.3%	3.2%	2.5%	83.0%
H32	Jct. Rte 5	0.00	Midpoint	4.82	7,200	612	8.5%	30.1%	9.8%	5.1%	55.1%
H32	Midpoint	4.82	Jct. Rte 45 S	9.63	7,300	1,036	14.2%	24.2%	12.9%	3.9%	59.0%
H32	Jct. Rte 45 S	9.63	Butte County	10.91	10,400	1,071	10.3%	30.7%	13.0%	4.5%	51.8%
H45	Colusa County	0.00	Jct. Rte 162 E	3.06	2,800	450	16.1%	29.6%	6.9%	1.1%	62.4%
H45	Jct. Rte 162 E	3.06	Midpoint	5.30	1,800	396	22.0%	36.4%	7.3%	0.8%	55.6%
H45	Midpoint	5.30	Jct. Rte 162 W	7.53	1,800	396	22.0%	36.4%	7.3%	0.8%	55.6%
H45	Jct. Rte 162 W	7.53	Midpoint	15.38	2,600	353	13.6%	27.2%	7.4%	1.4%	64.0%
H45	Midpoint	15.38	Jct. Rte 32	23.23	2,150	262	12.2%	34.4%	9.2%	3.1%	53.4%
H162	County Rd 307	37.65	County Rd 306 N	41.38	360	75	20.8%	9.3%	8.0%	2.7%	80.0%
H162	County Rd 306 N	41.32	County Rd 306 S	44.99	680	142	20.9%	36.6%	5.6%	0.7%	57.0%
H162	Midpoint	44.99	I-5 Jct.	55.26	2,500	300	12.0%	34.0%	11.0%	7.0%	48.0%
H162	I-5 Jct.	55.26	1st St. (Wllws)	65.52	7,900	948	12.0%	34.0%	11.1%	6.9%	48.1%
H162	1st St. (Wllws)	65.52	Midpoint	66.32	2,850	342	12.0%	31.9%	14.0%	2.9%	51.2%
H162	Midpoint	66.32	No. Jct. Rte 45	67.11	1,700	204	12.0%	37.3%	9.3%	1.5%	52.0%

Source: 1989 Annual Average Daily Truck Traffic on the California State Highway System, California Dept. of Transportation. 1989.

Table 4-21
Level of Service Analysis for Selected Freeway (I-5) Sections in Glenn County

Location	Percent Trucks	Peak Hour Percent	Design Speed (mph)	Peak Hour Split for Peak Drctn	Avg. Annual Daily Traffic	Volume-to-Capacity Ratio	Level of Service
FOUR-LANE FREEWAY							
I-5 N OF RTE 162	36%	8%	70	53	20,600	0.39	B
I-5 N OF ROAD 68	37%	8%	70	53	15,900	0.30	A
I-5 N OF ROAD 57	37%	8%	70	53	16,500	0.31	A
I-5 N OF ROAD 39	33%	8%	70	53	18,300	0.34	A
I-5 N OF ROAD 33	33%	8%	70	53	18,000	0.33	A
I-5 N OF ROAD 27	33%	8%	70	53	18,200	0.34	A
I-5 N OF ROAD 32	30%	9%	70	53	19,300	0.40	B
I-5 N OF ROAD 7	30%	9%	70	53	20,200	0.42	B
I-5 N OF ROAD 16	30%	9%	70	53	18,700	0.38	B

Source: Dowling Associates, 1991.

Table 4-22
Level of Service Analysis for Selected State Route Sections in Glenn County

Location	Percent Trucks	Peak Hour Percent	Design Speed (mph)	Peak Hour Split for Peak Drctn	Avg. Annual Daily Traffic	Volume-to-Capacity Ratio	Level of Service
TWO-LANE STATE HIGHWAY							
RTE 162 E OF 1-5	12%	8%	60	60	7,900	0.29	C
RTE 162 E OF 45	12%	10%	60	60	2,550	0.13	B
RTE 162 E OF 306	21%	10%	60	65	680	0.04	A
RTE 45 N OF HWY 162 E	22%	10%	60	60	1,800	0.11	A
RTE 45 N OF RD 39	12%	8%	60	60	2,350	0.10	A
RTE 45 S OF RTE 32	12%	12%	60	60	2,150	0.13	B
RTE 32 E OF I-5	9%	9%	60	60	7,200	0.31	C
RTE 32/6TH ST, ORLND	10%	9%	60	60	10,600	0.45	D
RTE 32 E OF 6TH, ORLND	10%	9%	60	60	12,000	0.51	D
RTE 32 E OF RTE 45	10%	12%	60	60	10,400	0.59	D

Source: Dowling Associates, 1991.

Table 4-23
Level of Service Analysis for Selected County Road Sections in Glenn County

Location	Percent Trucks	Peak Hour Percent	Design Speed (mph)	Peak Hour Split for Peak Drctn	Avg. Annual Daily Traffic	Volume-to-Capacity Ratio	Level of Service
TWO-LANE COUNTY ROADS (SELECTED)							
ROAD 16 W OF RD M	12%	10%	60	60	2,000	0.10	A
ROAD 16 AT OVERPASS	12%	10%	60	60	1,675	0.09	A
ROAD 16 E OF 99W	12%	10%	60	60	3,000	0.15	B
ROAD 33 W OF BRIDGE	12%	10%	60	60	2,800	0.14	B
ROAD 39 E OF RD P	12%	10%	60	60	1,500	0.08	A
HWY 99W N OF RD 20	12%	10%	60	60	4,625	0.23	B
HWY 99W N OF RD 24	12%	10%	60	60	4,975	0.25	C
HWY 99W N OF RD 27	12%	10%	60	60	1,750	0.09	A
HWY 99W N OF BLUEGUM	12%	10%	60	60	2,225	0.12	A
HWY 99W S OF RD 33	12%	10%	60	60	1,800	0.10	A
HWY 99W S OF RD 39	12%	10%	60	60	3,050	0.15	B
HWY 99W N OF RD 33	12%	10%	60	60	2,050	0.11	A
HWY 99W N OF RD 39	12%	10%	60	60	2,475	0.13	B

Table 4.23 (Continued)
Level of Service Analysis for Selected County Road Sections in Glenn County

Location	Percent Trucks	Peak Hour Percent	Design Speed (mph)	Peak Hour Split for Peak Drctn	Avg. Annual Daily Traffic	Volume-to-Capacity Ratio	Level of Service
HWY 99W S OF RD 35	12%	10%	60	60	3,225	0.16	B
HWY 99W N OF RD 25	12%	10%	60	60	4,200	0.21	B
HWY 99W N OF RD 48	12%	10%	60	60	3,525	0.18	B
ROAD 200 W OF I-5	12%	10%	60	60	3,925	0.20	B
HWY 99W S OF RD 48	12%	10%	60	60	3,750	0.19	B
ROAD 200 E OF RD MM	12%	10%	60	60	1,575	0.09	A
HWY 99W S OF GARDEN ST	12%	10%	60	60	4,475	0.22	B
ROAD 200 E OF RD 12	12%	10%	60	60	5,125	0.25	C

Source: Dowling Associates, 1991.

TABLE 4-24
DESCRIPTION OF LEVEL OF SERVICE FOR TWO-LANE HIGHWAYS AND FREEWAYS

LEVEL OF SERVICE	DESCRIPTION FOR TWO-LANE HIGHWAYS	DESCRIPTION FOR FREEWAYS
A	Average speed at 55 mph speed limit on level terrain. No significant demand for passing capacity. Few platoons of tree or more vehicles. Delays by slow-moving vehicles less than 30% of the time.	Primarily free-flow conditions. Average travel speeds near 60 mph where speed limit permits. Vehicles unimpeded in ability to maneuver. High level of psychological comfort. Effects of accidents easily absorbed.
B	Average speed still 55 mph speed limit. Passing demand approaches passing capacity; delays have increased to 45% of the time.	Reasonably free-flow conditions. Speeds of 57 mph maintained where speed limit permits. Only slight restrictions on ability to maneuver.
C	Noticeable increases in platoon formation, platoon size, and frequency of passing impediment. Unrestricted passing demand exceeds capacity. Average speed exceeds 52 mph on level terrain.	Stable operations but approaching range of lows where small increases will cause substantial deterioration in service. Average travel speeds over 54 mph. Freedom to maneuver noticeable restricted. Noticeable increase in driver tension.
D	Unstable traffic flow approached, as the two opposing traffic streams begin to operate separately. Passing becomes extremely difficult, and platoon sizes of 5 to 10 vehicles are common. Time that motorists are delayed approaches 75%.	Borders on unstable flow. Small increases in flow cause substantial deterioration in service. Average travel speeds of 46 mph or more can still be maintained. Freedom to maneuver severely limited. Drastically reduced physical and psychological comfort levels.
E	Percent time of delay is greater than 75%. Passing virtually impossible, and platooning can become intense. Speeds under ideal conditions will drop below 50 mph and can be as low as 25 mph on sustained grades.	Boundary between D and E describes operation at capacity. Extremely unstable operations with virtually no usable gaps in traffic stream. At capacity, traffic stream cannot dissipate even the most minor disruptions. Maneuverability extremely limited. Average travel speeds approximately 30 mph.
F	Heavily congested traffic flows with demand exceeding capacity. Volumes are lower than capacity level as is speed.	Forced or breakdown flow. Queuing results from breakdown in downstream operations. Designation refers to point where demand exceeds capacity as well as to upstream queuing.

Source: Highway Capacity Manual, Transportation Research Board. 1985

Existing conditions are described below for major roads:

Interstate 5

Interstate 5 is a four-lane freeway with a length of approximately 30 miles within Glenn County. It has been designated as a truck route for oversize trucks. Average daily traffic flows range from approximately 16,000 to 21,000, as shown in Table 4-19. The daily traffic for the peak month is approximately 40 percent above the daily annual average as far north as County Road 27, which is indicative of the heavy recreational traffic carried by the road during summer months. As shown in Figure 4-16, the traffic tends to be slightly greater on this road at the north end of the county. On a percentage basis, the largest increase in traffic from 1986-1989 has occurred between Orland (Highway 32) and the Tehama County border.

The route is the major connection between major California cities and the Pacific Northwest and, in addition, is the major farm-to-market route in the Sacramento Valley. As a result, the road experiences large truck volumes. The percentage of trucks is equal to or greater than 30 percent within the county. The highest percentage is 37 percent at the south end of the county, and the highest volume occurs in the road section north of the Highway 162 interchange at Willows. The percentage of large trucks (4 or more axles) is approximately 86 percent, which is evidence of the road's significant economic role. Ongoing maintenance, especially of the outer lane, is required because of the significant volume of large trucks.

The road operates at Level of Service A or B during peak hours of travel, which is acceptable for a major regional route. Considerable additional capacity is available, as the threshold for Level of Service C is approximately 28,000 vehicles per day.

State Route 32

State Route 32 is primarily a two-lane road that extends approximately 11 miles east from Interstate 5 through Orland and Hamilton City to the Butte County border. It continues an additional 11 miles to Chico and then northeast to Lassen Volcanic National Park. Traffic between I-5 and Chico has experienced a major increase in

recent years, which is expected to continue in conjunction with growth of the Chico Urban Area. The 1986-1989 annual growth rate has been approximately six percent in the Hamilton City area between the junction of Route 45 and the county border. Although traffic on the road in the Orland area has experienced minimal growth, it continues to have the highest volume, approximately 12,000 vehicles per day. The relatively low 13 percent difference between the peak month and the daily annual average traffic suggests that a high percentage of the traffic is either local traffic or serves local transportation needs.

Figure 4-17 shows the mix of three major traffic sources -- through traffic between I-5 and Chico, Orland local traffic, and local traffic between Hamilton City and Chico. The range of truck traffic percentages is significantly lower than for I-5, as is the percentage of heavy trucks. The range is 8.5 to 14.2 percent of total traffic, and heavy trucks comprise approximately 60 percent of total truck traffic.

The road operates at Level of Service C or D with "D" conditions occurring in the Orland and Hamilton City areas. Continued growth will eventually require widening of the road and, in the more urban areas, operational improvements.

State Route 45

State Route 45 is a two-lane road located west of the Sacramento River. It is the major east-west connection east of I-5 within the county. The road's proximity to the river has presented design problems. It has a number of right-angle turns and is subject to flooding due to irrigation of adjacent fields and winter rains. Average daily volumes are relatively constant along the road, ranging from 1,800 to 2,600 vehicles per day. The high peak month percentage reflects the road's proximity to the Sacramento River and farmland. The truck percentages are approximately twice those for State Route 32 but still significantly lower than those for I-5.

The level of service for all road sections is "A" or "B" except at isolated locations with right-angle turns where lower levels of service exist. Significant traffic growth on a percentage basis has occurred recently in the road section north of the intersection with Highway 162 westbound, but traffic still remains considerably below the Level of Service C threshold (approximately 4,600 vehicles).

Highway 162

State Route 162 extends approximately 47 miles from a point on Alder Springs Road (County Road 406-307) west of the intersection with Road 306 east to the Butte County border. The route has a break at milepost 76.27 where it intersects with State Route 45 and begins again 4.47 miles to the south.

The route can be divided into two sections for traffic analysis purposes. West of the freeway, the road is classified as a Major Collector; the traffic steadily falls from 2,600 vehicles per day at I-5 to less than 350 vehicles per day west of the intersection with Road 306. The available data suggest that no major monthly fluctuations exist for traffic on this section and that the level of truck traffic, 20 percent, is similar to the figures for other two-lane State routes within the county.

Traffic volumes east of I-5 are significantly higher than those to the west, especially within the City of Willows, where traffic ranges from 7,900 to 4,300 vehicles per day. From there to the Butte County border, the range is from 1,650 to 2,850 vehicles per day. The highest growth rates within the past three years on the road have occurred within the City of Willows. The percent of truck traffic, 12 percent, is somewhat lower than for State Route 45 and similar to data for State Route 32, the other major east-west road between I-5 and Butte County.

The Level of Service on the road is "A" or "B" except within the City of Willows where it is "C". None of the road sections outside of Willows are approaching the Level of Service "C" threshold, based on 1989 traffic volumes.

County Roads

The County road system, consisting entirely of two-lane roads, serves a variety of purposes. Traffic volumes range from a high of approximately 5,000 vehicles a day to less than 50 vehicles per day. The roads adjacent to Orland and Willows and within Hamilton City, which is unincorporated, serve traffic of an urban nature. Other roads serve rural transportation needs, such as farm-to-market, logging, and recreational trips as well as needs of adjoining residents.

Approximately 860 miles of road are maintained by the County, based on data compiled for the County's Pavement Management System. Of this amount, approximately 15 percent is unpaved, 72 percent has an oil and chip surface, and the remaining 12 percent is asphaltic concrete pavement. A significant percentage of the paved roads have substandard widths. Approximately 88 percent of the paved roads have paved surfaces less than 28 feet wide, and 40 percent have surfaces less than 24 feet wide.

The Pavement Management System, developed for the County by CHEC Engineering Consultants, has demonstrated the need for major capital expenditures to repair the existing road network. A visual survey was made of all paved surfaces. Results of this survey included a list of road segments requiring improvements ranging from maintenance to surface sealing treatments, and finally, reconstruction and an overall rating score for each road segment. Based on the results of the survey, improvement projects were recommended for 89.6 percent of County road mileage. The two major categories of improvements were chip seals (82.9 percent of road mileage) and reconstruction (6.2 percent). If chip seals are not provided in a timely manner, the paved surfaces will further deteriorate and more expensive remedies will be required in the future. These projects are in addition to any projects involving the widening of existing roads and the paving of gravel surfaces.

County roads are named based on their direction and location. Beginning at a location approximately two miles west of I-5 and extending to the east, north-south roads are assigned a letter, and east-west roads are assigned a number between 1 and 100. Numbers increase to the south and letters increase to the east. The exception to this numbering system is Road 99, a north-south road that was originally part of State Highway 99. Roads to the west of the area covered by this system are numbered between 200 and 500.

All County Roads are classified as either Major Collectors, Minor Collectors, or Local Roads. The Major Collectors include the 166 miles of Federal-Aid Secondary roads, which do not carry inter-regional traffic but serve major trip generators, such as airports and schools, or are significant for economic development. They include the following road sections: Road 406-307 (36.03 miles), County Road 200 (7.00 miles), Road 306 (18.00 miles), Road 68 (3.01 miles), Road 60 (9.37 miles), Road

99W (7.91 miles), Road P (10.96 miles), Road Z (5.56 miles), Road 206 (17.64 miles), Road D (6.96 miles), Road 33 (7.75 miles), Road 39 (11.33 miles), Road S (12.47 miles), Road 32 (0.80 miles), and Road 24 (11.64 miles).

Roads with traffic in excess of 3,000 vehicles per day are located adjacent to either Willows or Orland. Road 200 serves urban development near Orland west of I-5 and has the highest volume on any County road, 5,125 vehicles per day. It is followed closely by a section of Road 99 (4,975 vehicles per day) also adjacent to Orland. These two sections are the only County road sections where Level of Service C exists at the present time. This level of service is acceptable because they are located within the sphere of influence of incorporated cities. Other road sections with large traffic volumes include Road 16 (3,000 vehicles per day) adjacent to Orland and Road 99 adjacent to Willows (4,475 vehicles per day).

Roads outside urban areas with traffic volumes from approximately 800 to 3,000 vehicles for their entire length per day also serve as major collectors. These volumes are similar to those found on State Routes 45 and 162 away from major cities. Roads included in this category are Road 99, which even outside urban areas has traffic volumes of at least 1,750 vehicles per day. Road 39, also known as Bayliss Blue Gum Road, is a major east-west collector with volumes ranging from 900 to 1,500 vehicles per day from Road 99 east to State Route 45.

Minor collectors are roads that carry approximately 300 to 800 vehicles per day for their entire length. Among the roads in this category are Road P from Road 39 to State Route 32 (400 to 975 vehicles) and Road 24 (275 to 500 vehicles) from I-5 to State Route 45.

Several roads in the western portion of the county have somewhat lower volumes but are considered major collectors because of their length and the sparse road network. The 36-mile extension of State Route 162 west to the Mendocino County border is a County road and also designated Forest Highway 7, which makes it eligible for Forest Highway funding. The first 12.6 miles, designated as Road 406, has been paved; the remaining mileage is a gravel surface. The paved section was designed and constructed with Forest Highway funds by the Federal Highway Administration and then turned over to the County. The County has had to expend significant

resources to stabilize the subsurface materials. It is seeking Forest Highway funds to improve and pave the entire roadway so that a route to the coast comparable to State Routes 20 and 36 can eventually be provided.

Forest Service Roads

Currently, the U.S. Forest Service has approximately 387 miles of active logging roads. These roads have been constructed by the U.S. Forest Service and are designed for the harvesting of timber and its transportation to public roads. They are generally built to lower standards than roads designed for use of the general public. Over time, as their use becomes more oriented towards recreational activities than timber harvesting, they can be upgraded and, in some cases, turned over to the State or the County for on-going maintenance.

4.3.3 Air Facilities and Services

The County operates two general aviation airports, and numerous private landing strips, located on farms and ranches in the region. Orland Haigh Field Airport is located in the Orland area south of County Road 20 and west of County Road P. Willows Glenn County Airport is located west of I-5 and south of State Highway 162 near Willows. The Glenn County Airport Advisory Committee (eight members) assists the Glenn County Public Works Department with the administration of the airports.

The Glenn County Airport Land Use Commission (seven members) is established according to State Law to adopt comprehensive airport land use plans (CLUP). The Comprehensive Airport Land Use Plan for the Willows Glenn County Airport was adopted in May 1990. The Comprehensive Airport Land Use Plan for the Orland Haigh Field Airport was adopted in February 1991.

The Orland Haigh Field Airport has a single runway, and the Willows Glenn County Airport has two runways arranged in a "V" configuration. Operations at the two County airports are primarily by single-engine aircraft engaged in recreational or agricultural use. Approximately 105 aircraft are based at both airports, based on a 1988 figure of 55 aircraft for Orland Haigh Field and 49 aircraft for Willows Glenn County Airport. This figure is a 21 percent reduction from the 1985 figure of 133 aircraft. The decrease occurred

primarily at the Willows Glenn County Airport where the U.S. Forest Service reduced its operations. In the long term, it is expected that the number of aircraft based there will return to the previous level.

Neither airport is served by scheduled air carriers but charter service is available. Carriers serving Chico offer limited intrastate scheduled service, and for interstate flights residents must travel to either Sacramento or the major San Francisco Bay area airports (San Jose, Oakland, and San Francisco).

4.3.4 Bicycle and Pedestrian Trails

No specific bicycle facilities exist within the county at the present time. Bicyclists currently must ride in travel lanes on County roads, as the paved shoulders are not wide enough to accommodate bicycles. The area has long-term potential for extensive use of bicycles because of its flat terrain and promising corridors for the development of bicycle facilities.

Two major bicycle routes have been proposed as part of regional bicycle routes. A path on the east side of I-5 would be part of a route that eventually would extend along the I-5 corridor from the Oregon boundary to Bakersfield. A second path on Bayliss-Blue Gum Road would provide a connection between this route and a Butte County system at Ord Bend.

The U.S. Forest Service has many primitive and maintained trails interlacing the western section of the county. These trails serve local recreational purposes and are not oriented for extended hiking use.

4.3.5 Rail Services

The county is traversed by the Southern Pacific Transportation Company's (SPTCo) West Sacramento Valley railroad track which extends north from Davis in Yolo County to Tehama in Tehama County, where it joins the more heavily used mainline track from Sacramento that passes through Marysville and Chico. The track is located on the east side of the Old Highway 99W right-of-way and runs through the center of both Orland and Willows. A branch line runs to the Holly Sugar factory in Hamilton City and a spur serves

the Johns Manville facility west of Willows. Carload freight service is provided on several sidings, but no depots for general freight exist in the county. Freight service to and from the county is generally limited to large shipments that are being moved over long distances, where time is not a factor.

AMTRAK train service is available in Chico, with two trips northbound and southbound each day. The southbound departure times, as of July, 1991, were 3:54 a.m. and 9:10 a.m. and the northbound departure times 11:18 a.m. and 7:25 p.m. The one-way fare between Sacramento and Chico is $22.00.

4.3.6 Public Transit Services

Public transit includes surface transportation services available for the movement of persons from one place to another operated by both private and public operators. Included are specialized services that provide transportation for specific groups, such as the elderly, handicapped, and economically disadvantaged.

Commercial Public Transit for the General Public

The availability of commercial public transit services for the general public is limited at this time. For local trips, Jimmie's Cab operates service in both Willows and Orland. The availability of intercity services has become more limited in recent years. Greyhound provided five trips northbound and southbound per day to Willows and Orland along the I-5 Corridor in 1986 but in July, 1991 provided only three in each direction, as shown in Table 4-25.

Intercity bus services generally are unable to meet local transportation needs. At certain times, a large number of long-distance travelers can limit the number of seats available for short trips. Also, the services, by their nature, cannot provide convenient schedules and routing for riders at all locations on their routes. Of the six daily buses serving Orland, two leave in the early morning (before 6:30 a.m.) and two leave in the evening (7:25 and 9:50 p.m.). Greyhound can provide service from Orland to Chico in the early morning but no service is available in the return direction. All of the northbound trips from Willows and Orland leave in the late afternoon and evening, and all of the southbound trips are in the morning. This

TABLE 4-25
GREYHOUND TIMETABLE FOR GLENN COUNTY, 1991

	STOPS IN:			
Route Northbound	Chico	Sacramento	Leave Willows	Leave Orland
San Francisco-Seattle	No	No	5:10 PM	5:25 PM
Sacramento - Seattle	No	Yes	7:00 PM	7:25 PM
Sacramento - Seattle	No	Yes	9:25 PM	9:50 PM
	STOPS IN:			
Route Southbound	Chico	Sacramento	Leave Orland	Leave Willows
Seattle-Sacramento	No	Yes	4:00 AM	4:25 AM
Redding-San Diego	Yes	Yes	6:20 AM	--
Seattle-Sacramento	No	Yes	--	5:50 AM
Redding-San Francisco	No	No	11:00 AM	11:25 AM

Source: July, 1991 Greyhound Service Schedule (Table 600).

schedule would allow a person to travel from Orland to Willows or Sacramento and return the same day, but travel from Willows to Orland would require an overnight stay. The cost of a one-way fare between Orland and Willows is $3.00.

The carrier providing van service to Sacramento Metro Airport and AMTRAK service in Chico from Glenn County ceased operations in 1989, and no substitute exists at this time. Airport Transportation Services in Chico provides van service to Sacramento Metro Airport with five round- trips six days a week and three round-trips on Saturday, but Glenn County residents would have to provide their own transportation to Chico.

Merit Medi-Trans, based in Chico, is a private company providing wheelchair accessible vans by arrangement. The high cost of this service precludes its use on a frequent basis by persons that must be transported in a wheelchair. Mount Lassen Motor Transit, with offices in Red Bluff and Redding, offers charter and tour bus services in the region. It offers tours between Redding and Reno that stop in Orland to pick up and drop off passengers. The company also provides frequent tours to the San Francisco area and Mount Lassen Volcanic Park.

Supplementary Public Transit Services

The discussion of supplementary services is based in large part on material in the May, 1991 report entitled Glenn County Transit Feasibility Study, prepared by Nelson/Nygaard for the Glenn County Transportation Commission.

Tables 4-26 and 4-27 summarize the operations of the ten major supplementary public transit services that serve Glenn County residents. They serve one or more disabled groups, including elderly, handicapped, developmentally disadvantaged, and economically disadvantaged. Overall, these services reach a significant percentage of disadvantaged persons who do not have other feasible mobility options, but in many cases they only meet some of their needs.

Table 4-26
Summary of Glenn County Supplementary Transportation Services - Eligibility and Operations

Service	Operating Statistics			Ridership by Eligibility					
	Vehicles/ Whlchr Lifts	Monthly Riders	Monthly Trips	General Public	Elderly	Physical Handicap	Devlop-mntlly-Disadv.	Eco-nomic Disadv.	Native Amer-ican
County Department of Social Services	1/0	25	110					100%	
County Office of Education	8/2	77	3080			4%	96%		
County Health Department	0[1]	7	20					100%	
Senior Nutrition Program	Orland-1/1 Willws-1/1	22	1000		100%				
North Valley Services	2/0	27	1320				100%		
Northern Valley Indian Health Services	2/0	15	30						100%
County Headstart	1/0	8	250					100%	
County Gain Program	0[1]	450	11600[2]					100%	
Subsidized Taxi	3/0	957	957		X	X	X	X	
MediTrans Volunteer Driver Program	0[1]	34	2000		X	X	X	X	
Total Services	19/4	1622	20367	0	3	3	4	5	1

Notes: (1) Reimbursement for Expenses; (2) Estimate based on 3 round-trips per week for each rider.

Source: Transit Feasibility Study, Prepared for Glenn County Transportation Commission by Nelson/Nygaard. May, 1991.

Table 4–27
Summary of Glenn County Supplementary Transportation Services - Service Area and Trip Purpose

Service	Service Area				Trip Purpose				
	Intra-city	Inter-city	County-Wide	Inter-County	Medical	Education	Nutrition	Work	Shop/Other
County Department of Social Services			X	X	100%				
County Office of Education			X			100%			
County Health Department			X	X	100%				
Senior Nutrition Program	Orland Willows				10%		75%		15%
North Valley Services			X			25%		75%	
Northern Valley Indian Health Services				X	100%				
County Headstart	X				4%	95%	1%		
County Gain Program			X			100%			
Subsidized Taxi	Orland Willows				20%		15%	2%	63%
MediTrans Volunteer Driver Program			X	X					
Total Services	3	0	6	4	6	4	3	2	2

Source: Transit Feasibility Study, Prepared for Glenn County Transportation Commission by Nelson/Nygaard. May, 1991.

The services together have a total of nineteen vehicles, only four of which are equipped with wheelchair lifts. Despite this sizable number, no service operates more than two vehicles at a time except the transportation service operated by the County Office of Education to and from special education classes, which has eight vehicles. The subsidized taxi program has three vehicles, but one is a back-up vehicle and only one vehicle each is located in Willows and Orland.

Three of the programs do not have any vehicles but reimburse riders for their expenses. Reimbursement is generally limited to costs of operating a personal motor vehicle, e.g. $.35 per mile for the MediTrans volunteer program. The County Health Department has indicated that its funds for reimbursement fall short of the demand.

The supplementary programs are primarily oriented towards single trip purposes. For five of the services, all of the trips involved are for a single trip purpose, medical trips for three services and education/training for the two others. Three additional services provide between 75 and 95 percent of trips for a single purpose. The subsidized taxi programs in Willows and Orland are the only services that offer trips for a wide range of purposes. Over 60 percent of its trips fall into a broad category that includes shopping, personal business, social, and recreational trips. The service is available to all of the major disadvantaged groups, but its service area is limited to eligible residents within 1-1/2 miles of the City Halls of Willows and Orland.

Although many of the services technically provide county-wide and intercounty services, their limited resources and eligibility requirements make it difficult to meet all mobility needs. For example, the county-wide transportation services provided by the County Department of Social Services and the County Health Department are only for economically disadvantaged residents.

Unmet public transit needs, based on interviews with staff of existing providers and users, include the availability of intercity service between Orland and Willows, service between Orland and Chico, and expansion of the hours of service to early morning and evening hours. The 1991 Glenn County Transit Feasibility Study made two short-term recommendations to improve public transit service. First, the County should cooperate with Butte County in a joint intercounty study to identify the most feasible operating strategies. Second, the existing providers should improve coordination to increase the productivity of existing resources. Such coordination could include the joint scheduling of trips and sharing of vehicles that are in use for only part of the day.

4.4 HOUSING

Housing information presented in this Section, unless stated otherwise, refers to the unincorporated area of Glenn County. As described in Section 4.1 above, the population of Glenn County has grown moderately since 1980, at an average annual rate of 1.57 percent. A review of U.S. Census data and Department of Finance (DOF) estimates indicates that the housing stock in the unincorporated area of the county expanded by 491 units during the period 1980-1990, an average annual increase of approximately 50 units (see Table 4-28).

TABLE 4-28
TOTAL HOUSING STOCK 1980-1990
GLENN COUNTY UNINCORPORATED AREA

YEAR	NUMBER OF UNITS	% INCREASE
1980	4,590	
1990	5,081	+10.7%

Source: U.S. Census Bureau, 1980, 1990.

An examination of census data provides insight into the demand for different types of dwelling units within the unincorporated area. The three basic types of housing units for which data are presented include single family units, multiple family units (which range in size from duplexes to larger apartment complexes containing several units), and mobile homes located in mobile home parks and on individual lots.

The predominant type of dwelling unit in Glenn County continues to be the conventional single family residence, followed by mobile homes. Although the percentage of single family dwellings declined slightly from 1980 to 1990 (from 72.4 percent to 70.3 percent of the total housing stock), the percentage is still high in comparison to statewide figures. Statewide trends indicate a decline in the percentage of single family dwellings, due primarily to an increased market share of lower-priced mobile homes and rental apartment units (See Table 4-29).

Comparison of the growth rates of the three dwelling types in Glenn County illustrates the change in distribution of dwelling type. From 1980 to 1990, single family dwellings increased by only 7.4 percent, while multiple family units declined by 58.9 percent and the number of mobile homes increased by 63.5 percent. The proportion of the housing stock in the unincorporated area comprised of multiple-family units declined from 9.9

percent of the total supply in 1980 to 3.7 percent in 1990. This seemingly unusual decrease (in total numbers as well as percentage of the housing stock) can be explained by annexation of land with multiple-family structures to the cities of Willows and Orland.

The percentage of the local housing stock comprised of mobile homes, both in parks and on individual lots, has historically been higher than average in Glenn County, due to its rural and agricultural nature. The percentage of mobile homes increased from 17.6 percent of the housing stock in 1980 to 26.1 percent in 1990. Mobile homes are being located in the unincorporated communities of Glenn County as well as in agricultural areas.

Before current housing needs can be understood and future needs anticipated, housing occupancy characteristics must be identified. An analysis of household size, household growth, tenure and vacancy trends complements the previous analysis of population and housing characteristics during the same period.

A review of available data shown in Table 4-30 indicates that the number of households in Glenn County increased by 469 during the period 1980-1990, a 10.9 percent increase. The small decrease in the average household size in Glenn County during the 1980s follows a statewide trend toward smaller households (see Table 4-31), although it is still high in comparison to statewide averages. U.S. Census data for 1990 indicate that the average household size decreased to 2.8 persons per household in 1990.

The rate of home ownership within the Glenn County unincorporated area decreased slightly during this decade from 71.6 percent to 67.1 percent, as shown in Table 4-32. The statewide trend is toward a decreased rate of home ownership, due to the increased cost of housing.

The vacancy rate is a measure of the general availability of housing. It also indicates how well the type of units available meet the current housing market demand. A low vacancy rate suggest that families may have difficulty finding housing within their price range; a high vacancy rate may indicate either the existence of deficient units undesirable for occupancy, or an oversupply of housing units. The overall 1980 vacancy rate for Glenn County was 7.6 percent and the 1990 vacancy rate was 0.9 percent for owner-occupied units and 3.2 percent for renter-occupied units, showing a clear decline in the countywide vacancy rate.

TABLE 4-29
TOTAL DWELLING UNITS BY TYPE OF STRUCTURE
GLENN COUNTY UNINCORPORATED AREA
1980-1990

DWELLING TYPE	1980		1990		1980-1990
	Units	% of Total[1]	Units	% of Total	% Change
Single Family	3,324	72.4	3,570	70.3	+7.4
Multi-Family	456	9.9	187	3.7	-58.9
Mobile Homes	810	17.6	1,324	26.1	+63.5
Total Year-Round Dwelling Units	4,590	100.0%	5,081	100.0%	+10.7

1 Percentages may not total 100.0% due to rounding.

Source: U.S. Census Bureau, 1980, 1990.

TABLE 4-30
TOTAL HOUSEHOLDS 1980-1990
GLENN COUNTY UNINCORPORATED AREA

YEAR	NUMBER OF HOUSEHOLDS	% INCREASE 1980-1990
1980	4,301	
1990	4,770	+10.9%

Source: U.S. Census Bureau, 1980, 1990.

TABLE 4-31
AVERAGE NUMBER OF PERSONS PER OCCUPIED DWELLING UNIT 1980-1990
GLENN COUNTY UNINCORPORATED AREA

YEAR	AVERAGE HOUSEHOLD SIZE	% CHANGE 1980-1990
1980	2.9	
1990	2.8	-3.4

Source: U.S. Census Bureau, 1980; DOF Estimates, 1990.

TABLE 4-32
HOUSING TENURE 1980-1990
GLENN COUNTY UNINCORPORATED AREA

YEAR	OWNER OCCUPIED	%	RENTER OCCUPIED	%
1980	3,079	71.6	1,222	28.4
1990	3,199	67.1	1,571	32.9

Source: U.S. Census Bureau, 1980, 1990.

A windshield housing condition survey was completed in the unincorporated communities of Artois, Bayliss, Blue Gum Area, Butte City, Capay Area, Codora Four Corners, Glenn, and Ord Bend in June 1991, and surveys of the communities of Elk Creek, Hamilton City, North Willows, North East Willows and West Orland completed in 1987 by the Colusa-Glenn-Trinity Community Action Agency were updated. The results of the survey are presented in Table 4-33. It should be noted that the boundaries used in the earlier Community Action Agency Survey do not correspond to the boundaries used in the land use data reported in Section 4.2.

The rating system used in the 1991 survey was based on the format prescribed by the California Department of Housing and Community Development. The rating system evaluates residences based on the exterior condition of five components: roof, foundation, siding, windows, and doors.

Residences were rated as one of five possible condition categories: sound, minor, moderate, substantial, and dilapidated. These terms are defined as follows:

- Dwelling units rated as *"sound"* had no visible repair needs or needed one or two deferred maintenance repairs, such as painting, patching, or window repair.

- Dwelling units rated in need of *"minor"* rehabilitation required several deferred maintenance repairs and/or had one replacement repair need (such as the re-sheathing of the roof, replacement of siding, replacement of doors or windows, or partial foundation work).

- The *"moderate"* rehabilitation category was assigned to dwelling units that required two replacement repairs plus deferred maintenance. Complete replacement or installation of a foundation system and structural roof repair or replacement also typify "moderate" rehabilitation.

- A dwelling unit in need of *"substantial"* rehabilitation requires the replacement of three or more components.

- *"Dilapidated"* dwelling units are those which require the replacement of virtually all components and which are not financially feasible to repair.

Table 4-34 shows that 10.7 percent of the total housing units within the Glenn County unincorporated area were overcrowded in 1990 compared to 8.1 percent in 1980. The U.S. Census Bureau defines overcrowded housing units as those with in excess of 1.00 person per room average. The extent of the overcrowding problem in Glenn County is shown in the above-referenced table. However, the actual causes cannot be determined without conducting special studies.

TABLE 4-33
1991 HOUSING CONDITION SURVEY RESULTS
GLENN COUNTY UNINCORPORATED COMMUNITIES

Community	Condition	Number	Percent
Artois*	Sound	16	32.0
	Minor	8	16.0
	Moderate	11	20.8
	Substantial	10	20.8
	Dilapidated	5	10.4
Bayliss	Sound	14	73.7
	Minor	4	21.1
	Moderate	1	5.3
	Substantial	0	0
	Dilapidated	0	0
Blue Gum Area	Sound	5	71.4
	Minor	2	28.6
	Moderate	0	0
	Substantial	0	0
	Dilapidated	0	0
Butte City*	Sound	13	35.3
	Minor	6	17.7

Community	Condition	Number	Percent
	Moderate	7	18.8
	Substantial	7	18.8
	Dilapidated	3	9.4
Capay Area	Sound	121	87.7
	Minor	7	5.1
	Moderate	8	5.8
	Substantial	2	1.4
	Dilapidated	0	0
Codora Four Corners	Sound	12	100.0
	Minor	0	0
	Moderate	0	0
	Substantial	0	0
	Dilapidated	0	0
Elk Creek*	Sound	30	42.7
	Minor	15	21.3
	Moderate	10	14.4
	Substantial	10	14.4
	Dilapidated	5	7.2
Glenn	Sound	7	53.8
	Minor	4	30.8
	Moderate	1	7.7

Community	Condition	Number	Percent
	Substantial	1	7.7
	Dilapidated	0	0
Hamilton City*	Sound	321	55.3
	Minor	161	27.7
	Moderate	40	6.8
	Substantial	39	6.8
	Dilapidated	20	3.4
North East Willows*	Sound	49	23.3
	Minor	25	11.7
	Moderate	55	26.0
	Substantial	55	26.0
	Dilapidated	27	13.0
North Willows	Sound	200	85.1
	Minor	22	9.4
	Moderate	11	4.7
	Substantial	0	0
	Dilapidated	2	0.9
Ord Bend	Sound	8	61.5
	Minor	4	30.8
	Moderate	0	0
	Substantial	1	7.7

Community	Condition	Number	Percent
	Dilapidated	0	0
West Orland	Sound	212	88.3
	Minor	18	7.5
	Moderate	6	2.5
	Substantial	1	.4
	Dilapidated	3	1.3

* Note: Information updated from 1987 survey completed by Colusa-Glenn-Trinity Community Action Agency by QUAD Consultants; percentages represent estimates due to different methodology employed by that survey. Housing Conditions Survey boundaries do not correspond to Land Use Survey boundaries, thus totals are not necessarily equivalent.

Source: Colusa-Glenn-Trinity Community Action Agency, 1987; Glenn County Planning Department; QUAD Consultants, 1991.

TABLE 4-34
OVERCROWDING, 1980-1990
GLENN COUNTY UNINCORPORATED AREA

	1980 Housing Units			1990 Housing Units		
	Owner	Renter	Total	Owner	Renter	Total
Total Housing Units	3,079	1,222	4,301	3,199	1,571	4,770
Overcrowded (1.01+ persons per room)	184	163	347	271	241	512
Incidence of Overcrowding (%)	6.0	13.3	8.1	8.5	15.3	10.7

Source: U.S. Census Bureau, 1980; 1990 owner and renter estimates and calculations, QUAD Consultants.

State Housing Law requires that the special needs of certain disadvantaged groups be addressed. The needs of the elderly, disabled, large families, female heads of household and farm workers are described below. Table 4-35 indicates that 1849 residents of the unincorporated area, or 13.4 percent of the total population, were 65 years of age or older in 1990, compared to 1583 persons in 1980.

Table 4-36 indicates the number of persons in 1980 who had disabilities that either restricted working or restricted them from using public transportation. It should be noted that the listing of those persons with transportation disabilities also includes a large number of persons 65 years or older. As indicated 5.1 percent of Glenn County households contained members who have work limitations because of a disability and 2.5 percent experienced transportation disabilities. Estimates for 1990 are also included in this table; 1990 Census data is not yet available.

Large families are indicative not only of those households that require larger dwellings to meet their housing needs, but also are reflective of a large number that live below the poverty level. Table 4-37 indicates the numbers and percentages of those households that had five or more members in 1980 and 1990.

Families with female heads of household experience a higher than average incidence of poverty as well. Table 4-38 lists the numbers and percentages of female-headed households for 1980 and 1990 (U.S. Census, 1990).

TABLE 4-35
ELDERLY POPULATION 1980-1990
GLENN COUNTY UNINCORPORATED AREA

YEAR	NUMBER AGE 65+	PERCENT OF TOTAL
1980	1,583	12.6
1990	1,849	13.4

Source: U.S. Census Bureau 1980, 1990.

TABLE 4-36
DISABLED POPULATION 1980-1990
GLENN COUNTY UNINCORPORATED AREA

YEAR	WORKER DISABILITY	% OF POPULATION	TRANSPOR-TATION DISABILITY	% OF POPULATIO N
1980	638	5.1	317	2.5
1990	702	5.1	344	2.5

Source: U.S. Census Bureau, 1980; 1990 estimates and calculations, QUAD Consultants.

TABLE 4-37
LARGE FAMILIES 1980-1990
GLENN COUNTY UNINCORPORATED AREA

	1980 Housing Units			1990 Housing Units		
Household Type	Owner	Renter	total	Owner	Renter	Total
Total Housing Units	3,079	1,222	4,590	3,199	1,571	5,081
Large Families (5+ persons)	492	218	710	512	280	788
Rate of Large Families (%)	16.0	17.8	15.5	16.0	17.8	15.5

Source: U.S. Census Bureau, 1980; 1990 estimates and calculations, QUAD Consultants.

TABLE 4-38
FEMALE HEADS OF HOUSEHOLD 1980-1990
GLENN COUNTY UNINCORPORATED AREA

	1980	1990
Female-headed Families (2+ persons per household)	241	267
Total Households	4,301	4,770
% of Total Households	5.6	5.6

Source: U.S. Census Bureau, 1980; 1990 estimates and calculations, QUAD Consultants.

4.5 PUBLIC SERVICES

4.5.1 Water

Domestic water is provided in the City of Willows and Hamilton City by California Water Service Company (CWSC). CWSC maintains approximately 2,300 accounts in Willows and 440 accounts in Hamilton City. The two communities are supplied with groundwater by ten wells; eight serving Willows and two serving Hamilton City. The depth of the wells is estimated to range from 600 to 900 feet. The average winter demand amounts to one million gallons per day (MGD) and 2.5 MGD in summer. Weekly bacteriological samples are taken by CWSC throughout their service area to determine if bacteria exists in the water supply. The CWSC also tests annually for traces of organic and inorganic chemicals. There is an adequate supply of available ground water to meet the needs of future growth, according to CWSC. (Pers. comm., Bob Thompson, California Water Service Company, July 1991.)

The City of Orland provides domestic water to 1,877 residential customers and 338 commercial customers. The City currently operates eight wells to serve its customers. The Black Butte Water Company supplies domestic water to seventy-eight homes located in the

Black Butte subdivisions in West Orland. (City of Orland, Orland Area General Plan April, 1991.)

There are three Community Services Districts which supply domestic water in Glenn County:

- Elk Creek Community Services District, which serves 130 customers with water from Stony Gorge Reservoir.
- Butte City Community Services District which serves 39 customers.
- Artois Community Services District, which serves 52 customers.

Other domestic water is typically obtained by individual wells. Wells can be drilled successfully and are numerous in the Valley region, but are less numerous in the foothill region because of the additional cost and difficulty of locating potable water.

Irrigation water is supplied by ten water or irrigation districts or private wells. The Capay Rancho Water District and Chrome Water District are currently inactive. A complete list of the active water and irrigation districts is as follows:

- Stony Creek Water District
- 4-E Water District
- Provident Irrigation District
- Princeton-Codora-Glenn Irrigation District
- Orland Unit Water Users Association
- Orland-Artois Water District
- Kanawha Water District
- Glide Water District
- Glenn-Colusa Irrigation District
- Hunter Creek Water District

(Pers. comm., Christy Leighton, Glenn County Planning Department, July 1991.)

4.5.2 Wastewater

There are three wastewater treatment facilities serving most of the urbanized portion of Glenn County: Willows, Orland, and Hamilton City.

The Hamilton City Community Services District manages the community's wastewater treatment facility, which serves a population of 2,500. The facility treats an average daily flow of approximately 0.25 million gallons per day (MGD), about half of the 0.5 MGD design capacity. The plant has seven oxidation ponds, only three of which are currently in use. Since the facility was not designed to receive storm drainage, wet weather does not affect the flow. The facility can serve an additional 2,500 residences before expansion is necessary, according to District management. (Pers. comm., Ralph Vidauri, Hamilton Community Services District Wastewater Treatment Facility, July 1991; Don Holm, Glenn County Health Department, September 1991).

The City of Orland wastewater treatment plant serves approximately 2,000 residences as well as commercial and industrial uses. The plant has been treating 0.6 MGD of wastewater, and has a design capacity of 2.1 MGD. The City of Orland is anticipating a 110-acre expansion of its sewer treatment ponds near the Orland airport to accommodate expected future growth. (City of Orland, Orland Area General Plan, April 1991; Don Holm, September 1991).

The City of Willows wastewater treatment facility provides service to both the City of Willows and North East Willows, under contract to the Northeast Willows Community Services District. A population of approximately 6,000 is served by the facility. The 1990 average daily flow is estimated at 0.75 MGD, a little over half the 1.12 MGD design capacity. The facility is capable of handling the area's current yearly growth rate, assuming the rate remains constant, in the years to come. There are no future expansion plans. (Pers. comm., Thomas Landon, Landon Engineering and Surveying, July 1991; Don Holm, September 1991).

Other wastewater treatment facilities in the Glenn County area include a system operated by CALTRANS at the I-5 rest stop, industrial wastewater treatment ponds operated by Holly Sugar in Hamilton City and those operated by Glenn Milk Producers Association on County Road 39.

Wastewater treatment in areas not served by any of the wastewater treatment facilities is provided by individual septic tank and leachline systems. Septic tanks operate well in parts of Glenn County and City of Orland, typically where the soil drains well and is considered gravelly. However, the very rapidly percolating soils (<5 minutes/inch), such as the Cortina series, known to exist in the Orland area, provide inadequate treatment for the sewage before it reaches the groundwater. The southern part of the county is dominated by heavy clay soils with a slow percolation rate (>60 minutes/inch) and a high ground water table (less than 3 feet below the surface in some areas).

In the North Willows area the soils are deep, well-drained and slowly permeable resulting in the need for large leach fields to adequately treat the sewage. Septic tanks in the foothill region are difficult to install primarily due to the limited amount of soil covering rock.

In May, 1990, Glenn County adopted new sewage disposal regulations for on-site wastewater disposal systems. The Glenn County Health Department is in the process of initiating a study to further evaluate these regulations with regard to adequate filtration, the design of alternative systems for use in some of the extreme soil conditions that exist in the county, and the development of construction standards for the installation of shallow trench and lined trench leach line systems. (Pers. comm., Don Holm, Glenn County Health Department, July 1991.)

4.5.3 Utilities

Natural gas and electrical service in the county are provided by Pacific Gas and Electric Company (PG&E). PG&E owns, operates and maintains electric service in the Glenn County region. There are currently 129 miles of 230,000 volt (230 kV) transmission lines, and 112 miles of 115,000 volt (115 KV) transmission lines in the county. The 115 KV lines are currently operated at only 60 kV because of relatively low demand.

The Pacific Northwest-Pacific Southwest Intertie transmission line runs in a north-south direction through Glenn County approximately four miles west of Interstate 5. The intertie consists of two alternating current (AC) lines and one direct current (DC) line capable of transmitting 5,200 megawatts (MW) of power between the regions. The

California-Oregon Transmission Project, currently under construction, will add approximately 1,600 MW of additional transfer capability within the existing transmission corridor.

Voltage losses can occur over long distribution lines. Additional transmission facilities would be sited in areas designated for or experiencing development to minimize any potential voltage losses.

There are currently four primary natural gas transmission pipelines serving Glenn County, including a thirty-six inch diameter pipeline that spans the county from north to south along I-5. Smaller gas pipelines transport natural gas from gas field sites within the County to PG&E's main gas pipeline system (Fugro-McClelland (West) Inc., 1991).

Pacific Telephone Company provides telephone service to the Glenn County region.

4.5.4 Schools

There are ten public school districts in Glenn County, each with its own Board of Trustees. Table 4-39 provides a listing of the school districts, current and projected enrollment and facility capacity. There are ten elementary schools, two intermediate schools, five high schools, and three continuation schools in the county. Elk Creek Alternative School provides educational opportunities to adults and returning students.

All of the school districts anticipate the 1991-1992 enrollment to be approximately the same or slightly higher than the 1990-1991 enrollment with the exception of two school districts. Hamilton Union Elementary District projects an enrollment increase of twenty students and Willows Unified School District projects seventy-five. Willows Unified is currently the only school district in Glenn County at maximum facility capacity. Two new portables were recently added and the District is considering placing a bond issue on the local ballot to assist in financing needed additional facilities.

TABLE 4-39
GLENN COUNTY SCHOOL DISTRICTS
ENROLLMENT AND OPTIMUM CAPACITY

SCHOOL DISTRICT	JUNE 1991 ENROLLMENT	FALL 1991 PROJECTED ENROLLMENT	OPTIMUM FACILITY CAPACITY	PORTABLES NEEDED
Capay Joint Union	152	152	210	0
Lake School	130	130	150	0
Plaza School	131	131	N/A	N/A
Hamilton Union Elementary	470	490	550	0
Orland Joint Union	1,572	1,565	1,654	0
Hamilton Union High	220	220	300	0
Willows Unified	1,950	2,025	2,025	2
Princeton Joint Unified	230	230	N/A	0
Stony Creek Joint Unified	188	178	420	0
Orland Joint Union High	579	565	752	0

Source: QUAD Consultants, 1991.

4.5.5 Parks and Recreation

The Glenn County Building and Grounds Department operates nine parks encompassing approximately 100 acres. The Cities of Orland and Willows each maintain four parks totaling forty-two acres of parkland in Orland and thirty-two acres of parkland in Willows. Both cities offer their residents recreational programs for all age groups. Table 4-40 lists federal, county, and city parks located in Glenn County.

There are currently four federal park facilities, including Mendocino National Forest and the Sacramento National Wildlife Refuge. The Forest offers a variety of recreational opportunities both in Glenn County and in adjacent counties, including camping, backpacking, boating, fishing, hunting, and off-highway vehicle use. There are two designated wildernesses: the 100,600 acre Yolla Bolly Middle Eel Wilderness, and the Snow Mountain Wilderness with approximately 37,200 acres (Pers. comm., English).

The Sacramento National Wildlife Refuge is located in the southeastern portion of the county adjacent to Interstate 5, of which approximately 8,555 acres are located in Glenn County. The facility provides a wintering area for migratory waterfowl.

TABLE 4-40
PARK AND RECREATION FACILITIES IN GLENN COUNTY

FACILITIES	ACRES
Federal Facilities	
Mendocino National Forest	
The Sacramento National Wildlife Refuge	
Black Butte Lake	
Stony Gorge Reservoir	
County Facilities	
Orland Memorial Hall	.75

FACILITIES	ACRES
Hamilton City Park	1
Walker Creek Park	7
Willows Memorial Hall	.75
Ord Bend Park	12
Site 21	47
Site 48	28
Butte City Boat Ramp	2
Monroeville Cemetery Historical Site	1
City Facilities	
Orland	
Vinsonhalen Park	17
Tely Aquatic Park	21
Library Park	2.5
Spence Park	2.5
Willows	
Jensen Park	14
Sycamore Park	11
20-30 Park	2.5
SP Park	.25

Source: Glenn County Land Use Element.

4.5.6 Health Services

The United States Army Corps of Engineers provides camping facilities at Black Butte Lake. The two larger campsites, Orland Buttes and Grizzly Flat, receive approximately 72,000 visitors annually. The United States Bureau of Reclamation provides

three camping areas, three picnic areas, one boat ramp and one common area for groups at Stony Gorge Reservoir.

Health care facilities within Glenn County encompass Glenn General Hospital located in the City of Willows, Willow View Convalescent Center, residential care facilities, and a senior citizen housing complex as well as private physicians and other medical practitioners.

Glenn General Hospital, a County operated hospital, provides acute care service and is licensed for 80 beds. However, only thirty-two beds are currently available for use. There are currently eighty-two hospital personnel, forty per diem personnel and sixteen private doctors on the active staff. The hospital is located at 1133 West Sycamore in the City of Willows. Glenn General Hospital offers 24-hour emergency care, outpatient care, general surgical care, outpatient surgical care, and minor heart surgery. The hospital sponsors an orthopedic clinic, a urology clinic, a cardiology clinic, podiatry clinic, gastroenterology clinic, neurology clinic, and obstetric-gynecology clinic. Future hospital plans include reopening the pulmonary clinic.

Residents typically travel to other facilities, such as Enloe Hospital in Chico, for certain specialized services including burns, major heart surgery, and severe trauma and psychiatric care. (Pers. comm., Kathleen Wells, Glenn General Hospital, July 1991.)

The Glenn County Public Health Department is organized under the Glenn County Health Services Agency and provides maternal and child health care programming, California Children's Services, child health and disability programs, vaccinations and general public health nursing to the community. In addition, the Public Health Department also provides Environmental Health services to Glenn County citizens comprised of water system reviews, vector control, restaurant checks and consultation.

Alcohol & drug programs are also organized under the County Health Service Agency and provide residential treatment, out-patient counseling, perinatal programs and community education and information. Mental Health programs offered by the same agency provide services to citizens of all ages who have a demonstrated mental disorder or affective disorder. Services include but are not limited to in-patient services, residential services, out-patient counseling, medication monitoring and community education and referral (Pers. comm., Mike Cassetta, Glenn County Public Health Department, September 1991).

4.6 ECONOMIC PROFILE

The following section describes the current Glenn County economy. The subsections presented below focus on five distinct components of local economic activity: agriculture, forestry, tourism, retail, and industrial activity. Also discussed are several miscellaneous aspects of local and regional economic development and evident trends in the economic outlook for the county. A substantial amount of the data cited in this discussion is derived from existing sources of record (see References). Inferences drawn from this data, however, are largely those of QUAD Consultants, unless otherwise noted in the text.

A general characterization of the economy of Glenn County would be that it is comparatively dependent upon a narrow range of activities, is heavily dependent upon public sector (government) employment, generates employment and income at rates below the average for the State of California and the United States, and is somewhat static (that is, relatively little change occurs in the distribution of economic activity among the various segments of the economy from year to year). It may also be fair to characterize the local economy as fairly vulnerable to deterioration, however. At a time when agriculture is increasingly constrained by the combined effects of drought, intensified regulation, and declining markets (e.g. beef consumption), and when government spending is subject to greater scrutiny and reduced resources, the predominance of agriculture and government employment in the county's economic profile suggests that the absence of diversity in the local economy forebodes poorly for the county's long-term future.

Based upon data compiled by the University Center for Economic Development and Planning, California State University, Chico (Glenn County Profile, 1991), Glenn County has a proportionately high average annual unemployment rate in comparison to the rate for the balance of California and the national average. In 1989, the annual unemployment rate in Glenn County was 11.9 percent; in contrast, the Statewide rate for the same year was only 5.1 percent and the nationwide average was 5.3 percent. For 1990, the annual unemployment rates were 12.5 percent in Glenn County and 5.6 percent in California as a whole. Nationwide figures for 1990 were not yet available at the time of this writing. The total labor force in Glenn County numbers an estimated 10,350 workers; the average number of those workers employed is about 9,050. Of corollary interest, although not directly corresponding, is the percentage (12.5) of county residents receiving some form of public assistance through the County's Department of Social Services in June, 1991.

A significant characteristic of employment in Glenn County is the seasonal fluctuation in the availability of job opportunities. As is typical of California's more rural, agricultural regions, seasonal, agriculturally-oriented jobs result in high unemployment rates during the winter months and comparatively low rates during the summer and fall harvest seasons. Historically, Glenn County's unemployment rates on a monthly basis have reflected this pattern consistently from year to year, with unemployment dropping to well below ten percent from May through October, but rising to fifteen percent or more from December through March. It should be noted, however, that employment data maintained by the State Employment Development Department for 1991 in Glenn County indicate consistently high monthly unemployment rates, even through spring and summer, near eighteen percent.

According to the University Center's Glenn County Profile, previously referenced, the per capita personal income in Glenn County in 1989 was $16,185. This income level ranked twenty-sixth among California's fifty-eight counties. As the Profile notes, this per capita personal income represented only eighty-one percent of the Statewide average ($19,929) for 1989 and ninety-two percent of the national average ($17,596) for the same period. Growth in personal income in Glenn County for the decade 1979 to 1989, according to data supplied by the University Center, was 5.1 percent annually; growth in Statewide personal income over the same period averaged 6.5 percent per year, and personal income growth nationwide totalled 6.9 percent annually. From this data it can be ascertained that, in general, the average Glenn County wage earner kept up with inflation during the 1980's, but growth in local earnings and corresponding purchasing power did not increase as rapidly for Glenn County workers as for workers elsewhere in the State and nation.

4.6.1 Agriculture

Historically, agriculture has been one of the dominant segments of the Glenn County economy. Intensive agricultural production has been a significant activity since the initial settlement of the county. According to the State of California Employment Development Department (EDD), agriculture represented the single largest source of private sector employment in Glenn County in 1990. Rice grown in the eastern, valley floor portion of the county represents the single most substantial agricultural commodity produced in Glenn County. In 1990, rice accounted for over $50 million in crop value, compared to the $27.2 million in value attributable to dairy products, the next most valuable commodity. Almonds, prunes, cattle, hay and alfalfa, sugar beets, wheat, walnuts, and olives comprised the balance

of the ten most valuable agricultural commodities in the county last year. Other significant commodities produced in Glenn County include seed crops and nursery products.

Discussions with the Glenn County Agricultural Commissioner's office disclose that the rice industry in the county is subject to fluctuation in both production levels and value from year to year, based upon water availability in the case of the former and upon price and federal subsidy programs in the instance of the latter. In general, however, these levels do not vary significantly, and the predominant role of rice production in the local agricultural economy is anticipated to continue. No other major trends are foreseen by the Agricultural Commissioner's office in county agriculture. Proportionately minor growth is anticipated in the dairy industry locally, as metropolitan area dairy facilities are displaced by urban growth in other parts of the State and some such facilities relocate to Glenn County. Tomato production may also undergo local growth if new plant varieties are introduced into the region, particularly in Colusa County, with some "spillover" into Glenn County.

Agricultural employment in Glenn County in 1989 represented 21.8 percent of the total countywide jobs base. As is true throughout much of California, employment in agriculture has declined somewhat in Glenn County in recent years -- from 24.3 percent in 1972 and 26.3 percent in 1980. In terms of real jobs, there were 1,375 persons employed in agriculture in the county in 1972; 2,200 individuals held agricultural jobs in 1980; and 1,725 agricultural jobs existed in Glenn County in 1989. It should be noted, however, that these totals include persons employed in forestry, which has been subject to a more rapid decline than agriculture in general over the past decade, and consequently real agricultural employment is actually now comparatively constant in terms of numbers of local jobs available. However, as employment in other sectors of the county's economy may increase, the percentage of countywide employment attributable to agricultural jobs can be expected to continue to decrease.

Agriculture is a particularly fragile segment of the economy, in some respects, upon which to be as heavily dependent as Glenn County is for employment, income and economic stability. In addition to the seasonal profile of agricultural employment, agricultural production is susceptible to climatic factors (e.g. the 1990 freeze, the five-year drought) beyond human control; a variable U.S. dollar value against foreign currencies, affecting overseas marketability of agricultural products; federal policies regarding subsidies and

assistance to farmers; and the federal and State regulatory environments, which govern, and increasingly constrain, such agricultural operations as pesticide and herbicide application, waste burning, irrigation water, and employee/employer relations.

4.6.2 Forestry

The western portion of Glenn County is encompassed within the boundaries of the Mendocino National Forest, which occupies about 1,397.5 square miles and includes portions of six counties in the region. Approximately twenty-two percent of Glenn County's total land area lies within forest boundaries.

Data from the Glenn County Profile indicate that the value of harvested timber in Glenn County in 1990 was approximately $4.8 million. About 4.4 percent of the county's total workforce was employed in forestry-related industry in 1990, representing roughly 425 jobs, making this sector of the county's economy the sixth largest among categories of major employers. Approximately sixty percent of all forest-related employment is attributable to timber management programs and activities.

For decades, the harvesting of timber in the National Forest has been a substantial source of economic activity in Glenn County and the surrounding region. However, projections by the U.S. Forest Service (USFS) suggest that timber production in the Mendocino National Forest may decline to less than thirty to forty percent of levels prevalent in the 1980's. Substantially affecting timber production potential in the Mendocino National Forest are the recent listing of the northern spotted owl as a threatened wildlife species, recent and pending legislation, recent lawsuits, and increased regulation of private timber harvesting. Regionally, lumber mills have closed down or been consolidated into major milling centers. The role of the timber industry, and of forestry in general, is not expected to grow in relationship to the balance of the Glenn County economy.

4.6.3 Tourism

Tourism in Glenn County, principally capitalizing on the area's natural resources in the form of forest lands, the Sacramento River, native and migratory wildlife, and to a lesser extent, agriculture, currently occupies a proportionately small niche in the area's economy.

Existing attractions which are generally acknowledged to draw visitors to the county from out of the area include the camping and recreational facilities operated by the U.S. Forest Service in the western portion of the county; the Sacramento Valley National Wildlife Refuge just south of Willows; pheasant and migratory waterfowl hunting activities distributed throughout the easterly portion of the county; farming and agricultural activities on private properties throughout the county; and water-oriented recreational activities on reservoirs located in western Glenn County and along the Sacramento River. To some degree, the service sector of the county's economy is supported by incidental traveler-generated business from traffic on Interstate Highway Route 5 (I-5), as well.

There are currently virtually no statistical data sources available which would quantitatively describe the general level of tourism activity in the county. The Mendocino National Forest maintains statistics for recreational use of the forest, but record data is kept for the forest as a whole and is not readily available on a county-by-county basis. Moreover, the most recent comprehensive data supplied is current only through 1983, although Forest Service personnel are knowledgeable regarding present-day activity levels. According to Forest Service sources, the Mendocino National Forest experienced approximately 934,000 recreation visitor days in 1983, an increase of about 10.4 percent per year over the preceding five-year period. Of this total, 26.3 percent was comprised of utilization of developed recreation facilities in the forest; the remaining three-quarters was in the form of what the Forest Service refers to as "dispersed recreation". The Forest Service projects that population growth in the Mendocino National Forest's "recreation zone", the area lying within two hours' drive from the forest boundaries, will occur at a rate of 2.8 percent annually for the next fifty years. Based upon this growth rate, the Forest Service forecasts that the Mendocino National Forest has a land base sufficient to meet expected recreation demand up to the year 2030.

Two goals of the USFS pertinent to rural economic development are to add stability and stimulate rural economies and maximize tourism in the National Forests. There are a few programs that have been adopted to achieve these goals. One such program provides a limited number of grants to counties for economic diversification studies to identify rural development activities and projects in or adjacent to a National Forest. Another program sponsored by the USFS provides for a marketing plan developed by a county that publicizes the camping and recreational opportunities in and/or near National Forest land. At this time, there are no programs underway by Glenn County that are sponsored by the USFS.

However, the USFS periodically invites proposals for their programs, at which time Glenn County, along with other counties, has the opportunity to submit proposals (Pers. comm., Jim Giachino, 1991).

The Sacramento National Wildlife Refuge, located immediately southeast of the City of Willows, also maintains statistics on visitor activity levels on an annual basis. Operated by the U.S. Fish and Wildlife Service, Department of the Interior, the Sacramento National Wildlife Refuge is one of a network of four such facilities located in the Glenn/Colusa/Sutter County region. Serving as the headquarters for the Sacramento Valley Wildlife Refuges, the Sacramento National Wildlife Refuge offers a visitor center, a six-mile automobile tour, a walking tour, photography blinds, guided group tours and other opportunities and services related to wildlife observation. Portions of the refuge also are open to hunting during October and January each year and are open to fishing activities from February to October in designated areas. Among the four refuges comprising the network, the Sacramento National Wildlife Refuge experiences the greatest visitor activity. This is at least partially attributable to its location immediately adjacent to I-5, with a program of recently-installed freeway signage directing passers-by to the facility. In calendar year 1990, the Sacramento National Wildlife Refuge attracted approximately 61,000 visitors and an additional 6,000 hunters. According to refuge staff, the majority of visits to the facility take place between October and March annually, corresponding to the migratory waterfowl season. November and December are the peak months for visitor traffic. As new facilities (e.g. an observation tower) are constructed at the refuge, staff expect total visitation activities to increase.

It is reported by Glenn County officials that observable increases in travel to the area by nonlocal visitors occur during the fall hunting season. Upland bird and migratory waterfowl hunting on portions of the area's wildlife refuges, as well as on some privately-owned properties, is known to attract large numbers of out-of-area residents to the county, often for periods involving overnight stays.

In November, 1990, a study prepared under the auspices of the Glenn County Economic Development Corporation was published on tourism potential in Glenn County. That study focused on the extent to which farm operation visitation programs could be enhanced, identified potential for wildlife and nature-oriented activities to be expanded as a local tourist attraction, suggested that a series of sports activities could be conducted in

the county to attract additional visitors, and hypothesized that various "special events" might be successful in drawing tourism trade to the county and region. According to the study, there is already a limited amount of visitor activity on local farms and ranches; County Planning Department officials further indicate that policies accommodating tourism are being worked *de facto* into the administration of the County's zoning ordinance. There was only limited response, however, during the study to inquiries among area agricultural property owners regarding their interest in hosting farm and ranch-oriented tourist activities. At least some local officials active in economic development in Glenn County have expressed skepticism regarding the potential effectiveness of a farm visitation program as an economic enhancement strategy.

Current traffic volumes on I-5 passing through Glenn County are reported in Section 4.3. In recent years, highway-oriented commercial uses (e.g. restaurants, fast food outlets, motels, and gasoline sales and service) have been developed at one freeway interchange in Willows to capture a portion of the business typically generated by such highway traffic. Similar development in Orland is constrained by current jurisdictional boundaries, property ownership and configuration, and the absence of any identifiable entrepreneurial initiative. Tourism traffic through the county utilizing I-5 is generally comprised of motorists traveling between California's metropolitan areas to the south and Lake Shasta, the Lassen National Park area, Mount Shasta recreational areas and the Pacific Northwest.

The U.S. Forest Service is coordinating the paving of Forest Highway 7 (Alder Springs Road) from approximately Alder Springs in Glenn County to Covelo in Mendocino County. This process is expected to occur in two phases. The first phase involves the repairing and asphalt repaving from the terminus of State Highway 162 to Alder Springs. It is anticipated that phase one will commence in 1993 or 1994 and conclude three years later. In the second phase, the unpaved portion will be asphalt paved and widened at various points according to federal and state standards. The entire project is expected to be completed in 10 to 15 years and is being sponsored in part by Federal Highway Funds and in part by the USFS (pers. comm., Gianchino, 1991).

4.6.4 Retail

Retail trade in Glenn County represents a somewhat smaller proportionate source of employment and corresponding economic activity locally than is true for the State of

California as a whole. In 1989, approximately 13.2 percent of Glenn County employment was in the retail sector of the economy. For the same period, 17.1 percent of the Statewide labor force was employed in retail trade. It is worth noting, as well, that Glenn County's percentage of employment in retail outlets is substantially lower than the percentages for adjacent Butte (22.7 percent) and Tehama (20.4 percent) Counties. This disparity suggests that Glenn County retail outlets capture proportionately less of the regionally-generated retail trade than do outlets in other nearby counties.

Annual taxable sales in Glenn County in 1990 totaled approximately $172 million (see Table 4-41). Retail sales accounted for about $89.2 million of that total. Per capita taxable sales for that year were approximately $7,036; per capita retail sales were $3,646 (see Table 4-42). In contrast, per capita taxable sales for Butte County in 1990 were $7,723; per capita retail sales were $5,881. Per capita taxable sales in Chico were $16,816 in 1990, in comparison to per capita taxable sales in Orland of $8,884 and per capita taxable sales in Willows of $7,259 during the same year. Per capita retail sales in Orland and Willows in 1990 were $6,795 and $6,165, respectively, while in Chico, per capita 1990 retail sales amounted to $14,861. Adjusting actual retail and taxable sales data for inflation for the period 1986 to 1990 discloses that, in real dollars, sales activity in Glenn County as a whole, and in the City of Willows, has declined slightly during the past five years. Adjusted taxable sales countywide for the period actually decreased by 3.5 percent, while adjusted retail sales dropped 1.5 percent. Similarly, in Willows for the same period, adjusted taxable sales were down one percent; adjusted retail sales declined 6.2 percent. Only in Orland did adjusted sales actually increase. From 1986 to 1990, total taxable sales, adjusted for inflation, grew by 9.9 percent, while retail sales, after adjustment, showed 10.5 percent growth. It is worth noting that the total number of outlets selling taxable and retail goods remains virtually unchanged in Glenn County from five years ago (see Table 4-43).

It is generally acknowledged that substantial "leakage" of retail sales, particularly for so-called "comparison shopper goods" (e.g. furniture, appliances, automobiles, high-ticket clothing, and electronics) takes place in Glenn County. Many shoppers are presumed to travel to Chico and even to Sacramento to make major retail purchases. Such leakage often occurs in market areas with a population and/or economic base too small to support major comparison shopper goods outlets.

TABLE 4-41
TOTAL ANNUAL RETAIL AND TAXABLE SALES, BY JURISDICTION,
IN GLENN COUNTY
1986-1990
(000'S)

	1986		1987		1988		1989		1990	
	Retail	Total	Retail	Total	Retail	Total	Retail	Total	Retail	Total
Orland	25,522	33,543	27,147	33,922	31,857	38,963	32,852	42,387	34,330	44,884
Willows	32,320	36,062	34,683	39,820	35,920	41,006	38,194	44,486	36,917	43,466
Total County	74,376	146,380	76,833	145,764	83,561	159,836	87,755	173,386	89,158	172,030

Source: California State Board of Equalization

TABLE 4-42
PER CAPITA ANNUAL RETAIL AND TAXABLE SALES, BY JURISDICTION,
IN GLENN COUNTY
1986-1990

	1986		1987		1988		1989		1990	
	Retail	Total	Retail	Total	Retail	Total	Retail	Total	Retail	Total
Orland	5,710	7,504	6,060	7,572	6,836	8,361	6,960	8,980	6,795	8,884
Willows	6,470	7,002	6,606	7,585	6,809	7,774	7,206	8,394	6,165	7,259
Total County	3,248	6,392	3,362	6,379	3,610	6,904	3,718	7,347	3,646	7,036

Sources: California State Board of Equalization; California Department of Finance, Population and Research Unit; U.S. Bureau of the Census

TABLE 4-43
NUMBER OF TAXABLE SALES OUTLETS, BY JURISDICTION,
IN GLENN COUNTY
1986-1990

	1986 Retail Total		1987 Retail Total		1988 Retail Total		1889 Retail Total		1990 Retail Total	
Orland	100	203	99	198	102	207	97	204	102	219
Willows	92	206	96	213	98	215	96	218	94	209
Total County	276	710	278	700	285	713	281	715	279	709

Source: California State Board of Equalization

4.6.5 Industry

Industrial development in Glenn County traditionally has been limited. The predominance of agriculture in the county's historic economic profile has resulted in a concentration of agriculturally-related industries, but diversity among the industrial sector of the county's economy is a missing attribute.

Statistics available from the State's Employment Development Department indicate that approximately one-fifth of the workforce is employed in the manufacturing sector of the Glenn County economy. This figure represents nearly a doubling of manufacturing employment over the past five years and is slightly higher than the statewide rate of industrial employment (about 16.7 percent of the workforce). According to local officials, however, the major industrial employers in the county are predominantly agricultural in orientation. The Manville Building Insulation plant near Willows is the only major nonagricultural industrial employer in the county at the present time.

4.6.6 Other

Among other aspects of the Glenn County economy not specifically discussed above, but regarded to be important to describing the county's economic profile, are real estate and property values, construction activity, natural gas production and government employment.

According to real estate industry contacts, strength in the local real estate market is principally attributable to demand for single-family residences in the $75,000 to $100,000 price range. Several realtors have suggested that there is currently a shortage of listings for homes in this price range. Residences priced up to $125,000 are perceived to be readily saleable. A substantial portion of this residential real estate demand, local sources indicate, is attributable to buyers seeking to relocate from substantially more expensive Chico-area and Woodland housing markets. In general, although the number of available properties is currently limited and there is, consequently, only minimal sales data available, residential real estate values are characterized by area brokers as rising somewhat at the present time. travel to Chico and even to Sacramento to make major retail purchases. Such leakage often occurs in market areas with a population and/or economic base too small to support major comparison shopper goods outlets.

Conversely, commercial real estate values have been characterized by industry sources as "depressed" or "flat". Realtors contacted indicated that there is little sustained demand for commercial property and generally attribute this to the region's limited population base and comparatively low income levels.

Agricultural property was described by local contacts as characteristically turning over very slowly, given the limited number of ownerships in the county, and values for agricultural lands were labeled as static.

Construction activity levels in Glenn County have been low during the past five years in comparison to those in much of the rest of California. According to data presented in the Tri-County Economic Development Corporation's Statistical Abstract, 1990-91, the county ranked fifty-second among California's fifty-eight counties in total building permits issued between 1984 and 1988. The cities of Willows and Orland ranked 310th and 336th among California municipalities in issued permits for the same period. From 1985 through 1989, 472 housing units were constructed in the county, an average of about ninety-five new units yearly. Construction and mining together (although mining in Glenn County refers principally to the construction-related gravel extraction industry) represent approximately 3.5 percent of the county's employed workforce. Overall, the comparatively inactive construction sector of the local economy corresponds proportionately to the static condition of economic activity in the county across the board.

Refer to Section 2.5 and the Glenn County Energy Element for a discussion of natural gas resources. According to Energy Facility Siting in Glenn County - Working Paper, in 1989 approximately 10.5 billion cubic feet of natural gas (about 2.8 percent of total statewide production) was produced within Glenn County. Known reserves within the county totaled approximately 50 billion cubic feet. As further exploration and drilling occur, new reserves will likely be found and added to the known reserve figure; thus, extraction will likely slow while reserves increase. For this reason, it is anticipated that natural gas production will continue in Glenn County for at least the next twenty years.

Government employment in Glenn County, in contrast to the statewide average of 15.5 percent, represents almost a quarter of countywide employment. Federal employment, including both Forest Service and wildlife refuge employees, amounts to about three percent of the workforce, with State and local government jobs comprising the balance of

government employment in the area. Schools are included as local government agencies for purposes of compiling these employment statistics.

4.6.7 Trends

Several consistent themes were repeated as local public officials, economic development agencies and other interested parties were contacted regarding the condition of the Glenn County economy. First, as the data presented in the preceding pages indicate, the current state of the local economy is not good in comparison to other portions of California and to other regions of the U.S. Succinctly, the availability of employment is limited; what jobs there are pay less, on the average, than work elsewhere in California; countywide employment is restricted predominantly to only a few sectors of the economy; and the combined effects of both low year-round employment and particularly high seasonal unemployment have produced disproportionately high population totals on public assistance program rolls. On a broader scale, this weak economy acts to constrain the overall quality of life capable of being enjoyed by Glenn County residents. In colloquial terminology, the Glenn County economy, and current economic trends locally, may be described as "flat".

What must be done to improve the economic health of the county is the intended focus of the proposed Economic Development Element of the County's General Plan. The essential emphasis of that element will be establishing a Countywide commitment to strategies which:

- Increase the total net number of jobs available in Glenn County, as well as increasing the ratio of available jobs to population;
- Introduce greater diversity into the local employment mix, reducing the extent to which:
    - Many (particularly agriculturally-related) jobs are only seasonal in nature, resulting in high off-season unemployment;
    - Local employment is concentrated among just a few, potentially declining sectors of the economy (e.g. lumber, agriculture and government);

- Create employment opportunities with wage rates substantially higher than at present in Glenn County, without correspondingly adversely affecting the cost of business for existing local employers;

- Foster a "balanced" economic system in which locally-generated income will be expended and/or reinvested locally to the extent feasible, rather than "exported" from the county in the forms of sales leakage, a commuter workforce, and/or absentee profit-taking;

- Reduce the extent to which public subsistence programs are required to support segments of the county's population; and

- Generally improve the economic position and quality of life of the residents of the county.

At the same time that recent economic trends in Glenn County have been lacking material basis for encouragement, there is potential for a brighter outlook. As is true of many areas in California in the 1980's and early 1990's, Glenn County has identified economic development as a key priority and has formalized commitments of resources to economic development programs and activities in substantial ways. The Glenn Economic Development Corporation (GEDCO) was formed in 1987 with the mandate to assist existing local business retention and expansion and to recruit new businesses to the county. GEDCO is currently under contract to the City of Willows to market that community to developers of commercial or business enterprises. Under the auspices of GEDCO, a feasibility study is being conducted to determine whether Glenn County might qualify and compete for designation as a "recycling market development zone" under the provisions of AB 1322 (1989). A study is also being conducted to determine the feasibility of developing sixty acres at the Orland Airport for industrial park purposes. The City of Willows is creating approximately seven acres of industrial park at the southerly end of that community.

The Tri-County Economic Development Corporation is the operating entity established through an Economic Development Administration (EDA) district encompassing Butte, Tehama and Glenn Counties. The Tri-County EDC's purpose is "to plan and implement a sound, long-term regional economic development program designed to encourage new employment opportunities and to assist small business development." The

Tri-County EDC annually prepares an overall economic development program, funded in combination by a planning grant from EDA and a local match from communities in the district. The EDC also administers a nearly $900,000 U.S. Economic Development Administration Revolving Loan Fund and packages and services Small Business Administration (SBA) program loans.

Tri-County EDC staff is also available to assist member jurisdictions with preparation of applications for state and federal funding for economic development projects, including Community Development Block Grants (CDBG), AB26 Planning and Technical Assistance Grants, and the various EDA grant and loan programs. Additionally, Tri-County EDC also has the capacity, experience and expertise to administer locally capitalized Revolving Loan Funds for municipalities and counties in the District (Pers. comm., Jon C. Gregory, Tri-County Economic Development Corp., September 1991).

California State University, Chico, established its University Center for Economic Development and Planning in September, 1986. Serving a region encompassing over 32,000 square miles and twelve counties, the purpose of the Center is to provide economic development capacity-building assistance to its service area. The Center, utilizing faculty with technical expertise in business administration, computer science, public administration, regional planning, agriculture, and natural resources, supplies research, technical assistance, training and referral services to economic development entities in the area.

In addition, the City of Orland has an Economic Development Commission in place, the City of Willows is actively administering local economic development activities under its own auspices, and the County is increasing its initiative in economic development through the application of its zoning code to various projects and in its undertaking of the preparation of an economic development component of the current General Plan revision project. Notwithstanding a predictable amount of concern regarding proportionate relationship between investment and return of public resources, the impacts of growth on the county's environment and ambience, and the politics of who benefits and who pays for economic growth, the overall popular and policy commitment to economic development in Glenn County appears to be generally strong.

The desirability of such programs and activities is underscored by projections included in the State Employment Development Department's analysis of industry trends

and outlook in Glenn County. According to EDD, only 250 net additional jobs are anticipated in the county between the present and 1993. Agricultural employment is expected to remain at existing levels. Manufacturing employment is expected to decrease by approximately 200 jobs, and construction and mining employment is forecasted to increase by seventy-five jobs. Transportation and public utilities employment is expected to grow by twenty-five jobs, and retail trade is projected to add seventy-five jobs by 1993. The services sector of the economy will add 125 jobs, according to EDD, principally in health services, membership organizations, business services and lodging. Government employment is forecasted to grow by 100 jobs, primarily in education to meet demands generated by population growth.

Trends identified by local officials potentially affecting the Glenn County economy include the following:

- The possible displacement of industries from the Chico metropolitan area, as population growth and resultant economic dislocation of industrial sites occurs, is foreseen by some. It is speculated that such industries may seek Glenn County locations, to maintain their current employment base. A related trend has been housing construction in Glenn County, particularly in Orland, absorbed by residents working in Chico but seeking more affordable housing opportunities than are available in the larger communities. According to several sources, however, housing prices in Chico are also decreasing substantially from levels reached several months ago.

- The possible imposition of restrictive rules on the burning of rice fields following annual harvest to achieve air quality objectives and on pumping of irrigation water from the Sacramento River is anticipated to have potentially significant effects on the economic role of this crop in the area. Similarly, drought-imposed cutbacks in available State and federal water sources for the rice industry may curtail production and corresponding crop value and employment.

- The substantial number of recipients in the county of public assistance are viewed as both a source of stress on local government financial resources and a limited source of support for other segments of the economy.

- Investment by the federal government in improvements at the Sacramento National Wildlife Refuge may result in more visitors being attracted to this facility annually.

- As supplies in other portions of the State or region are exhausted, the county's aggregate resources may become economically viable for marketing on a broader scale than is currently economically feasible.

- Increasingly, constrained State and local government financing limits the extent to which these sectors of the local economy can continue to grow and to contribute proportionately to Glenn County's economic vitality.

4.7 ANALYSIS OF ISSUES, OPPORTUNITIES AND CONSTRAINTS

The community profile of Glenn County presented in this chapter identifies a region which has been largely unaffected to date by the unprecedented growth, and its accompanying opportunities and problems, impacting many areas of California. This situation may be on the verge of changing.

Population growth has been slow but steady, occurring for the most part in the cities of Willows and Orland. It has shown a greater rate of growth in the last three years. Housing is still affordable in the context of California and the Sacramento region, although not necessarily to local residents. Public services and facilities have been able, for the most part, to keep up with local needs. One notable exception to this observation is the current condition of County roads. As in other primarily agricultural counties in California, Glenn County government faces difficulties in balancing local needs and desires for public services with State-mandated services.

The General Plan revision process affords the opportunity to plan for the physical development of the county in a way that maximizes the ability of public service providers to plan for efficient service delivery in a proactive, rather than reactive, fashion. Because land use and circulation (traffic, roads) plans must be consistent, the General Plan revision process requires the County to make choices regarding the provision of adequate roadways or other transportation modes to serve proposed development (or, alternatively, assuring that new development will not overburden existing roadways).

The issues surrounding the state of the economy in Glenn County are summarized below, focusing on a lack of diversity, low wages, and difficulties facing agriculture, timber and government. There are, however, based upon preliminary analysis and the judgment of many others who have evaluated, and are responsible for, the potential enhancement of Glenn County's economy, at least some opportunities for appreciable economic development and improvement in the area. These opportunities are also outlined below.

Some factors to be considered in the General Plan revision process include:

- Data shows that housing needs focus on rehabilitation, overcrowding, farm labor housing, and new housing for moderate and high income households.
- The lack of a direct highway route to the coast may inhibit some tourism opportunities.
- Highway 32 may be characterized as having an inadequate level of service in the vicinity of Orland and Hamilton City.
- There is a need for major capital expenditures to improve the existing road network.
- The lack of commercial air service, passenger train service, and limited public transportation place limitations on travel within and through the county, other than by private automobile.
- The percentage of heavy truck traffic on I-5 demonstrates the important role that freeway plays in the economy of the county and the Western States.
- Potential bike routes have been identified on the east side of I-5 and on Bayliss-Blue Gum Road.
- The availability of water represents an opportunity for attracting business and industry to the county.
- Limitations on septic systems and lack of sewer systems may represent a constraint on new development in certain areas.

- The county's economy is comparatively lacking in diversity, with nearly two-thirds of all employment locally being concentrated in agriculture, agriculturally-oriented industries and government. Agriculture and government are particularly "fragile" segments of the economy upon which to be dependent for economic vitality, given current conditions and trends in California.

- The present distribution of employment in Glenn County results in large portions of the work force being employed in comparatively low-paying jobs. Correspondingly, disposable per capita and per household income are relatively low, as well, contributing to the overall static state of the economy and suppressing the area's general standard of living.

Among the factors contributing to the prospective opportunity for Glenn County to successfully undertake economic improvement programs are:

- Local public and political commitment to economic development is evident. The number and types of organizational resources dedicated to economic development in the area is substantial, and the capabilities of the "system" in the county to successfully undertake economic development programs are excellent. Local leaders, University faculty members with specialized expertise, professional economic development staffs, and government agency staffs are all evidently well-prepared and unusually qualified to pursue the county's economic improvement agenda.

- The county has a readily available, low-cost labor force potential to offer to new industry. Glenn County's year-round unemployment rate, although costly in both economic and social terms, simultaneously represents an accessible pool of prospective workers for unskilled and semi-skilled employment at probable low cost to industry.

- The general flight of industry from the State's urban areas to more rural settings, including the previously-referenced displacement of industry from the expanding Chico area, may result in businesses being interested in Glenn County as a potential base of operations. The county has excellent highway transportation access, adequate rail access, and is not so remote from urban area shipping terminals and markets that it is infeasible as an industrial location.

- The two airports located in Willows and Orland offer some opportunity to attract smaller industries and businesses. Although growth in general aviation nationwide is projected to be relatively flat, airport facilities have been demonstrated to be attractive to a number of types of small businesses as sites for operations.

- The availability of a substantial number of National Forest campgrounds and other recreational opportunities will attract visitors to the county. The southerly I-5 corridor through Glenn County particularly may be positioned to capitalize upon such visitor traffic as it passes through from the Sacramento area to forest destinations.

- Overall, the county's highway and service commercial sectors of the economy may not be capturing the share of traffic-generated business along I-5 that may be possible.

- The wildlife refuges in the region, particularly as visitor amenities improve, will continue to attract thousands of visitors annually to Glenn County. The extent to which these visitors can be induced to stay and spend money locally is indeterminate, but may represent a substantial potential opportunity.

- The county's aggregate resources may have an expanded market in future years. Although not proportionately employment-intensive, this segment of the economy would provide some additional jobs and income to county residents.

- The tourism study previously performed for the County identifies farm and ranch-related tours and special events as potential attractions for tourism in Glenn County.

- The presence of California State University, Chico, and to a somewhat lesser extent, Butte Community College in close proximity to Glenn County represents a substantial resource. Technical assistance to businesses, the appeal of a university environment, training and research capabilities, and other factors make the two colleges an attribute in attracting and retaining businesses locally.

- Glenn County currently has several operational natural gas fields that produce significant amounts of natural gas. There remain significant deposits of natural gas that are expected to be extracted throughout the next twenty years.

- The State Department of Water Resources has conducted engineering feasibility studies that demonstrate significant hydroelectric development potential in western Glenn County.

- The county's predominant agricultural sector provides significant potential for biomass energy production.

Overall, opportunities for economic development in Glenn County are evident. It should be stressed, however, that there is no one segment of the economy which apparently has the potential to, by itself, have a major effect on the enhancement of local economic activity. Briefly, the constraints operating to limit the county's economic development potential include:

- The commitment of substantial portions of valley floor land to agriculture, including many parcels under Williamson Act contracts along the I-5 corridor, limits development potential for industrial and highway-oriented commercial uses. Similarly, property owners with little inclination to develop and/or unrealistic economic expectations pertaining to development may retard local ability to capitalize on the I-5 corridor as an economic resource.

- Expansion of the tourism economy associated with the National Forest and the wildlife refuges will be incremental. There is not sufficient capacity and/or potential activity associated with either of these resources to have "wholesale" impacts on the local economy. Moreover, the "multiplier" effects on the local economy of tourism-related activities such as camping are comparatively minimal.

- The labor force available to industry in Glenn County is comparatively untrained and unskilled. Some industries require a greater diversity of education and training than is currently available in labor resident to the county.

- It is difficult to attract businesses and industry to communities which are not large enough to offer substantial amenities. Although the rural environment and lifestyle offered in Glenn County are appealing to many, analysis of industrial site location decisions across the nation indicates that community amenities rank relatively high on decision-makers' lists of criteria.

- While there are clearly benefits that would be associated with new energy facilities in the county (less reliance on outside sources, increased tax base, etc.), such benefits must be carefully balanced with the potential environmental "costs" that such facilities may incur.

5.0 RELATIONSHIP TO OTHER PLANS

5.1 CITIES OF WILLOWS AND ORLAND

Orland Land Use and Circulation Element

It is stated in the Summary of the City's Land Use and Circulation Element that one of the primary purposes of the Plan is for the City of Orland and Glenn County to jointly coordinate planning within the Orland Service Area and Planning Area, and to establish mutually agreeable procedures in order to develop a consistent land use pattern and circulation system; provide adequate public services and facilities; and to provide for the eventual conversion of these lands to City jurisdiction. In order to maintain consistency between the City and the County, the land use designations, the arterial and collector system, and improvement standards should be reflected in the General Plan, Zoning Code, and Land Division Standards of Glenn County.

It is further stated that the City of Orland shall adopt a single set of road standards uniformly applied to all subdivisions, including parcel maps, and actual development. The City will request that Glenn County adopt these standards for the Orland Service Area. A set of road standards should be jointly developed by the City and County for roads in the Planning Area.

The following goals, objectives, policies and implementation measures are pertinent to the Glenn County General Plan:

Goals

- Assure the coordination of land use, public services and facilities, and circulation and transportation systems in the City and in the Orland Service Area.

- Assure the coordination of land use and circulation systems in the Planning Area.

- Maintain environmental quality by decreasing air pollutants caused by the circulation system within the City, Urban Service Area and Planning Area, and conserve energy used for transportation.

Objectives

- Plan for and guide development, in the City and the Orland Service Area which, to the maximum extent feasible, minimizes the expenditure of public funds for new infrastructure or improvements unless it is for the benefit of existing and future citizens of the City.

- Do not allow the development of lands both in the City and Orland Service Area which do not have a full complement of public services, facilities and utilities unless provisions are made to guarantee their availability in the future.

- Encourage the coordination of land use and circulation planning, public services, facilities, utilities and improvements with Glenn County and other public agencies, as applicable.

- Provide a circulation system which permits the safe and efficient movement of people and goods throughout the City, the Orland Service Area, and the Planning Area.

- Existing City streets and those in the Orland Service Area should be used and improved to serve future development, to the extent feasible, prior to constructing new roads.

- Develop a system of high-standard collector and arterial roads to reduce travel time and improve traffic safety in the City, the Orland Service Area and the Planning Area.

- Formulate and adopt circulation design and improvement standards which are uniformly applied on a citywide basis, in the Orland Service Area and the Planning Area, according to development type.

- Increase, where feasible, the total mileage of safe bike routes, bike trails and pedestrian walkways within the City and Orland Service Area.

Policies and Implementation

- The City of Orland and Glenn County shall jointly coordinate planning within the Orland Service Area and Planning Area and establish mutually agreeable procedures in order to develop a consistent land use pattern and circulation system; provide adequate public services and facilities; provide for the eventual conversion of these lands to City jurisdiction. Land uses and especially infrastructure improvements shall be adequate to meet short and long-term needs and plans. In order to maintain consistency among the jurisdictions, the resulting land use designations, circulation system, and improvement standards should be reflected in the General Plan, Zoning Code, and Land Division Standards of Glenn County.

- The City shall monitor, on a yearly basis, the rate at which the developable land inventory in the City and Orland Service Area is being consumed, the population and employment growth of the City, and other useful indicators of growth.

- In 1990 and thereafter at least every five years, as part of a comprehensive General Plan review, the City shall examine the results of the monitoring process for the previous period. By amendment of this Plan appropriate adjustments shall be made in the inventory of

developable land so that it will accommodate the growth projected. The intent of this policy is to insure that the amount of developable land available will always be in adequate supply, at the current ratio, and to gauge when it will become necessary to annex lands in the Orland Service Area.

- A Land Use Capability Analysis shall be used in order to convert Agricultural and Suburban Residential land use categories into other land use districts.

- Encourage Glenn County to maintain compatible land uses adjacent to the City's wastewater treatment plant and ponds. It is recommended that the County General Plan designate lands adjacent to the treatment facilities as Agriculture General or Residential with 10 acre minimum lot sizes with minimum residential building setbacks of 500 feet.

- The City, the Orland Service Area, and the Planning Area shall be divided into Zone of Benefit Districts for planning purposes. All land divisions and development in the City, Orland Service Area, and Planning Area shall be required to pay their respective "fair share" for improvement and maintenance of designated services and facilities benefiting the particular Zone.

- Residential development adjacent to arterials including South Street, Highway 32, Sixth Street, and the proposed Stony Creek and South Street bypasses in the City and Orland Service Area should be designed to minimize the noise impact received from traffic. Circulation improvements shall also be designed with consideration given to noise impacts on adjacent development. For development proposed in the Orland Service Area, the Glenn County Building Department shall automatically refer any building permit for a residence abutting the identified roads to the Glenn County Planning Department for review in order to determine consistency with the Policy.

- The City will encourage the State Department of Transportation to widen State routes and improve vertical and horizontal alignments, intersections, and bridges within the routes to safely accommodate existing and projected traffic flows. These routes are State Highway 32 and Interstate 5. Inclusion of this policy in the Regional Transportation Plan is recommended.

- The City shall adopt a single set of road standards uniformly applied to all subdivisions, including parcel maps, and actual development. The City will request that Glenn County adopt these standards for the Orland Service Area. A set of road standards should be jointly developed by the City and County for those roads in the Planning Area.

- Roads in the City and in the Orland Service Area serving new land divisions or development shall be served by a paved road, to the extent necessary, to avoid regional air quality impacts and to improve the quality of the existing and future City road system. In lieu of off-site paving the City may permit the subdivider or developer to buy out the paving obligation. In order for this provision to be implemented in the Sphere of Influence of the City, Glenn County will institute such a provision for projects proposed in the Orland Service Area and possibly in the Planning Area.

- The table below delineates the Arterial and Collector Road System for the Orland Service Area and Planning Area. This policy shall require the County of Glenn to adopt the system as proposed for the Orland Service Area and the Planning Area.

  Orland Service and Planning Area Arterial and Collector System

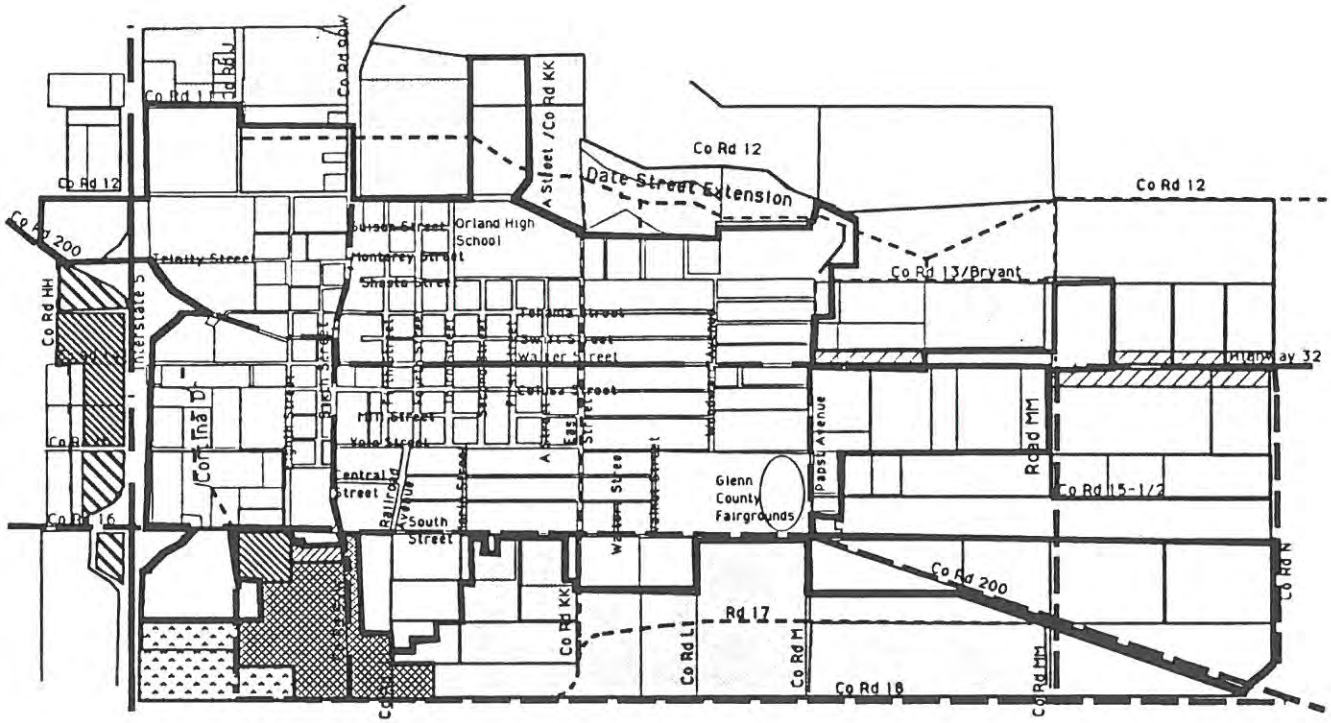
  - Bryant Street
  - Cortina Drive (New)
  - County Road 18
  - County Road 20

- County Road KK (East Street)
- County Road M (Papst Avenue)
- County Road MM
- County Road MM Extension (New)
- East Street North Extension (New)
- Extension from Cortina Drive to Sixth Street (New)
- Highway 32
- Papst Avenue North Extension (New)
- Shasta Street East Extension (New)
- Sixth Street
- South Railroad Avenue
- South Street
- South Street Bypass (New)
- Stony Creek Bypass (New)
- Yolo Street East Extension (New)

The Orland Service Area includes approximately 1,300 acres and is based on existing infrastructure, current land use, realistic expectations for growth, and the ability to finance the growth. This area can reasonably be expected to be annexed and adequately served by the City, according to the Plan. The Orland Planning Area encompasses an additional 1,600 acres. Although this area is not envisioned to be annexed to the City, the General Plan does address the need for road improvements and land uses which will not create adverse impacts on the circulation system and land uses in the City and the Service Area.

Orland Area General Plan

The Orland Area General Plan was adopted by the City of Orland and Glenn County in 1991. It is a land use, circulation and zoning plan for the unincorporated area surrounding the City of Orland, as shown in Figure 5-1. The primary purpose of this Plan is to establish policies and provide guidance for growth and development of land adjacent to the City of Orland. Relevant goals, objectives and policies are listed below.



Arterial (I-5, Highway 32, Sixth Street, South Street-I-5 to Sixth Street)

Proposed Minor Collector

Major Collector (South Street-Sixth to Papst, Co Rd 200, Papst Avenue, Co Rd 18)

City Limits

Note: Precise locations of proposed streets are available at Orland City Hall and the Glenn County Planning Department

Agriculture General, 20 acre minimum parcel size

Rural Residential, 5 acre minimum parcel size

Industrial

Highway and Visitor Serving Commercial

Service Commercial

Commercial Reserve

N

SCALE: 1 INCH = 2300 FEET

0 1150 2300

Source: Orland Area General Plan

QUAD

ORLAND AREA GENERAL PLAN
Land Use & Circulation Plan

Figure 5-1

- To preserve agricultural land by encouraging development within the City of Orland and discouraging small lot development of lots less than ten acres in size in the unincorporated area of the county.

- To provide for development which is served by appropriate services and infrastructure.

- To promote development which will provide a balance of jobs and housing for the Orland area.

- To discourage unserviced or poorly serviced urban development within the unincorporated area of Glenn County.

- Those areas which are in the Orland Planning Area will not be zoned or designated to allow parcels smaller than ten acres in size prior to annexation.

- Those areas in the unincorporated Planning Area shall be annexed to the City of Orland and shall be developed to full City of Orland development standards.

- Streets and roads shall be developed to City Standards for parcels smaller than 10 acres in size and with connections to existing City streets and to adjacent properties.

- Land in the Planning Area may be used for agriculture or residential uses until such time as development is approved.

- Complete mitigation shall be required of development for public facilities to City Standards for any parcels less than 10 acres in size including roads and bridges, fire protection and other facilities and (or) infrastructure for the protection of health and safety in the Orland Planning Area.

City of Willows Land Use Element

The Land Use Element defines the planning area boundaries for the purpose of the Plan as the existing Sphere of Influence. Policies which are relevant to Glenn County are listed below.

- To establish a land use pattern which will accommodate growth the City of Willows can expect during the planning period.

- To encourage orderly growth in the planning area by encouraging infilling and extension of existing neighborhoods and by discouraging sprawl and scattered development.

- The City should begin to annex vacant parcels adjacent to the City to provide for future residential growth consistent with the goals of this plan.

- The area around the airport should be limited to airport, airport related industry, and other light industrial uses.

- The City will work closely with the area Chamber of Commerce and the County Economic Development Council to encourage new industrial development in Willows.

- The City shall encourage urban development in areas adjacent to existing development so urban expansion into surrounding farmlands is limited or curtailed.

- The City should coordinate the land use plans of the City and the County to insure the conservation of agricultural lands and the elimination of conflicting policies.

- The City shall allow only those types of land uses near the airport that will not conflict with airport operations or activities.

- Proposed land uses near the airport should be referred to the County Airport Land Use Commission for review and comment.

5.2 SPHERES OF INFLUENCE

The Glenn County Local Agency Formation Commission (LAFCO) adopts and maintains sphere of influence boundaries for the cities of Willows and Orland and all special districts within the county (with the exception of school districts). LAFCO is an independent commission composed of two County supervisors, two City Council members, and a public member. A sphere of influence is defined in the California Government Code as a plan for the probable ultimate physical boundaries and service area of a local agency, as determined by LAFCO. In determining the sphere of influence of a local agency, LAFCO considers the following criteria:

- The present and planned land uses in the area, including agricultural and open space lands.
- The present and probable need for public facilities and services in the area.
- The present capacity of public services which the agency provides or is authorized to provide.
- The existence of any social or economic communities of interest in the area.

Annexations of territory to a city or special district must be consistent with (i.e. within) the adopted sphere of influence.

5.3 SPECIAL DISTRICTS

There are six Community Services Districts (CSDs) in Glenn County which provide urban services to the unincorporated communities of Artois, Butte City, Elk Creek, Hamilton City, Ord and Northeast Willows. Although CSDs may provide a variety of services, most of the CSDs in Glenn County are single-purpose districts at this time. Information on the existing CSDs is provided below.

Districts	Services
Artois CSD	Water
Butte City CSD	Water
Elk Creek CSD	Water
Hamilton City CSD	Sewer, Lighting, Fire Hydrants
Northeast Willows CSD	Sewer
Ord CSD	Community Hall

As described in Section 3.2, there are ten fire districts in Glenn County, serving the communities and areas of Artois, Bear Valley/Indian Valley, Elk Creek, Glenn-Codora, Glenn-Colusa, Hamilton-Bayliss, Kanawha, Ord, Orland and Willows. Irrigation water is provided by the following active irrigation or water districts:

Glenn-Colusa Irrigation District

The Glenn-Colusa Irrigation District serves 175,000 acres of farmland in Glenn and Colusa Counties and has an annual water supply of 825,000 acre feet from the Sacramento River. The major crop in the District is rice.

Glide Water District

The Glide Water District covers 9,375 acres located between County Roads 48 and 39 west of I-5. The District was formed in 1969 and has been delivering water from the Tehama-Colusa Canal to a portion of the District since 1976 via a temporary distribution system using siphons, creeks and lift pumps. The District has made an application to the U.S. Bureau of Reclamation for a loan to fund the construction of a permanent underground pipeline distribution system.

Kanawha Water District

The Kanawha Water District was formed in 1955 and now covers 16,000 acres. Water is obtained from the Sacramento River via the Tehama-Colusa Canal. The delivery system is entirely underground and all deliveries are metered. Major crops grown in the District include rice, wheat, beans, alfalfa, beets, corn, sunflowers and pasture.

Orland-Artois Water District

The Orland-Artois Water District was formed in 1954 and currently includes 29,033 irrigable acres. Water is obtained from the Sacramento River via the U.S. Bureau of Reclamation (USBR) Tehama Colusa Canal. The distribution system is underground with metered outlets.

Orland Unit Water Users Association

The Orland Unit Water Users Association was started in 1909 and currently supplies water to 20,400 acres around the City of Orland. Water comes from East Park, Stony Gorge and Black Butte Reservoirs and is delivered through a system of open canals and laterals.

Princeton-Codora - Glenn Irrigation District

The Princeton-Codora - Glenn Irrigation District was organized in 1916 and covers 11,500 acres of land in Glenn and Colusa Counties. Water is purchased from the U.S. Bureau of Reclamation and is pumped from the Sacramento River at two pumping plants - one at Sidds Landing north of Glenn and the other at Schaad north of Princeton. Water is distributed through an open canal system to approximately 90 users. The major crop in the District is rice.

Provident Irrigation District

The Provident Irrigation District was started in 1918 and supplies Sacramento River water to 16,041 acres in Glenn and Colusa Counties. The water is distributed by open ditches and canals to approximately fifty customers. Rice is the major crop grown in the District.

4-E Water District

This water district was formed in order to establish an entity eligible to contract with the U.S. Bureau of Reclamation for water from Stony Creek for the 1690 acre ranch in the district.

Stony Creek Water District

The Stony Creek Water District was formed in 1966 and serves 15 ranches in Glenn and Colusa Counties. There is no distribution system but members are responsible for getting their own supplies of water from Big and Little Stony Creek by gravity or pump. The water is mainly used in sprinkler systems.

Hunter Creek Water District

This District serves an area west of Willows, generally encompassing the south half of Section 11 and all of Section 12, Township 18 North, Range 24 West, MDB&M. The District purchases Tehama Colusa Canal Water from the Bureau of Reclamation.

In addition there are two inactive water districts in the county: Capay Rancho Water District and Chrome Water District.

There are two storm drain maintenance districts and a County Service Area which provide storm drainage in Glenn County. They serve the areas southeast of Orland, north of Willows, and the area between the Kanawha Water District and the Willows Airport. They are described in Section 3.5.2 of this document. The Mosquito Abatement District and the Rice Pest Abatement District serve a portion of the southeast area of the county, in and

around the City of Willows. There are also eight cemetery districts in the county, three levee maintenance districts, the Air Pollution Control District, and the Glenn County Resource Conservation District.

5.4 COMPREHENSIVE AIRPORT LAND USE PLANS

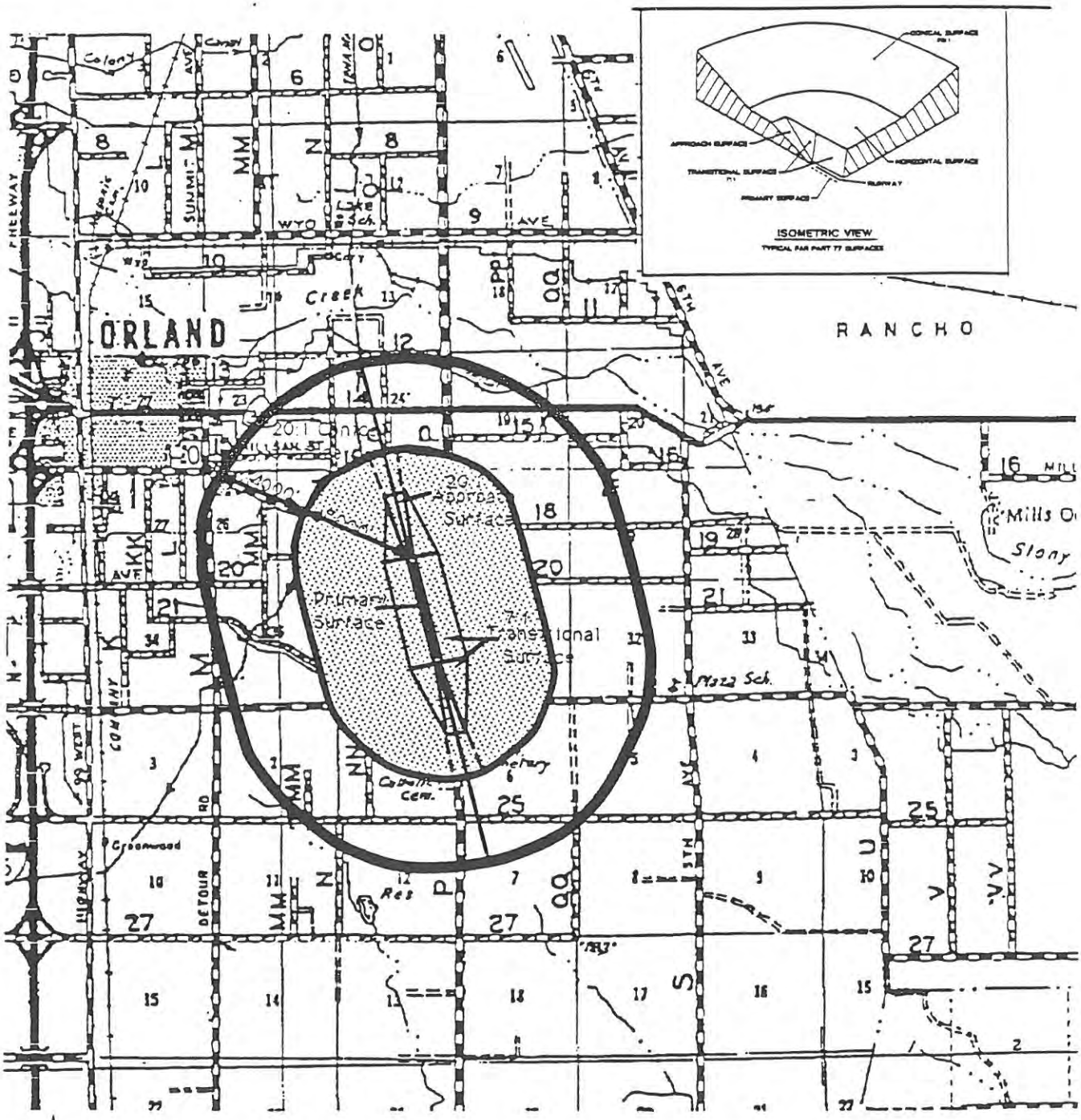
The Glenn County Airport Land Use Commission (ALUC) is responsible for preparing comprehensive airport land use plans for the area around Orland Airport and Willows Glenn County Airport, according to PUC Section 21675. As part of these plans, the Commission may develop building height restrictions, specify land uses, and determine building standards within the airport planning areas.

These plans determine the criteria which the ALUC uses in evaluating general and specific plans, zoning ordinances and building regulations. Proposals for the adoption or amendment of City or County general and specific plans, zoning ordinances, building regulations, and airport master plans are referred to the Commission prior to final action being taken by the appropriate governing body (City Council or Board of Supervisors).

These plans present policies addressing land use compatibility with the airports' noise, airspace protection, safety and general nuisance impacts. Standards and criteria are necessary to insure that no new land use or expansion of an existing land use is permitted within any part of an airport's area of influence which may result in a hazard to aircraft using the airport or any aircraft-related hazard to the health or safety of persons on the ground. Standards also address lands needed for airport facilities and airport-related land uses. The ALUC has no authority to enforce removal of pre-existing land uses which do not conform to the criteria and standards outlined in this document.

Orland (Haigh Field) Airport

The land use planning boundaries for the Orland Haigh Field Airport are shown in Figure 5-2. The Plan for Orland Airport includes the following goals, objectives and policies:



Source: Orland Haigh Field Airport Comprehensive Airport Land Use Plan

QUAD

ORLAND HAIGH FIELD AIRPORT
Land Use Planning Boundary

Figure 5-2

- To provide for the orderly growth of the Orland Airport and the area surrounding the airport within the identified planning boundaries, and to safeguard the general welfare of the inhabitants within the vicinity of the airport and the public in general.

- To provide the County of Glenn and the City of Orland with comprehensive land use policies designed to protect the viability and growth-potential of the airport, and to contribute to the safe and efficient use of the airport by ensuring compatible land uses in the vicinity of the airport.

- To include a long-range master plan for the airport that reflects the anticipated growth of the airport during the next 20 years.

- The Commission may, at its own discretion, request information and review any project occurring within the airport's referral area. Such projects, however, need not be routinely submitted to the Commission for review.

The Clear Zone Safety Areas, Approach Zone Safety Areas and Overflight Safety Area for the Orland Haigh Field Airport Land Use Plan are indicated on maps included in the Plan. Table 1 of the Plan sets forth Land Use Guidelines for the respective safety areas.

- It is a policy of this Plan that these guidelines be applied in the planning, zoning and project review of land use within the recognized airport safety areas.

- Land use or land use characteristics which may affect safe air navigation or which, because of their nature and proximity to an airport, may pose high risks to the land users shall be avoided in the vicinity of an airport.

The Plan also includes policies which address noise compatibility, height restrictions, general nuisance, and future facility development. It includes the following policy regarding airport related land uses as well:

- Airport related land uses located at Orland Haigh Field Airport shall be restricted to industrial, commercial and public facility uses contiguous to the airfield or immediately adjacent as long as county dedicated access to public roads and the runway is provided.

Willows Glenn County Airport

The land use planning boundaries for Willows Glenn County Airport are shown in Figure 5-3. The Plan for this airport includes the following goals, objectives and policies:

- To provide for the orderly growth of the Willows Glenn County Airport and the area surrounding the airport within the identified planning boundary, and to safeguard the general welfare of the inhabitants within the vicinity of the airport and the public in general.

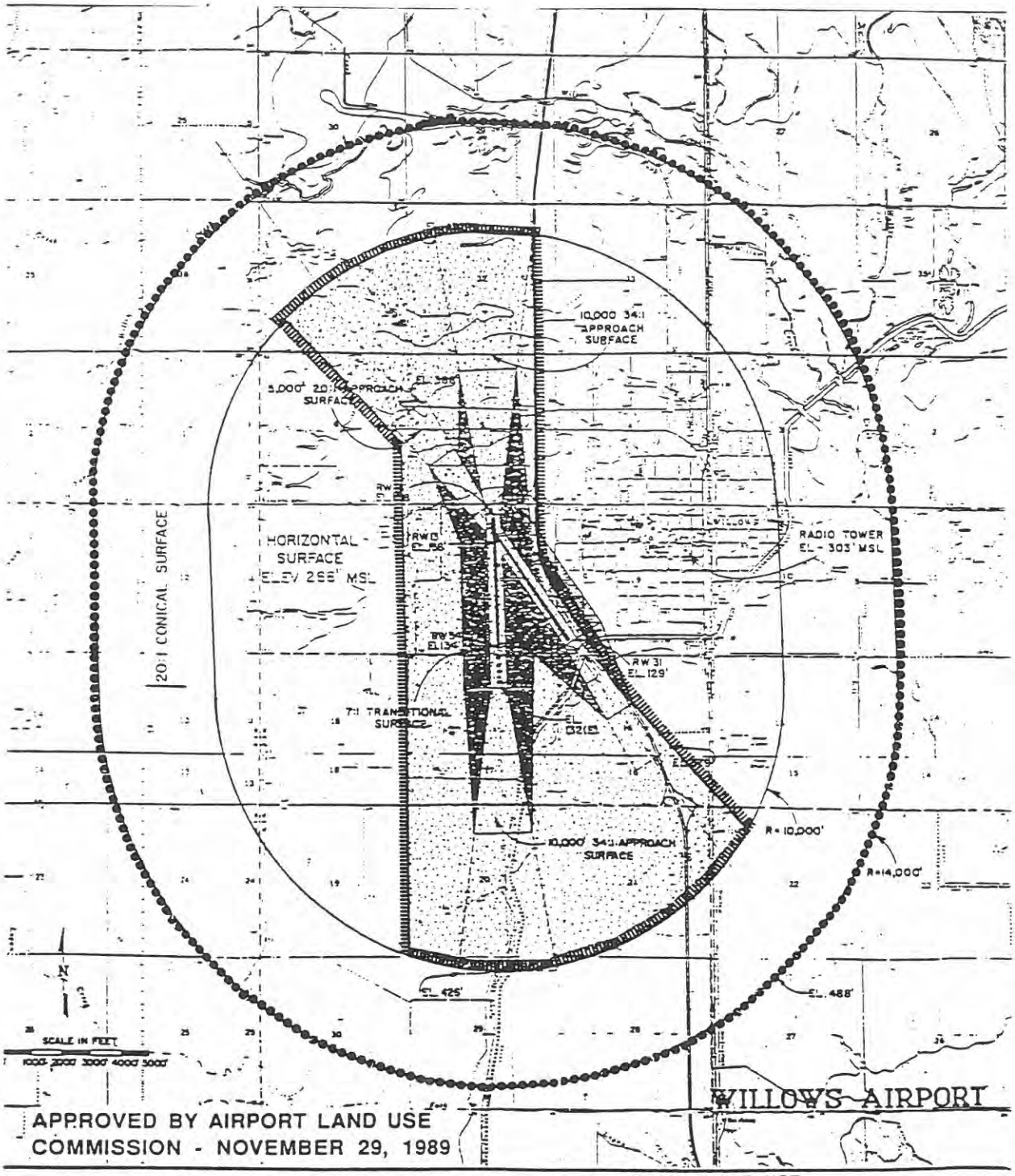
- To provide the County of Glenn and the City of Willows with comprehensive land use policies designed to protect the viability and growth-potential of the airport, and to contribute to the safe and efficient use of the airport by ensuring compatible land uses in the vicinity of the airport.

- To include a long-range master plan for the airport that reflects the anticipated growth of the airport during the next 20 years.

- All proposed projects within the Planning Area Boundary shall be referred to the Airport Land Use Commission.

- The Commission may, at its own discretion, request information and review any project occurring within the airport's referral area. Such projects, however, need not be routinely submitted to the Commission for review.

The Clear Zone Safety Areas, Approach Zone Safety Areas and Overflight Safety Area for the Willows Glenn County Airport Land Use Plan are indicated on maps included in the Plan. Table 1 of the Plan sets forth Land Use Guidelines for the respective safety areas. This Plan includes the same policies as the Orland Haigh Field Airport Land Use Plan regarding application of the Guidelines, noise compatibility, height restrictions, general nuisance, future facility development, and airport related land uses.



Source: Willows Glenn County Airport Comprehensive Airport Land Use Plan

QUAD

WILLOWS GLENN COUNTY AIRPORT
Land Use Planning Boundary

Figure 5-3

5.5 NORTHERN SACRAMENTO VALLEY AIR BASIN 1991 DRAFT AIR QUALITY ATTAINMENT PLAN

The Draft Air Quality Attainment Plan for the Northern Sacramento Valley Air Basin (NSVAB, which includes the counties of Butte, Colusa, Glenn, Shasta, Sutter, Tehama and Yuba) has been prepared for submittal to the Air Resources Board in compliance with the California Clean Air Act of 1988. The Plan is designed to achieve a reduction in districtwide emissions of five percent or more per year for each non-attainment pollutant or its precursors, averaged every consecutive 3-year period. By law, the five percent requirement is calculated against the 1987 actual emission level of each non-attainment pollutant or its precursor.

According to the draft Plan, it does not demonstrate a five percent reduction of the pollutant levels, as the control efficiencies and cost-effectiveness are not available for many of the proposed control strategies. The Plan states that it does, however, include every feasible control measure and a schedule of adoption for the control measures.

According to the draft Plan, Glenn County must reduce reactive organic gases (ROG) emissions by 4.24 tons per day and reduce nitrogen oxides (NO_X) emissions by 4.60 tons per day by 1994 in order to comply with the requirements of the California Clean Air Act. The County must reduce ROG emissions by 6.07 tons per day and reduce NO_X emissions by 6.54 tons per day by 1997, and must reduce ROG emissions by 7.88 tons per day and reduce NO_X emissions by 8.50 tons per day by 2000.

The draft Plan contains proposed community contact, educational and public information elements designed to reduce emissions from transportation and areawide sources. The Plan also contains a list of feasible control measures, which are proposed to be implemented according to the following schedule:

- All measures ranked #1 shall be proposed and implemented by applicable Districts no later than July 1, 1992.

- All measures ranked #2 shall be proposed and implemented by applicable Districts no later than July 1, 1993.

- All measures ranked #3 shall be proposed and implemented by applicable Districts no later than July 1, 1994 only if attainment of the State ambient air standard for ozone is not achieved by January 1, 1994.

The ranking of feasible control measures is based upon technical feasibility, cost-effectiveness, emission reduction potential, rate of emission reductions, public acceptability, and enforceability. The control measures include a new source review rule (requirements for permitting new and modified stationary sources of air pollution), indirect source review (sources which generate or attract motor vehicle activity, including shopping centers, residential and commercial developments, government buildings, medical facilities, office buildings, hospitals, hotels, restaurants, etc.), and transportation control measures, for which each district will develop measures that are appropriate for only its own jurisdiction.

5.6 REGIONAL TRANSPORTATION PLAN

The Glenn County Transportation Commission was designated as a single-county Regional Transportation Planning Agency (RTPA). State law requires each RTPA to prepare and adopt a Regional Transportation Plan (RTP) every two years (even-numbered years) and/or recertify the present RTP. The Plan includes goals, objectives and policies, an action element (a collection of five-year, short-range actions necessary to achieve Glenn County's transportation objectives, including capital projects, administrative and operational commitments and institutional arrangements necessary to implement the desired transportation systems), and a financial plan. The Plan identifies the top three Glenn County concerns as follows:

1. Maintaining I-5 to the high standards required for the benefit of the local economy;

2. Rehabilitating local farm-to-market roads to facilitate the movement of agricultural field produce to consumers; and

3. Implementing adequate drainage and flood control measures to extend the life of the existing roadway network, limit on-going maintenance costs and improve mobility.

Goals, objectives and policies contained in the Plan which are relevant to the General Plan include:

- To achieve a diverse, flexible, affordable and balanced multimodal transportation system for the region at the lowest reasonable cost that satisfies the needs of the county for rapid, efficient, comfortable, and safe passage of people and commodities through and within Glenn County. The system must be capable of serving the social and economic needs of the region, promoting sound land use and minimizing adverse impacts upon the environment.

- Provide a regional transportation plan which achieves the transportation goals and objectives of the General Plans of the cities and County while recognizing the interdependence of State, regional and local planning.

- Review State Systems Management Plans and circulation elements of local general plans to insure the appropriate information is included in the Regional Transportation Plan.

- The Glenn County Regional Transportation Plan is to be consistent with local General Plans and the Emergency Services Plans.

- Encourage preparation and regular updates of master plans for the Willows and Orland airports.

- Develop a bicycle plan that will provide bicycle facilities as needed.

- Support preparation of a plan that will provide for safe transportation route alternatives during natural disasters in the area, such as flooding.

- All regional transportation planning shall be coordinated with appropriate regulatory agencies to achieve present and future air, noise, and water quality standards.

5.7 HAZARDOUS WASTE MANAGEMENT PLAN

The Glenn County Hazardous Waste Management Plan, adopted in 1988, was prepared in accordance with State law (AB 2948) and the Guidelines prepared by the State Department of Health Services. State law also requires that the State-approved Plan be

adopted by ordinance or as part of the County and City General Plans. Pertinent goals, objectives and policies of the Plan include the following:

- Approval of proposed hazardous waste management facilities that do not exceed Glenn County's "fair share" will depend on siting criteria and other criteria required by existing law, unless effective interjurisdictional agreements provide for adequate hazardous waste management capacity for the specific hazardous waste which the facility would have handled in another California county.

- Glenn County can reject a proposed hazardous waste management facility/project that exceeds its "fair share", if there are effective interjurisdictional agreements for the management of the specific hazardous waste generated in the county or there is adequate capacity to handle these wastes in the county.

- If adequate capacity does not existing the county, or effective interjurisdictional agreements do not exist, Glenn County shall not reject hazardous waste management proposals that exceed "fair share" if the proponent demonstrates that the "fair share" (i.e. smaller) facility is economically non-viable, except in cases in which the County demonstrates that there are appreciably increased public health and/or environmental risks associated with the proposed facility.

- Routes for transportation of hazardous wastes shall be established.

- Any new hazardous waste storage, treatment or disposal facilities approved in Glenn County shall meet the criteria established in the County Hazardous Waste Management Plan.

- The importance of small businesses and agriculture to the county economy shall be recognized by this Plan.

- The use of hazardous materials to manufacture necessary goods and equipment shall be recognized by this Plan.

- The County Hazardous Waste Management Plan shall be incorporated into the County General Plan within 180 days after it is approved by the State of California Department of Health Services.

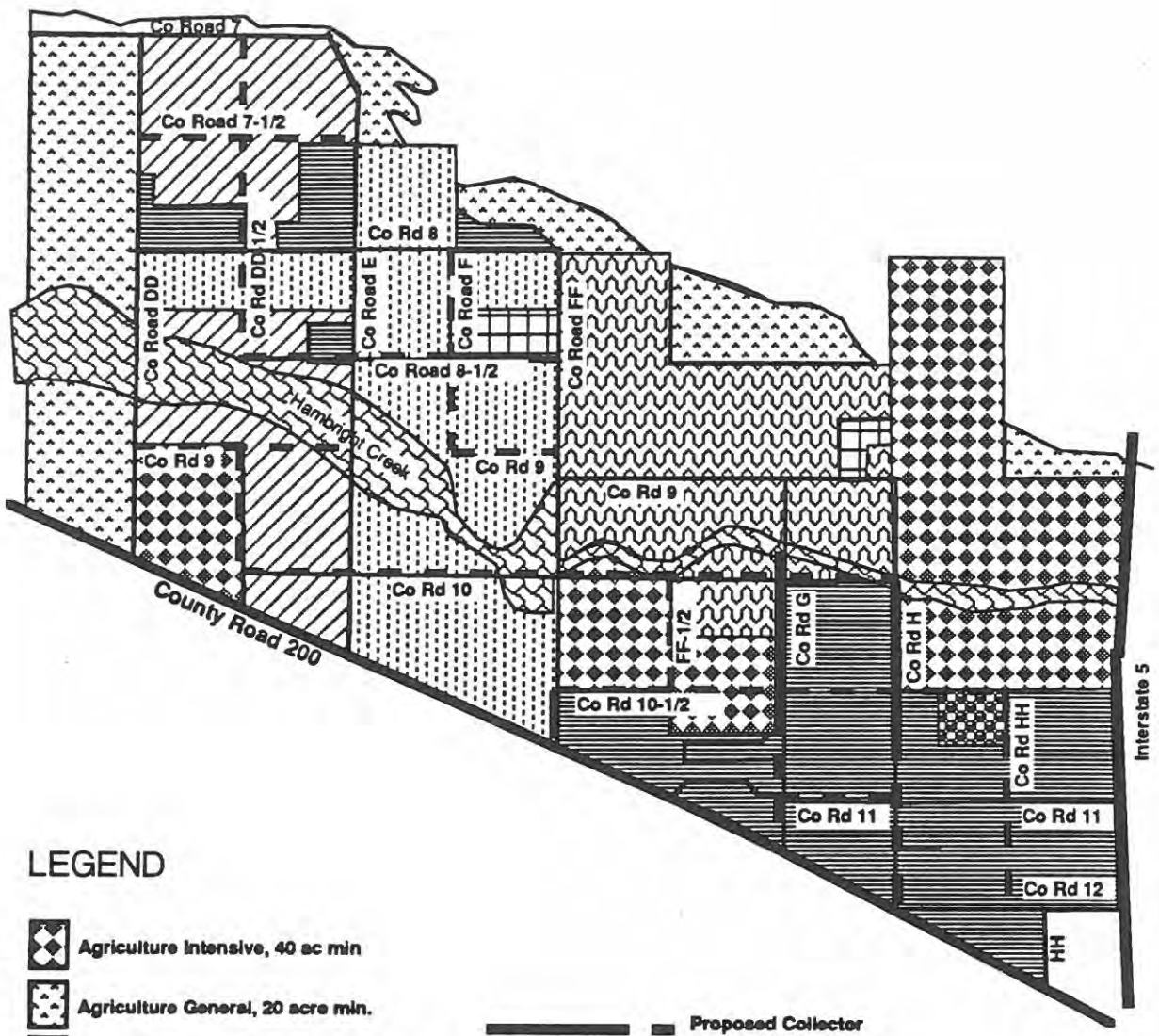
- Cooperation with adjacent counties for regional hazardous waste management shall be examined and mitigation of impacts on counties accepting hazardous waste from Glenn County shall be considered. Glenn County may become a site for hazardous waste treatment, storage or disposal.

- Any new hazardous waste storage, treatment or disposal facilities approved in Glenn County shall meet the criteria established in the County Hazardous Waste Management Plan.

The Plan also includes siting criteria for proposed specified hazardous waste management facilities, and designates general areas of the cities and county where the criteria might apply. Included are criteria that hazardous waste repositories shall be located 2000 feet or more away from any residential unit, and that facilities shall not be located on land which is prime agricultural land and shall not be located on land which is under a Williamson Act contract. The criteria also provide that facilities shall be located in areas designated as Public Facility, Agriculture Intensive, Industrial or Commercial/Industrial Reserve on the Land Use Element of the City or County General Plan. The general areas where criteria might allow various types of facilities to be located are shown in the maps on pages 91-97 of the County Hazardous Waste Management Plan. The Plan also specifies hazardous materials delivery routes.

5.8 WEST ORLAND SPECIFIC PLAN

The West Orland Specific Plan was adopted by the Board of Supervisors in 1986 encompassing an area west of the City of Orland and north of County Road 200. The Specific Plan was prepared to determine the most desirable pattern of development for this area, the basic facilities required, and the costs of these facilities. The adopted land use and circulation plan for West Orland is shown in Figure 5-4. It is anticipated that this plan will be incorporated as part of the revised Glenn County General Plan. Relevant objectives and policies of the Specific Plan are listed below.



LEGEND

- Agriculture Intensive, 40 ac min
- Agriculture General, 20 acre min.
- Rural Residential, 10 acre minimum
- Rural Residential, 5 acre minimum
- Rural Residential, 5 ac min w/PUD
- Rural Residential, 2 acre minimum
- Rural Residential, 2 ac min w/PUD
- Rural Residential, 1 acre minimum

- Proposed Collector
  Co Rds FF, G, H
- Proposed Minor
  Co Rds 7-1/2, 8-1/2, 9, 10, 10-1/2, 11, DD-1/2, F, FF-1/2, HH
- Existing Highway I-5
- Existing Arterial-Co Rd 200
- Existing Minor
  Co Rds 7, 8, 9, 10-1/2, 11, 11-1/2, 12, DD, E, FF, G, H, HH

QUAD

West Orland Specific Plan

Figure 5-4

- Orderly growth and development shall be encouraged within the West Orland Specific Plan Planning Area. This development shall be consistent with the Glenn County General Plan and its implementation ordinances.

- Safe, adequate public access for motor vehicles and pedestrians shall be encouraged.

- Development shall be coordinated with public service capabilities.

- Comprehensive economic development efforts to the long term benefit of the county shall be encouraged in the West Orland Specific Planning area.

- Encourage agriculture by supporting land uses that preclude intrusion of incompatible development into prime agricultural areas.

- The extension of water or sewer infrastructure into agricultural areas west of Road DD shall be discouraged.

- Viable farmlands and viable grazing lands in Glenn County are valuable long term resources. Those lands designated Class I and II west of Road DD shall be preserved.

The Plan assumes that the West Orland Specific Plan area is highly unlikely to be annexed to the City of Orland or to be developed to a density which would allow incorporation, and that the area is unlikely to be served with a public sewer system.

5.9 ANALYSIS OF ISSUES, OPPORTUNITIES AND CONSTRAINTS

The existing Glenn County General Plan consists of Land Use, Circulation, Housing, Conservation Management, Safety, Seismic Safety, Noise, and Scenic Highways elements and a Fire Safety sub-element. The revised General Plan will consist of Natural Resources, Public Safety, Community Development and Energy elements. State law requires that the County's General Plan be "internally consistent". According to the State General Plan Guidelines, the concept of internal consistency, as used in California Planning Law, means that no policy conflicts exist, either in the Plan text or maps, between any components of

the General Plan. The Guidelines identify five aspects of the internal consistency requirement:

(1) All elements of the General Plan have equal status. No element is subordinate to another, thus conflicts between elements cannot be resolved by stating that one element supersedes another.

(2) All General Plan elements, whether mandatory or optional, must be consistent with each other. The assumptions, projections, and standards used in each element must be uniform and consistent. This is most easily assured when the entire General Plan is revised at one time, as Glenn County is doing.

(3) Within each General Plan element, the data, analysis, goals, policies and implementation programs must be consistent and complementary.

(4) Area, community and specific plans must be consistent with the General Plan. The General Plan must contain a discussion of the role of area plans and their relationship to the General Plan, which is satisfied by this Chapter.

(5) The text and the map(s) or other diagram(s) within the General Plan must be consistent with each other.

In the process of revising the General Plan, it must be assured that the revised Plan meets all the consistency requirements outlined above, which includes assuring that the West Orland Specific Plan and the Orland Area General Plan are consistent with the revised Glenn County General Plan.

There are other requirements in State law regarding consistency of the County General Plan with specific aspects of the County Hazardous Waste Management Plan, Comprehensive Airport Land Use Plans, and the Integrated Waste Management Plan. The General Plan will need to be consistent with the Air Quality Attainment Plan, which in all likelihood be more restrictive regarding land use planning than the existing General Plan. From the standpoint of efficiency and effectiveness, it is obviously desirable that the County's plans for solid and hazardous waste disposal, airport protection, and other topics be consistent with, and reflective of, its plans for the physical development of the county.

While not a requirement, it is also generally desirable to try to achieve consistency with City General Plans for the unincorporated area surrounding the city limits; in the case of Glenn County, with the General Plans of the cities of Willows and Orland. County actions in these areas affect the adjacent city, and the area may eventually be annexed to the city. If an area is proposed to be annexed to the city, it is required by State law that the area be within the City's Sphere of Influence and the action be consistent with either the City or County General Plan.

Issues which are usually of interest in such areas include the type of development permitted, potential land use conflicts, the road network and road improvement standards, and provision of sewer and water service. Special districts, including community services districts, may become involved in these issues as potential providers of urban services. Agreement between the County and the affected city regarding these issues can result in great efficiency in the provision of infrastructure and services, provide property owners with reasonable expectations regarding future development potential, and avoid pitting City and County decision-makers against one another. Glenn County and the City of Orland have already jointly adopted an Orland Area General Plan, which demonstrates the ability of the County and the City to work cooperatively to resolve community planning issues.

Should the County choose to plan for new urban development in unincorporated areas, additional special districts or County Service Areas may need to be created to deliver urban services.

APPENDICES

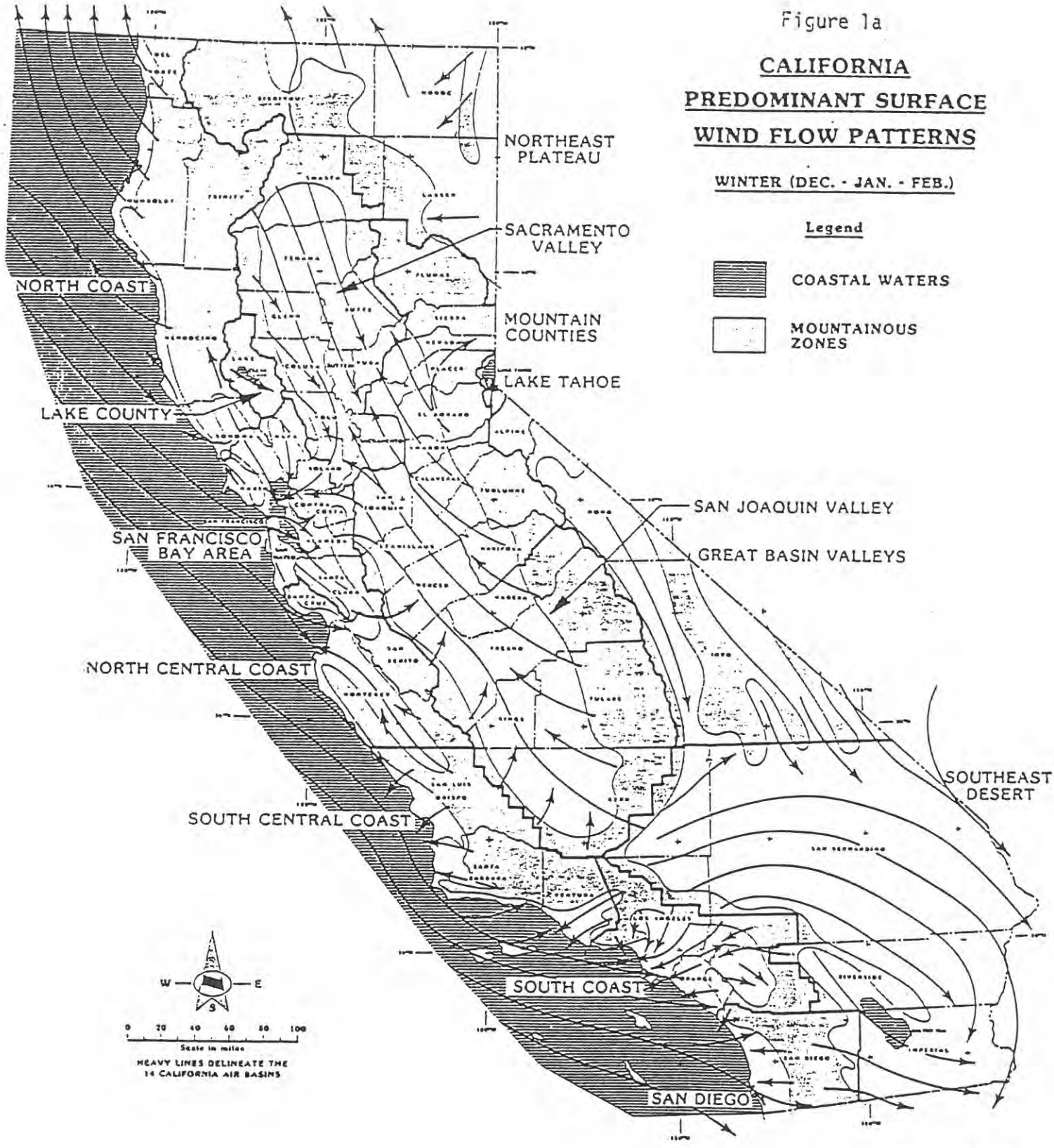
APPENDIX A

PREDOMINANT SEASONAL SURFACE WIND FLOW PATTERNS, CALIFORNIA AND GLENN COUNTY

Figure 1a

CALIFORNIA PREDOMINANT SURFACE WIND FLOW PATTERNS

WINTER (DEC. - JAN. - FEB.)



CALIFORNIA AIR RESOURCES BOARD
AEROMETRIC DATA DIVISION 4/84

Figure 1b

CALIFORNIA PREDOMINANT SURFACE WIND FLOW PATTERNS

SPRING (MAR. - APR. - MAY)

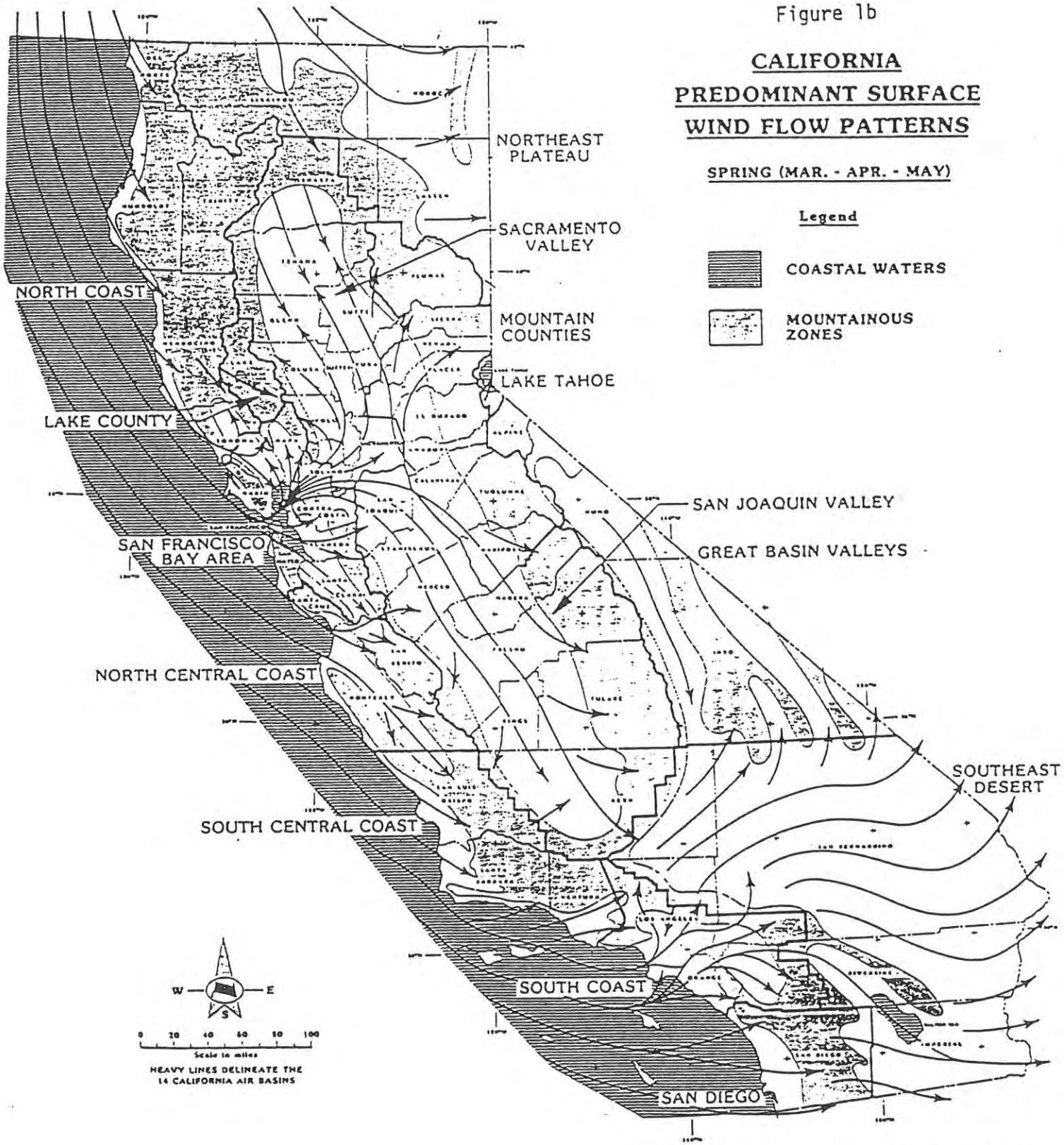


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Figure 1c

CALIFORNIA PREDOMINANT SURFACE WIND FLOW PATTERNS

SUMMER (JUN. - JUL. - AUG.)

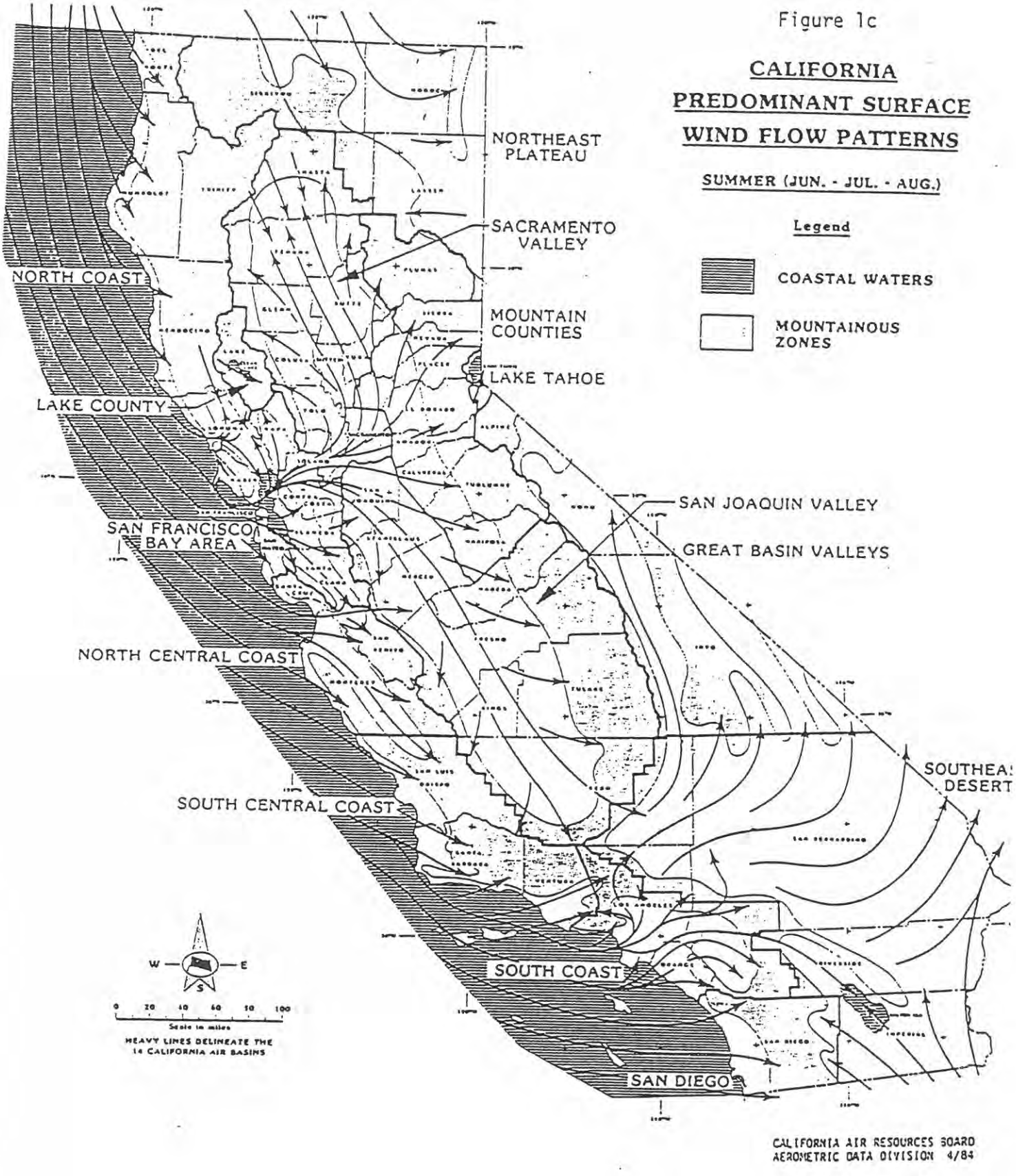

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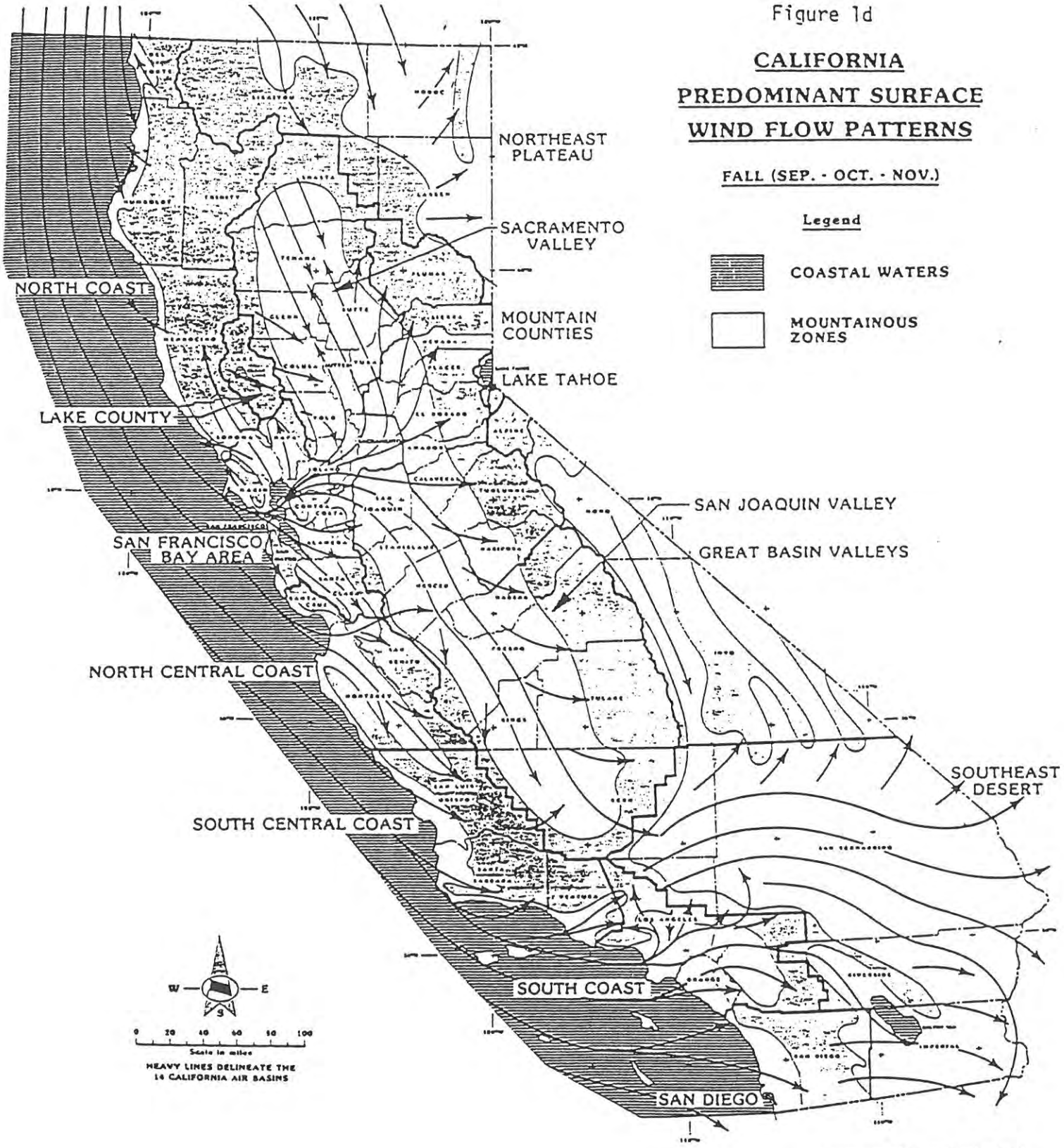
Figure 1d

CALIFORNIA PREDOMINANT SURFACE WIND FLOW PATTERNS

FALL (SEP. - OCT. - NOV.)



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APPENDIX B

TYPICAL WILDLIFE ASSOCIATED WITH COVER TYPES FOUND IN GLENN COUNTY

APPENDIX B

TYPICAL WILDLIFE ASSOCIATED WITH COVER TYPES FOUND IN GLENN COUNTY

BIRDS	MAMMALS	AMPHIBIANS AND REPTILES
COAST RANGE MONTANE FOREST		
Bald Eagle Peregrine Falcon Spotted Owl Goshawk Western Flycatcher Chestnut-backed chickadee golden-crowned kinglet Hutton's vireo solitary vireo hermit warbler varied thrush acorn woodpecker pileated woodpecker California thrasher black-headed grosbeak yellow-rumped warbler western tanagers	black-tailed deer black bear Douglas tree squirrel fisher dusky-footed woodrat red-backed vole creeping vole Trowbridge's shrew	Ensatina Pacific giant salamander tailed frog northwestern garter snake
BLUE OAK-PINYON PINE COMMUNITY		
Stellar's jay scrub jay wild turkey mountain quail band-tailed pigeon yellow-billed magpie plain titmouse acorn woodpecker	California ground squirrel dusky-footed woodrat black bear mule deer western gray squirrel	Ensatina western fence lizard sagebrush lizard slender salamander rubber boa western rattlesnake mountain kingsnake sharptailed snake
GRASSLAND COMMUNITY		
burrowing owl short-eared owl barn owl red-tailed hawk northern harrier turkey vulture black-shouldered kite prairie falcon horned lark western meadowlark western bluebird savannah sparrow grasshopper sparrow	Townsend's mole coast mole western harvest mouse Botta's pocket gopher black-tailed jackrabbit brush rabbit California ground squirrel California vole black-tailed deer coyote	western fence lizard side-blotched lizard coast horned lizard western skink northern alligator lizard rubber boa ringneck snake racer common kingsnake common garter snake western terrestrial garter snake

BIRDS	MAMMALS	AMPHIBIANS AND REPTILES
CROPLANDS/ORCHARDS		
mourning dove California quail band-tailed pigeon American crow Brewer's blackbird house finch yellow-billed magpie American robin northern mockingbird pheasant	opossum vagrant shrew big brown bat black-tailed jackrabbit Audubon cottontail California ground squirrel Valley pocket gopher California mouse California vole red fox long-tailed weasel	western fence lizard side-blotched lizard coast horned lizard western skink northern alligator lizard rubber boa ringneck snake racer common kingsnake common garter snake western terrestrial garter snake
RIPARIAN		
western flycatcher yellow warbler MacGillivary's warbler Wilson's warbler song sparrow yellow-billed cuckoo Anna's hummingbird scrub jay black-headed grosbeak rufous-sided towhee belted kingfisher western kingbird American kestrel	Virginia opossum Trowbridge shrew big brown bat black-tailed jackrabbit Audubon cottontail California ground squirrel western gray squirrel beaver western harvest mouse deer mouse dusky-footed woodrat muskrat raccoon ringtail mink-striped skunk river otter	bullfrog Pacific tree frog western spadefoot toad California newt western pond turtle western aquatic garter snake
WETLANDS		
common yellow-throat red-winged blackbird great blue heron cattle egret American bittern black-necked stilt American avocet shoveler gadwall ruddy duck sora Virginia rail cinnamon teal mallard	vagrant shrew beaver western harvest mouse deer mouse dusky-foot woodrat California vole muskrat ringtail mink striped skunk river otter	Pacific tree frog bullfrog western spadefoot toad western toad Pacific giant salamander California newt western aquatic garter snake

Sources: Faber et al., 1989; Brown et al., 1986; Herbold and Moyle, 1989; Mayer and Laudenslayer, 1988; Jones & Stokes Associates, 1987; U.S. Department of Agriculture, 1986; Arend, 1967.

APPENDIX C

STATE AND FEDERAL AMBIENT AIR QUALITY STANDARDS

APPENDIX C
STATE AND FEDERAL AMBIENT AIR QUALITY STANDARDS

Pollutant	Averaging Time	California Standards[1]		National Standards[2]		
		Concentration[3]	Method[4]	Primary[3,5]	Secondary[3,4,6]	Method[7]
Ozone	1 Hour	0.09 ppm (180 μg/m3)	Ultraviolet Photometry	0.12 ppm (235 μg/m3)	Same as Primary Std.	Ethylene Chemiluminescence
Carbon Monoxide	8 Hour	9.0 ppm (10 mg/m3)	Non-dispersive infrared Spectroscopy (NDIR)	9.0 ppm (10 mg/m3)		Non-dispersive infrared Spectroscopy (NDIR)
	1 Hour	20 ppm (23 mg/m3)		35 ppm (40 mg/m3)		
Nitrogen Dioxide	Annual Average	—	Gas Phase Chemiluminescence	0.053 ppm (100 μg/m3)	Same as Primary Std.	Gas Phase Chemilumi-nescence
	1 Hour	0.25 ppm (470 μg/m3)		—		
Sulfur Dioxide	Annual Average	—	Ultraviolet Fluorescence	80 μg/m3 (0.03 ppm)	—	Pararosoaniline
	24 Hour	0.05 ppm[8] (131 μg/m3)		365 μg/m3 (0.14 ppm)	—	
	3 Hour	—		—	1300 μg/m3 (0.5 ppm)	
	1 Hour	0.25 ppm (655 μg/m3)		—	—	
Suspended Particulate Matter (PM_{10})	Annual Geometric Mean	30 μg/m3	Size Selective Inlet High Volume Sampler and Gravimetric Analysis	—	—	—
	24 Hour	50 μg/m3		150 μg/m3	Same as Primary Stds.	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	—	—	50 μg/m3		
Sulfates	24 Hour	25 μg/m3	Turbidimetric Barium Sulfate	—	—	—
Lead	30 Day Average	1.5 μg/m3	Atomic Absorption	—	—	Atomic Absorption
	Calendar Quarter	—		1.5 μg/m3	Same as Primary Std.	
Hydrogen Sulfide	1 Hour	0.03 ppm (42 μg/m3)	Cadmium Hydroxide Stractan	—	—	—
Vinyl Chloride (chloro-ethane)	24 Hour	0.010 ppm (26 μg/m3)	Tedlar Bag Collection, Gas Chromatography	—	—	—
Visibility Reducing Particles[9]	8 Hour (10 a.m.-6 p.m. PST)	In sufficient amount to produce an extinction coefficient of 0.23 per kilometer due to particulates when the relative humidity is less than 70 percent. Measurement in accordance with ARB method V.		—	—	—

(Footnotes are listed on the following page.)

Notes for Appendix C

1. California standards for ozone, carbon monoxide, sulfur dioxide (1 hour), nitrogen dioxide, suspended particulate matter - PM_{10} and visibility-reducing particulates, are values that are not to be exceeded. The sulfur dioxide (24-hour), sulfates, lead, hydrogen sulfide and vinyl chloride standards are not to be equaled or exceeded.

2. National standards, other than ozone and those based on annual averages or annual arithmetic means, are not to be exceeded more than once a year. The ozone standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above the standard is equal to or less than one.

3. Concentration is expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 mm of mercury. All measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 mm of mercury (1,013.2 millibar); ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

4. Any equivalent procedure which can be shown to the satisfaction of the Air Resources Board to give equivalent results at or near the level of the air quality standard may be used.

5. National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health. Each state must attain the primary standards no later than three years after that state's implementation plan is approved by the Environmental Protection Agency.

6. National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant. Each state must attain the secondary standards within a "reasonable time" after the implementation plan is approved by the EPA.

7. Reference method as described by the EPA. An "equivalent method" of measurement may be used but must have a "consistent relationship to the reference method" and must be approved by the EPA.

8. At locations where the state standards for ozone and/or total suspended particulate matter are violated. National standards apply elsewhere.

9. This standard is intended to limit the frequency and severity of visibility impairment due to regional haze and is equivalent to a ten-mile nominal visual range when relative humidity is less than 70 percent.

APPENDIX D

ACOUSTICAL TERMINOLOGY

APPENDIX D

ACOUSTICAL TERMINOLOGY

AMBIENT NOISE LEVEL: The composite of noise from all sources near and far. In this context, the ambient noise level constitutes the normal or existing level of environmental noise a a given location.

CNEL: Comunity Noise Equivalent Level. The average equivalent sound level during a 24-hour day, obtained after addition of approximately five decibels to sound levels in the evening from 7:00 p.m. to 10:00 p.m. and ten decibels to sound levels in the night before 7:00 a.m. and after 10:00 p.m.

DECIBEL, dB: A unit for describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure, which is 20 micropascals (20 micronewtons per square meter).

L_{dn}: Day-Night Average Sound Level. The average equivalent sound level during a 24-hour day, obtained after addition of ten decibels to sound levels in the night after 10:00 p.m. and before 7:00 a.m.

L_{eq}: Equivalent Sound Level. The sound level containing the same total energy as a time varying signal over a given sample period. L_{eq} is typically computed over 1, 8 and 24-hour sample periods.

Note: CNEL and L_{dn} represent daily levels of noise exposure averaged on an annual basis, while L_{eq} represents the average noise exposure for a shorter time period, typically one hour.

L_{max}: The maximum sound level recorded during a noise event.

L_n: The sound level exceeded "n" percent of the time during a sample interval. L_{10} equals the level exceeded 10 percent of the time (L_{90}, L_{50}, etc.)

BBA

ACOUSTICAL TERMINOLOGY

NOISE EXPOSURE CONTOURS: Lines drawn about a noise source indicating constant levels of noise exposure. CNEL abd L_{dn} contours are frequently utilized to describe community exposure to noise.

SEL OR SENEL: Sound Exposure Level or Single Event Noise Exposure Level. The level of noise accumulated during a single noise event, such as an aircraft overflight, with reference to a duration of one second. More specifically, it is the time-intgrated A-weighted squared sound level for a stated time interval or event, based on a reference pressure of 20 micropascals and a reference duration of one second.

SOUND LEVEL: The sound pressure level in decibels as measured on a sound level meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the response of the human ear and gives good correlation with subjective reactions to noise.

BBA

FHWA Model RD-77-108: Brown-Buntin Associates, Inc.
Calveno Emission Curves Run Date: 07-26-1991
Project Number: 91-253 Run Time: 13:33:17
Year: Existing
Soft Site

INPUT DATA SUMMARY:

Segment	ADT	Day%	Eve%	Nite%	%MT	%HT	Speed	Distance	Offset
1	16500	86.0	0.0	14.0	4.0	33.0	55.0	100.0	0.0
2	20600	86.0	0.0	14.0	4.0	33.0	55.0	100.0	0.0
3	18700	86.0	0.0	14.0	4.0	29.0	55.0	100.0	0.0
4	19300	86.0	0.0	14.0	3.0	27.0	55.0	100.0	0.0
5	7200	87.0	0.0	13.0	3.0	5.5	45.0	100.0	0.0
6	7300	87.0	0.0	13.0	3.0	11.2	45.0	100.0	0.0
7	10400	87.0	0.0	13.0	3.0	7.3	45.0	100.0	0.0
8	2800	87.0	0.0	13.0	5.0	11.6	45.0	100.0	0.0
9	1800	87.0	0.0	13.0	8.0	14.0	45.0	100.0	0.0
10	1800	87.0	0.0	13.0	8.0	14.0	45.0	100.0	0.0
11	2600	87.0	0.0	13.0	4.0	9.6	45.0	100.0	0.0
12	21500	87.0	0.0	13.0	4.0	8.2	45.0	100.0	0.0
13	360	87.0	0.0	13.0	2.0	18.8	45.0	100.0	0.0
14	680	87.0	0.0	13.0	8.0	12.9	45.0	100.0	0.0
15	2500	87.0	0.0	13.0	4.0	8.0	45.0	100.0	0.0
16	7900	87.0	0.0	13.0	4.0	8.0	45.0	100.0	0.0
17	2850	87.0	0.0	13.0	4.0	8.0	45.0	100.0	0.0
18	1700	87.0	0.0	13.0	4.0	8.0	45.0	100.0	0.0

FHWA Model RD-77-108: Brown-Buntin Associates, Inc.
Calveno Emission Curves Run Date: 07-26-1991
Project Number: 91-253 Run Time: 13:33:19
Year: Existing
Soft Site

NOISE LEVELS:

Segment	Level, dB Ldn Distance	Offset	Autos	Med. Trk.	Hvy. Trk.	Total
1	100.0	0.0	64.1	59.2	72.4	73.1
2	100.0	0.0	65.1	60.2	73.3	74.1
3	100.0	0.0	64.9	59.8	72.3	73.3
4	100.0	0.0	65.3	58.7	72.2	73.1
5	100.0	0.0	59.5	52.9	60.0	63.2
6	100.0	0.0	59.2	52.9	63.1	64.9
7	100.0	0.0	61.0	54.5	62.8	65.4
8	100.0	0.0	54.9	51.0	59.1	61.0
9	100.0	0.0	52.7	51.1	58.0	59.8
10	100.0	0.0	52.7	51.1	58.0	59.8
11	100.0	0.0	54.8	49.7	58.0	60.1
12	100.0	0.0	64.0	58.9	66.5	68.9
13	100.0	0.0	45.8	38.1	52.3	53.3
14	100.0	0.0	48.6	46.9	53.4	55.3
15	100.0	0.0	54.7	49.5	57.0	59.5
16	100.0	0.0	59.7	54.5	62.0	64.5
17	100.0	0.0	55.3	50.1	57.6	60.1
18	100.0	0.0	53.0	47.8	55.3	57.8

FHWA Model RD-77-108: Brown-Buntin Associates, Inc.
Calveno Emission Curves Run Date: 07-26-1991
Project Number: 91-253 Run Time: 13:33:20
Year: Existing
Soft Site

NOISE CONTOURS:

Distance to Ldn Contour, in feet

Segment	Offset	Level, dB 75	70	65	60	55
1	0.0	75	162	349	752	1619
2	0.0	87	188	405	872	1878
3	0.0	77	165	355	766	1649
4	0.0	75	162	348	750	1616
5	0.0	16	35	75	163	350
6	0.0	21	46	99	212	457
7	0.0	23	49	106	228	491
8	0.0	12	25	54	116	251
9	0.0	10	21	45	97	208
10	0.0	10	21	45	97	208
11	0.0	10	22	47	101	219
12	0.0	39	84	182	391	843
13	0.0	4	8	17	36	77
14	0.0	5	11	23	49	105
15	0.0	9	20	43	92	199
16	0.0	20	43	92	199	429
17	0.0	10	22	47	101	217
18	0.0	7	15	33	71	154

APPENDIX E

INITIAL STUDY AND NOTICE OF PREPARATION

NOTICE OF PREPARATION
OF A DRAFT ENVIRONMENTAL IMPACT REPORT

TO: Responsible and Trustee Agencies
Interested Parties
Office of Planning and Research, State Clearinghouse

FROM: Glenn County Planning Department
125 South Murdock Avenue
Willows, CA 95988

SUBJECT: Notice of Preparation of a Draft Environmental Impact Report
Glenn County General Plan Revision

Glenn County will be the Lead Agency and will prepare an environmental impact report for the project identified above. We need to know the view of your agency as to the scope and content of the environmental information which is germane to your agency's statutory responsibilities in connection with the proposed project. Your agency may need to rely on the EIR prepared by our agency when considering permits or approvals related to the General Plan.

The project description, location, and the probable environmental effects are contained in the attached materials. A copy of the Initial Study is attached.

Due to the time limits mandated by State law, your response must be sent at the earliest possible date but not later than 30 days after receipt of this notice.

Please send your response c/o QUAD Consultants, 2530 J Street, Suite 302, Sacramento, CA, 95816. We will need the name of a contact person in your agency.

You are invited to attend an E.I.R. Scoping Meeting to be held at 3:00 p.m., June 26, 1991, at the Glenn County Board of Supervisors Chambers, 526 West Sycamore, Willows, CA 95988. The purpose of the meeting will be to describe the project in more detail, answer questions from interested agencies and allow you an opportunity to assist us in focusing the E.I.R. on the relevant and significant environmental issues and their associated impacts.

DATE:_____ **Signature:**_____
John Benoit
Planning Director

INITIAL STUDY
GLENN COUNTY GENERAL PLAN REVISION

PROJECT DESCRIPTION

The proposed project is a revision to the General Plan for Glenn County which will identify issues and guide the growth and development of the unincorporated areas of the County for the next twenty years (with the exception of the Housing Element which must be updated every five years in accordance with State law). The revised plan will incorporate the seven State-mandated elements, an economic development element, and a capital improvements plan. The Plan will include four components which will identify issues and establish policies for the following topics.

NATURAL RESOURCES

- Geography and Climate
- Soils and Slope
- Water Resources
- Vegetation and Wildlife
- Agriculture and Forestry
- Minerals
- Critical Resource Areas including Wetlands
- Scenic Resources
- Cultural Resources
- Natural Resource Policies

PUBLIC SAFETY

- Fire Hazards
- Flood Hazards
- Geologic and Seismic Hazards
- Air Quality
- Water Quality
- Noise
- Public Safety Policies

COMMUNITY DEVELOPMENT

- Land Use
- Circulation
- Regional Transportation Plan
- Public Services

- Housing
- Economic Development
- Community Development Policies

CAPITAL IMPROVEMENTS

- Needs Assessment
- Capital Improvements Financing

Also included within the scope of the EIR will be the rezoning of parcels consistent with the proposed land use designations and general plan policies.

LOCATION/ENVIRONMENTAL SETTING

Located in the Sacramento Valley approximately 80 miles north of the City of Sacramento, Glenn County encompasses 843,000 acres. This 1,317 square mile area extends west from the Sacramento River to the crest of the Coast Range. Included within the County boundary are federal land holdings in the Mendocino National Forest (186,958 acres) and the Sacramento National Wildlife Refuge (8,555 acres).

Within the County of Glenn are two incorporated cities, Orland and Willows, with 1991 estimated populations of 5,175 and 6,100 respectively. The 1991 population of Glenn County was 25,300. In 1989 Glenn County had an unemployment rate of 11.9%. The major industry in the County is agriculture, with rice the primary crop.

Elevations vary from flat alluvial fans along the Sacramento River in the eastern portion of the County (60' above sea level) to elevations of 7,000'+ in the west (Black Butte Mountain - 7,484' above sea level). The County can generally be divided into thirds: the agricultural valley (east), the foothills (central), and the mountains (west). The County is predominantly rural in nature with 66% of the land devoted to agricultural cropland and pasture. The federally-owned land described above comprises another 24% of the land area.

Major transportation arteries include Interstate Highway 5 and the main line of the Southern Pacific Railroad. The County is also served by two airports: Willows Glenn County Airport and Orland Haigh Field Airport.

Water area within the County comprises an additional two square miles or 1,280 acres. This area primarily consists of the Black Butte and Stony Gorge Reservoirs, Stony and Butte Creeks, and the Sacramento River.

Areas of special biological importance include the riparian habitat along the Sacramento River and the area adjacent to the Sacramento National Wildlife Refuge. Vegetation communities include riparian, grassland, mixed chaparral, oak/pine

woodland, and montane forests. These communities provide habitat, foraging areas, and migration corridors for a wide range of wildlife of endangered, threatened, candidate, and special concern status. There are also a number of sensitive plant species throughout the County.

Glenn County is in a relatively inactive seismic area having experienced only minor earthquakes within its boundaries over the last 100 years. Fault activity that has been experienced has been centered out of the County. Other geologic constraints and/or hazards include: landslides (western mountainous area); subsidence (eastern area subject to extensive groundwater withdrawal); erosion (foothill and mountain areas); and expansive soils (valley and foothill areas).

Flooding potential throughout the County is highest in the valley floor, especially along the river, creeks, and streams. The majority of the areas subject to flooding are within a Zone A, defined by the U.S. Department of Housing and Urban Development Flood Insurance Rate Map as being areas of 100 year flooding.

A total of 464 archaeological sites of varying nature and magnitude have been recorded throughout the County.

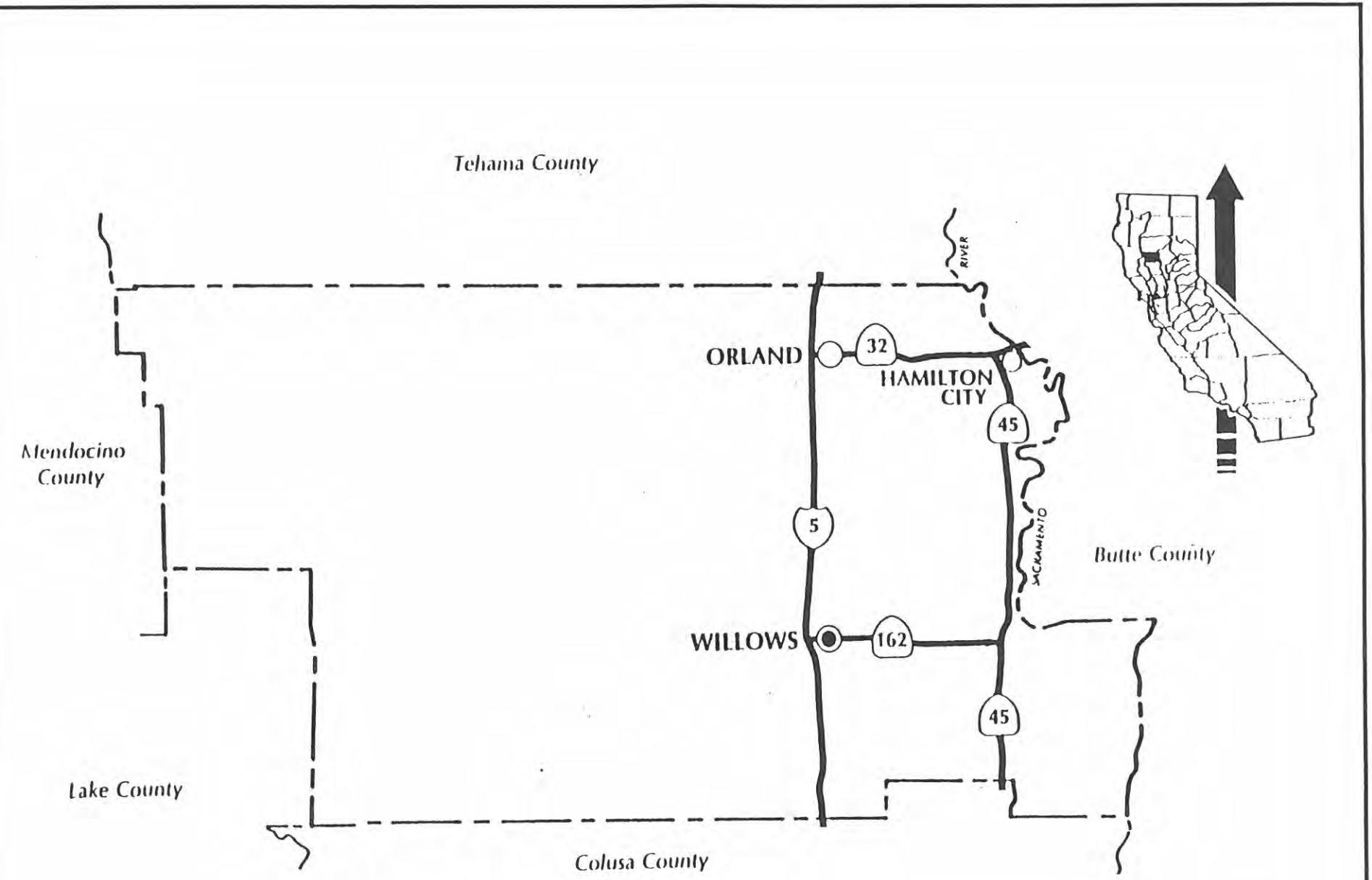
COMPATIBILITY WITH EXISTING ZONING AND PLANS

The current General Plan has been adopted by the County incrementally over the last 17 years. Components of the existing Plan include: Safety (1974), Seismic Safety (1974), Noise (1974), Fire Safety (1985), Land Use (1985), Conservation Management/Open Space (1987), Circulation (1987), and Housing (1989). All mandated elements, as well as optional components as outlined in the Project Description, will be integrated into one plan which will provide overall policy direction and guidelines for evaluating development and growth. Zoning Ordinance amendments will be undertaken as necessary along with the plan adoption to ensure consistency between zoning designations and general plan policies.

All elements of the Plan will be coordinated to ensure internal consistency. Management policies of the solid waste and hazardous waste plans will also be incorporated as relevant. Other applicable policies and regulations, i.e., California Clean Air Act plans, will be reviewed for conformance and consistency.

PREPARATION OF THE INITIAL STUDY

This initial study has been prepared for the County of Glenn by QUAD Consultants, Sacramento, California. Preparation of the study has relied extensively upon the content and findings of previous environmental and other documents descriptive of the County and its setting.



QUAD

GLENN COUNTY VICINITY MAP

Figure 1

Glenn County, CA

AME: Glenn County CASE NO.

	Yes	Maybe	No
b. Possible interference with an emergency response plan or an emergency evacuation plan?		X	
2. Population. Will the proposal alter the location, distribution, density, or growth rate of the human population of an area?		X	
2. Housing. Will the proposal affect existing housing, or create a demand for additional housing?		X	
3. Transportation/Circulation. Will the proposal result in:			
a. Generation of substantial additional vehicular movement?		X	
b. Effects on existing parking facilities, or demand for new parking?		X	
c. Substantial impact upon existing transportation systems?		X	
d. Alterations to present patterns of circulation or movement of people and/or goods?		X	
e. Alterations to waterborne, rail or air traffic?		X	
f. Increase in traffic hazards to motor vehicles, bicyclists or pedestrians?		X	
4. Public Services. Will the proposal have an effect upon, or result in a need for new or altered governmental services in any of the following areas:			
a. Fire protection?		X	
b. Police protection?		X	
c. Schools?		X	
d. Parks or other recreational facilities?		X	
e. Maintenance of public facilities, including roads?		X	
f. Other governmental services?		X	
5. Energy. Will the proposal result in:			
a. Use of substantial amounts of fuel or energy?		X	
b. Substantial increase in demand upon existing sources or energy, or require the development of new sources of energy?		X	
6. Utilities. Will the proposal result in a need for new systems, or substantial alterations to the following utilities:		X	
7. Human Health. Will the proposal result in:			
a. Creation of any health hazard or potential health hazard (excluding mental health)?		X	
b. Exposure of people to potential health hazards?		X	
8. Aesthetics. Will the proposal result in the obstruction of any scenic vista or view open to the public, or will the proposal result in the creation of an aesthetically offensive site open to public view?		X	
9. Recreation. Will the proposal result in an impact upon the quality or quantity of existing recreational opportunities?		X	
10. Cultural Resources.			
a. Will the proposal result in the alteration of or the destruction of a prehistoric or historic archaeological site?		X	
b. Will the proposal result in adverse physical or aesthetic effects to a prehistoric or historic building, structure, or object?		X	
c. Does the proposal have the potential to cause a physical change which would affect unique ethnic cultural values?		X	
d. Will the proposal restrict existing religious or sacred uses within the potential impact area?		X	

	Yes	Maybe	No
21. Mandatory Findings of Significance.			
a. Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?		X	
b. Does the project have the potential to achieve short-term, to the disadvantage of long-term, environmental goals? (A short-term impact on the environment is one which occurs in a relatively brief, definitive period of time while long-term impacts will endure well into the future.)			X
c. Does the project have impacts which are individually limited, but cumulatively considerable? (A project may impact on two or more separate resources where the impact on each resource is relatively small, but where the effect of the total of those impacts on the environment is significant.)		X	
d. Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?		X	

III. Discussion of Environmental Evaluation
(Narrative description of environmental impacts is included in t project staff report).

IV. Determination

On the basis of this initial evaluation:

We find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared. ☐

We find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because the mitigation measures described on an attached sheet have been added to the project. A NEGATIVE DECLARATION WILL BE PREPARED. ☐

We find the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required. ☒

Date of Determination Planning

DISCUSSION OF "YES," "MAYBE" AND "NO" ANSWERS ON ENVIRONMENTAL CHECKLIST

1. Earth

(b)	Maybe	New urban or rural residential development in previously undeveloped or agricultural areas, will result in changes in the condition of the soil(s), including leveling, compaction, and overcovering of soil. Soils in Glenn County can be grouped into five (5) major physiographic units: the mountains, the foothills, the older alluvial fans in the valley, the Butte basin east of the Sacramento River, and the more recent alluvial fans in the valley.
(c,d,e)	Maybe	Any additional or new development will require grading. In areas with sloping terrain, relatively permanent alteration to the natural topography of the area may occur. If improper grading or cut-and-fill occurs, or if development is attempted on extremely steep slopes, it is likely that erosion, siltation subsidence, and/or other adverse impacts, could occur. Erosion can be expected primarily in the foothills and mountainous areas in the County where new urban development occurs and vegetation is removed by construction, fire or cultivation. Other known factors that contribute to erosion include rainfall, topography and soil type. With regard to expansive soils, the valley and foothill regions of Glenn County have high expansion potential. The areas between Orland and Hamilton City and along the Sacramento River are considered low potential, while the western portion of the county is classified as moderate expansion potential.
(f)	Maybe	If new areas are planned for urban or rural residential development, changes in siltation, deposition or erosion which may modify the

channel of local rivers, streams and/or drainage swales may result.

(g) Maybe Several major faults exist in Glenn County as depicted in studies compiled by the State of California Division of Mines and Geology (DMG); however, there has been little seismic activity during recent historical times. The last 100 years has revealed only minor earthquakes within the County, while the County has experienced only secondary impacts from earthquakes centered outside of the area. Projections based on information available from DMG indicate that the possibility of the County experiencing an earthquake of major proportions is low to moderate. Other potential Geologic hazards in Glenn County include landslides, subsidence, erosion and soil expansion. The mountainous western portion of the County has the highest potential for landslides, while areas of lower relief in the western portion of the County are considered areas of lower potential. Due to extensive groundwater extractions in the eastern portion of the County, there are known and potential subsidence areas. The removal of natural gas from reservoirs located in the same region can also contribute to local subsidence of the land surface.

Mitigation Measures: The proposed General Plan will endeavor to minimize adverse impacts through consideration of policies that ensure soil resources are utilized in the most efficient manner possible, minimizing the cumulative impact on soils, and encouraging soil preservation. The General Plan will consider policies that address restrictions on development on slopes greater than a predetermined degree, such as 30%, as well as guidelines for development in areas with unique geologic or physical features, and for grading and cut-and-fill activities. Policies of this nature are implementable through adoption and amendment of the local zoning and other ordinances.The

General Plan will attempt to minimize adverse impacts on rivers, wetlands, and streams through consideration of policies which address grading and storm drainage and proximity of development to such features. The General Plan, which will include policies designed to minimize impacts of and related to seismic hazards. Consultation with DMG will occur during the General Plan revision process. Continuing enforcement of the Uniform Building Code in all new and remodeled structures will help to minimize potential damage resulting from seismic activity. Soil erosion could potentially occur at any development site. Impacts which are identified with soil erosion can be mitigated by all necessary grading being managed in a manner consistent with Glenn County's land leveling and "Title 17" - Land Division Ordinance.

2. Air

(a,b,c) Maybe

If additional population concentrations and urban development or rural residential are planned, the increase in vehicle traffic, increased emissions, and contributions to the cumulative degeneration of ambient air quality will ensue. Impacts will also result from grading and construction during any new development, Plan buildout, or for improvements to the existing road system. As of December 31, 1987, Glenn County, along with numerous other counties, had not attained the federal or State standards for either Ozone or Ten Micron Particulate Matter (PM_{10}). The County is currently drafting an Air Quality Attainment Plan pursuant to the California Clean Air Act.

Glenn County is considered by California Air Resources Board (ARB) as attainment for nitrogen dioxide, sulfur dioxide, sulfates, lead, and nonattainment for suspended particulate matter, while unclassified for carbon monoxide, hydrogen sulfide, and visibility reducing particles. The ARB operates the only recognized air quality

monitoring station in Glenn County, located on Villa Avenue in the City of Willows. This station monitors only particulate matter (PM_{10}). In an effort to ensure compliance with CCAA, Glenn County Air Pollution Control District (GCAPCD) operates an ozone monitoring station that is unrecognized as an official ARB ozone monitoring station. The GCAPCD adheres to ARB criteria for ozone monitoring and anticipates the station will become officially recognized. Factors in the Glenn County region which may contribute to adverse air quality include automobile emissions, wood stoves, agricultural waste burning, industry, pesticide and herbicide application, and the prevailing wind patterns that transport pollutants from the Sacramento Metropolitan Area to the northern Sacramento Valley Air Basin, all of which contribute to hydrocarbon emissions.

If new residential development is planned in proximity to specific types of commercial activities and industrial operations, residents may be exposed to unpleasant odors.

Mitigation Measures: Short-term impacts generated by construction-related dust attributable to General Plan buildout or new development over time can be mitigated by proper dust suppression practices. While impacts caused by emissions from construction equipment are generally unmitigable, it is not anticipated that they would be significantly adverse.

The General Plan revision process, in part, will incorporate coordination with GCAPCD plans, the policies and regulations, including indirect source rules and transportation control measures, to the extent that those are available within the time frame for General Plan adoption. The General Plan will include policies that encourage increased transit ridership and other forms of alternative transportation. Circulation system

		improvements will reduce traffic congestion and improve air quality in the County.
3.	Water	
	(a,b) Maybe	If new urban development or rural residential is planned in previously undeveloped areas, changes in soil drainage patterns, absorption or percolation rates, and the rate and amount of surface runoff, due to grading and an increase in impermeable surfaces (paved streets, structures, parking areas, etc.), will ensue. Improperly planned development and/or individual alteration may adversely impact natural drainage swales and basins, creeks and streams.
	(c) Maybe	It is plausible that if additional, inappropriately-planned urban or rural residential development occurs, alterations to the course or flow of floodwaters resulting in inundation of areas not previously subject to flooding could follow. Localized stream flooding may result from individual and project-related alterations to natural drainage courses.
	(d,h) Maybe	If additional urban development or rural residential is planned, consumption of additional surface water from the Sacramento River, Stony Gorge Reservoir, Tehama-Colusa Canal, and numerous other tributaries for domestic use may result; the quantity is unknown at this time.
	(e) Maybe	New urban development or rural residential in previously undeveloped areas or agricultural areas may increase the amount of stormwater runoff. This may result in adverse impacts on surface water quality.
	(f) Maybe	Development may result in the alteration of the direction or rate of flow of ground waters, in particular gravel extraction activities which may expand during the planning period.

(g,h)	Maybe	If additional urban development or rural residential or agricultural development is planned, increased demands upon groundwater supplies will result. It is possible that increased demand for domestic water supplies may contribute to groundwater overdraft. Mitigation Measures: Impacts which are identified may be mitigated through policies and implementation standards included in the General Plan regarding location of development, hydrology, grading, drainage, and development standards.

4. Plant Life

(a,b,c)	Maybe	New urban or rural residential development may replace some agricultural crops, vernal pools, and some native vegetation with structures, roads and landscaping. The California Natural Diversity Data Base (CNDDB) indicates that special-status plants occurring in Glenn County include the following: Caper-fruited Tropidocarpum, *Tropidocarpum Capparideum* (Federal-Category 2, State-None), Drymaria-like Dwarf Flax, *Hesperolinon Drymarioides* (Federal-Category 2, State-None), California Hibiscus, *Hibiscus Californicus* (Federal-Category 2, State-None), Brandegee's Eriastrum, *Eriastrum Brandugeae* (Federal-Category 2, State-None), Plaskett Meadows Linanthus, *Linanthus Harknessii SSP Condensatus* (Federal-Category 2, State-None), Dimorphic Snapdragon, *Antirrhinum Subcordatum* (Federal-Category 3C, State-None), Indian Valley Brodiaea, *Brodiaea Coronaria SSP Rosea* (Federal-Category 2, State-Endangered), and Adobe Lily, *Fritillaria Pluriflora* (Federal-Category 2, State-None). A field reconnaissance will be conducted during preparation of the Natural Resources Element which will provide more detailed information regarding existing conditions and impacts.

(d) Maybe If land which is currently in agricultural production and/or potential agricultural land is designated for urban or rural residential development in the General Plan revision, a reduction in acreage of agricultural crops will occur.

Mitigation Measures: The General Plan land use designations and policies will ideally be designed to assure protection of and mitigate impacts on vernal pools and endangered and threatened plant species and habitat. Measures may include conservation or open space easements, requirements for site-specific biotic surveys, enhancement of the riparian corridors along the Sacramento River, Butte Creek, Willow Creek, Stony Creek, Elk Creek, habitat acquisition, and/or dedications of land. Additional mitigation measures may be identified during the environmental review process.

The potential loss of agricultural resources will be evaluated in the Environmental Impact Report. It is anticipated that the General Plan revision will include policies which prevent premature conversion of agricultural lands and which promote preservation of agricultural areas in the County.

5. Animal Life

(a,b,c,d) Maybe The CNDDB indicates that some Endangered, Threatened, and Candidate (ET&C) species may exist within Glenn County including the following: Bald Eagle, *Haliaeetus Leucocuphalus* (Federal-Endangered, State-Endangered); Swainsons Hawk, *Buteo Swainsoni* (Federal-Category 3C, State-Threatened); Western Yellow Billed Cuckoo, *Coccyzus Americanus Occidentalis* (Federal-Category 3b, State Endangered); Bank Swallow, *Riparia Riparia* (Federal-None, State-Threatened); Tricolored Blackbird, *Agelaius Tricolor* (Federal-Category 2, State-None); Valley Elderberry Longhorn Beetle, *Desmocerus*

Californicus Dimorphus (Federal-Threatened, State-None).

Glenn County is known for its big game, upland game, waterfowl and nongame wildlife. The valley floor of the County contains some highly important wintering grounds for waterfowl. Also located within the County are 8,555 acres of the 10,776-acre Sacramento National Wildlife Refuge which is a waterfowl concentration point. The other 2,221 acres of the Refuge are located within Colusa County. The riparian, marsh and seasonal marsh vegetation types are critical in terms of wildlife habitat. Glenn County has three major deer herds with known populations of up to 30 to 60 per square mile in pine-fir-chaparral and woodland-chaparral vegetation. A field reconnaissance will be conducted during preparation of the General Plan which will provide more detailed information regarding existing conditions and impacts. Changes in land use and increased levels of human activity may restrict uninterrupted open space which may serve as foraging areas for certain species.

Mitigation Measures: The General Plan land use designations and policies should be designed to assure protection of, and mitigate impacts upon, special-status animal species and habitat. Measures may include conservation or open space easements, requirements for site-specific biotic surveys, restrictions on fence construction and enhancement of riparian corridors. Additional mitigation measures may be identified during the environmental review process.

6. Noise

(a,b) Maybe If additional urban or rural development is planned, especially certain types of commercial and industrial development and new or expanded roadways are built, increased noise levels due to increased traffic and noise-generating land uses will result. If areas are designated for noise-

sensitive land uses (e.g. residential, schools, hospitals) adjacent to noise-generating land uses (Interstate 5, major roadways, airports), potentially severe noise impacts could occur.

Mitigation Measures: The General Plan revision will include within the Public Safety Issue Paper a section on Noise which will contain existing and projected noise exposure contours for major roads and other major noise generators. Polices and standards will be provided for any new development, and subsequent individual projects will be evaluated for consistency with those policies and standards. Land use patterns will be consistent with these policies as well. Individual projects will also be subject to the environmental review process.

7. Light and Glare

Maybe

If additional urban or rural residential development is planned, especially certain types of commercial and industrial development, new sources of light and glare in the surrounding area may result. Until specific development proposals are received, exact locations or intensities are unknown.

Mitigation Measures: The General Plan will attempt to avoid these impacts when assigning land use designations by buffering or otherwise separating light-sensitive uses from sources of light and glare. As property is developed in unincorporated areas, County development standards and conditions of approval will be applied to mitigate potential impacts of light and glare upon surrounding properties. Individual discretionary projects will be subject to County project review process prior to approval.

8. Land Uses

Maybe

Adoption of the General Plan revision may result in substantial changes from the present and/or

planned land use in areas with existing development, if areas which are not presently developed or designated for urban or rural residential development are so designated.

Mitigation Measures: The proposed project is a General Plan revision, which involves changing present and/or planned land uses, including, but not limited to, potential residential, commercial, industrial or open space designations. The impacts associated with proposed land use designations, and related mitigation measures, are addressed under the appropriate subject heading above and below.

9. Natural Resources

(a) Maybe

If additional urban development, including rural residential development, is planned, this development will consume natural resources both during construction and through continued maintenance of facilities and industrial production, if industries are involved.

Mitigation Measures: Because any new development in the Plan area will require new construction of residences, businesses and industries, modern energy-conservation practices, design and materials will be incorporated which will minimize the use of natural resources to the extent possible.

10. Risk of Upset

(b) Maybe

If additional urban or rural residential development is planned and/or densities are increased, evacuation made necessary by wildland fires or other emergencies may become more complex.

Mitigation Measures: The General Plan revision will address emergency evacuation plans.

11. Population

Maybe — Adoption and implementation of the General Plan along with the subsequent rezoning may result in lands available for residential development not previously so designated, potentially altering the location and distribution of the population. Currently, the highest population density is located in and around the two incorporated cities of Orland and Willows and the unincorporated community of Hamilton City. There are also four unincorporated communities served by community services districts: Artois, Butte City, Hamilton City, and Elk Creek.

There is also a potential for the population to increase due to the growth of areas outside the County; e.g., Hamilton City, located near the Glenn/Butte County line, receiving overflow growth from Chico.

Mitigation Measures:. It is anticipated that the policies and programs contained in the General Plan will mitigate adverse impacts associated with population distribution and housing availability.

12. Housing

Maybe — Growth and/or redistribution of the population would likely create the need for additional housing. Also see Item 11.

Mitigation Measures: Adoption of the General Plan will address housing needs and all housing related issues as required by State law as part of the Community Development Issue Paper.

13. Transportation/Circulation

(a,b,c,d,f) Maybe — If new urban and/or rural residential development occurs in presently undeveloped areas, the need for new roads and/or extension

and improvement of existing roads would likely occur. Attendant impacts include the generation of additional traffic and increased hazards, the alteration of circulation patterns, impacts on existing roads and parking facilities, increased vehicle emissions, and increased noise levels.

As part of the environmental analysis, a traffic impact study will be undertaken to determine the impacts on the existing circulation patterns and road network. The General Plan process will identify the general location of existing and proposed transportation routes as required by State law. The Plan process will also include an update to the Regional Transportation Plan which will establish needs and project lists. In addition, a Capital Improvements Plan will be adopted which will cover the needs and financing solutions for a countywide infrastructure system, including roads.

Mitigation Measures: The General Plan, which will provide for comprehensive planning of areas designated for development, will attempt to mitigate potential traffic problems through measures such as street design, traffic controls, and plans for improvements to existing roads. The Capital Improvements Program will include the framework and methodology for allocating costs to provide for roads and other infrastructure improvements to accommodate future growth as well as maintenance of existing facilities.

(e) Maybe

The County is presently served by a main line of the Southern Pacific Railroad and two airports: Willows Glenn County Airport and Orland Haigh Field Airport. As the County population grows, it is possible that the demand for rail and air service will increase.

Mitigation Measures: It is anticipated that the General Plan will address air and rail transportation and include recommendations

		regarding provision of expanded and/or additional services.
14.	Public Services	
(a,b)	Maybe	Additional development, especially in areas outside of those presently developed, may increase the demand for, or dilute the existing level of service for police and fire protection. Mitigation Measures: It is anticipated that the policies and programs contained in the Public Safety and Community Development portions of the General Plan will mitigate or lessen potential impacts to an acceptable level by establishing a reasonable geographic area for provision of services and outlining emergency service programs.
(c)	Maybe	New residential development and increase in population may result in an increased enrollment within some or all of the local school districts. This would contribute to the overcrowded conditions of the existing facilities as well as the need for additional school sites and facilities, and additional student transportation. Mitigation Measures: Future school location planning in coordination with the General Plan, coordination with future development proposals, and identification of future school sites, will help mitigate impacts on schools. Other mitigation measures include continued implementation of developer impact fees which determined by the State to be adequate mitigation, and implementation of year-round schools.
(d)	Maybe	If residential growth occurs, demand for new or expansion of existing park and recreational facilities may occur. Development may also impact regional, state, and federal recreational areas through increased use.

Mitigation Measures: It is anticipated that the implementation strategies of the General Plan will address future park sites and needs and means for providing recreational services. The "Quimby" provision included within the State Map Act provides for the collection of fees and/or dedication of land prior to subdividing land.

(e,f) Maybe Additional development may increase the demand for community facilities and services, i.e., libraries, and construction and maintenance of roads.

Mitigation Measures: The Plan update will include an inventory and capacity analysis of the available public services as well as a needs analysis to accommodate future growth. The Capital Improvements Plan will identify financing mechanisms to meet future demands.

15. Energy

(a,b) Maybe As urban development occurs, increased demand for, and consumption of, natural gas, electricity, and other power sources will occur. In addition the County is currently investigating energy sources which could be developed through the proposed Energy Element of the General Plan.

Mitigation Measures: Utility companies will be consulted during formulation of the General Plan/EIR to determine impacts upon their service capacities. Because any new development will consist primarily of new construction, modern energy-conservation practices, design and materials will be incorporated which will minimize the use of energy resources to the extent possible as set forth in the Uniform Building Code. In addition, the County is in the process of preparing an Energy Element of their General Plan which will also address energy resources/conservation and identify alternative energy sources.

16. Utilities

Maybe

If additional urban and/or rural residential development occurs, it may result in a need for new systems and/or services or expansion or alterations to the existing systems or services such as water, sewer/waste water treatment, or solid waste disposal.

Mitigation Measures: As indicated in the energy discussion (Item 15) above, utility companies will be consulted during formulation of the General Plan/EIR. Local community services districts and other special districts will also be consulted to determine impacts upon their service capacities. Expansion of, improvements to, or formation of these districts will be examined in the Capital Improvements Plan along with potential funding sources.

17. Human Health

(a,b) Maybe

Because of the lack of community sewage treatment facilities throughout most of the County area, urban or rural residential development could result in the creation of health hazards such as the potential of ground water contamination from the installation of additional individual sewage disposal systems. Additional development, if not properly regulated, could result in the exposure of people and property to potential hazards such as flooding or exposure/contamination from hazardous wastes.

Mitigation Measures: It is anticipated that limiting density through land use designations and policies will help to preclude the potential for groundwater contamination from individual septic systems. Conformance with Health Department and Regional Water Quality Control Board regulations along with regular inspections of the existing septic systems will also help to mitigate impacts caused by individual systems. As part of

the Public Services/Capital Improvements Plan consideration may be given to the feasibility of establishing wastewater collection and treatment facilities. Exposure of people and property to flooding hazards can be mitigated by complying with flood insurance criteria, i.e., raising building pad elevations and restricting construction within designated floodways and elsewhere. Potential health hazards from exposure to hazardous wastes can be mitigated by compliance with the County adopted Hazardous Waste Management Plan policies for siting of facilities which will be incorporated into the General Plan.

18. Aesthetics

Maybe

New development could result in the elimination of areas now considered open space which would alter the aesthetic character which now exists.

Mitigation Measures: It is anticipated that the General Plan policies will consider the maintenance and enhancement of the County's aesthetic qualities. The General Plan will consider the retention and preservation of open space and recreational areas.

19. Recreation

Maybe

Refer to item 14(d).

Mitigation Measures: Refer to item 14(d).

20. Cultural Resources

(a,b,c,d) Maybe

The California Archaeological Inventory Information Center at the California State University, Chico has 464 cultural sites listed throughout Glenn County.

Mitigation Measures: It is anticipated that the General Plan will include policies to address preservation of cultural resources. In areas of high sensitivity, it is anticipated that these policies

will provide for compliance with Appendix K of the CEQA Guidelines, including provisions that a qualified professional archaeologist be contracted to conduct a field survey as part of the environmental review process for development permits. Cultural resource mitigation programs can include such measures as the careful recovery and relocation of discovered resources by qualified professionals, or preservation in-place through the use of fill material placed between the resources and site-disturbing activities.

APPENDIX F

RESPONSES TO NOP

☑ PUBLIC HEALTH
240 N. Villa
WILLOWS, CA 95988
(916) 934-6588
FAX: (916) 934-6592

☐ MENTAL HEALTH
242 N. Villa
WILLOWS, CA 95988
(916) 934-6582
FAX: (916) 934-6592

☐ SUBSTANCE ABUSE
1187 E. South St.
P.O. Box 1174
ORLAND, CA 95963
(916) 865-1146
FAX: (916) 865-1150

Glenn County Health Services

Quad Consultants
2530 J Street, Suite 302
Sacramento, CA 95816

Re: Glenn County General Plan Revision, Draft EIR

We have several areas of concern that should be addressed in the general plan:

Solid Waste: The general plan should recognize the existing solid waste disposal site, the existing ag waste drying site at the Orland Airport and the drilling mud disposal sites. Since composting will be necessary to meet the requirements of AB939, the general plan should provide for composting activities near the cities of Willows and Orland and at the Glenn County Landfill (or at some other central site). Septage (the solids pumped from septic tanks) disposal is another issue that should be addressed, especially since the Central Valley Regional Water Quality Control Board has indicated that they may take action that will result in the closure of the existing private septage spreading facility.

Liquid Waste: The general plan should recognize that some of the land currently zoned for residential use has soil that is not suitable for standard on-site sewage disposal systems. This may mean expensive alternative sewage disposal systems will be required. Development in areas with soil that is poor or marginal for on-site sewage disposal should be encouraged only when municipal sewage collection systems are available. The I-5 exits are often suggested as sites for commercial development, however the soil around the exits may also be unsuitable for on-site sewage disposal systems. Development in these areas could require expensive sewage treatment plants similar to the waste water treatment ponds serving the Cal Trans roadside rest north of County Road 39.

Vector Control: The general plan should recognize that promoting urban development outside of the urban areas will bring more people into contact with vectors of disease such as skunks, mosquitoes and flies. There are no effective mosquito abatement activities outside of the Willows and Hamilton City areas. Planning should provide for large buffer zones between vector and odor producing agricultural activities such as dairying and rice

farming and residential areas.

Injection Wells: Injection wells siting has been a source of controversy in the past. Injection wells should be located outside of urban or urbanizing areas.

Hazardous Materials: The two major transportation corridors I-5 and the railroad and the similar state highways are routes for movement of large quantities of hazardous materials. The general plan should recognize the potential for accidental release of these materials.

Please feel free to contact me if you have any questions on these or any other issues.

R. Barry Engrahm, M.D.
Glenn County Health Officer

Donald J. Holm, REHS
Sanitarian II

cc: John Benoit
Glenn County Planning Department

90310

Butte County

LAND OF NATURAL WEALTH AND BEAUTY

PLANNING DEPARTMENT
7 COUNTY CENTER DRIVE - OROVILLE, CALIFORNIA 95965-3397
TELEPHONE: (916) 538-7601

June 18, 1991

Glenn County General Plan Revision
c/o QUAD Consultants
2530 J Street, Suite 302
Sacramento, California 95816

RE: Response to Notice of Preparation of a Draft EIR for Glenn County General Plan Revision.

Dear Mr. Benoit:

Thank you for the opportunity to comment on the Notice of Preparation of a Draft Environmental Impact Report for the Glenn County General Plan Revision. The Butte County Planning Department has the following comments and concerns in addressing the impact areas addressed by the initial study:

1. Soils and development suitability

   * A soil survey might be considered to guide site selection for residential, industrial, and commercial development that involves surface and subsurface structures.

   * EIR should determine texture and composition of soils and identify bearing capacity, internal drainage, erodibility, and slope stability.

2. Hydrology

   * EIR should provide analytical forecasts of the changes of overland flow and stream discharge expected from the proposed development and evaluate the performance of the entire watershed that is subject to any development.

   * EIR should estimate the concentration time by making separate estimates for:
     (1) the time overland flow; and
     (2) the time of channel flow and then summing the two.

* Utilize the ten year and hundred year storms of sixty minutes duration for storm water computations.

* EIR should develop performance goals for the watershed on the County of Glenn which reflect local values, policies pertaining to development intensity, storm water retention, wetlands, open space and the like.

* EIR should develop performance standards and controls or the specific levels of performance that must be met if goals are to be achieved.

* EIR should recommend performance controls to enforce the standards and goals. Controls may be specific ordinance or site plan review criteria within General Plan.

* EIR should map precisely areas prone to flooding, taking into account development and runoff factors.

* EIR should map the drainage network and supply the following data: number of streams, bifurcation ratio, drainage basin order, drainage area, and drainage density.

* EIR should estimate nutrient loading of any impacted water body by identifying the various land uses proposed by the General Plan and major cover types in each land use category, noting the relationship to the drainage system and water features, what kinds of pollutant each land use category is apt to contribute (both nutrients and other types), and the locations of critical entry points.

3. Vegetation and Wildlife

* EIR should document the distribution and makeup of the vegetative cover utilizing a scheme which outlines:
    (1) vegetative structure,
    (2) dominant plant types,
    (3) plant size and density,
    (4) site and habitat or associated use, and
    (5) special plant species

  Vegetative scheme should grant an understanding of both the biological phenomenon as well as the physical component of landscape having height, volume, texture, color, and functional ties with soil, water, air and land use.

4. Land Use

* EIR should conduct a careful evaluation of demographic and economic trends to predict the nature and future character of the County.

* EIR should inventory cultural resources available to the County and how the General Plan will impact future opportunities for the County to expand these opportunities.

* EIR should develop projections of needs for land use and probable phasing of development and analyze how it might impact other environmental goals.

* EIR should identify scenic areas within the County which may be disturbed or adversely effected by developments.

* EIR should evaluate the relationship between the County's General Plan, the newly required Congestion Management Plan, and the General Plans of the incorporated communities of Orland and Willows.

5. Recreation

* EIR should describe and inventory the current recreational resources of the county by classifying resources and opportunities, inventorying existing land, facilities, and programs.

* EIR should evaluate the cost of providing recreational resources and programs for the buildout population of the county.

* EIR should analyze the demand/supply relationship and describe the deficiencies created by the allowed development under the new general plan.

6. Traffic and Circulation

* EIR should evaluate the land use scenarios with transportation infrastructure and improvement program to ensure balance and desired level of service will be maintained.

* EIR should review land use proposal to ensure compliance with the required Congestion Management Plan.

* EIR should discuss future volume to capacity ratios and what it means in terms of level of service.

* EIR should discuss traffic safety problems which will be associated with the projected traffic generated by the new General Plan.

* EIR should discuss short and long range transportation improvement alternatives and the benefits of each alternative in meeting the projected traffic demands.

* EIR should make recommendations for possible financial

strategies to implement the transportation improvement plans and the pros and cons of each financial strategy.

* EIR should discuss future impacts on the State Route 32 Corridor between Orland and Chico.

8. Socio/Economic

* EIR should evaluate and analyze the housing needs by considering the following items:
  (1) The market area - the area within which dwelling units compete with one another; will General Plan and development policies exert pressure for housing development in the Orland area which is in close proximity to Butte County?
  (2) Demand - employment, incomes, population, total households, family and household size.
  (3) Supply - Housing inventory, residential construction activity.

* EIR should analyze the fiscal impacts of the General Plan and estimate all costs and revenues associated with future development.

* EIR should estimate the income potential for the county from all revenue sources for each year in the life of the plan.

* EIR should evaluate the level of service to be provided for all governmental services.

If you have any questions concerning the above comments, please advise.

Sincerely,

B.A. Kircher
Director of Planning

Brent Moore

Brent Moore
Associate Planner

County of Glenn Air Pollution Control District

ED ROMANO, Air Pollution Control Officer

June 20, 1991

QUAD Consultants
2530 J Street, Suite 302
Sacramento, CA 95816

SUBJECT: COMMENTS ON DRAFT EIR FOR GLENN COUNTY

We at the Glenn County Air Pollution Control District (GCAPCD) have reviewed the Preparation of a Draft Environmental Impact Report for the Glenn County General Plan Revision. Our comments will be limited to two sections, "Air" and "Transportation/Circulation".

Comments on "AIR" Section:

In the first "Air" paragraph, page 3, delete "federal or". According to the National Area Designations, Glenn County is "unclassified" for all national ambient air quality standards, which are ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide and PM10.

In the second "Air" paragraph, page 3, add "ozone" to ARB nonattainment list.

In the same paragraph but on page 4, on the third line, delete "only" and add "a coefficient of haze (COH) monitor, a nephelometer, and various meteorological instruments."

In the same paragraph, the "Factors..." sentence is confusing, because different sources contribute to different air quality problems. Since ozone and PM10 are Glenn County's nonattainment pollutants, perhaps this sentence is better:
"Factors in the Glenn County region which may contribute to exceedences of state ozone standards include vehicle emissions, industrial internal and external combustion engines, agricultural burning, and pesticide and herbicide application. PM10 exceedences may be attributed to dusty roads and fields, agricultural waste burning, and wood burning stoves and fireplaces. In addi-

720 N. Colusa Street • P. O. Box 351 • Willows, California 95988 • Phone (916) 934-6500 or 865-4280

tion, prevailing wind patterns that transport ozone and ozone-precursors from the Sacramento Metropolitan Area to the northern Sacramento Valley air basin can contribute to or cause ozone exceedences."

To the bottom paragraph, page 4, add the following and capitalize the following:
"...including New Source Review rules, Indirect Source Review rules, and Transportation Control Measures,..."

Comments on "Transportation/Circulation" Section:

As part of the requirements of the California Clean Air Act, and as mentioned in the "Air" section, Glenn County must develop Transportation Control Measures. These TCMs could easily be incorporated into this part of the General Plan.

In addition to the measures mentioned in the "Mitigation Measures" paragraph on page 12, you could add under "measures": "...traffic controls, parking for car-pooling and bus turnouts, especially along Highway 32 between Orland and Chico,..."

Overall, the coverage in this draft was very good as far as air quality concerns go. The mandates of the California Clean Air Act, which include New Source Review rules, Indirect Source Review rules and Transportation Control Measures, will have a very definite effect on the Glenn County General Plan.

If you have any questions, comments, etc, please feel free to contact me at the district.

Sincerely,

Paul E. Turek

Paul E Turek
Senior Air Pollution Specialist

cc: John Benoit

STATE OF CALIFORNIA PETE WILSON, Governor

PUBLIC UTILITIES COMMISSION
505 VAN NESS AVENUE
SAN FRANCISCO, CA 94102-3298

Tack S. Joe
(415) 557-9884

June 20, 1991

John Benoit, Glenn County Planning Director
c/o QUAD Consultants
2530 J Street, Suite 302
Sacramento, CA 95816

Dear Mr. Benoit:

This is in response to Glenn County's NOP of a Draft Environmental Impact Report for Glenn County General Plan Revision.

We have reviewed this document and we would suggest that the following be given consideration:

1. With the potential increase in polulation and residential development in the cities of Orland and Willows and the fact that the Southern Pacific Transportation Company's track bisect these cities into two parts, consideration should be given to a possible separation of grades of at least one existing at-grade crossing in each city.
2. Consideration should be given to the type of development proposed adjacent to the railroad right of way. Any development should be compatible with railroad activities.
3. Any emergency evacation plans should include evacation due to a railroad hazardous material spill or derailment.
4. Lastly, consideration should be given to possible closure of any railroad grade crossing not required or necessary.

Sincerely,

Tack S. Joe, Transportation Engineer
Special Projects Section
Railroad Safety Branch
Safety Division

cc: State Clearinghouse

STATE OF CALIFORNIA—THE RESOURCES AGENCY PETE WILSON, Governor

DEPARTMENT OF CONSERVATION
DIVISION OF ADMINISTRATIVE SERVICES
DIVISION OF MINES AND GEOLOGY
DIVISION OF OIL AND GAS
DIVISION OF RECYCLING

1416 Ninth Street
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July 11, 1991

Mr. John Benoit, Planning Director
Glenn County Planning Department
125 South Murdock Avenue
Willows, CA 95988

Dear Mr. Benoit:

Subject: Notice of Preparation (NOP) of a Draft Environmental Impact Report (DEIR) for the Glenn County General Plan Revision

The Department of Conservation is responsible for monitoring statewide farmland conversion, administering the Williamson Act and implementing the State's soil conservation plan. The Department has reviewed the above NOP and has the following comments.

The project addresses a general plan revision for the unincorporated areas of Glenn County. The revision will address issues and guide growth and development for the next 20 years. The Department's 1988 Glenn County Important Farmland Map indicates areas of Prime Farmland (173,565 acres), Farmland of Statewide Importance (91,185), Unique Farmland (12,080), Farmland of Local Importance (136,186) and Grazing Land (173,509). There are also 314,058 acres under Williamson Act contract in Glenn County.

The loss of prime agricultural land should be identified and treated as a significant environmental impact of the project. The California Code of Regulations (Section 15000 et seq., Appendix G (y)) states that a project will normally have a significant effect on the environment if it will convert prime agricultural land to non-agricultural use or impair the agricultural productivity of prime agricultural land. The Department also recommends that the DEIR contain a discussion of the following issues:

<u>Agricultural Character of the Project Site and Surrounding Area</u>

- A map which identifies the location of agricultural preserves in the project area, the number of acres and type of land in each preserve (i.e., prime/non-prime).

- Types and relative yields of crops grown in the affected areas, or in areas of similar soils under good agricultural management.
- Agricultural potential of the area's soils, as defined by the Department of Conservation's Important Farmland Series map designations.

Williamson Act Issues

- The location of Williamson Act contracts on lands within and adjacent to the project area.
- A discussion of the effects that the project would have on future nonrenewals or cancellations of Williamson Act contracts.
- A discussion of the specific findings and public hearing requirements for contract cancellations (Government Code Sections 51282 and 51284).

Farmland Conversion Impacts

- The type, amount and location of farmland conversion that would result from implementation of the project.
- The impact on current and future agricultural operations.
- The cumulative and growth-inducing impact of the project on farmland in the project and surrounding area.

Mitigation Measures and Alternatives

Some general mitigation measures and alternatives that would lessen farmland conversion impacts of the project are listed below. Any mitigation measures referenced in the DEIR should also be supported by policies in the General Plan.

- Directing urban growth to lower quality soils in order to protect prime agricultural land.
- Increasing densities or clustering residential units to allow a greater portion of sites to remain in agricultural production.
- Protecting other, existing farmland of equivalent, or better, quality through planning policy that relies on an active and strategic use of the Williamson Act.
- Establishing buffers such as setbacks, berms, greenbelts and open space areas to separate farmland from urban uses. Many communities have considered 300 feet as a sufficient buffer for impacts such as pesticide spraying, noise and dust.
- Implementing right-to-farm ordinances to diminish nuisance impacts of urban uses on neighboring agricultural operations, and vice-versa.

- Adopting a farmland protection program, under the auspices of a farmland trust, that utilizes such land use planning tools as transfer of development rights and purchase of development rights or conservation easements.
- Supporting continued agricultural uses of lands designated for urbanization until actual development ensues.
- Allowing and encouraging activities that support local agriculture such as farmer's markets, on-site sale of produce, and special events promoting local agricultural products.
- Encouraging development of agricultural lands already compromised by adjacent urban development.

Soil Erosion Issues

The NOP notes that soil erosion may be an impact of development in the foothill and mountainous areas of the County. The Department recommends that soil erosion and sedimentation control plans be developed for the project by a Certified Erosion and Sediment Control Specialist. A list of these specialists is available from the Department.

The County should also consider a discussion of any monitoring/ reporting criteria ensuring compliance with adopted mitigation measures.

The Department appreciates the opportunity to comment on the NOP. We hope that the above issues are given adequate consideration in the DEIR. If I can be of further assistance, please feel free to call me at (916) 322-5873.

Sincerely,

Stephen E. Oliva
Environmental Program Coordinator

Enclosure

cc: Ken Trott
Office of Land Conservation

WILLIAMSON ACT CANCELLATIONS

GOVERNMENT CODE

SECTIONS 51282 AND 51284

51282. Cancellation as to all or part of land; conditions for approval.

(a) The landowner may petition the board or council for cancellation of any contract as to all or any part of the subject land. The board or council may grant tentative approval for cancellation of a contract only if it makes one of the following findings:

(1) That the cancellation is consistent with the purposes of this chapter (California Land Conservation Act of 1965; Williamson Act); or

(2) That cancellation is in the public interest.

(b) For purposes of paragraph (1) of subdivision (a) cancellation of a contract shall be consistent with the purposes of this chapter only if the board or council makes all of the following findings:

(1) That the cancellation is for land on which a notice of non-renewal has been served pursuant to Government Code Section 51245.
(2) That cancellation is not likely to result in the removal of adjacent lands from agricultural use.
(3) That cancellation is for an alternative use which is consistent with the applicable provisions of the city or county general plan.
(4) That cancellation will not result in discontiguous patterns of urban development.
(5) That there is no proximate non-contracted land which is both available and suitable for the use to which it is proposed the contracted land be put, or, that development of the contracted land would provide more contiguous patterns of urban development than development of proximate non-contracted land.

As used in this subdivision, "proximate, non-contracted land" means land not restricted by contract pursuant to this chapter, which is sufficiently close to land which is so restricted that it can serve as a practical alternative for the use which is proposed for the restricted land.

As used in this subdivision "suitable" for the proposed use means that the salient features of the proposed use can be served by land not restricted by contract pursuant to this chapter. Such nonrestricted land may be a single parcel or may be a combination of contiguous or discontiguous parcels.

(c) For purposes of paragraph (2) of subdivision (a) cancellation shall be in the public interest only if the council or board makes the following findings: (1) that other public concerns substantially outweigh the objectives of this chapter; and (2) that there is no proximate noncontracted land which is both available and suitable for the use to which it is proposed the contracted land be put, or, that development of the contracted land would provide more contiguous patterns of urban development than development of proximate noncontracted land.

As used in this subdivision "proximate, noncontracted land" means land not restricted by contract pursuant to this chapter, which is sufficiently close to land which is so restricted that it can serve as a practical alternative for the use which is proposed for the restricted land.

As used in this subdivision "suitable" for the proposed use means that the salient features of the proposed use can be served by land not restricted by contract pursuant to this chapter. Such nonrestricted land may be a single parcel or may be a combination of contiguous or discontiguous parcels.

(d) For purposes of subdivision (a), the uneconomic character of an existing agricultural use shall not by itself be sufficient reason for cancellation of the contract. The uneconomic character of the existing use may be considered only if there is no other reasonable or comparable agricultural use to which the land may be put.

(e) The landowner's petition shall be accompanied by a proposal for a specified alternative use of the land. The proposal for the alternative use shall list those governmental agencies known by the landowner to have permit authority related to the proposed alternative use, and the provisions and requirements of Section 51283.4 shall be fully applicable thereto. The level of specificity required in a proposal for a specified alternate use shall be determined by the board or council as that necessary to permit them to make the findings required.

(f) In approving a cancellation pursuant to this section, the board or council shall not be required to make any findings other than or in addition to those expressly set forth in this section, and, where applicable, in Section 21081 of the Public Resources Code.

51284. Public hearing; notice and publication.

No contract may be canceled until after the city or county has given notice of, and has held, a public hearing on the matter. Notice of the hearing shall be published pursuant to Section 6061 and shall be mailed to the Director of Conservation and every owner of land under contract, any portion of which is situated within the same agricultural preserve and within one mile of the exterior boundary of the land upon which the contract is proposed to be canceled.

STATE OF CALIFORNIA

PETE WILSON, *Governor*

STATE LANDS COMMISSION

LEO T. McCARTHY, *Lieutenant Governor*
GRAY DAVIS, *Controller*
THOMAS W. HAYES, *Director of Finance*

EXECUTIVE OFFICE
1807 - 13th Street
Sacramento, CA 95814

CHARLES WARREN
Executive Officer

July 12, 1991

Mr. John Benoit
Glenn County Planning Department
125 South Murdock Avenue
Willows, CA 95988

Dear Mr. Benoit:

This letter is the State Lands Commission's staff response to the Notice of Preparation (NOP) for the Draft Environmental Impact Report (DEIR) for the Glenn County General Plan Revision. We did not receive a State Clearinghouse number for this document.

Our general comments are provided in order to better inform the County of the typical responsibilities of the State Lands Commission. While this is offered simply to apprise you of when and how our two agencies might interact, the County may find it helpful to incorporate parts or all of these comments into the General Plan.

GENERAL COMMENTS

The State acquired sovereign ownership of all tidelands, submerged lands, and the beds of navigable waterways upon its admission to the United States in 1850. This sovereign ownership includes the beds of the Sacramento River within the project area. The State holds these lands for the benefit of all the people of the State, for purposes of commerce, navigation, fisheries, recreation, habitat preservation, and open space.

The SLC has jurisdiction and control over the State's sovereign interests in the project area and has a legal responsibility for, and a strong interest in, protecting the ecological and public trust values associated with these lands. Of particular concern to the Commission is the protection of riparian and fisheries habitat areas. As manager of these lands, a permit may be required from the SLC for proposed projects that are within and/or adjacent to the River, and the SLC could be either a Lead, a Trustee or a Responsible Agency as defined by the California Environmental Quality Act.

The SLC, in identifying and evaluating impacts to the Sacramento River, will analyze project consistency with the adopted "Inventory of Unconveyed State School Lands and Tide and Submerged Lands Possessing Significant Environmental Values" (Significant Lands

Inventory) which identifies the following environmentally significant values for the Sacramento River: biologic, aesthetics, fish spawning, critical ecosystem, fishery, wildlife support and recreation. Sacramento River lands are placed in use category "B", "Limited Use". These areas are defined as those "...in which one or more closely related dominant, significant environmental values is present". Limited use compatible with and nonconsumptive of such values may be permitted. Use of the information contained in the Significant Lands Inventory is governed by California Code Regulations Sections 2953 and 2954.

In addition to information and designations provided within the Significant Lands Inventory, the SLC relies on the information and analyses developed in the Sacramento River Marina Carrying Capacity Study (River Study). The River Study was accepted by the SLC in 1986 and an implementation program was developed in 1987. The implementation program provides for a case-by-case review of marina projects with an emphasis on detailed CEQA review of the issues raised in the River Study. Although the River Study concentrated on marina proposals in proximity to Sacramento, other projects might affect the river environment and could, therefore, benefit from a review of issues raised by the River Study.

Government Code Section 66478.1, et. seq., prohibits local agencies from approving either a tentative or a final map of any proposed subdivision to be fronted upon a public waterway, river or stream which does not provide reasonable public access from a public highway to that portion of the bank of the river or stream bordering or lying within the proposed subdivision. Mention of this requirement in the General Plan and implementation through the Subdivision Map requirements would help to ensure that this important legal requirement is satisfied.

Under Government Code Section 56108, approval from the SLC is necessary for proposed annexation boundaries [56108(c)], and incorporation or annexation of State-owned Tidelands and submerged lands without the express approval of the SLC is prohibited [56108(a)]. These requirements should be kept in mind if the cities in the County anticipate annexing any additional property, especially if it is in proximity to the Sacramento River.

The County should also be aware that local General Plan designations and zoning ordinances are not binding on the SLC. Although the Commission endeavors to coordinate with local government to the maximum extent feasible and appreciates the utility of plans and zoning as expressions of a city or county's land use preferences, the SLC is guided by applicable constitutional, statutory and case law in determining appropriate uses of land subject to the Public Trust Doctrine.

SPECIFIC COMMENTS

The discussion of plant life, items 4a, 4b and 4c, which appears on page 6, does not mention riparian vegetation (habitat). The protection of this habitat is of critical concern to the State Lands Commission.

It should be recognized that the Sacramento River and tributaries within Glenn County are included in the Upper Sacramento Fisheries and Riparian Habitat Management Plan, January 1989, as specified under SB1086 (Nielsen) and SCR 62 (Nielsen). The County General Plan should attempt to incorporate the overall goals and specific recommended solutions of the 1086 Plan to the maximum extent feasible. The major objectives of the 1086 Plan include protection of existing riparian habitat, re-establishment of riparian ecosystems on the mainstem Sacramento River and tributaries, and, protection and restoration of fisheries resources giving highest priority to wild, naturally spawning salmon and steelhead stocks.

The County of Glenn should consider the potential impacts of this plan on the waterways within and adjacent to the subject area. Significant biological values associated with these riparian areas should be protected from direct and indirect impacts. Such impacts could include, but not be limited to, runoff, sedimentation, degradation and erosion. It is anticipated that implementation of the plan will induce growth and encourage the development of the affected area. The potential impacts of such growth on the sensitive and finite resources, as described, should be addressed at this time and advance thought given to how such impacts may be mitigated.

The document must fully analyze the impacts of the plan and associated activities to riparian habitat. The Sacramento River Marina Carrying Capacity Study (River Study) identified the following potential impacts on riparian habitat from development activities:

- removal of vegetation, grading and construction
- compaction of roots of remaining vegetation
- disruption of banks and placement of bank protection
- alteration or removal of understory plants
- fragmentation of migratory corridors for terrestrial wildlife
- introduction of human activities, noise, night lighting
- isolation, reduction or destruction of threatened and rare species and their

habitats

- disruption of shoreline, instream fish habitats
- disruption from activities of adjacent developments

All of these impacts should be addressed in the DEIR with sufficient detail to enable the preservation and enhancement of this significant, yet diminishing resource. To this end, the document must begin by locating, cataloging and quantifying the nature, scope and values of this vegetation type.

Particular attention should be given to the special needs of threatened and endangered species, e.g. the Swainson's Hawk, which nests in the tall trees of riparian forests, yet requires large expanses of open grassland for hunting rodents; and the Bank Swallow, which requires eroding banks for nesting colonies.

The DEIR should also make use of the following recommendations from page 113 of the River Study:

1) The plan should avoid development of environmentally sensitive areas to the maximum extent; such areas would include habitat for threatened and endangered species and riparian vegetation.

2) The plan should require development proposals to incorporate all feasible modifications and construction techniques to eliminate or minimize adverse impacts on ecological resources of land and water.

3) Replacement of riparian vegetation should be planned by experts familiar with native riparian plants and their requirements, and monitoring programs should be established to ensure the satisfactory completion and maintenance of revegetation programs.

4) The overall goal of mitigation should be that post project habitat productivity be at least equal to pre-project habitat productivity. Determinations of habitat productivity should be made by a panel of qualified biologists using habitat analysis methods acceptable to the U.S. Fish and Wildlife Service and the California Department of Fish and Game.

Concerning animal life in general, aquatic resources, especially fisheries, also need to be addressed. Recent references which should be consulted with regard to sensitive fisheries are:

Moyle, P., J. Williams, and E. Wikramanayake. 1989. Fish species of special concern of California. Report to California Department of Fish and Game. Contract No. 7337. 222.

Nehlsen, S., J. Williams, and Ja. Lichatowich. 1991. Pacific salmon at the crossroads: Stocks at risk form California, Oregon, Idaho, and Washington. Fisheries 16(2):4-21.

CONCLUSION

The County's Notice of Preparation does a credible job of identifying a wide range of issues to be assessed in the DEIR. We look forward to receiving a copy of this document when it is published.

If you have any questions about these comments please call John Lien at (916) 322-7805. Thank you for this opportunity to comment.

Sincerely,

Dwight E. Sanders

Dwight E. Sanders, Chief
Division of Environmental
Planning and Management

cc: Charles Warren, Executive Officer
John Lien

STATE OF CALIFORNIA--BUSINESS, TRANSPORTATION AND HOUSING AGENCY PETE WILSON, Governo

DEPARTMENT OF TRANSPORTATION
DISTRICT 3
P.O. BOX 942874-MS41
Sacramento, CA 94274-0001
TDD 916-741-4509
FAX 916-323-7669
916-327-3859

July 19, 1991

CGLE007
03-GLE
Glenn Co. G.P. Revision
NOP DEIR

Mr. John Benoit
Planning Director
Glenn County Planning Department
125 South Murdock Avenue
Willows, CA 95988

Dear Mr. Benoit:

Thank you for the opportunity to review and comment on the above referenced document.

COMMENT:

A traffic study should analyze the existing conditions, future build-out on the existing network, and future conditions with all necessary improvements for each State Route. The County should develop a funding mechanism to finance any needed improvements.

If you have any questions regarding these comments, please contact Sharon Scherzinger at 916-324-6642.

Sincerely,

ROBERT M. O'LOUGHLIN
Chief, Planning Branch C

JUL 22

GLENN COUNTY PLANNING DEPARTMENT
125 SOUTH MURDOCK STREET
WILLOWS, CALIFORNIA 95988
916-934-6540

DATE: August 6, 1991

TO: Gene Smith, Quad

FROM: John Benoit

MESSAGE: Received this today. Sending a copy for your information regarding the NOP for General Plan.

_____ As Requested

_____ For Information

_____ For Review

STATE OF CALIFORNIA—THE RESOURCES AGENCY PETE WILSON, Governor

DEPARTMENT OF FISH AND GAME
REGION 2
1701 NIMBUS ROAD, SUITE A
RANCHO CORDOVA, CALIFORNIA 95670

(916) 355-7020

August 2, 1991

Mr. John Bensit
Glenn County
125 South Murdock Avenue
Willows, California 95988

Dear Mr. Bensit:

The Department of Fish and Game (DFG) has received your Notice of Preparation (NOP) of a Draft Environmental Impact Report (EIR) on the Glenn County General Plan Revision and welcomes the opportunity to work with you on this plan.

Glenn County contains some of the finest fish and wildlife populations in the State. These fish and wildlife resources represent a renewable natural resource that becomes more valuable economically and aesthetically as an increasingly urban California population seeks escape in rural counties such as Glenn County. Because Glenn County has retained healthy fish and wildlife populations and because future generations will place a premium on the enjoyment of the resources, it would be prudent of Glenn County to revise the General Plan so that these renewable wildlife resources are not diminished.

In addition to the general overview of fish and wildlife resource policy, the DFG recommends the following specific areas be addressed in the Draft EIR:

Designations and policies toward:

1) Threatened and endangered species
2) Wetlands
3) Critical wildlife habitats (deer, waterfowl, sensitive species)
4) Minimum parcel sizes in rural areas and their impact on wildlife
5) Rezoning of agricultural land and its impact on wildlife
6) Designation of areas of high wildlife value that may be used as future mitigation sites
7) Riparian corridors along natural waterways
8) Preservation of native hardwoods
9) Fishery resources

The DFG staff would be pleased to work with you to develop protective policies and mitigation for the above areas or concerns. If the DFG can be of further assistance, please contact Mr. Bob Mapes, Associate Wildlife Biologist or Ms. Patricia Perkins, Wildlife Management Supervisor at (916) 355-7010.

Sincerely,

James D. Messersmith
Regional Manager

APPENDIX G

LIST OF PERSONS CONTACTED

Shirley Wood, Orland Joint Union School District
Gary Kemp, Superintendent, Willows Unified School District
Ed Mueller, Stony Creek Joint Unified School District
Phil Manning, Superintendent, Hamilton Union Elementary School District
Thomas E. Landon, Civil Engineer, Consultant to the City of Willows
Kathleen Wells, Secretary, Glenn General Hospital
Ralph Vidauri, Plant Manager,Hamilton Community Services District
Willy Warren, Pacific Gas and Electric Company
Ed Romano, Commissioner, Glenn County Department of Agriculture
Patti Blakeman, Eligibility Program Manager, Glenn County Department of Social Services
Gary R. Freeman, President, Tri-County Economic Development Corporation
Jim Mann, Supervisor, Glenn County
Richie Matley, California State Board of Equalization, Research and Statistics Division
Denise Dachner, Outdoor Recreation Planner, Sacramento National Wildlife Refuge
Jim Goodwin, Executive Director, Glenn Economic Development Corporation
Tom Guarino, Public Affairs Director, Chico Chamber of Commerce
Dave McGarr, Broker, American Homes and Farms Realty
Rhoda Smith, Realtor, Secretary, Willows Board of Realtors
Jon C. Gregory, Economic Development Planner, Tri-County Economic Development Corporation
Mike Cassetta, LCSW, Glenn County Health Services Director
Jim Giachino, District Ranger, U.S. Forest Service
Leeds Lacy, Superintendent, Orland Joint Union School District

APPENDIX H

REFERENCES

LIST OF REFERENCES

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