MEI
GENERAL PLAN VOL II
BACKGROUND ANALYSES

Nevada County
Master Environmental Inventory

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December 1991

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INTRODUCTION

1.1 PURPOSE OF COUNTY DATA INVENTORY

This document provides a Data Inventory identifying existing conditions and constraints for use in the preparation and evaluation of the General Plan Update for the County of Nevada (See Figure 1-1).

The purpose of this document is to provide a baseline inventory of the natural and human environment of Nevada County and the constraints to growth which result. The document has been compiled from a variety of sources, but has not been field-checked to confirm all data.

1.2 ORGANIZATION OF THE DOCUMENT

The Data Inventory is organized in 13 sections:

Section 1 - Introduction describes the purpose and organization of the Data Inventory;

Section 2 - Summary provides a brief discussion of each technical element;

Sections 3 through 12 - Technical Sections describe the existing conditions and constraits for the following:

- Geology
- Hydrology
- Biology
- Air Quality
- Land Use Trends
- Safety
- Transportation
- Noise
- Public Services
- Cultural and Historic Resources

Section 13 - Persons Contacted/Bibliography provides a comprehensive list of the persons contacted and data sources used in the preparation of this document.

Appendices to this document are bound separately.

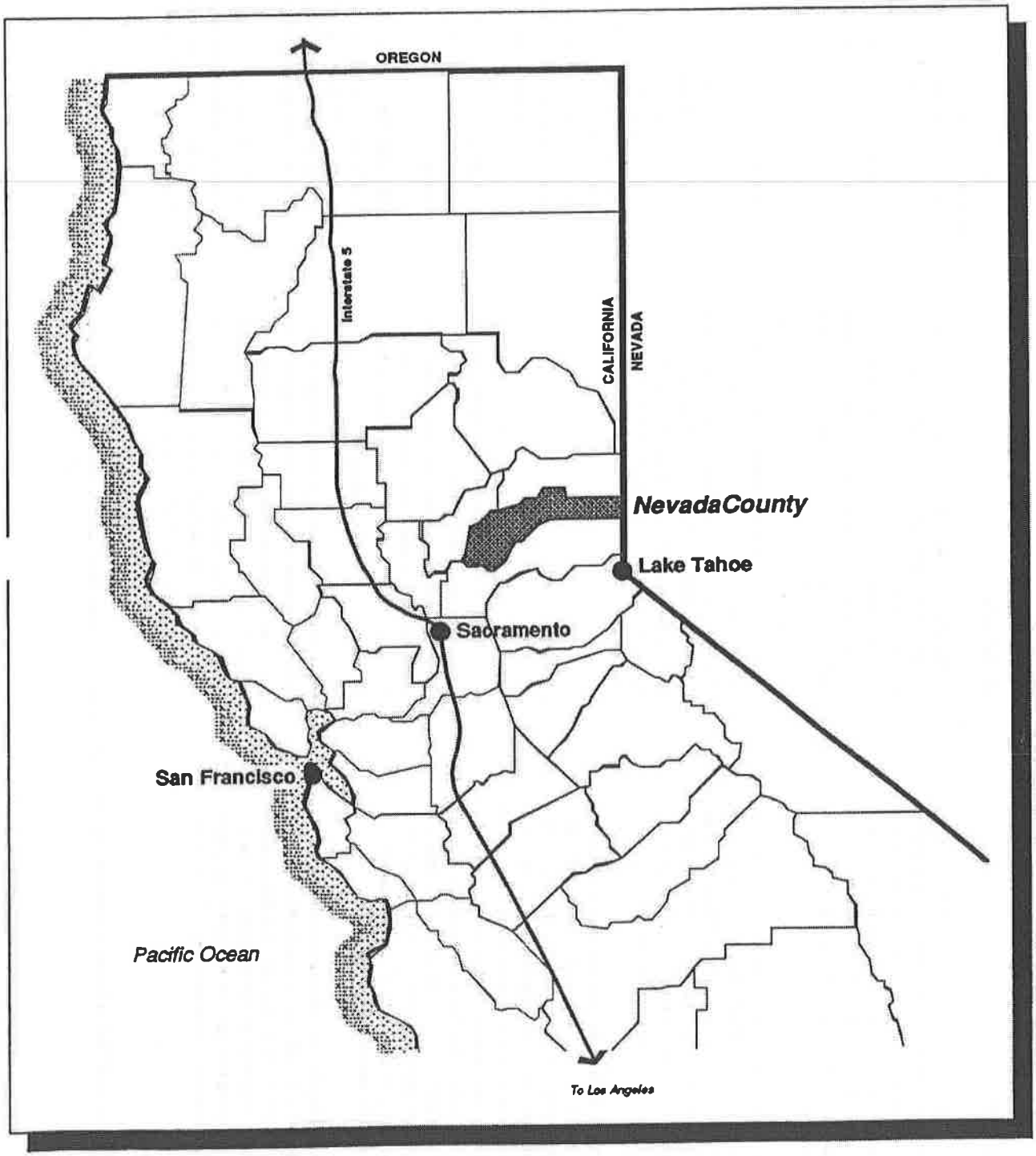


Figure 1-1
Location Map

SUMMARY 2

2.1 OVERVIEW

This Data Inventory has been prepared to provide the County and General Plan consultant with baseline data which can be used to assist in refining General Plan policies and land use designations. The goal of the Data Inventory is to collect the most current and up-to-date information available from federal, state, county and other local sources.

The technical sections are summarized into two primary categories: natural resources and community resources. The natural resources sections include geology, hydrology, biology and air quality, while the community resource sections include land use trends, safety, transportation, noise, public services and cultural and historic resources.

The data for the natural resource sections was collected by conducting interviews with all relevant responsible and trustee agencies at the federal, state and local level. Based upon the interviews and review of data obtained from the various agencies, a characterization of the existing natural environment was prepared. In those cases where the data were available in a mapped form, the maps were reviewed and, where appropriate, included in the Data Inventory. In cases where interview or textual sources provided more current data than available maps, the information was included in the text but was not mapped.

The methodology for preparing the community resources sections was essentially the same as that for the natural resources section. For both groups of sections, reliance was placed on agency staff, available published data and existing mapping to obtain data. No new studies or field work was utilized in preparation of the individual sections.

2.2 METHODOLOGY

An environmental constraint is herein defined as a relative measure of the limits posed on human activities by a particular factor of the natural or man-made environment. For the purposes of the Data Inventory, constraints were identified when a particular resource had limitations which could affect development. These constraints took the form of either direct physical characteristics (i.e., steep slopes, presence of endangered plant, areas of important wildlife corridors, etc.) or secondary limitations (i.e., lack of septic suitability, presence of congested roads, lack of adequate fire protection, etc.). Each of the Data Inventory sections contains a brief listing of the primary constraints to development which were identified during the preparation of the document to give the reader an overall sense of the constraints identified.

2.3 SECTION OVERVIEW

GEOLOGY: The geology discussion (Section 3) considered geologic substructure, seismic characteristics, mineral resources, and soils characteristics. The constraints identified include moderate seismic risk, areas of important mineral resources, severe soil constraints for septic systems, areas of high erosion hazard, and areas with constraints to excavations such as pipelines.

HYDROLOGY: The hydrology section (Section 4) considered both surface and groundwater resources. The surface water discussion focused on water quality and determined that contamination by septic tanks and public wastewater treatment systems, mining activities and soil erosion/ sedimentation are the primary contributions to decreased water quality in the County. Hydroelectric projects have also contributed to the degradation of area creeks and rivers. The groundwater discussion focussed on the eastern portion of the county as the west county has no documented aquifers and relies for groundwater on locally variable and inconsistent resources. The eastern county relies on the Martis Valley aquifer which appears to contain adequate supplies to serve the area.

Overall however, water quality is good and constraints to future development, as far as water quality and quantity, are low.

BIOLOGY: The biology discussion (Section 5) considered wildlife habitat areas of both animals and plants within the County. Species of special status as recognized by the California Department of Fish and Game and the U.S. Fish and Wildlife Service are discussed and listed in a table provided in the appendix. Other components of this section include deer population, wetlands, oak trees and riparian corridors. Constraints to development include oak woodland areas which are experiencing a decline in numbers and areas heavily used by deer populations. In addition, agricultural operations and increasing development have encroached upon the rural habitats of many species.

AIR QUALITY: The air quality discussion (Section 6) considered climatology, air pollution standards, current air quality and regional air quality planning. The constraints identified included exceedence of federal standards for ozone and suspended particulate matter.

LAND USE: The land use trends discussion (Section 7) addresses residential development in the smaller rural communities as well as growth in the more developed areas around Grass Valley and Nevada City. Commercial

and industrial development is also discussed in this section. A review of building permits issued by the County illustrating the significant growth in recent years is included. Constraints to future land use include the large amount of land in public ownership, topography, and inadequate infrastructure to support development.

SAFETY: The safety discussion (Section 8) addresses different physical hazards including fire, avalanche, landslide, seismicity, flood and severe weather conditions. Also included in the discussion are airport hazards and hazardous materials. Safety related constraints to development include severe fire hazard, avalanche hazard in eastern county, areas of landslide activity, and seismic hazard.

TRANSPORTATION: The transportation section (Section 9) discusses Nevada County's existing transportation system. Components of the transportation system include the street system, transit facilities, air transportation facilities, rail transportation facilities, and bikeway/pedestrian/equestrian corridors. Constraints include isolated capacity deficiencies at various locations in both eastern and western portions of the County.

NOISE: The noise discussion (Section 10) considered the identification of noise sources including roadways, railroads, airport noise, industrial areas such as lumber mills and mining operations, and other stationary noise sources. Constraints include specific noise sources in relation to development proposals and noise sensitive uses and areas.

PUBLIC SERVICES: The public services discussion (Section 11) considered the staffing, facilities and equipment of all of the public service districts serving the County, including general county departments, fire, schools, water/sewer/public utility districts, other districts and state/federal agencies. Of the 43 local agencies surveyed, 58 percent identified deficiencies in staffing. Additionally, 42 percent identified deficiencies in equipment, and only 28 percent identified deficiencies in space. Other constraints include inadequate septic systems, near capacity public sewer systems, and soil and topography limitations which restrict sewer service.

CULTURAL/HISTORIC: The cultural and historic resources discussion (Section 12) considered existing resource surveys, historic sites, and cultural sensitivity models. Cultural/Historic related constraints to development include a high percentage of recorded sites in western county and a high sensitivity for potential cultural/historic resources throughout the county.

2.4 CONSTRAINT MATRIX

A "constraint matrix" was developed in order to summarize the major conclusions of the MEI using three geographic areas – "Western", "Central" and "Eastern", as shown below.

The constraints are measured in general terms as "low", "moderate" and "high". The matrix is found on the following page.

CONSTRAINT MATRIX

Constraint	Western County	Central County	Eastern County
Geology/Soils			
Seismicity	LOW - Pre-Quaternary and quaternary faults are in western County. Only two epicenters have been located with a richter magnitude of 3.0-4.4.	MODERATE - Although several pre-quaternary faults exist, no recorded epicenters have been located in central county.	HIGH - Relatively active quaternary faults are located in eastern county. Four epicenters of 4.5-6.4 magnitude and seven of 3.0-4.4 magnitude have been located in this area during 1970-1987.
Mineral Resources	HIGH - Significant mineral resources are located within western and central county. *Need to identify potential and existing mining areas.		MODERATE - Isolated areas of significant mineral resources have been identified within eastern area.
Soils	HIGH - There are severe constraints to development (i.e. septic use, effluent disposal, and installation of pipelines and subsurface infrastructure) throughout the County due to slow permeability and depth of soils. In addition, all septic systems may be cumulatively contributing to nitrate loading in ground water (Martis Valley Aquifer and Truckee River).		
Erosion	MODERATE-HIGH - According to the Soil Conservation Service, erosion hazard is quite high in western county. However, some areas are classified as only "slight".	MODERATE-HIGH - Erosion hazard increases with steeper slopes, thereby creating a moderate to high constraint to future development.	MODERATE-HIGH - Erosion hazard increases with steeper slopes, thereby creating a moderate to high constraint to future development.
Hydrology			
Water Quality	LOW-MODERATE - Generally, as elevation decreases so does the water quality. This is due to inadequate septic tank filtration, the public sewage treatment system, mining, and grazing (sedimentation and erosion).	LOW- Generally, in the more mountainous and less developed areas, water quality is good. However, some degradation occurs due to recreational and logging uses.	LOW- Generally, in the more mountainous and less developed areas, water quality is good. However, some degradation occurs due to recreational and logging uses.
	*It should be noted that water quality is also affected by logging, grading practices and public and private dirt roads in all three areas of the County.		
Groundwater	UNKNOWN- Groundwater resources are poorly defined and vary. Further studies should be conducted.		LOW - The Martis Valley Aquifer is the primary subsurface hydrologic resource. The aquifer is currently under study to determine its total storage, recharge and yield. It has been estimated that there is a safe yield of 13,000 acre feet per year.
Biology			
Special Status Species	LOW - Only one area in the western county contains a known location of a "special plant".	MEDIUM-LOW - Eight locations of special status species have been identified in central county.	HIGH - The eastern county contains numerous identified locations of special status species, especially in mid eastern county.
	*Note: There is a high potential for the existence of special status species throughout the County in areas not previously mapped		

Note: For the purpose of this matrix, a constraint is a restriction to future development, measured in general terms as "low", "moderate" and "high".

CONSTRAINT MATRIX

Constraint	Western County	Central County	Eastern County
Important or Unique Habitat Zones *Movement Corridors/Valuable Habitat*	MODERATE-HIGH - According to the California Dept. of Fish and Game (CDFG), generally where there are large, undeveloped/underutilized parcels, the constraints to future development are high because these areas are heavily used by deer populations. This becomes more critical if a migratory deer winter range is present, such as in western and central county.		
Wetlands	LOW - Wetlands in the County are generally small, isolated features dependent upon riparian water, NID ditch leaks or overflows, diversions by agricultural operations or natural seeps or springs. *Note: Wetlands of the County are not well mapped.		
Oak Woodlands/ Hardwoods	HIGH - Oak Woodlands have a high habitat value which creates a high constraint to future development. Both the western and central portions of the County are experiencing a decline in both numbers and regeneration due to agricultural and timber practices and residential development.	HIGH - Oak Woodlands have a high habitat value which creates a high constraint to future development. Both the western and central portions of the County are experiencing a decline in both numbers and regeneration due to agricultural and timber practices and residential development.	
Air Quality	HIGH - Both state and federal ambient ozone standards are exceeded in Nevada City. However, PM10 measured in Grass Valley meet federal standards, but exceed state standards (mostly due to wood burning in winter).	Monitoring is not conducted in this area of the County.	MODERATE - The Truckee monitoring station revealed that PM10 federal standards are met, but state standards are exceeded.
	*Note: Nevada County is considered to be "non attainment" for ozone and PM10, and is either "attainment" or unclassified for other pollutants.		
Land Use Public Land	MODERATE - The County has a total area of 625,920 acres. Almost one-third of the total area is in public ownership. The ownership breakdown is shown below.		
	The Federal government (Bureau of Land Management) owns 20,000 acres in the western county.	The Federal government owns 169,045 acres, managed by the U.S. Forest Service-Tahoe National Forest.	The Federal government owns 169,045 acres, managed by the U.S. Forest Service-Tahoe National Forest.
	The State of California owns 10,856 acres which includes state parks located throughout the County. This ownership also includes approximately one-half of the State Department of Fish and Game's 11,000 acre Spenceville Wildlife and Recreation Area located in western county.		
Topography	LOW - Constraints to future development as related to topography is relatively low in western county.	LOW-MODERATE - Constraints in the central area are slightly increased from western area due to the steepening topography.	HIGH - Development within the eastern portion of the County is constrained by the steep topography, especially for land uses requiring level sites (i.e. Industrial land uses).

Note: For the purpose of this matrix, a constraint is a restriction to future development, measured in general terms as "low", "moderate" and "high".

CONSTRAINT MATRIX

Constraint	Western County	Central County	Eastern County
Safety			
Fire	HIGH - Almost all of the County is considered to be in the "very high" fire hazard zone, as defined by the California Department of Forestry. This is mainly due to the vegetation type and topography of the area. In addition, certain developed areas lack adequate ingress and egress routes which make fire protection very difficult for those areas. An inventory of these roads needs to be conducted in order to fully address fire-related constraints.		
Avalanche			MODERATE-HIGH - Eight out of eighteen identified potential avalanche areas are considered "high" hazard areas. However, these mapped areas only include currently populated areas and do not include areas where people may travel by foot, snowshoes, skis, or snowmobile (i.e. back county or roadless areas).
Landslide	*Note: Mapping of landslide activity in the County has not been done in over 20 years. At that time most of the County is within the "low" zone of landslide activity, relative to the state of California. There are however, specific areas within each portion of the County that have higher ratings which are described as follows:		
	MODERATE - Isolated areas of landslide activity with a rating 3 or 4, (rating of 6 is the most active) exist in western county. However, this information is based on 1970 data. Western county also contains several historic hydraulic mining sites which are known to be susceptible to landslide activity.	MODERATE - Three isolated areas within central county have been mapped with a rating of 4. Again, this is based on 1970 data. Central county also contains hydraulic mining sites.	MODERATE-HIGH - Large areas of eastern county have had landslide activity rated at 3, according to 1970 data.
Seismicity	See previous discussion in the "Geology" section.		
Flooding	LOW - Flooding generally occurs adjacent to rivers and major streams and poses a low constraint to future development throughout the County.		
Airport	HIGH - Severe constraints exist within the vicinity of the hazard zones of the Nevada County Air Park (see Figure 8-6).		HIGH - Severe constraints exist within the vicinity of the hazard zones of the Truckee-Tahoe Airport (see Figure 8-7).
	LOW - Noise exposure in areas containing noise sensitive land uses (i.e. residences, parks, schools, hospitals) are overall, relatively low throughout the County. There are however, noise sources that should be discussed.		
Transportation			
Roadways	HIGH - Limited available capacity on some roadways.		HIGH - Limited available capacity on some roadways. MODERATE - Large amounts of regional traffic using local roads.
Bicycle/Pedestrian	LOW - The limited bicycle/pedestrian system serves mainly recreational needs and does not accommodate travel demand. This is manly due to the County's topography and long travel distances related to rural development patterns.		

Note: For the purpose of this matrix, a constraint is a restriction to future development, measured in general terms as "low", "moderate" and "high".

CONSTRAINT MATRIX

Constraint	Western County	Central County	Eastern County
Noise Airport	**HIGH** - Noise levels are significant for residences located within the 60 db Cnel noise contour of the Nevada County Air Park.		**HIGH**- Noise levels are significant for residences located within the 60 db Cnel noise contour of the Truckee-Tahoe Airport.
Industry	**VARIES** - Industrial-related noise includes landfill operations, lumbermills, and mining. These noise sources are scattered throughout the County. Constraints would vary depending on site specific decibel levels and location of the noise source.		
Railroad		**HIGH** - Noise levels are significant in close proximity to railroad crossing bells and at grade crossings within the 60 db Ldn contour.	
Traffic	**MODERATE** - Noise generated by traffic on highways and major roadways is a moderate constraint which exists throughout the County. It has been noted that SR 49 and SR 20 are of particular concern in the western portion of the County.		
Public Services County Departments/ Agencies	**MODERATE** - Of the 43 local agencies surveyed in the County, 59 percent are deficient in staff; 42 percent are deficient in equipment; and 28 percent are deficient in space. Some of these include the County Clerk's Office, Environmental Health Dept., Dept. of Transportation, Fire Districts (Alta-Oaks, Gold Flat, Ophir Hill, 49er, Watt Park) and School Districts (Clear Creek, Grass Valley, Nevada City, Tahoe-Truckee, Twin Ridge and Nevada Joint High School).		
Water	**LOW** - Only five percent of total water consumed in western county is used for domestic use. The total amount available for agricultural use is unknown because water rights are unknown (also see the "Hydrology" section).		**LOW** - The Martis Valley aquifer is the source of water in eastern county. It has been estimated that 1 million ac. ft. of groundwater is in the aquifer. Recharge is 18,000 ac. ft. per year with a safe yield of 13,000 ac. ft. The California Dept. of Water Resources will be undertaking a major study of this aquifer to determine the true extent of supply.
Sewer	**MODERATE** - Sewer constraints are moderate in the Nevada City/Grass Valley area. The Grass Valley system is reaching capacity (at appx. 82%) but is in the process of design work for future expansion. The Nevada City system has no plans of expansion. It is currently operating at appx. 58% capacity.	**HIGH** - Sewer constraints in the central area are severe and are associated with soil limitations, steeper slopes, high precipitation, and the need to protect the watershed and ground water.	**LOW** - Almost all of eastern county is sewered with adequate capacity for current use. Few areas are on septic systems.

Note: For the purpose of this matrix, a constraint is a restriction to future development, measured in general terms as "low", "moderate" and "high".

CONSTRAINT MATRIX

Constraint	Western County	Central County	Eastern County
	LOW- All other areas within the district appear to have adequate capacity for current service area.		
Sewer (cont.)	**HIGH** - Areas outside the district are on septic system. In the more densely populated areas, groundwater contamination and septic system failure are severe constraints to future development in these areas.		
Cultural/Historic Recorded Sites	**HIGH** - Forty percent of the recorded prehistoric sites and 46 percent of the historic sites are located between the 400 and 3,000 ft. elevation.	**LOW-MODERATE** - Twenty-two percent of the recorded prehistoric sites and ten percent of the historic sites are located between 5,000 and 6,000 feet on the eastern slope. Nineteen percent of the prehistoric sites, 25 percent of the historic are located between 3,000 and 8,000 feet on the western slope. Ten percent of the prehistoric sites, seven percent of the historic are located between 5,000 and 8,000 feet.	
Predicted Sites	**HIGH** - Cultural resource sensitivity for potential prehistoric and historic sites is high throughout much of the County. Particularly in areas less than one-quarter of a mile from water and in elevations between 400 and 3,000 feet on the west slope and 5,000 and 6,000 feet on the east slope.		

Note: For the purpose of this matrix, a constraint is a restricti[illegible] future development, measured in general terms as "low", "moderate" and "[illegible]h".

GEOLOGY 3

3.1 GEOLOGIC SUBSTRUCTURE

Nevada County is part of the Sierra Nevada Range, a geologic block approximately 400 miles long and 80 miles wide which extends in a north-south band along the eastern portion of California. The terrain of Nevada County is distinctly characterized by two features of the Sierra Nevada Range. The western third of the County is comprised of rolling foothills which form a transition between the low-lying Sacramento Valley and the mountains to the east. The eastern two-thirds of the County is comprised of the steep terrain and exposed granite of the Sierra Nevada range itself.

The geologic substructure of the county can be divided into three very broad groups(See Figure 3-1).

Western Foothills. This area, extending from the Yuba County border to just northeast of the Grass Valley/ Nevada City area, is generally comprised of metavolcanic (Mesozoic Jura-Trias Metavolcanic) and granitic (Mesozoic Granitic) formations.

Central Portion. The area extending northeast of the Grass Valley/Nevada City area to the upper mountainous area near Bowman Lake Road is generally comprised of sedimentary and metasedimentary (Paleozoic Marine Metasedimentary) and volcanic (Cenozoic Volcanic) formations.

Eastern Half. This portion of the County is generally comprised of volcanic (Cenozoic Volcanic) and granitic (Mesozoic Granitic) formations.

3.2 SEISMIC CHARACTERISTICS

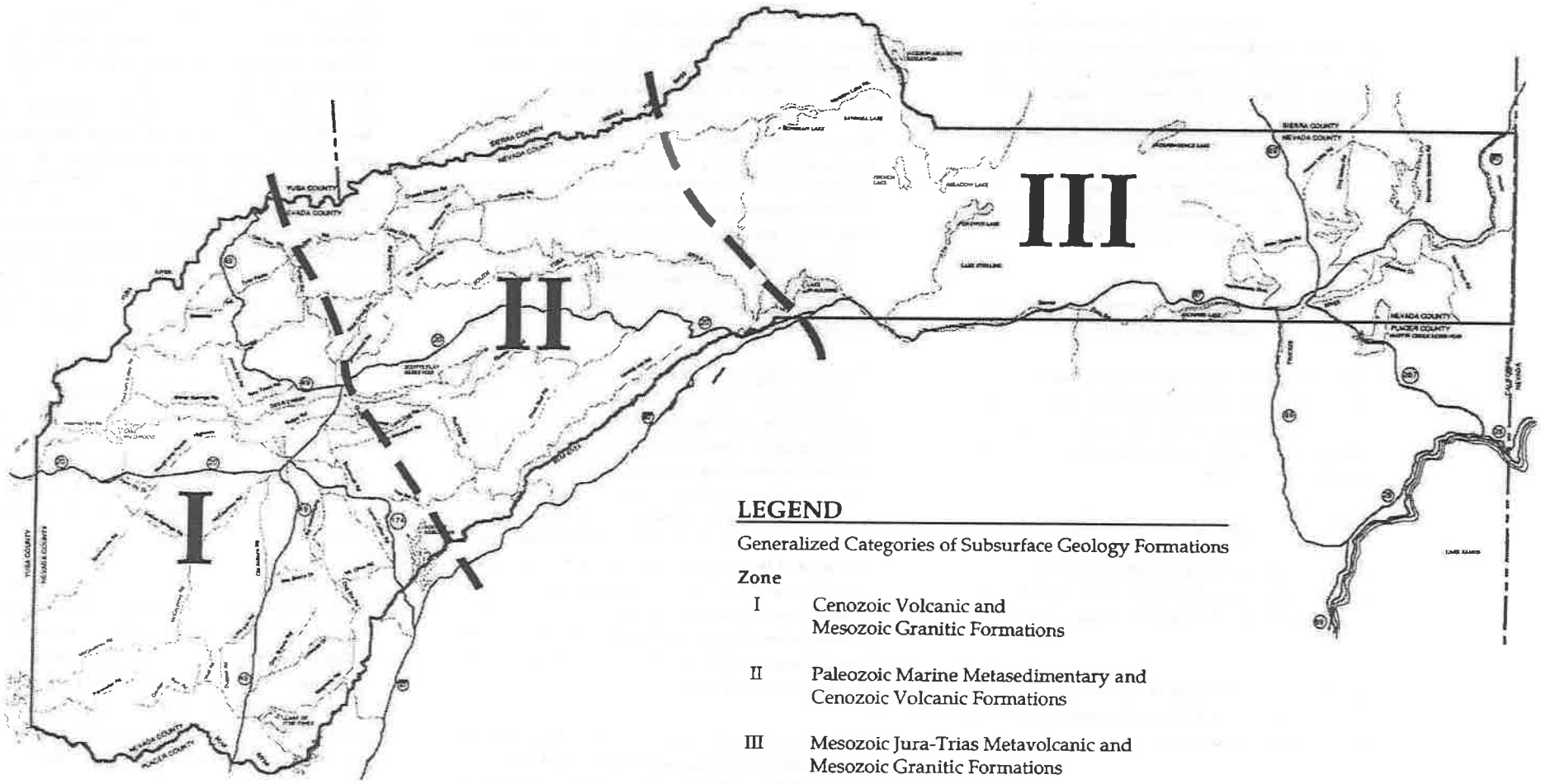
Faults are breaks and fractures in the earth's crust formed by movement in the crust. Movement along a fault is what occurs during an earthquake. The greater the number of faults within an area, the greater the risk of seismic activity. The amount of seismic risk involved with a fault is dependent upon several factors, including fault size, depth and length, and fault activity. Seismic risk increases as fault depth decreases and length increases. Whether or not a fault is considered to be active is based on fault movement at or near the surface of the ground during a given period of time. However, at the present, there is no general agreement among authorities as to the length of the time period to be used to distinguish an active fault from an inactive fault.

As shown on Figure 8-4, prequaternary faults can be found in the County's western half, running generally in a north-south direction. Although the western half of the County contains relatively inactive faults, it should be pointed out that a very high percentage of building construction within the high-density areas of Grass Valley and Nevada City is quite old, and, therefore, damage in these areas might be considerable if a major earthquake occurs, despite the fact that most of the buildings are only one or two stories. Quaternary and historic faults can be found in the eastern portion of the County near Truckee. Of particular note is the Dog Valley or Truckee fault which runs through Truckee from Prosser Reservoir past Boca Reservoir to Stampede Reservoir in Sierra County.

Seismic, or earthquake hazards, can be divided into two areas: primary hazards, caused by the actual rupture or shaking of the ground; and secondary hazards, caused by various topographic and hydrologic conditions triggered by the earthquake (See Safety, Section 8 for additional discussion). Actual ground breakage generally affects only those buildings directly over or nearby the fault. Ground shaking generally has a much greater impact over a greater geographical area. The amount of breakage and shaking is a function of earthquake magnitude, type of bedrock, depth and type of soil, general topography, and groundwater. In the Sierra Nevada Range, the common occurrence of relatively shallow weathered material underlain by dense bedrock lessens the seismic risk. This is consistent with the fact that many authorities list igneous and metamorphic bedrock (found extensively throughout Nevada County) as providing the least amount of seismic hazard due to ground shaking. Hazard due to ground breakage is considerably less dependent upon the kind of bedrock.

Secondary hazards include ground settlement or subsidence, which is caused when poorly consolidated soils are compacted; liquefaction, which occurs when a shock or strain causes a sudden loss of soil strength in saturated cohesionless soils; and landslides which are part of the process of erosion that can be triggered by earthquake shock.

Because much of Nevada County is steeply sloping, the threat of landslides is ever present. However, due to the fact that most of the soils within the County are underlain with dense bedrock, and lack the depth and cohesionless structure associated with ground failure, most secondary hazards should be considered moderate at worst. Some communities have assigned a "low risk" landslide rating to all areas with igneous and metamorphic bedrock, and



Source: Nevada County General Plan 1980.

Planning • Engineering • Landscape Architecture
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Sacramento, California

NEVADA COUNTY GENERAL PLAN

Geologic Substructure

1" = 25,000'

FIGURE 3-1

since most of the Nevada County is underlain with similar formations, it is a safe assumption to assign a similar "low risk" rating to most of the County (see Figure 8-3). The "low risk" rating would apply to ground settlement and liquefaction hazards, as well. Even though geologic conditions in Nevada County reduce the potential hazards from ground failure and landslides, the County's steep terrain and deep snowpack present the potential for earthquake induced avalanches in the mountainous areas. Further discussion of avalanche hazards and landslides induced by mining activity, can be found in the Safety, Section 8.

In summary, since Nevada County, and most of the state of California, is a seismically-active region, the potential for earthquake-induced hazards must be acknowledged. However, the history of past earthquake activity does not indicate that Nevada County is a particularly hazardous area. Current engineering design, and construction practices, such as the Uniform Building Code, provide the opportunity to reduce earthquake related hazards.

3.3 MINERAL RESOURCES

Mineral resources, particularly gold, have played a major role in the history of Nevada County. Since 1849, when gold was first discovered in the area, to the years preceding World War II, most of the County's population was economically supported, directly or indirectly, by the local gold mining industry. Other metals produced in the County since 1880 include silver, copper, lead, zinc, chromite, and small amounts of tungsten and manganese. Industrial minerals include barite, quartz for silicon production, and small amounts of limestone, asbestos, clay, and mineral paint. Also, significant deposits of sand, gravel, and rock types suitable for construction aggregate are exposed throughout the County. (Mineral Land Classification of Nevada County, State Division of Mines and Geology, 1990).

In order to promote the conservation of the state's mineral resources, and ensure adequate reclamation of mined lands, the Surface Mining and Reclamation Act of 1975 (SMARA) was enacted. SMARA requires that the State Geologist classify land in California for its mineral resource potential. Local governments are required to incorporate the mineral and classification reports and maps into their general plans and consider the information when making land use decisions.

Areas subject to mineral land classification studies are divided into various Mineral Resource Zone (MRZ) categories that reflect varying degrees of mineral potential. Figure 3-2 indicates areas which are classified by the State Geologist as areas of identified mineral resource significance. Mineral deposits of all types which are designated MRZ-2a or MRZ-2b, are used for areas underlain by mineral deposits where geologic data indicate that significant measured or indicated (MRZ-2a), or inferred (MRZ-2b) resources are present.

Since mining activities often result in truck traffic, noise, air and water pollution, it is important that incompatible land uses be separated from existing and potential mineral extraction areas. Increasing urbanization in Nevada County, particularly residential uses, has the potential to conflict with future mineral extraction opportunities. Identification of existing and potential mining areas during the planning process can help avoid encroachment of incompatible land uses in mineral resource areas.

3.4 SOILS

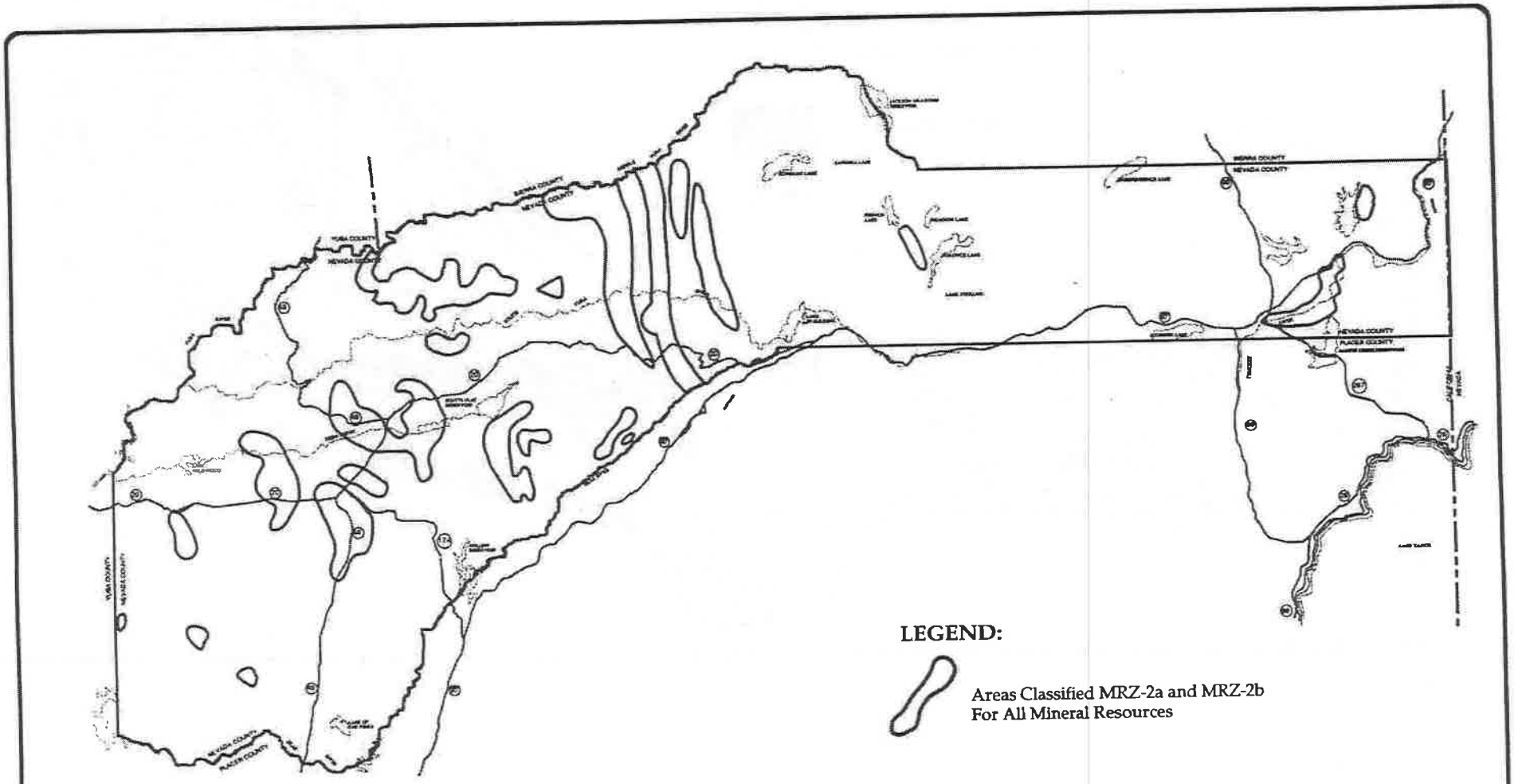
Soil surveys for Nevada County have been conducted by the United States Department of Agriculture Soil Conservation Service and the Tahoe National Forest. The Soil Conservation Service has surveyed the western third of the County, roughly the area west of Scotts Flat Reservoir, while the Forest Service has surveyed the balance of the County.

The characteristics of different soil types result in varying constraints in terms of permeability, septic suitability, erosion hazards, agricultural and timber capabilities, etc. Table 3-1 on the following page summarizes some of the basic characteristics of the general soil types found in the County.

Within the County, the soils present significant constraints to septic uses and effluent disposal due to slow permeability, steep slopes, and soil depth. These same constraints limit the suitability of county soils for installation of pipelines and subsurface infrastructure (see Figure 11-4 for septic capabilities in the County). As shown on Figure 3-3, erosion hazard is variable but generally increases near major rivers and with steeper slopes. Although the soils are generally poor for intensive agriculture use, ranging from Class II and up, the moderate to high elevation soils are an excellent resource for timber growth.

Table 3-1
Soil Characteristics

Type of Soil	Topography	Slope	Permeability	Dwelling Limitations	Septic Limitations	Erosion Hazard	Agricultural Capability	Timber Capability
SOIL CLASSIFICATIONS OF THE SOIL CONSERVATION SERVICE								
Soils of the Lower and Middle Foothills								
Ahwanhee - Sierra Association	gently sloping to steep	2-50%	moderately slow to moderately rapid	slight to severe	severe	moderate to high	III-VII	low
Auburn - Sobrante Association	undulating to steep	2-50%	very slow to moderate	moderate to severe	severe	moderate to very high	III-VI	low
Trabuco - Sierra Association	gently rolling to steep	2-50%	very slow to moderately slow	slight to severe	severe	slight to very high	II-VII	low
Soils of the Mountainous Uplands								
Alken - Cohasset Association	gently sloping to steep	2-50%	moderately slow to moderatley rapid	slight to severe	slight to severe	high	II-VI	very high
Boomer-Sites - Sobrante Association	undulating to steep	2-50%	slow to moderate	slight to severe	severe	slight to high	II-VII	low to very high
Hoda-Chaix - Musick Association	gently sloping to very steep	5-75%	moderately slow	slight to severe	severe	moderate to high	III-VII	moderately high to very high
Josephine-Sites - Mariposa Association	undulating to very steep	2-75%	moderately slow to moderate	slight to severe	severe	moderate to very high	II-VII	moderately high to very high
Secca - Boomer Association	undulating to steep	2-50%	very slow to moderate	moderate to severe	severe	slight to high	III-VII	low to very high
Placer Diggings-Tailings - Horseshoe Association	gently rolling to extremely steep	2-75%	moderately slow to very rapid	moderate to severe	variable to severe	variable	III-VII	low to very high
SOIL CLASSIFICATIONS OF THE TAHOE NATIONAL FOREST								
Soils of the Westside								
Hurlburt-Deadwood-Putt	nearly level to fairly steep	2-30% 2-30%	moderately slow to rapid	moderate to severe	severe	moderate to high	N/A	N/A
McCarthy-Crozier-Ledmount	nearly level to fairly steep	2-30% 2-30%	moderately slow to rapid	moderate to severe	severe	moderate to high	N/A	N/A
Soils of the High Elevation								
Tallac-Meiss	level to very steep	2-75%	very slow to very rapid	moderate to severe	severe	slight to moderate	VI-VII	low to very high
Fugawee-WACA-Ahart	level to very steep	2-75%	very slow to very rapid	moderate to severe	severe	moderate to high	VII	low to very high
Rock outcrop	level to very steep	2-75%	very slow to very rapid	severe	severe	high	VII	low to very high
Soils of the Eastside								
Ever-Martis	nearly level to steep	2-50%	rapid over slow	moderate to severe	severe	moderate to high	N/A	N/A
Trojan-Kyburg-Portola	level to very steep	2-30%	moderately slow	moderate to severe s	evere	high	N/A	N/A



Source: California State Geologist, 1991.

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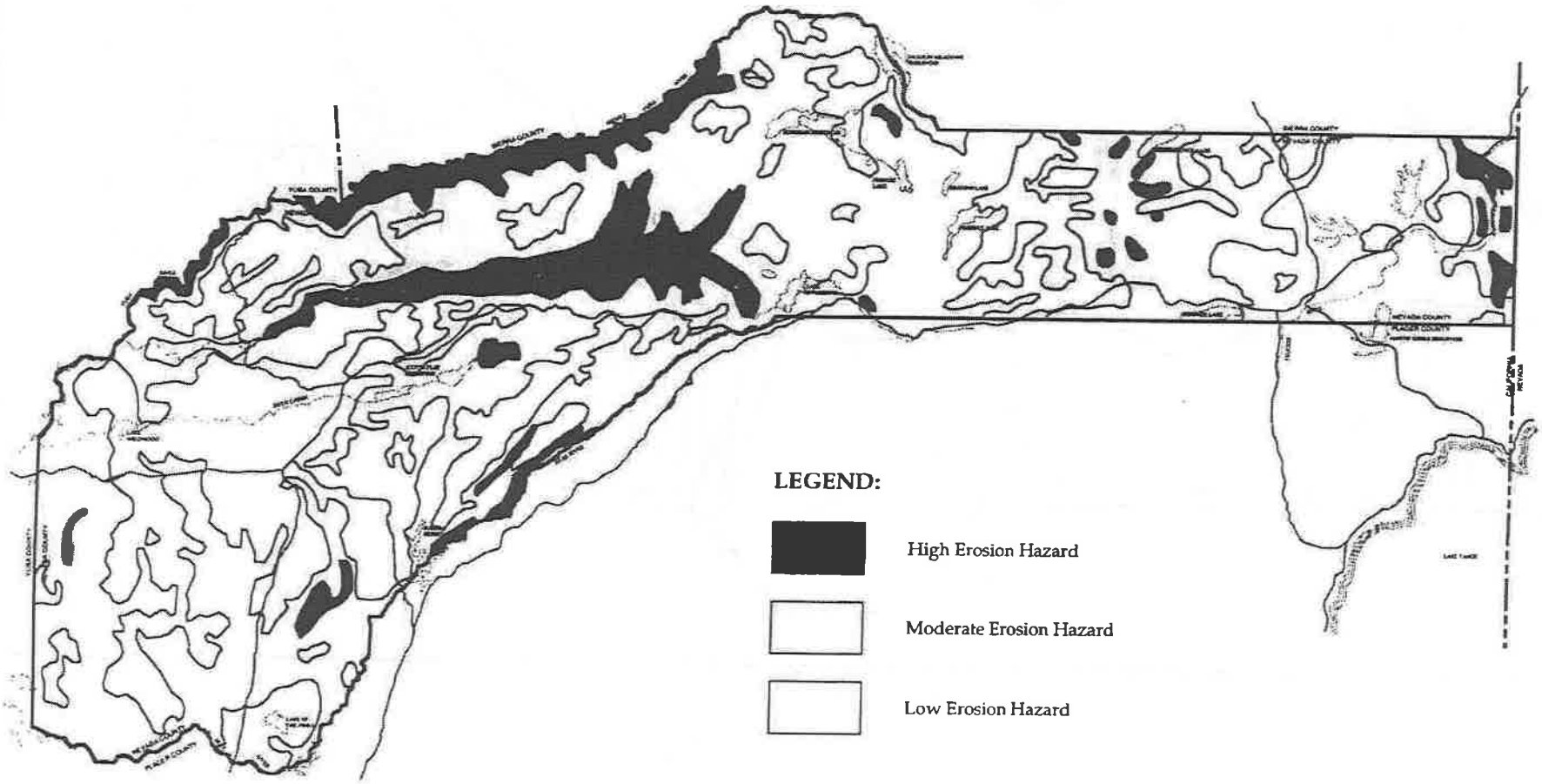
NEVADA COUNTY GENERAL PLAN
Mineral Land Classification Map
(Areas Containing Potentially Significant Mineral Deposits)

1" = 25,000'

FIGURE 3-2



Source: Nevada County General Plan, Technical Data, 1980.

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NEVADA COUNTY GENERAL PLAN
Erosion Hazard

1" = 25,000'

FIGURE 3-3

HYDROLOGY 4

4.1 HYDROLOGY

Surface water drainage within Nevada County is composed of three separate watersheds that when combined produce enough water to serve portions of both northern California and western Nevada. The three major watershed areas include:

1. The Truckee River basin;
2. The Yuba River basin; and
3. The Bear River basin.

The Truckee River basin drains approximately 170 square miles within the County and flows from Lake Tahoe in a northerly eastern direction through Nevada County into Pyramid lake in the State of Nevada.

The South Fork and Middle Fork of the Yuba River combined make up the largest of the three watershed areas within Nevada County. The Middle Fork of the River drains approximately 86 square miles of Nevada County and eventually drains into Englebright Reservoir. The South Fork drains approximately 343 square miles of the County before connecting with the Middle Fork of the Yuba River near Englebright Reservoir.

The third basin, the Bear River, forms just below Spaulding Reservoir, flows in a southwesterly direction and drains approximately 277 square miles of Nevada County.

Many of the creeks and rivers in the County supply both water and hydroelectricity. A variety of impoundments, canals and diversions serve to divert water to these uses. As would be expected, all of the hydrologic features in the County are dependent on winter rain and snowfall. The Sierra snowpack is the primary source of water throughout the watersheds. The volume of flows varies considerably from year to year, season to season and between watersheds. Appendix A, Hydrology, includes a table which depicts the measured maximum and minimum flows or storage on a variety of monitored rivers and impoundments. As illustrated in Table 1 of the Appendix, the low season for water is typically summer, however the current drought figures have not yet been tabulated. Peak months vary due to snow melt, with rainfall peaks typically occurring in the November-February period and snowmelt-related peak typically occurring between April and June.

The seasonal as well as annual river flows are highly variable. During extremely heavy storms, the maximum daily flow can be on the order of 25 to 50 percent of average annual flow

Most of the waterbodies in the County support or contribute to the wildlife values by providing habitat as well as necessary drinking water. Figure 4-1 presents a hydrography map of the County which illustrates all of the perennial and seasonal (or intermittent) water courses. As illustrated by the map, Nevada County is characterized by a large and diverse hydrologic system. A history of water development in the County is presented in the public services section 11, as well as a discussion of water rights. Section 8, Safety, presents a discussion of flood hazards.

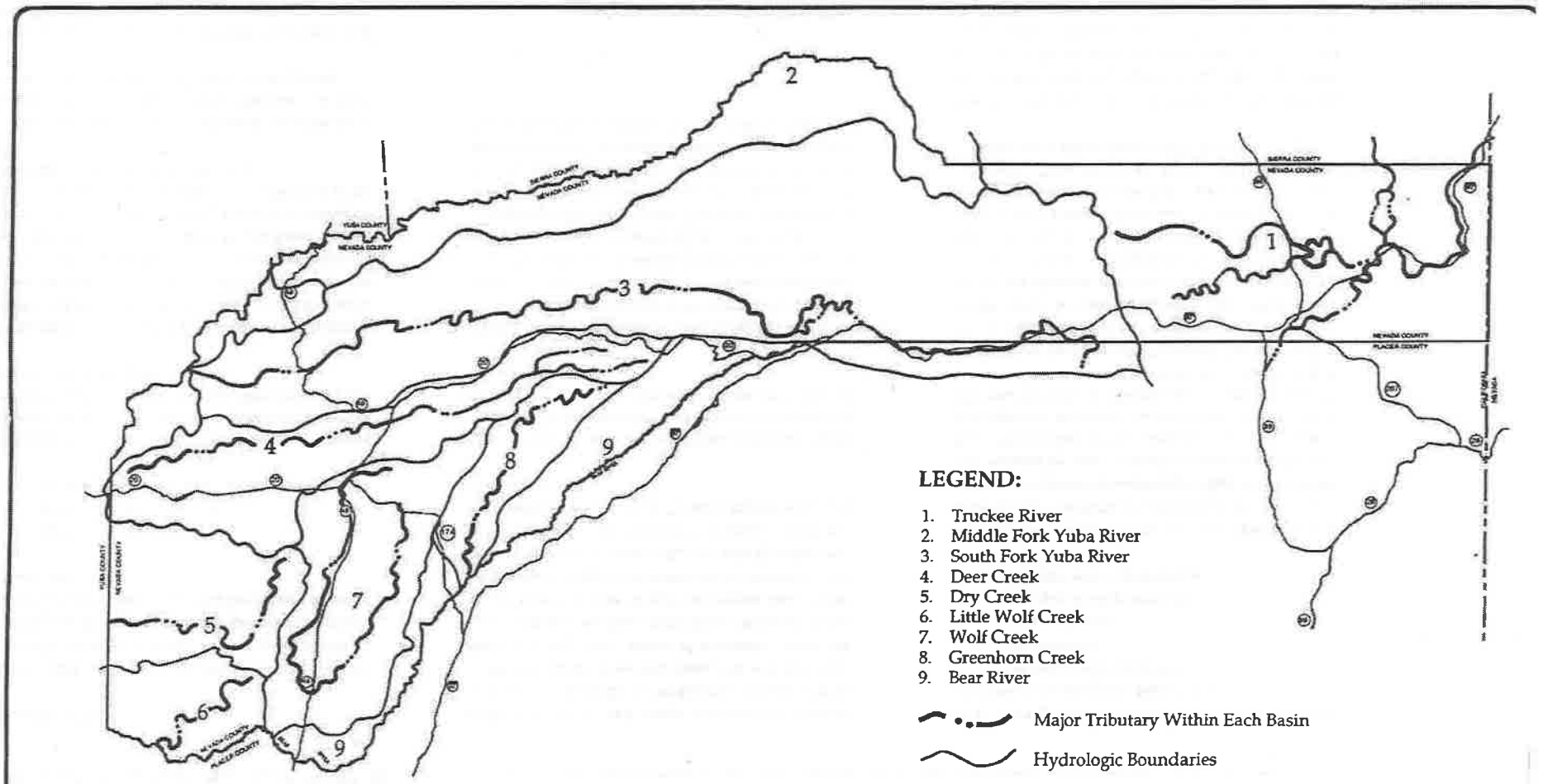
4.2 WATER QUALITY

Levels of water quality vary within Nevada County. In the more mountainous, less-developed areas, the water quality is generally very good; however, as elevation decreases, so does water quality. This, in part, is due to inadequate septic tank filtration as the water passes through the more populated areas of the County and also has to do with public sewage treatment system. Other variables that contribute to water quality degradation include:

1. Soil erosion with resultant sedimentation;
2. Inadequate soils;
3. Improper development; and
4. Naturally occurring elements.

Soil erosion and sedimentation are closely tied to surface water quality. The Dictionary of Geological Terms defines erosion as the process of loosening or dissolving earthy or rock material by water or wind sources into smaller particles. The smallest of those particles may be transported and deposited by water or air constituting the process of siltation. These silt elements typically consist of 80 percent soil or silt and less than 12 percent clay. Sedimentation occurs when the larger particles consolidate into another rock or earthen material and are deposited on the beds of creeks, rivers or streams. Eroding soils, siltation, and streambed alteration as a result of new subdivision development contribute to a lower level of surface water quality within Nevada County. Naturally occurring elements such as heavy metals, have also contributed to water quality degradation in a number of areas within the western county. The eastern county is currently being tested by Department of Water Resources for Radon.

The State Water Resources Control Board (Central Valley Region and Lahontan Region) is responsible for water quality for the wetlands, rivers and streams, lakes and groundwater in Nevada County. Data listed in Appendix A presents the results of their April 1991 Statewide Water Quality Assessment. In summary, the range of water quality impacts in Nevada County result from sewage contamination (bacteria), grazing and ORV uses (sedimentation), recreational impacts (sedimentation), watershed disturbances such as logging (sedimentation), water



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NEVADA COUNTY GENERAL PLAN
Drainage Basins

1" = 25,000'

FIGURE 4-1

diversions, hydrologic modification, urban runoff (hydrocarbon), heavy metals, and eutrophication. The results of these problems are limits on beneficial uses such as domestic water supplies, habitat values, agricultural uses, recreational uses and groundwater recharge. Water quality tends to degrade in the upper elevations as a result of recreational and logging uses, while the lower elevations are affected by land development, mining, grazing and domestic sewage contamination.

4.3 HYDROELECTRIC

A variety of hydroelectric projects are approved or are involved in the application process. Figure 4-2 illustrates the location of these projects. Table 4-1 on the following page summarizes the status of these facilities as of 1990. These facilities can range from relatively low-impact installations to fairly large scale high-impact projects.

4.4 GROUNDWATER

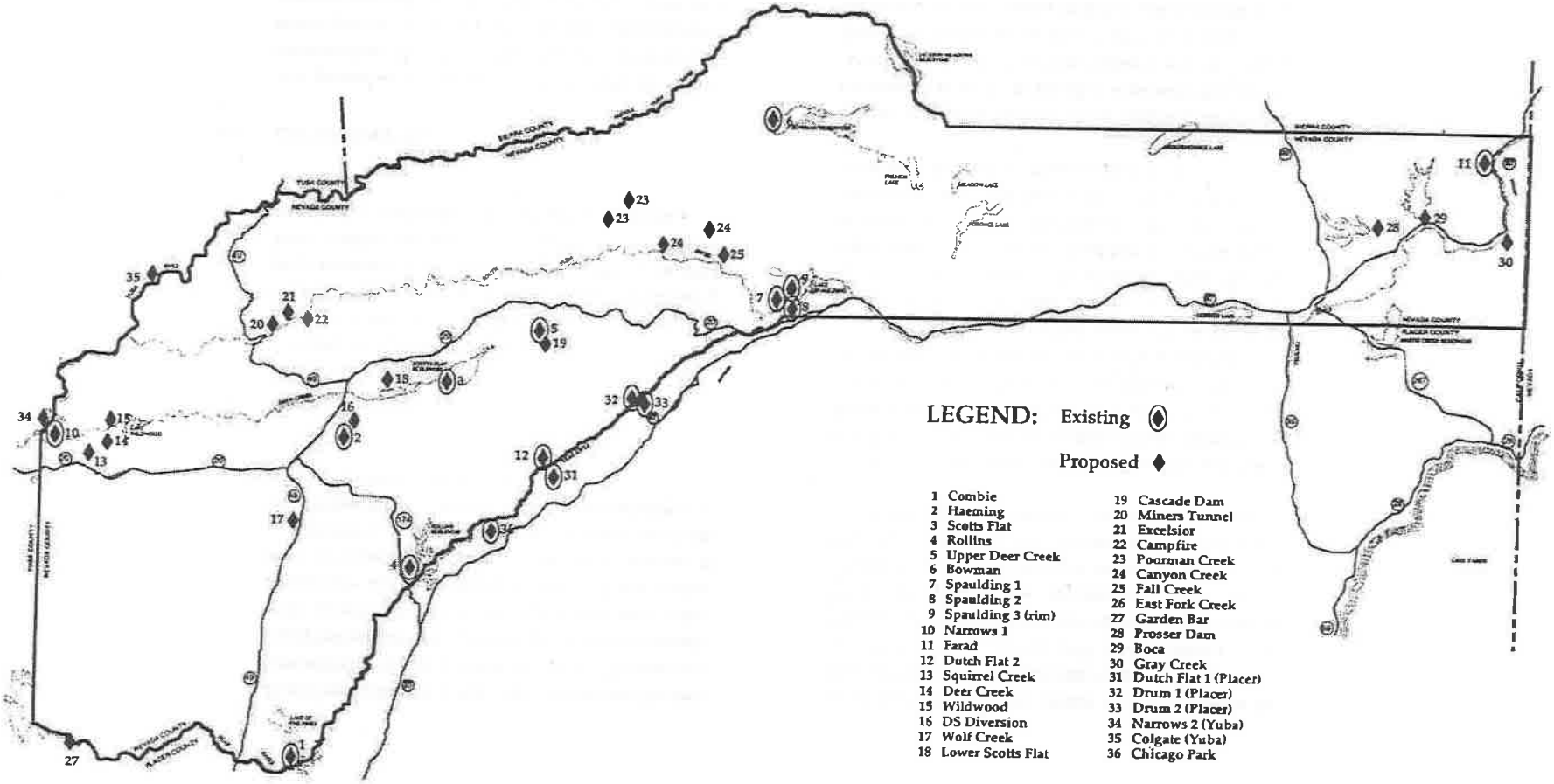
The groundwater resources in the County are of two distinct types. Those in the Western County are characterized as poorly defined and variable. The highly fractured characteristics of the subsurface geology, as well as a variety of other factors such as soil depth and percolation, combine to create a highly variable and inconsistent groundwater characteristics. In Eastern County, the Martis Valley aquifer is the primary subsurface hydrologic resource. This aquifer is currently under study to determine its total storage, its recharge and its safe yield.

4.5 FLOOD HAZARD ZONES

Areas susceptible to flood hazard were identified by the Federal Emergency Management Agency in "Flood Insurance Study, Revised July 2, 1987" and associated maps. The study covered unincorporated areas within the county which have potential for development. Grass Valley, Nevada City and land formerly belonging to Beale Air Force Base in the western county were not included in this study. A summary of the maps is shown on Figure 4-3.

There are policies referenced in the Nevada County General Plan Open Space and Conservation Element and Safety Element which relate to flooding hazards and floodplains. Policy 18 in the Open Space Element states that an action program specifically for land sedimentation and environmentally sensitive areas will be provided through the use of low-density rural zoning measures and other land use controls. Policy 5 in the Safety Element states that the most current flood hazard and floodplain information concerning the County will be reviewed in accordance with appropriate local, State and Federal agencies to limit development in such areas.

In general, there are no significant wide flood plains within the County as would be found in areas with less general slope. Squirrel Creek in Penn Valley is relatively wider than other flood potential areas within the County, however is still not considered a wide floodplain, such as those identified in the Central Valley, which cover thousands of acres. The major flooding problems normally occur during the winter months from November through April. Flooding can be severe when the ground is already saturated or existing snow is melted by warmer rains.



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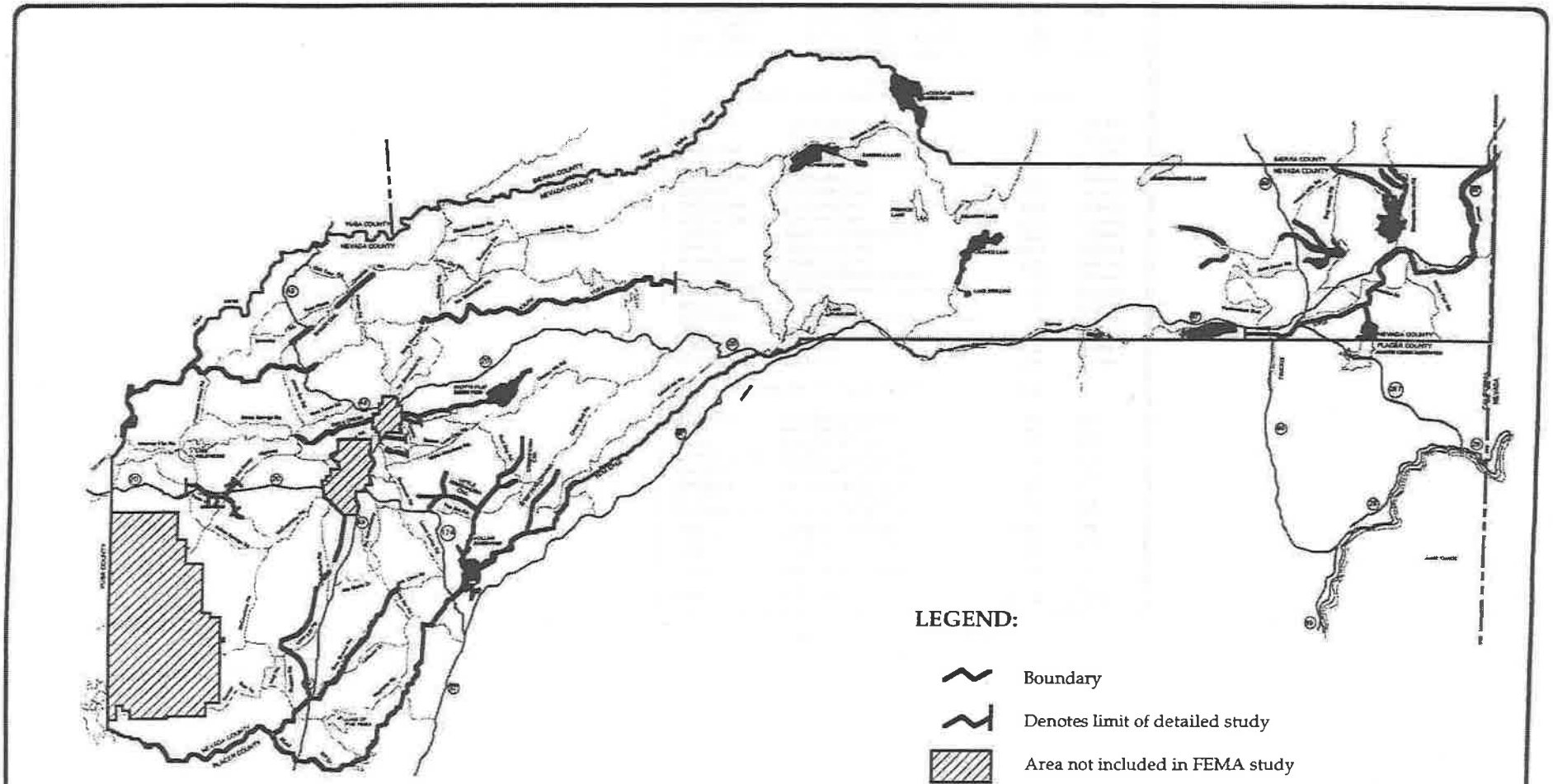
NEVADA COUNTY GENERAL PLAN
Hydroelectric Power Plants

1" = 25,000'

FIGURE 4-2

Table 4-1
Status of Hydroelectric Facilities

NAME	OWNER/DEVELOPER	SIZE(kW)	STATUS
Combie	Nevada Irrigation District	300	Built
Haemmig	A. Haemmig	27 hsp.	Built
Scotts Flat	Nevada Irrigation District	825	Built
Rollins	Nevada Irrigation District	11,000	Built
Upper Deer Creek	Pacific Gas and Electric Co.	300	Built
Bowman	Nevada Irrigation District	3,600	Built
Spaulding 1	Pacific Gas and Electric Co.	7,000	Built
Spaulding 2	Pacific Gas and Electric Co.	4,400	Built
Spaulding 3 (Rim)	Pacific Gas and Electric Co.	5,800	Built
Narrows 1	Pacific Gas and Electric Co.	12,000	Built
Farad	Sierra Pacific Power Co.	2,800	Built
Dutch Flat #2	Nevada Irrigation District	26,000	Built
Existing Total Kilowatts in Nevada County		72,900	
Squirrel Creek	E. Navickis	1300	Proposed
Deer Creek	E. Navickis	2,100	Proposed
Wildwood	E. Navickis	650	Proposed
DS Diversion	E. Navickis or Nevada Irrigation District	825	Proposed
Wolf Creek	R. Poquette	100	Proposed
Lower Scotts Flat	Sugar Pine Hydro (R. McDonald)	600	Proposed
Cascade Dam	DCH Development Company	300	Proposed
Miners Tunnel	Northwest Power	3,500	Proposed
Excelsior	Northwest Power	14,000	Proposed
Campfire	Piedmont Campfire Council	2,000	Proposed
Poorman Creek	Poorman Hydro	2,000	Proposed
Canyon Creek	P. Eichenberger	4,300	Proposed
Fall Creek	Northwest Power	4,950	Proposed
East Fort Creek	Northwest Power	4,950	Proposed
Garden Bar	South Sutter Water District	75,000	Proposed
Prosser Dam	Truckee Donner Public Utility District	1,100	Proposed
Boca	Truckee Donner Public Utility District	2,400	Proposed
Gray Creek	Gray Creek Hydro	780	Proposed
HYDROELECTRIC POWER PLANTS ON NEVADA COUNTY LINE IN ADJOINING COUNTY			
Dutch Flat #1 (Placer)	Pacific Gas and Electric Company	26,000	Built
Drum 1 (Placer)	Pacific Gas and Electric Company	54,000	Built
Drum 2 (Placer)	Pacific Gas and Electric Company	49,500	Built
Narrows 2 (Yuba)	Pacific Gas and Electric Company	55,500	Built
Colgate (Yuba)	Pacific Gas and Electric Company	341,000	Built
Chicago Park	Nevada Irrigation District	41,500	Built



Source: Federal Emergency Management Agency Flood Maps

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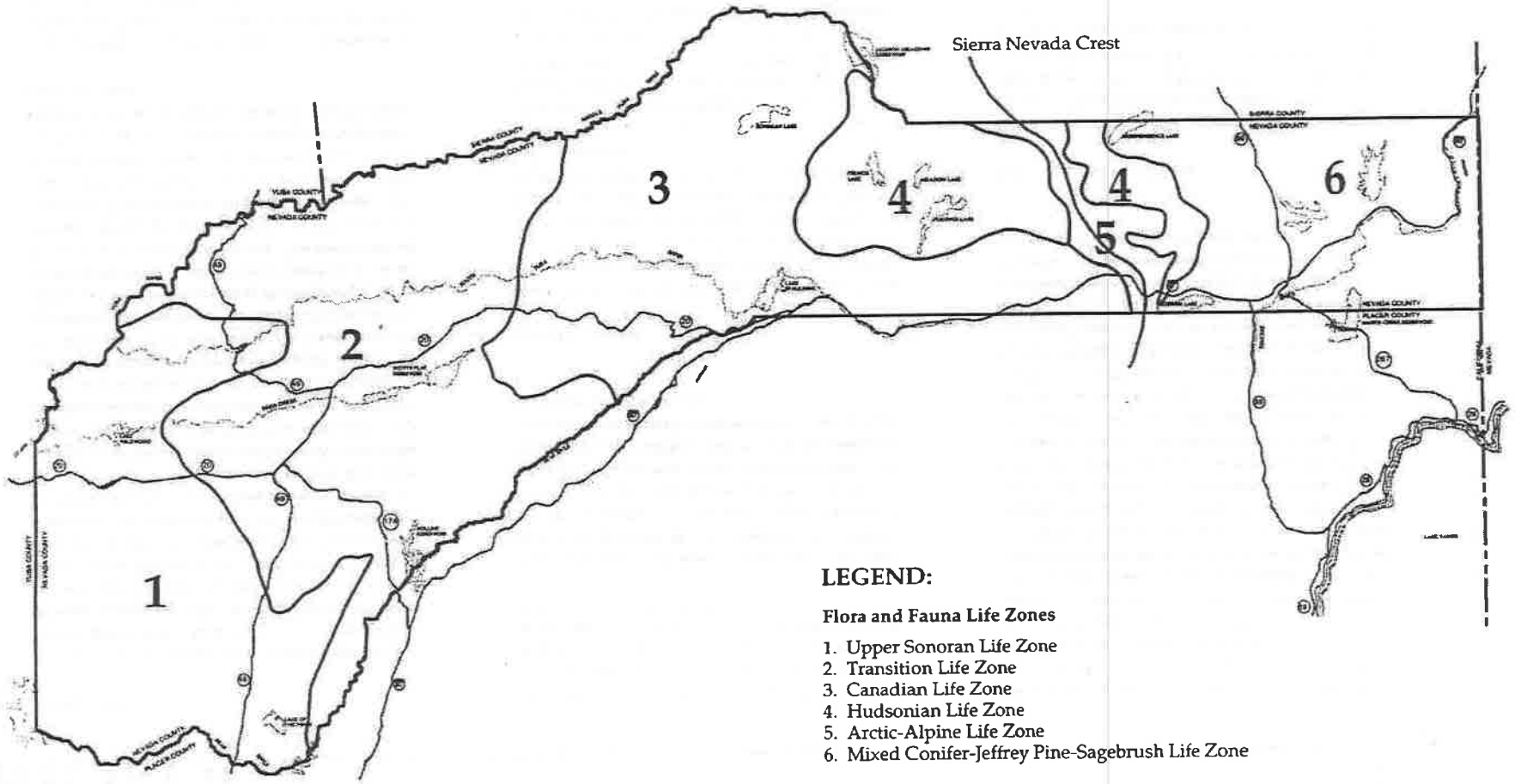
NEVADA COUNTY GENERAL PLAN
Flood Potential Areas
(includes 100 through 500 year events)

1" = 25,000'

FIGURE 4-3



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NEVADA COUNTY GENERAL PLAN
Flora & Fauna Life Zones

1" = 25,000'

FIGURE 5-1

BIOLOGY 5

5.1 OVERVIEW

Nevada County contains an extremely wide range of plants, animals and habitat types. With topographic elevations ranging from 300 feet in the west to 9,143 feet in the east and precipitation (snow or rainfall) amounts varying from 30 inches in the west to 60 inches in Nevada City and near the crest of the Sierras, the County supports a true diversity of habitat types. Generally, the county can be characterized by gently rolling oak woodlands in the west transitioning to coniferous forest and then to an almost desert-like association on the eastern slope of the Sierras. A given type of vegetation association, with associated animal life, is referred to a life zone. A life zone is an area generally uniform of homogeneous characteristics located within very general geographic boundaries. The life zones which exist in Nevada County include: Upper Sonoran, Transition, Canadian, Hudsonian, Arctic-Alpine and Mixed Conifer-Jeffrey Pine-Sagebrush. Table 5-1 on the following pages presents a description of the six life zones which occur in the county. The table identifies the basic habitat groups which occur in each zone and presents a characterization of the dominant vegetation and wildlife species which occur in each zone. The life zones, and related habitat types shown in Figure 5-1 give an overview of the county from a biological perspective. Figure 5-2 presents the vegetation located within the Tahoe National Forest.

The vegetation discussion concentrates on an assessment of the relative value of the plants from a strictly botanical perspective. The wildlife evaluation concentrates on the relative value of the various vegetational communities as habitats for wildlife (providing foraging, nesting, hiding and breeding locations) and describes the animal populations which utilize the various habitats. In this context, it is possible that loss of a habitat would constitute an adverse effect (because of local or regional scarcity and ecological value of a habitat) even though the individual species of plants which make up the habitat, or animal species which use the habitat may not, in and of themselves, be endangered or rare.

The various governmental agencies and nonprofit organizations which focus on plants and animals have developed a variety of materials, data bases and mapping systems to describe these resources. Appendix B contains a variety of data collected from these sources. For the purposes of this section, the county will be considered from the perspective of the plants and animals which characterize each primary habitat group in the county.

5.2 HABITAT TYPES

The State of California Department of Fish and Game recognizes five primary wildlife habitat types in California: tree dominated; shrub dominated; herbaceous dominated; aquatic; and developed. Each of these basic habitat types is further subdivided as shown in Table 5-2 on page 5-4. Appendix B contains a brief description of each community.

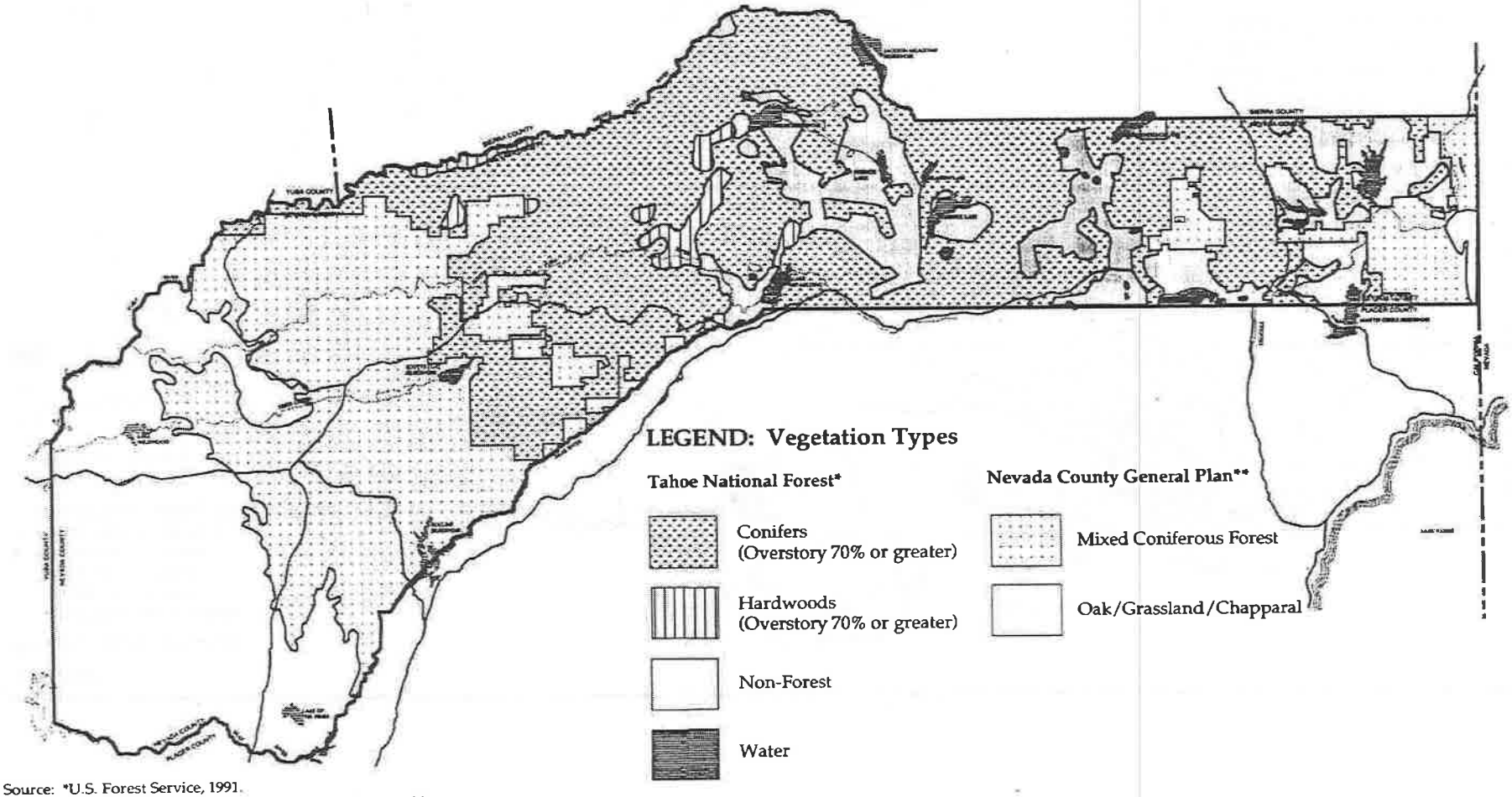
These habitats occur in continuous stretches, as well as isolated "pockets" depending on the overall topography, elevation, climate and pattern of development of a particular area. Animals may move between various habitat types to satisfy their life requirements. Animals will utilize riparian corridors, low lying or "saddle" areas of ridges, established trails, and other corridors for this inter-habitat movement. In addition, many species including deer move seasonally throughout the county in response to their seasonal habitat requirements.

Habitats throughout the county have been modified by human activity. The western portion of the county, especially the upper sonoran and transition life zones, have experienced rapid residential growth in recent years and the resultant parcelization, fencing, alteration of vegetation, introduction of cats and dogs, roadways, noise and nightlighting have served to reduce the habitat values throughout the area. In the mid to high elevations, logging, mining, and development of second homes and rural subdivisions have also served to alter habitats. Habitat values can be reduced by both direct (construction of housing) and indirect (increased density in wide movement corridors) activities. Although the overall trend in the county is toward a decline in habitat values as identified by the Department of Fish and Game, there is a wide localized variation in habitats, tolerances of species and degrees of human disturbance. In some cases, disruption of predator-prey balances occur; in others, food sources are affected; while in others, breeding or birthing areas are disturbed. While some species may benefit, the larger percentage of species are adversely affected.

5.3 SPECIAL STATUS SPECIES

Special status species are those plants or animals which are recognized by the California State Department of Fish and Game or the U.S. Fish and Wildlife Service as being rare, endangered, or threatened. Generally, animals are considered to be endangered if one of the following characteristics applies:

1. Mortality rate exceeds birth rate.
2. Is incapable of adapting to environmental change (intolerant).
3. Habitat is threatened by serious disturbance.
4. Survival is threatened by introduction of unwanted



Source: *U.S. Forest Service, 1991.
**Nevada County General Plan, Technical Data, 1980.

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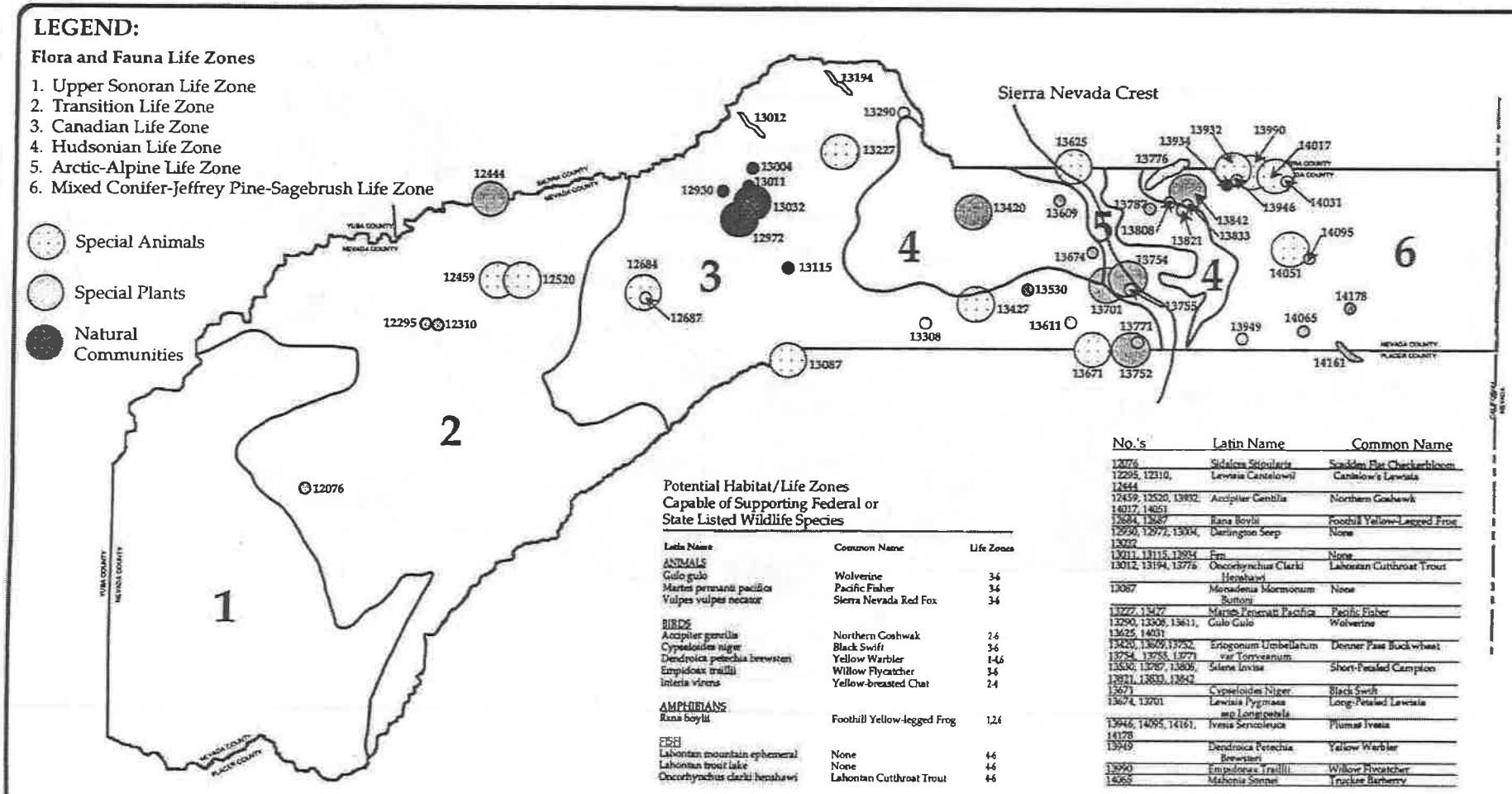
NEVADA COUNTY GENERAL PLAN
Vegetative Resources

1" = 25,000'

FIGURE 5-2



Potential Habitat/Life Zones Capable of Supporting Federal or State Listed Wildlife Species

Latin Name	Common Name	Life Zones
ANIMALS		
Gulo gulo	Wolverine	3-6
Martes pennanti pacifica	Pacific Fisher	3-6
Vulpes vulpes necator	Sierra Nevada Red Fox	3-6
BIRDS		
Accipiter gentilis	Northern Goshwak	2-6
Cypseloides niger	Black Swift	3-6
Dendroica petechia brewsteri	Yellow Warbler	1-4,6
Empidonax traillii	Willow Flycatcher	3-6
Isteria virens	Yellow-breasted Chat	2-4
AMPHIBIANS		
Rana boylii	Foothill Yellow-legged Frog	1,2,6
FISH		
Lahontan mountain ephemeral	None	4-6
Lahontan trout lake	None	4-6
Oncorhynchus clarki henshawi	Lahontan Cutthroat Trout	4-6

No.'s	Latin Name	Common Name
12076	Sidalcea Stipularis	Scadden Flat Checkerbloom
12295, 12310, 12444	Lewisia Cantelowii	Cantelow's Lewisia
12459, 12520, 13932, 14017, 14051	Accipiter Gentilis	Northern Goshawk
12684, 12687	Rana Boylii	Foothill Yellow-Legged Frog
12930, 12972, 13004, 13032	Darlingtoni Seep	None
13011, 13115, 13934	Fen	None
13012, 13194, 13776	Oncorhynchus Clarki Henshawi	Lahontan Cutthroat Trout
13087	Monadenia Mormonum Buttoni	None
13227, 13427	Martes Pennati Pacifica	Pacific Fisher
13290, 13308, 13611, 13625, 14031	Gulo Gulo	Wolverine
13420, 13609, 13782, 13754, 13755, 13771	Eriogonum Umbellatum var Torreyanum	Donner Pass Buckwheat
13530, 13787, 13808, 13821, 13833, 13842	Silene Invisa	Short-Petaled Campion
13671	Cypseloides Niger	Black Swift
13674, 13701	Lewisia Pygmaea ssp Longipetala	Long-Petaled Lewisia
13946, 14095, 14161, 14178	Ivesia Sericoleuca	Plumas Ivesia
13949	Dendroica Petechia Brewsteri	Yellow Warbler
13990	Empidonax Traillii	Willow Flycatcher
14065	Mahonia Sonnei	Truckee Barberry

Source: California Department of Fish and Game, 1991.

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NEVADA COUNTY GENERAL PLAN
Special Status Species

1" = 25,000'

FIGURE 5-3

TABLE 5-1
Life Zones and Habitat Types Located in Nevada County

Life Zone	General Characteristics	Typical DFG Habitat Types	Primary Vegetation	Primary Wildlife
Upper Sonoran Life Zone (1)	Exists in western portion of County; grasslands with various shrubs and trees; dry summers, moderate winters; rainfall = 15-40 in./year; growth season = 6-10 months; lack of adequate moisture	Ponderosa Pin; Closed-Cone Pine-Cypress; Montane Hardwood-Conifer; Montane Hardwood; Valley Oak Woodland; Blue Oak-Digger Pine; Valley Foothill Riparian; Montane Chaparral; Mixed Chaparral; Annual Grassland; Fresh Emergent Wetland; Riverine, Lacustrine; Urban, Orchard-Vineyard	Digger Pine; Interior Live Oak; Scotch Broom; Redbud; Buckeye; Chamise; Poison Oak; Toyon; Soap plant; Fawn Lily; Mistletoe; Buttercup; California Poppy; Bush Lupin	Red-legged frog; striped racer; common kingsnake; western rattlesnake, California jay; plain titmouse; wrentit; yellow warbler common wren; California thrasher; brown towhee; brush rabbit; grey fox; ring tail; raccoon; spotted skunk; striped skunk; mule deer; mountain lion mosquito fish; small mouth bass; large mouth bass; foothill yellow-legged frog
Transition Life Zone (2)	Between Upper Sonoran and Canadian Zones; rainfall = 25-80 in./year; growth season = 4-7 months; good for growing timber	Sierran Mixed Conifer; Ponderosa Pine; Closed-Cone Pine-Cypress; Montane Hardwood-Conifer; Montane Hardwood; Montane Riparian; Valley Foothill Riparian; Montane Chaparral; Mixed Chaparral; Chamise-Redshank Chaparral; Wet Meadow; Fresh Emergent Wetland; Riverine; Urban; Lacustrine; Orchard-Vineyard	Ponderosa Pine; Sugar Pine; Douglas Fir; White Fir; Incense Cedar; Black Oak; Black Cottonwood; Broadleaf Maple; California Dogwood; Buck Brush; Deer Brush; Mountain Misery; Western Azalea; Snow Brush; Squaw Carpet; Larkspur; Anemone; Bleeding Heart; Brown Lupin; Sierra Shooting Star; Pine Drops	Rubber boa; deer; mountain lion; California mountain kingsnake; western rattlesnake; foothill yellow-legged frog; rainbow trout; brown trout; Sacramento squawfish; band-tailed pigeon; pygmy owl; stellar jay; pygmy nut hatch; American robin; russet-backed thrush; orange-crowned warbler; Nashville warbler; spotted owl; California quail; northern goshawk; yellow warbler; yellow breasted chat
Canadian Life Zone (3)	Higher elevations extending to crest of Sierra Nevadas; rainfall = 35-65 in./year; growth season = 3-5 months	Subalpine Conifer; Red Fir; Lodgepole Pine; Sierran Mixed Conifer; White Fir; Montane Hardwood-Conifer; Montane Hardwood; Montane Riparian; Montane Chaparral; Mixed Chaparral; Chamise-Redshank Chaparral; Wet Meadow; Fresh Emergent Wetland; Riverine, Lacustrine; Urban	Red Fir; Jeffrey Pine; Lodgepole Pine; Silver Pine; Aspen; Western Yew; Green Manzanita; Huckleberry Oak; Snowbrush; White Horn; Tobacco Brush Sierra Juniper; Corn Lily; Bush Chinquapin; Sierra Vein-Orchins; Camas Tigerliliy; Snow Plan	Black bear; coyote; Pacific fisher; wolverine; pine marten; Sierra Nevada Red fox; mountain lion; snowshoe hare; stripped skunk; Allen chipmunk; golden mantled squirrel; rainbow trout; brown trout; long-toed salamander; Pacific tree frog; garter snakes; western rattlesnake; mountain white fish; northern goshawk; Williamson sapsucker; Hammond flycatcher; fox sparrow; green-tailed towhee; Lincoln sparrow; Spotted owl; black swift; yellow warbler; willow fly-catcher; yellow breasted chat

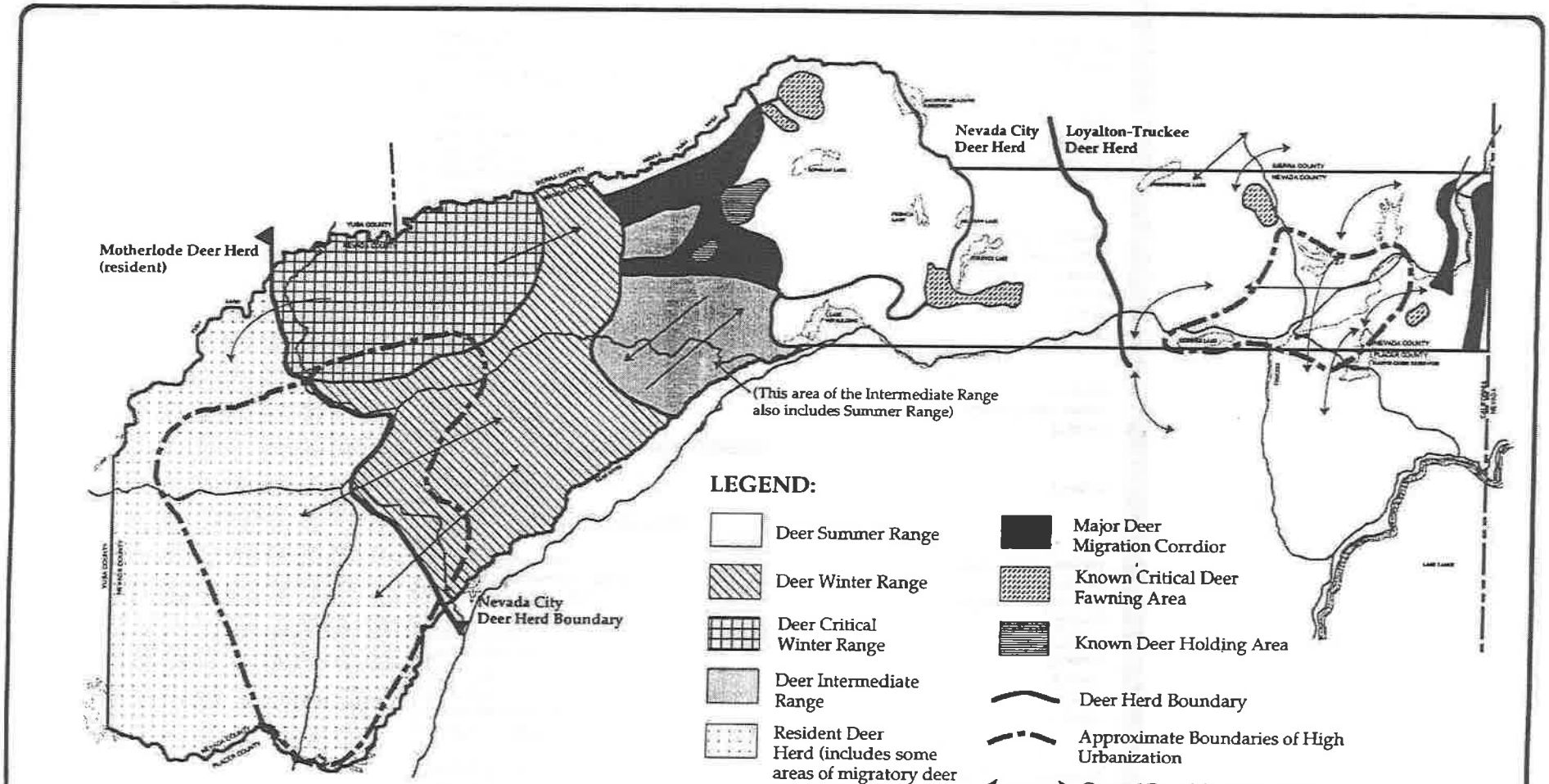
TABLE 5-1 continued
Life Zones and Habitat Types Located in Nevada County

Life Zone	General Characteristics	Typical DFG Habitat Types	Primary Vegetation	Primary Wildlife
Hudsonian Life Zone (4)	Small areas near crest of the Sierra Nevadas; highest zone trees grow; rainfall = 30-50 in./year on western slopes of crest, 15-20 in./year on eastern slopes of crest with snowfall; growth season = 2-3 months	Subalpine Conifer; Red Fir; Lodgepole Pine; Sierran Mixed Conifer; White Fir; Jeffrey Pine; Eastside Pine; Juniper; Montane Hardwood; Montane Riparian; Bitterbrush; Montane Chaparral; Wet Meadow; Fresh Emergent Wetland; Riverine; Lacustrine Urban	Whitebark Pine; Lodgepole Pine; Foxtail Pine; Mountain Hemlock; Red Heather; White Heather; Indian Paintbrush; Stone Crop	Black bear; deer; Pacific fisher; wolverine; pine marten; Sierra Nevada red fox; Pine grosbeak; rosy finch; blue grouse; northern goshawk; willow flycatcher; black swift; yellow warbler; Pacific treefrog; beaver; yellow-bellied marmot; cony; martin; brown trout; rainbow trout; Eastern brook trout; Labontan mountain ephemeral trout; Lahontan lake trout; Lahontan cutthroat trout
Artic-Alpine Life Zone (5)	Only small areas at tip of crest of Sierra Nevadas; climate severe; no trees; rainfall = 25-36 in./year, mostly snowfall; growth season = 1-2 months	Subalpine Conifer; Red Fir; Lodgepole Pine; White Fir; Jeffrey Pine; Eastside Pine; Juniper; Montane Riparian; Bitterbrush; Montane Chaparral; wet meadow; Fresh Emergent Wetland; Riverine; Lacustrine; Urban	Wallflower; prickly-phlox; grasses; sedges	Deer; black bear; mountain lion; Pacific fisher; wolverine; pine marten; Sierra Nevada red fox; blue grouse; willow fly catcher; northern goshawk; black swift
Mixed Conifer-Jeffrey Pine-Sagebrush Life Zone (6)	Eastern portion of County; mixed coniferous forest with brushland; dry area with moderately hot summers; cold winters; rainfall = 10-30 in./year, mostly snowfall; growth season = 2-5 months	Subalpine Conifer; Red Fir; Lodgepole Pine; White Fir; Eastside Pine; Juniper Montane Riparian; Low Sage; Bitterbrush; Sagebrush; Wet Meadow; Fresh Emergent Wetland; Riverine; Lacustrine;	Jeffrey Pine; Lodgepole Pine; Pinon Pine; Incense Cedar; Sagebrush; Bitterbrush; Butterbrush; Mountain Mahogany; Utah Juniper; Corn Lily; Buckwheat; Shrub Pea; Fireweed	Black bear; desert jack rabbit; American badger; pocket mouse; Nuttall cottontail; kangaroo rat; grasshopper mouse; short-tailed vole; deer; wolvering; Pacific fisher; mountain lion; Eastern brook trout; mackinaw trout; brown trout; rainbow trout; Lahontan cut-throat trout; Lahontan mountain ephemeral trout; Lahontan lake trout; long-toed salamander;Pacific tree frog; yellow-legged frog; western fencelizard; sagebrush lizard; horned lizard; western rattlesnake; soy phoebe; pinon jay; black-billed magpie; grey flycatcher; vesper sparrow; blue sparrow; bruewer sparrow; northern goshawk; willow fly catcher; black swift; yellow warbler

T `LE 5-2
Wildlife Hab. . in Nevada County

Wildlife Habitats in California	Areas of County
TREE DOMINATED HABITATS	
Subalipine Conifer	Western and central
Red Fir	Western and central
Lodgepole Pine	Western and central
MIXED CONIFER	
Sierran Mixed Conifer	Central
White Fir	Central
Jeffrey Pine	Eastern
Ponderosa Pine	Western
Eastside Pine	Eastern
Juniper	Eastern
Closed-cone Pine-cypress	Western and central
Montane Hardwood-Conifer	Western
Montane Hardwood	Western and central
VALLEY FOOTHILL HARDWOOD	
Blue Oak Woodland	
Valley Oak Woodland	Western
VALLEY FOOTHILL HARDWOOD-CONIFER	
Blue Oak-Digger Pine	Western
Montane Riparian	Central and eastern
Valley Foothill Riparian	Western
SHRUB-DOMINATED HABITATS	
Low Sage	Eastern
Bitterbrush	Eastern
Sagebrush	Eastern
Montane Chaparral	Central and western
Mixed Chaparral	Central and western
Chamise-Redshank Chaparral	Central and western
HERBACEOUS-DOMINATED HABITATS	
Annual Grassland	Western
Wet Meadow	Countywide
Fresh Emergent Wetland	Countywide
Pasture	Western
AQUATIC HABITATS	
Riverine	Countywide
Lacustrine	Countywide
DEVELOPED HABITATS	
Cropland	Western
Orchard-Vineyard	Countywide
Urban	

SOURCE: *A Guide to Wildlife Habitats of California, 1988*



Source: California Department of Fish and Game, 1985 and 1991.
Teale Data Center, 1991.

NOTE: Wildlife "Homerange" movement corridors are not illustrated.

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NEVADA COUNTY GENERAL PLAN
Migratory Deer Ranges

1" = 25,000'

FIGURE 5-4

species.
5. Environmental pollution threatens survival.

An animal is defined as "rare" if any one of the following characteristics apply:

1. Confined to a small specialized habitat and incapable of change.
2. Nowhere abundant.
3. So limited that any appreciable reduction would cause it to be endangered.
4. If current management programs were stopped, would become endangered.

A complete list of federally- and state-listed plants and animals which are considered to be endangered is presented in Appendix B (Tables 5-3 & 5-4).

Figure 5-3 presents the known locations of rare plants and animals in the County. There is a high potential that special status species exist in areas not yet officially mapped, as the majority of the county has not been systematically surveyed and studied. Much of the known mapping is the result of field surveys prepared for specific development projects.

The list of plants located within Nevada County considered by the California Native Plant Society (CNPS) to be threatened is presented in Appendix B. This list is more extensive than the federal and state listing as these are species which the CNPS considers to be at risk which have not been listed by either the Federal or State governments.

According to the Department of Fish and Game, the overall trend in the county is toward a decline in habitat values. It is probable that such a decline could result in an increase in plant and animal species gaining formal listing as endangered, rare, or threatened. Additionally, without ongoing management and monitoring, species in the County that are currently listed as endangered, rare, or threatened could become extinct in the County.

5.4 IMPORTANT OR UNIQUE WILDLIFE HABITAT ZONES

Nevada County supports a variety of wildlife habitats which are important or unique. These habitats consist of movement corridors, wetlands and riparian areas, and residence/breeding/foraging areas.

Movement corridors serve two primary purposes: first, to enable migratory animals, especially deer, to move seasonally from and between winter and summer habitats, and second, to allow animals to move within their home range or residence areas.

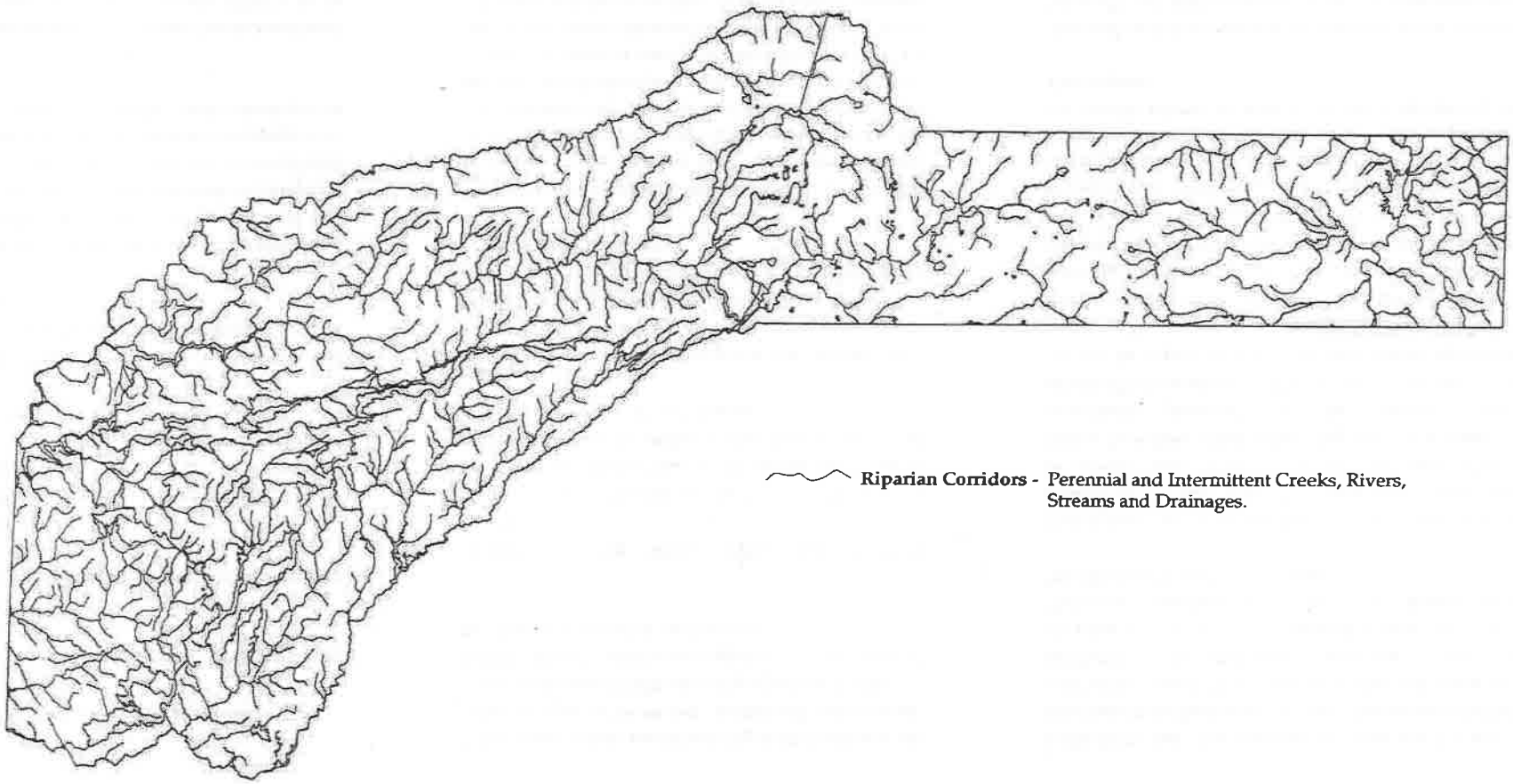
Figure 5-4 illustrates the general deer movement corridors as well as ranges and deer herd boundaries. Seasonal corridors serve to sustain overall habitat values and insure population density and diversity. These corridors are not necessarily individual paths, but can also be characterized as zones or corridors through which animals move. In the case of deer, the corridors serve to link winter and summer habitats which serve the lifecycle of the animal. Seasonal corridors therefore tend to run east to west for the Nevada City herd, and more north-south with the Truckee-Loyalton herd. In general, animal movement generally occurs along riparian corridors and/or low-lying "saddles" which connect various mirco-habitat areas. The creeks, streams and drainages shown on Figure 5-5 constitute riparian corridors which are capable of support, for both migratory and resident wildlife movement.

Aside from deer, discussed below in Section 5.5, most mammals in the County move locally through established vegetation. Even corridors which have been impacted by residential development, road construction or other uses can retain residual values and support animal movement. These areas are shown on Figure 5-4 as "Approximate Boundaries of High Urbanization".

The highest values for resident wildlife in the County generally occur in areas which have not yet been disturbed by development. Within the County, resident wildlife values have been significantly degraded as a result of urbanization, parcelization and the direct and indirect effects of human activities. The areas of the county which are still in large-parcel, undeveloped acreage generally represent the more valuable habitat areas simply due to their essentially open space and low density land uses, although the values vary locally with density and diversity varying in response to local vegetational characteristics. Animals which do not migrate, but which move throughout a home range can be severely affected by development within their range, especially those species which are less tolerant of human activity or are dependent on specific habitat characteristics which are altered by development.

Wetlands and riparian areas (discussed below in Sections 5.6 and 5.7 respectively) both serve as important habitats in their own right, as well as critical components in animal movement and migration and as supporting habitat for special-status species.

Areas which support migratory populations (see Figure 5-4) are essential to the long-term viability of area deer herds, as well as other species which also use the habitat provided



Riparian Corridors - Perennial and Intermittent Creeks, Rivers, Streams and Drainages.

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NEVADA COUNTY GENERAL PLAN
Existing and Potential Riparian Corridors

1" = 25,000'

FIGURE 5-5

by these areas.

5.5 DEER

The deer population in Nevada County is made up of both resident and migrating animals (see Figure 5-4). The western portion of the county supports both resident deer and winter populations of migrating deer. The migratory populations tend to move seasonally with winter ranges located in the eastern slope near Reno or western slope, and summer and spring ranges moving into the timbered area of mid-county. Much of the summer range is in the forested mid-county area currently designated for timber preserve. Deer populations throughout the county have been characterized by both the California Department of Fish and Game and the Tahoe National Forest as unstable and declining. The east side of the County supports portions of the Truckee-Loyalton migratory deer herd, while the western portion of the County supports the migratory Nevada City deer herd, as well as resident populations known as the Motherlode herd. Winter ranges of the Nevada City and Motherlode herds often overlap. Development in the winter range of west county and disruption of migration corridors are significant contributors to the decline. However, an overall decline in habitat values throughout the county is also contributing. Such factors as fire suppression, road kills, subdivision, harassment by dogs, and predator control all may be part of the decline.

5.6 WETLANDS

Wetlands in Nevada County are generally small, isolated features dependent on riparian water, NID ditch leaks or overflows, diversions by agricultural operations or natural seeps or springs. Man-made or naturally occurring wetlands provide an important biological resource both through provision of localized habitat and habitat for migratory species and as a natural water filtration system. The wetlands of the County are not well mapped but are located throughout the area. The primary issues related to wetlands are loss due to filling as a result of land development; degradation or loss due to interruption of water supply from natural and man-made drainage systems; and degradation due to degraded water quality, resulting from increased pollution from urban runoff, sedimentation, pesticides and herbicides. Nevada County's zoning ordinance, General Provisions Section 3.28 of Chapter II of the Nevada County Land Use and Development Code, provides for protection and replacement of "significant" wetlands.

5.7 HARDWOODS

Oak woodlands and savannas provide an important habitat which serves as a significant grazing resource for area ranchers, a wildlife habitat of diverse values, and as a source of hardwood. Additionally, oak woodlands and savannas contribute to the overall protection of watersheds by stabilizing soils on even the steepest slopes.

The oak trees of California have been experiencing a significant decline in reproduction rates in recent years. Since 1979, or before, this phenomenon had been documented and concerns have been raised. The decline in regeneration has resulted in a variety of studies and the development of guidelines for resource management. While the Nevada County oak woodlands have not been officially evaluated, oak populations, both locally and statewide, appear to be experiencing a decline in both numbers and regeneration due to impacts of agricultural practices, residential development, and cord wood harvesting (affecting primarily Blue Oak and Black Oak) in the western foothill area and due to timber practices in the mid-county area (affecting Black Oak).

As contributions to wildlife values, oaks are extremely important. Oak trees, although varying by species and by associated plant communities, provide food (acorns), shelter, roosting, and nesting habitats for a wide variety of birds. The understory associated with the oaks can also provide browsing, shelter and breeding habitat for mammals, insects and reptiles. They also provide microhabitats due to their shading characteristics, which contribute to the overall diversity of species in areas where they occur. Of all these characteristics, the provision of acorns as a food source appears to be the most significant contribution. As stands of oaks or individual trees age, their production of acorns peaks and then begins to decline. Therefore, consistent regeneration is needed to ensure ongoing supplies of trees and acorns.

The gradual decline of hardwood habitats in the county will result in a commensurate reduction in habitat values.

5.8 STREAM AND RIPARIAN CORRIDORS

As shown in Figure 5-5, Nevada County is a veritable network of intermittent (seasonal) and perennial (year round) creeks, streams and rivers.

These waterways are critical habitats in their own right, as well as providing important movement, fishing values and corridors for wildlife. These waterways range from the South Yuba River to small unnamed seasonal drainages. Yet, despite their varied characteristics, these areas

provide important year round and migratory habitats. The trees and shrubs which grow in the corridors provide shelter, forage, and nesting values, as well as drinking water and habitat for water dependent amphibians, mammals and birds.

Riparian corridors in the county have been disrupted as a result of agricultural operations, logging activities, domestic water development, residential development, water pollution, hydroelectric facilities and other improvement activities. The quality of individual corridors relates to the vegetative cover, the width of the undisturbed corridor, the microclimate conditions, proximity to development, and a variety of factors. However, even apparently degraded areas can retain value, as can corridors traversing developed areas. Riparian corridors can provide important habitats and linkages between rural areas for wildlife.

5.9 TIMBERLANDS

Nevada County supports an extensive timber resource, the majority of which is under the jurisdiction of the Tahoe National Forest (TNF). According to the Soil Conservation Service, "forests are one of the important resources of the Nevada County area. They supply raw material for one of the major industries, provide recreation and aesthetic enjoyment for many people, provide food and cover for many forms of wildlife, and protect watersheds."

There are three categories of land under the jurisdiction of the TNF: timberlands, woodlands, and chaparral. The following is a brief discussion of each vegetational category.

TIMBERLANDS: Considered a renewable resource, commercial timberlands are located primarily in the mid and eastern areas of the county, in elevations ranging from 1200 feet above sea level in the west to over 9,000 feet in the east. Timberlands are those lands capable, available and suitable for commercial timber production. There are 449,842 acres of prime forest land on the TNF. Approximately 629,018 acres are considered suitable for timber production. Shown on the following page, Table 5-3 identifies classifications of forest types by approximate acreage suitable for timber production.

WOODLANDS: Woodlands on the TNF occur throughout the Forest and are defined as forested land not suitable for timber production. These forested lands provide opportunities for important wildlife habitat, vegetation diversity, firewood resources, and multiple-use considerations. Forested land considered as woodlands are included in Table 5-3 located on the following page.

CHAPARRAL: Two-thirds of the chaparral lands on the TNF occur in scattered parcels of less than 100 acres. About 8 percent are in areas needing reforestation and another 11 percent are on slopes greater that 50 percent. These lands are primarily managed as wildlife habitat. Table 5-3 on the following page identifies the types of chaparral vegetation on the TNF.

LAND OWNERSHIP CONFLICTS: About one-third of the land within the boundaries of the TNF is private, or in non-federal ownership. The majority of these ownerships are small (less than 1,500 acres). Development pressures will continue to increase on the intermingled private lands. More residential use will likely intensify conflicts with resource management on the TNF lands and create "Urban/Rural Wildland Interface" conflicts. As more private lands are developed, demand will increase for roads, water systems, utilities, and other services on TNF lands. Utility companies feel there is a need for additional utility corridors to transport power from the east. Additionally, within the urban/rural wildland interface there is a continuing demand for timber, as well as a visually pleasing natural environment.

The need for fire protection services to protect life and property will also increase with development on private lands. Often such pockets of development are at a great distance from TNF or California Department of Forestry fire stations or are difficult to access because of narrow roads or steep and winding access routes. As a result, the demand for additional fire protection districts is likely to increase with development on private land within the TNF. The TNF, in its 1990 Land and Resource Management Plan, identified the need for cooperation with local, State and Federal agencies to appropriately plan for the urban/rural wildland interface.

Table 5-3
CATEGORIES OF VEGETATION IN THE TAHOE NATIONAL FOREST

Timberlands	*Acres*
Mixed Conifer	361,797
Red Fir	100,818
Eastside Pine	104,281
Lodgepole Pine	9,041
Hardwood-Conifer	36,660
Reforestation and TSI Needs	16,256
TOTAL	**629,018**

Woodland Vegetation	*Acres*
Live Oak and associated hardwoods	26,483
Black Oak, Tanoak, and Madrone	5,881
Knobcone Pine	285
Digger Pine	139
Juniper	1,534
Aspen (pure stands larger than 10 acres)	75
TOTAL	**34,397**

Chaparral Vegetation	*Acres*
Brushland capable of reforestation	6,439
Areas less than 100 acres	53,748
Areas less than 100 acres with slopes over 50 percent	8,453
Basin Sage, Bitterbrush, Mountain Mahogany with Perennial Grass, and Wyethia	6,607
Huckleberry Oak, Wyethia, Forbs, Perennial Grass	2,397
Whiteleaf Manzanita, Deerbrush, Bear Clover	1,141
Tobacco Brush, Whitehorn, Greenleaf Manzanita, Huckleberry Oak, Wyethia	392
Whiteleaf Manzanita, Annual Grass, Forbs	136
TOTAL	**79,313**

AIR QUALITY 6

.1 CLIMATOLOGY

Nevada County exhibits large variations in terrain and consequently exhibits large variations in climate. The western portions of the County slope relatively gradually with deep river canyons running from southwest to northeast towards the crest of the Sierra Nevada Range. East of the divide, the slope of the Sierra is steeper, but river canyons are relatively shallow. Elevations range from about 300 feet at the southwest corner of the County to 9,143 feet at Mt. Lola on the crest of the Sierras.

The topography of the County strongly affects temperature and rainfall distributions. The warmest areas within the County are found at the lower elevations along the west side of the County, while the coldest average temperatures are found at the highest elevations. Average annual precipitation generally increases with altitude ranging from about 30 inches in the western portions of the County to over 60 near the crest of the mountains. East of the crest of the Sierra, annual precipitation drops off rapidly, diminishing to about 30 inches at the eastern end of the County.

The prevailing wind direction over the County is westerly. However, the terrain of the area has a great influence on local winds, so that wide variability in wind direction can be expected. Afternoon winds are generally channelled up-canyon, while nighttime winds generally flow down-canyon. Winds are, in general, stronger in spring and summer and lower in fall and winter.

Periods of calm winds and clear skies in fall and winter often result in strong, ground-based inversions forming in mountain valleys. These layers of very stable air restrict the dispersal of pollutants, trapping these pollutants near the ground, representing the worst conditions for local air pollution occurring in the County.

6.2 AIR POLLUTION STANDARDS

The State Mulford-Carrell Act of 1969 and the federal Clean Air Act of 1970 established state and federal air quality standards for several pollutants. These standards are divided into primary standards, designed to protect the public health, and secondary standards, intended to protect the public welfare from effects such as visibility reduction, soiling, nuisance and other forms of damage. The state and federal standards are summarized in Table 6-1 on the following page.

The overall air quality in Nevada County is very good. Of the many standards shown in Table 6-1 only two (ozone and PM-10) are known to be problems in the County. These two pollutants and their effects are described below.

Ozone

Ozone is the most prevalent of a class of photochemical oxidants formed in the urban atmosphere. The creation of ozone is a result of a complex chemical reactions between hydrocarbons and oxides of nitrogen in the presence of sunshine. Unlike other pollutants, ozone is not released directly into the atmosphere from any sources. The major sources of oxides of nitrogen and reactive hydrocarbons, known as ozone precursors, are combustion sources such as factories, automobiles and evaporation of solvents and fuels.

Ozone can be transported many miles by prevailing winds. For the most part the ozone affecting Nevada County is transported into the area by the prevailing summertime westerly winds. Ozone is known to be transported from the Sacramento Metropolitan area to the mountainous areas to the east and north.

The health effects of ozone are eye irritation and damage to lung tissues. Ozone also damages some materials such as rubber, and may damage plants and crops.

Suspended Particulate Matter (PM-10)

Suspended particulate matter consists of solid and liquid particles of dust, soot, aerosols and other matter which are small enough to remain suspended in the air for a long period of time. A portion of the suspended particulate matter in the air is due to natural sources such as wind blown dust and pollen. Man-made sources include combustion, automobiles, field burning, factories and unpaved roads. Fireplaces and woodstoves are known to be major sources of particulate matter in mountain towns during the winter months.

The effects of high concentrations on humans include aggravation of chronic disease and heart/lung disease symptoms. Non-health effects include reduced visibility and soiling of surfaces.

6.3 CURRENT AIR QUALITY

Nevada County is within the Mountain Counties Air Basin, an air basin consisting of 9 counties or portions of counties stretching from Plumas County on the north to Mariposa County on the south. The North Sierra Air Quality Management District is the local agency for air quality planning with authority over air pollutant sources.

Until recently, air quality was not monitored in Nevada County. Beginning in 1986 the North Sierra Air Quality Management District started operating air quality moni-

Table 6-1
Federal/State Ambient Air Quality Standards

Pollutant	Averaging Time	Federal Primary Standard	State Standard
Ozone	1 Hour	0.12 PPM	0.09 PPM
Carbon Monoxide	8 Hour	9.0 PPM	9.0 PPM
	1 Hour	35.0 PPM	20.0 PPM
Nitrogen Dioxide	Annual	0.05 PPM	—
	1 Hour	—	0.25 PPM
Sulfur Dioxide	Annual	0.03 PPM	—
	24 Hour	0.14 PPM	0.05 PPM
	1 Hour	—	0.5 PPM
Particulates	AGM	50 ug/m3	30 ug/m3
	24 Hour	150 ug/m3	50 ug/m3
Lead	30 Day Ave.	—	1.5 ug/m3
	3 Month Ave.	1.5 ug/m3	—

PPM = Parts Per Million
ug/m3 = Micrograms Per Cubic Meter

Table 6-2
Ozone Air Quality Data, 1989-1990[1]

Standard	Year	Nevada City
Annual Maximum (PPM)	1989	0.12
	1990	0.15
Days over Federal Standard	1989	0
	1990	2
Days over State Standard	1989	12
	1990	8

[1]Based on partial years data.

Sources: California Air Resources Board, California Air Quality Data, Annual Summary, Vols. SSI, 1990.

Northern Sierra Air Quality Management District, Unpublished Summaries of 1990 Air Quality Data, 1991.

Table 6-3
PM-10 Air Quality Data, 1988-1990

	Year	Grass Valley	Truckee
Days above Federal	1988	0	0
24-hour Standard	1989	0	0
	1990	0	0
Days above State	1988	1	11
24-hour Standard	1989	2	6
	1990	2	12

Sources: California Air Resources Board, California Air Quality Data, Annual Summary, Vols. XXI, 1990.

Northern Sierra Air Quality Management District, Unpublished Summaries of 1990 Air Quality Data, 1991.

toring sites in the County. At present, the District has monitoring sites in Nevada City, Grass Valley and Truckee. The Nevada City station was established to monitor ozone levels, while those in Truckee and Grass Valley are designed to monitor PM-10. The Placer County Air Pollution Control District also operates a monitoring site just south of the Nevada County border in Colfax.

Ozone monitoring began in Nevada City in 1989 (see Table 6-2 on the preceding page).

Data from 1989 and 1990 shows that both the state and federal ambient air quality standards are exceeded in Nevada City. Data from Colfax, located just south of the Nevada County border, also shows violations of both the state and federal standards.

PM-10 is measured in Nevada County in Grass Valley and Truckee. Data from the Grass Valley and Truckee monitoring sites for 1988-1990 are shown in Table 6-3 on the preceding page. In general, both sites meet the federal PM-10 standards, but exceed the more stringent state standards.

The violations of the PM-10 standards in Grass Valley and Truckee generally occur in winter, although violations in the summer months have been noted during forest fires or periods of open burning. This pattern suggests that the major contributor to PM-10 violations is woodsmoke.

The Northern Sierra Air Quality Management District is currently planning to add air monitoring capabilities during 1991. A continuous PM-10 monitor is planned for installation in downtown Truckee, and a new ozone and carbon monoxide monitoring site is planned for the Tahoe-Truckee Airport.

6.4 REGIONAL AIR QUALITY PLANNING

The California Clean Air Act, enacted in 1989, requires local air pollution control districts to prepare air quality attainment plans for areas deemed "nonattainment" for the California state air quality standards. Generally, these plans must provide for district-wide emission reductions of five percent per year averaged over consecutive three-year periods. The Act also grants air districts explicit statutory authority to adopt indirect source regulations and transportation control measures, including measures to encourage or require the use of ridesharing, flexible work hours or other measures which reduce the number or length of vehicle trips.

Nevada County is considered to be "nonattainment" for ozone and PM-10, and is either "attainment" or unclassified for other pollutants. The California Clean Air Act requires that a nonattainment plan for ozone be adopted by June 30, 1991. There is currently no deadline for adoption of a nonattainment plan for PM-10.

LAND USE TRENDS 7

7.1 HISTORIC GROWTH

The growth that has occurred in Nevada County during the past two decades has been significant. With a population increase of 53,250 during the 1970-1991 period, considerable land has been absorbed for residential, commercial and industrial uses.

A land use inventory was conducted in 1991 and included all industrial, commercial, residential, public and quasi-public lands (excluding major open spaces). Figure 7-1 is a general and gross depiction of those areas where the inventory reveals a predominance of commercial, industrial, public and quasi-public lands, and/or other residential and residential/agricultural lands with average densities exceeding one household per three acres.

The Grass Valley/Nevada City area has been the focal point of most of the County's commercial, industrial and residential growth and development. Grass Valley and Nevada City have had a combined increase of nearly 3,000 residences during the past twenty years, primarily in standard lots. New residential land use is predominantly located in the Alta Sierra area, Lake Wildwood, and Lake of the Pines. This residential growth has consisted of urban-sized lots, as well as three- to five-acre ranchette parcels. Alta Sierra was divided with over twenty subdivision plats and includes a wide range of lot sites including ranchettes. Lake Wildwood and Lake of the Pines were started in the late 1960s and are primarily divided into standard lots. The current population of Alta Sierra, Lake Wildwood and Lake of the Pines is approximately 15,000.

7.2 RESIDENTIAL DEVELOPMENT

While residences are found along many of the highways of the County, residential development is also found in a dozen or so smaller rural communities. These small rural places have several hundred residences and include Cascade Shores, Cedar Ridge, Chicago Park, Deer Creek Park, Peardale, Red Dog/You Bet and Rough and Ready.

Single family residential is the predominant housing type throughout the County, with most of the multi-family housing development located in Grass Valley. In addition, considerable development has occurred throughout much of rural Nevada County.

Residential land uses in eastern Nevada County are concentrated around Donner Lake, in the large Tahoe-Donner development, in the Glenshire area to the east and the Prosser subdivisions to the north on Highway 89. Soda Springs, Kingvale and Floriston are small rural places of less than 100 residences. There are few residential uses outside of these established areas thus, the eastern County area is unique in that it does not contain scattered rural homes found in most counties. Growth in eastern Nevada County area has kept pace with the overall County. The population of the "Truckee Community" increased from 5,700 in 1980 to nearly 10,000 in 1990.

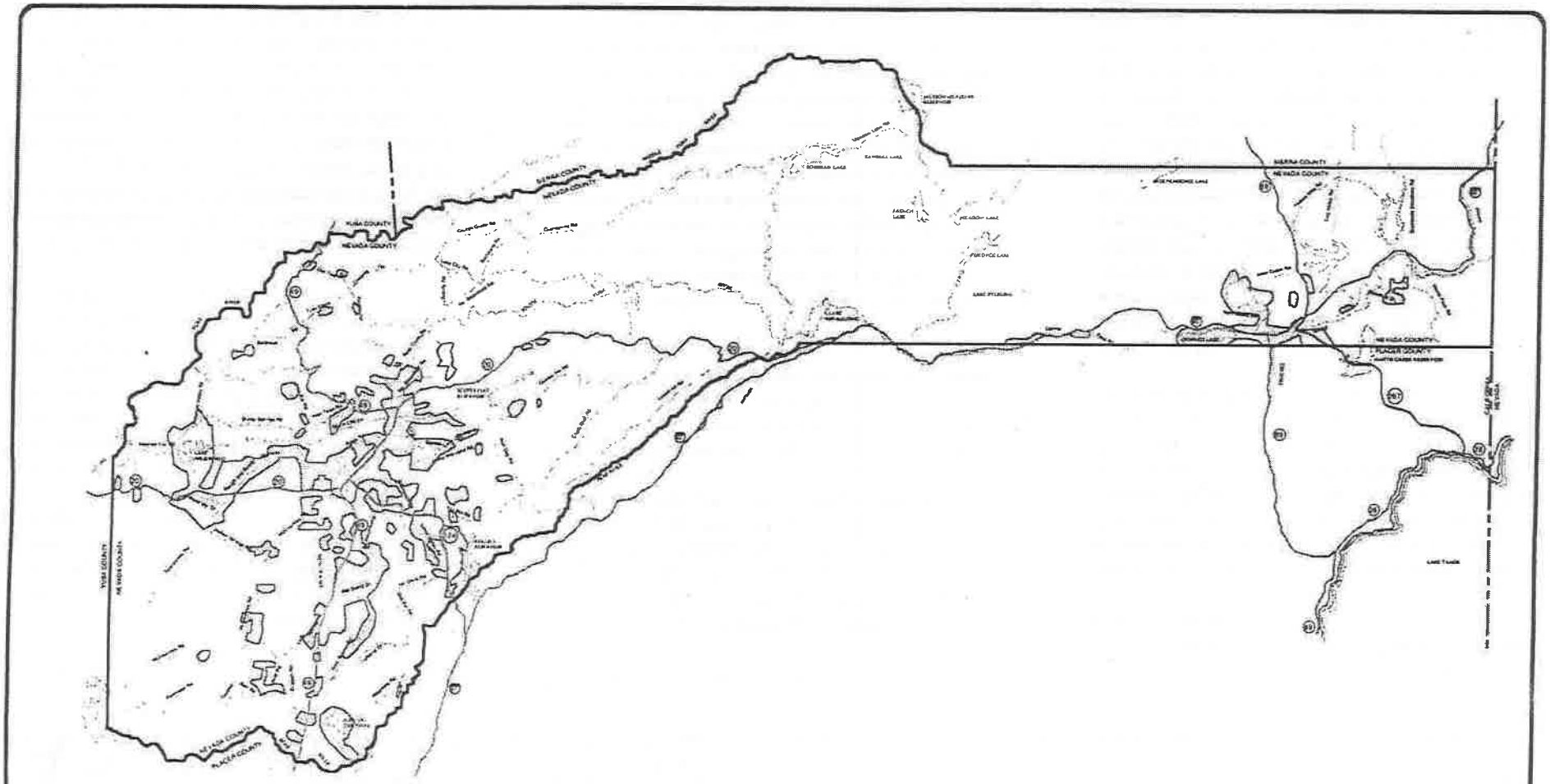
The residential developments in Nevada County are situated in areas of great natural beauty. The heavily wooded foothill terrain provides most residences in the County with outstanding vistas.

The quality of supporting infrastructure for residential developments varies. Lake Wildwood has paved streets and a sewer and water system. Some of the lots in Penn Valley have paved streets, whereas most of the larger three- and five-acre parcels have gravel roads. Most areas have septic tanks.

Alta Sierra was one of the first developments in Nevada County outside of the cities of Grass Valley and Nevada City. Alta Sierra was started in 1963 and essentially finished in the middle 1970s. Over twenty separate plats were developed as one-half-acre to five-acre-plus parcels. While this area has both gravelled private roads and surfaced roads and a water system, sewerage is provided by septic tanks. Alta Sierra now has 2,600 homes.

Lake of the Pines was designed in the late 1960s as a planned lake development with 2000 lots proposed for second homes. Today, there are approximately 1,800 residences in the community. Surfaced roads were constructed at the inception. This area has standard urban lots, as well as acreage ranchettes. This project was approved with septic tanks as the method for sewage disposal. As the area shifted to permanent residents, County sewer lines and a treatment plant were put in during the middle 1970s. Lake of the Pines is totally built out. The community is served by the adjacent Bear River High School and several elementary schools which are relatively new facilities opened in the mid 1980s. Higgins Corner, at the intersection of Highway 49, Wolf Road and Combie Road, provides commercial and retail services.

Penn Valley contains many subdivisions with both small lots and ranchettes. Today, the overall community has over 500 dwelling units. The Penn Valley Shopping Center, started in 1966, was developed in several stages and is an excellent example of a small community commercial center. Access to Penn Valley from Grass Valley was improved with the completion of the Highway 20 by-pass



Source: Harland Bartholomew & Associates, Inc., 1991.

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Sacramento, California

NEVADA COUNTY GENERAL PLAN

Areas of Concentrated Development

1" = 25,000'

FIGURE 7-1

completion in the late 1970s. The Penn Valley Fire District grew out of a private organization that raised money through their annual rodeo. The new fire hall was built in 1980 and all of the buildings and rodeo grandstands are part of public district properties. A public sewer system in Penn Valley involves the drainage of sewage from on-site holding tanks with sludge removal by trucks.

Lake Wildwood originally developed in 1970 has grown steadily to over 3,000 single-family parcels with 2,300 homes. It was started as a second home development and has since evolved into a permanent residential community. The area has a variety of housing in terms of size and value. Most of the lots range from 10,000 to 20,000 square feet in area. All lots are sold, however, there are about 700 vacant lots. This project is serviced with a County sewage collection system and a treatment plant that provides primary and secondary treatment. All roads are paved. This development includes a 300-acre lake and an 18-hole golf course. The Pleasant Valley Elementary School, built in the 1970s, adjoins the Lake Wildwood Development.

7.3 COMMERCIAL AND INDUSTRIAL DEVELOPMENT

A majority of the commercial and industrial development in Nevada County is located in or around the City of Grass Valley and in Nevada City. Commercial uses are concentrated in downtown Grass Valley and downtown Nevada City, with newer uses in the Brunswick area. The Pine Creek Shopping Center on Highway 49 south of Grass Valley is a relatively new facility.

Since 1983, approximately 8,500 new jobs have been created in Nevada County, with 2,000 new manufacturing jobs, 1,700 in services, 1,400 in retail, 700 in construction and 2,700 jobs in other categories. This translates into 860 acres of new commercial and industrial land uses. New commercial development was substantial in the 1980s, but has not kept pace with the growth of the County, according to the Center for the Continuing Study of the California Economy. Nevertheless, retail sales since 1986 have increased at a rate of about 10 percent annually in recent years.

The amount of land developed for commercial and industrial uses has increased substantially since 1983, as indicated in Table 7-1 on the following page. A 1983 land use survey by the County indicated a total of 561 acres of commercial and 343 acres of industrial for a total of 904 acres. The 1991 Land Use Survey by HBA indicates a total of 1,426 acres of commercial and 601 acres of industrial for a total of 1,640 acres. This land use survey, reflecting developed acreage as opposed to zoned but undeveloped, suggests an increase of 736 acres of commercial and industrial land use.

The amount of land used for commercial and industrial purposes in Nevada County is compared with 32 other counties in Table 7-1 on the following page. The acres used per 100 persons of population in Nevada County increased from 1.47 in 1983 to 2.43 in 1990. The 1990 ratio is similar to the average of the other 32 counties. The acres used per 100 persons for commercial development in 1990 is nearly identical to the 32-county acreage. Much of these new commercial uses are found in the Grass Valley vicinity, such as the Brunswick area and the Pine Creek Shopping Center area.

7.4 PUBLIC LANDS

There are several land use/land ownerships that cover a significant amount of the County's total land area. About 169,045 acres or 265 square miles of land in Nevada County is owned by the Federal Government for the Tahoe National Forest, operated by the U.S. Forest Service. The U.S. Forest Service lands are primarily located on the summit and north of Truckee. The Bureau of Land Management has some 20,000 acres of land in Nevada County. The Spenceville Wildlife and Recreation Area contains 11,000 acres or 17.19 square miles, with half the tract in western Nevada County and the other half in Yuba County. These three areas cover a total of 314 square miles of Nevada County's 943 square miles.

7.5 GENERAL PLAN AMENDMENTS

General Plan Amendments have primarily occurred in the unincorporated areas around Grass Valley and Nevada City. The number of general plan amendments approved since 1980 is shown in Table 7-2 on the following page.

As indicated in this table, general plan amendments peaked out in 1985 with a total of 23 map or policy changes.

The County General Plan currently has a total of twenty land use designations. The total number of acres on the General Plan Land Use Diagram totaled 603,892 acres. Located on the following page, Table 7-3 illustrates the number of acres by land use designation and the changes approved between the date of plan adoption in 1980 and 1987.

The commercial and industrial categories contain 3,050 acres, and were amended to add 220 acres, which isless than ten percent. The "large lot" residential designations (with 1.5-acre to 40-acre lots) had a net total gain of 1,654 acres, which is a relatively small portion of the total land in these designations.

Table 7-1
Commercial/Industrial Land Use

	Commercial Uses	Industrial Uses	Total
Nevada County			
1983 Acre Uses	561(1)	343(1)	904
1983 Population	61,400	61,400	
1983 Acres/100 Persons of Population	0.91	0.56	1.47
Nevada County			
1990 Acre Uses	1,426(2)	601(2)	1,640
1990 Population	83,200	83,200	
1990 Acres/100 Persons of Population	1.71	0.72	2.43
Compared Counties (3)			
Acres/100 Persons of Population	1.67	0.60	2.27

(1)Nevada County Land Use Survey 1983

(2)Land Use Survey by HBA

(3)Source: Land Use Surveys by HBA in 32 counties. The acres per 100 persons of population is the average for the 32 counties.

Table 7-2
General Plan Amendments

Year	General Plan Amendments	Year	General Plan Amendments
1980	6	1986	12
1981	10	1987	5
1982	14	1988	1
1983	11	1989	3
1984	10	1990	1
1985	23		

Source: Nevada County Planning Department

Table 7-3
Land Use Designation

General Plan Designation	Area in Acres (as adopted)	Changes in Acres
Urban High Density	130	- 38
Urban Medium Density	1,100	+ 446
Urban Single Family	8,000	- 265
Residential	19,500	+ 103
Residential Low Density	2,000	+ 55
Estate	79,700	+ 50
Rural	58,100	+ 650
Rural Low Density	79,100	- 54
Forest	324,000	+ 830
S.F. High Density	2	+ 2
R&D	490	- 1
Neighborhood Commercial	280	+ 5
Regional Commercial	120	+ 94
Office and Professional	60	+ 13
Industrial	1,670	+ 88
Open Space	23,800	- 52
Public	410	+ 12
Recreation/Rec Svc. Center	2,500	- 1,786
Planned Development	2,500	No Change

Source: Nevada County Planning Department

7.6 BUILDING PERMIT ACTIVITY

A review of residential building permits clearly portrays the significant growth in the County, as shown in Table 7-4 on the following page.

The highest growth year was 1980 with 1826 permits, and the economic down-turn of 1982 is reflected in the issuance of 847 permits. A total of 12,143 residential building permits were issued from 1980-1989 resulting in a population increase of 31,355 persons. This 68 percent rate of growth exceeded the growth in the State of California (up from 23.7 to 29.5 million) or 24 percent.

7.7 SUBDIVISION ACTIVITY

Trends in subdivision plat approvals provide a picture of past residential land-use trends. Table 7-5 on the following page provides a summary of parcel maps and final maps processed by the County since 1980:

The number of new lots recorded varied considerably from year-to-year in the 1980 to 1989 decade, as indicated in the above table. The 400-plus recorded lot totals in the 1981-85 years dropped to a low in 1988. The 1990 total of 414 new lots may be the beginning of a higher annual rate.

The number of existing improved lots within the County at the end of 1990 was 33,214. There are 21,074 existing unimproved lots within the County for a total of 54,288 lots. With a 1990 population of 78,510, the ratio is 2.4 persons per improved parcel. The 21,074 vacant lots would accommodate an additional population of 50,000 based upon this ratio. In other words, Nevada County could accommodate a future population of 130,000 without recording any new lots.

7.8 POPULATION PROJECTIONS

Population projections for Nevada County prepared by the State Department of Finance are provided in Table 7-6 on the following page. This estimate anticipates a year 2005 population of 125,000, which represents a 57 percent increase in fifteen years.

7.9 LAND USE PROJECTIONS

Based on the existing developed land in Nevada County, Table 7-7 was prepared to show the relationship between land uses and land available for development. In order to show this relationship, the undeveloped land was distributed between the General Plan Land Use Alternatives. Acres were distributed by land use category based on a ratio between existing land use and population.

Table 7-4
Residential Building Permits 1978-1989

Year	Building Permits	Year	Buiding Permits
1973	784	1984	947
1975	792	1985	970
1980	1826	1986	1204
1981	1519	1987	1198
1982	847	1988	1431
1983	992	1989	1209

Table 7-6
Population Forecast

Year		Population
July	1990	79,600
	1995	95,300
	2000	110,400
	2005	125,000

Source: *California State Department of Finance, April 1991.*
Note: *These projecttions were obtained from the Department in December 1991. Projections for 2010 were not available.*

Table 7-5
Processed Parcel/Final Maps

Year of Period	Maps Recorded	New Lots Recorded
1981-82	84	481
1982-83	68	486
1983-84	43	164
1984-85	70	410
1985-86	68	264
7/86 - 12/86	26	78
1987	69	233
1988	157	124
1989	141	189
1990	71	414
Total	**797**	**2,843**

Source: *Nevada County Planning Department*

NEVADA COUNTY LAND USE COMPARATIVE ANALYSIS

Nevada County General Plan

	Land Use Category	Comparison in Acres: Existing G.P.	Current Land Use	Undeveloped (1-2)	Acres Per 100 Pop.
I	Urban High Density - 20 DU/AC	92	13	79	0.02
II	Urban Medium Density - 6 DU/AC (1)				
	Urban Single Family - 4 DU/AC	9,282	8,205	1,077	10.14
III	Residential - 1.5 AC LOT				
	Residential Low Density - 2 AC LOT	21,658	9,916	11,742	12.25
IV	Estate - 3-10 AC LOT	79,750	37,912	41,838	46.84
V	Rural - 10-30 AC LOT				
	Rural Low Density - 30-40 AC LOT	137,797	10,680	127,117	13.20
VI	Neighborhood Commercial				
	Regional Commercial				
	Highway Commercial				
	Office and Professional				
	Research and Development	1,514	1,426	88	1.76
VII	Industrial	1,757	601	1,156	0.74
VIII	Public/Rec./Service Center	1,145	1,398		1.73

Notes:
(1) Includes SFHD

SAFETY 8

8.1 FIRE HAZARD

As demonstrated by the 49'er Fire of 1988, Nevada County has a high potential for wildland fires of devastating intensity. Based on a "Fire Hazard Severity Zone" map developed by the California Department of Forestry (CDF), almost all of Nevada County has been placed in the "very high" category of severity. Figure 8-1 displays the hazard severity zones and fire district boundaries. Fire protection service provided by Fire Districts does not include wildland areas. The U.S. Tahoe National Forest Service and CDF provide fire protection for the wildland areas, and are legally responsible only for wildland fires - not structural fires - during the fire season. Therefore, as shown on Figure 8-1, most of the County does not have year-round fire protection. In addition, most of these districts are manpowered with volunteers, making it difficult to coordinate with other agencies.

There are several factors that influence the potential for fire hazard including population growth, vegetation and slope, and weather.

The California Department of Forestry has stated that, "The rapid population increase of the County continues to compound the potential for wildfires with each fire season. This fact must be impressed upon the residents living in the wildlands and to those charged with providing life and property protection to the populous" (Nevada County General Plan, Technical Data, 1980). The 49'er Fire proved this statement to be true. The main problem encountered during this disastrous fire was the lack of adequate ingress and egress routes to the residential areas (telephone conversation, Dennis Babson, February 22, 1991). The State Responsibility Area Fire Safe Regulations (to become effective on July 1, 1991) cover "basic wildland fire protection standards of the California Board of Forestry" for "future design and construction." These new standards and regulations do not apply to existing structures, roads, streets, and private lanes or facilities. According to the Office of Emergency Services (OES), there are no regulations that apply to existing conditions.

According to the "Be Fire Safe" guidelines, vegetative areas generally over 8 percent in slope are defined as fire hazardous. Basically, the steeper the slope the faster the fire climbs. The California Department of Forestry has categorized vegetation based on fuel burning, or "fuel loading" characteristics. These are as follows:

- Light - flammable grass and annual herbs;
- Medium - scrub brush of lighter species; and
- Heavy - timber, woodland, and heavier brush species.

Weather also plays a critical role in determining fire hazard. According to the California Department of Forestry, summers with little precipitation and low relative humidity dry out vegetation which increases the amount of fuel available for burning. The drying winds of the winter months also contribute to fire hazard in Nevada County (OES).

8.2 AVALANCHE HAZARD

Avalanche hazard areas are generally located on high, mountainous slopes and terrain at elevations above 7,000 feet. The location of avalanche hazard areas depends upon the location of snow accumulation areas - those areas where snow tends to drift during peak winter storms. Wind velocity and the density of vegetation determine the pattern of snow drift and accumulation. In general, snow drifts from areas of low, or no vegetation to areas such as woodland terrain, where the wind is less able to exert its influence. The most important factor necessary to release an avalanche is heavy snow fall. A rapidly increasing snow layer is unable to stabilize or bond with the old layer of snow or the ground below it, so that after a certain amount of time the new snow layer will simply slide off as an avalanche.

Hazard zones are classified according to the following criteria:

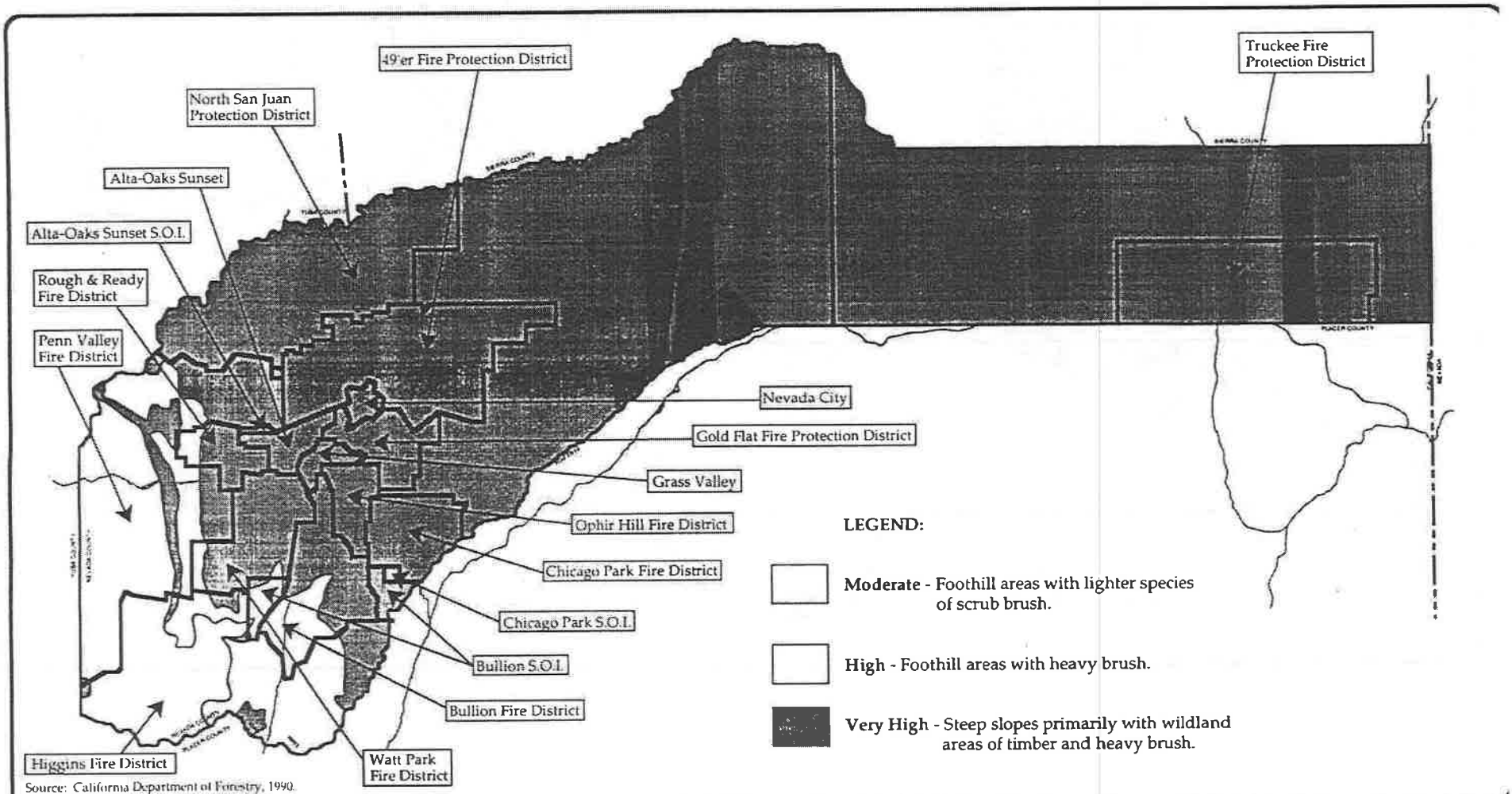
- Red Zones (high hazard): Areas where avalanches that could damage standard wood-frame structures and/or bury automobiles are expected to occur with a probability of one chance in twenty per year;

- Blue Zones (moderate hazard): Areas where avalanches that could damage standard wood-frame structures and/or bury automobiles are expected to occur with a probability of less than one chance in twenty per year, but more than one chance in one hundred per year;

- Yellow Zones (low hazard): Areas where avalanches that could damage standard wood-frame structures and/or bury automobiles are expected to occur with a probability of less than one chance in one hundred per year; and

- White Zones (no hazard): Areas where, barring cataclysmic or unprecedented events, avalanches will not occur. (Wilson)

In 1982, Snow Consultant Services prepared a study that identified avalanche hazard areas within Nevada County. The areas include portions of the Donner Lake, Tahoe-Donner, and Soda Springs areas (see Figure 8-2). These



Source: California Department of Forestry, 1990.
Nevada County General Plan, 1980.

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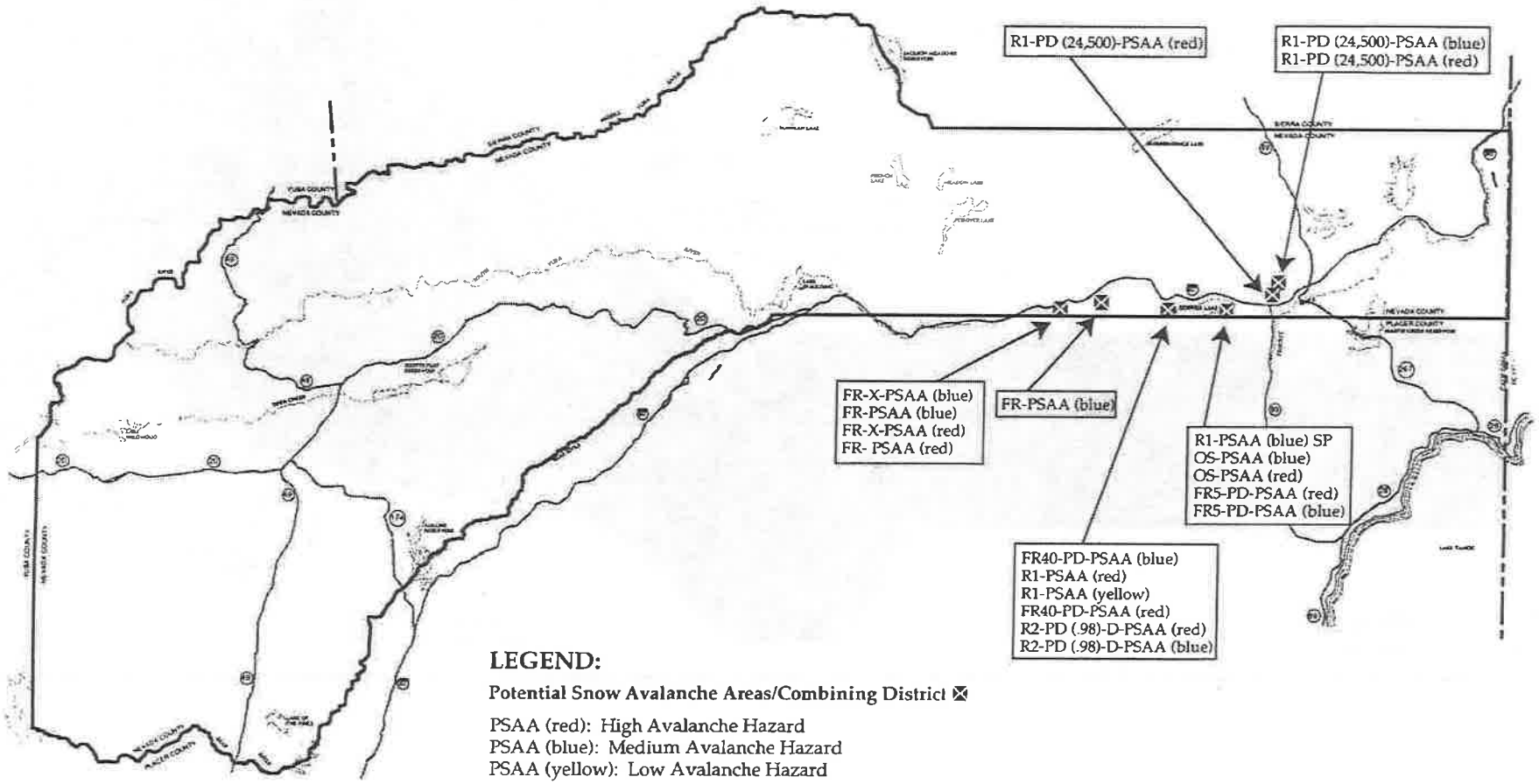
Sacramento, California

NEVADA COUNTY GENERAL PLAN
Fire Hazard Zones and Fire Districts

1" = 25,000'

FIGURE 8-1



Source: Snow Consultants, Avalanche Hazard Study, Nevada County, 1982.

Harland Ba[illegible]omew & Associates, Inc
Sacramento, Cali[illegible]

NEVADA COUNTY GENERAL PLAN
Potential Snow Avalanche [illegible]eas/Combining District

1" = 25,000'

FIGURE 8-2

hazard areas are currently populated, subdivided, or where domestic or commercial uses are planned (ski areas are not included). The mapping does not include areas where people would likely travel by foot, snowshoes, skis, or snowmobile (i.e. back country or roadless areas).

8.3 LANDSLIDE HAZARD

A landslide can be defined as an event in which surface masses of slope-forming earth move outward and downward from their underlying and stable floors in response to the force of gravity. This occurs whenever "shear resistance" of the mass is exceeded by the "shear stress."

Such movements include:

- **Falls** - Falling of soil or rock masses where a sliding surface does not occur.
- **Flows** - Surface material breaks up and moves down a slope and flows as viscous fluid.
- **Creeps** - Slow down-slope movements of an earth mass.
- **Transitional or Rotational Slides** - Movements of earth that involves a distinct rupture or zone of weakness separating the earth slide (Wieczorek)

Unstable or potentially unstable slopes are those areas susceptible to slides, falls, creeps, or flows. Topography, climate, geology, and hydrology are factors contributing to slope instability. The degree of severity of these factors and their interactions is what determines potential hazard.

The geologic properties of slope forming materials are a primary factor determining the stability of a slope (Petak). Although slope movements can occur in any type of rock material, certain bedrock formations exhibit a high susceptibility to such movement (Leighton). Cenozoic Volcanic is of this type which is found in the central portion of the County (see subsection 3.1 for further discussion). However, most of the County's soils are underlain with dense bedrock formations and lack the characteristics contributing to landslide susceptibility.

There are however, other factors such as steep topography, past hydraulic mining, and large amounts of precipitation (as in 1982 and 1983) that create the potential for landslide activity. As shown on Figure 8-3, most of Nevada County falls within zone 2; areas of low landslide activity. It should be noted that mapping of landslide activity in Nevada County has not been done in over 20 years. In addition, there has been no mapping done that includes the locations of hydraulic mining-related landslide activity. Due to this lack of adequate and updated mapping, Figure 8-3 shows only generalized areas of past landslide activity.

Historic Hydraulic Mining. According to the Soil Conservation Service, any area adjacent to a hydraulically mined area is subject to landslide activity. The mining removes the toe of the slope resulting in slope instability uphill or upstream. Triggering devices such as an earthquake or heavy rainfall would set a slide in motion.

Within Nevada County are many hydraulic mining sites. Located east of Nevada City is an area of over 20,000 acres containing the majority of these sites .

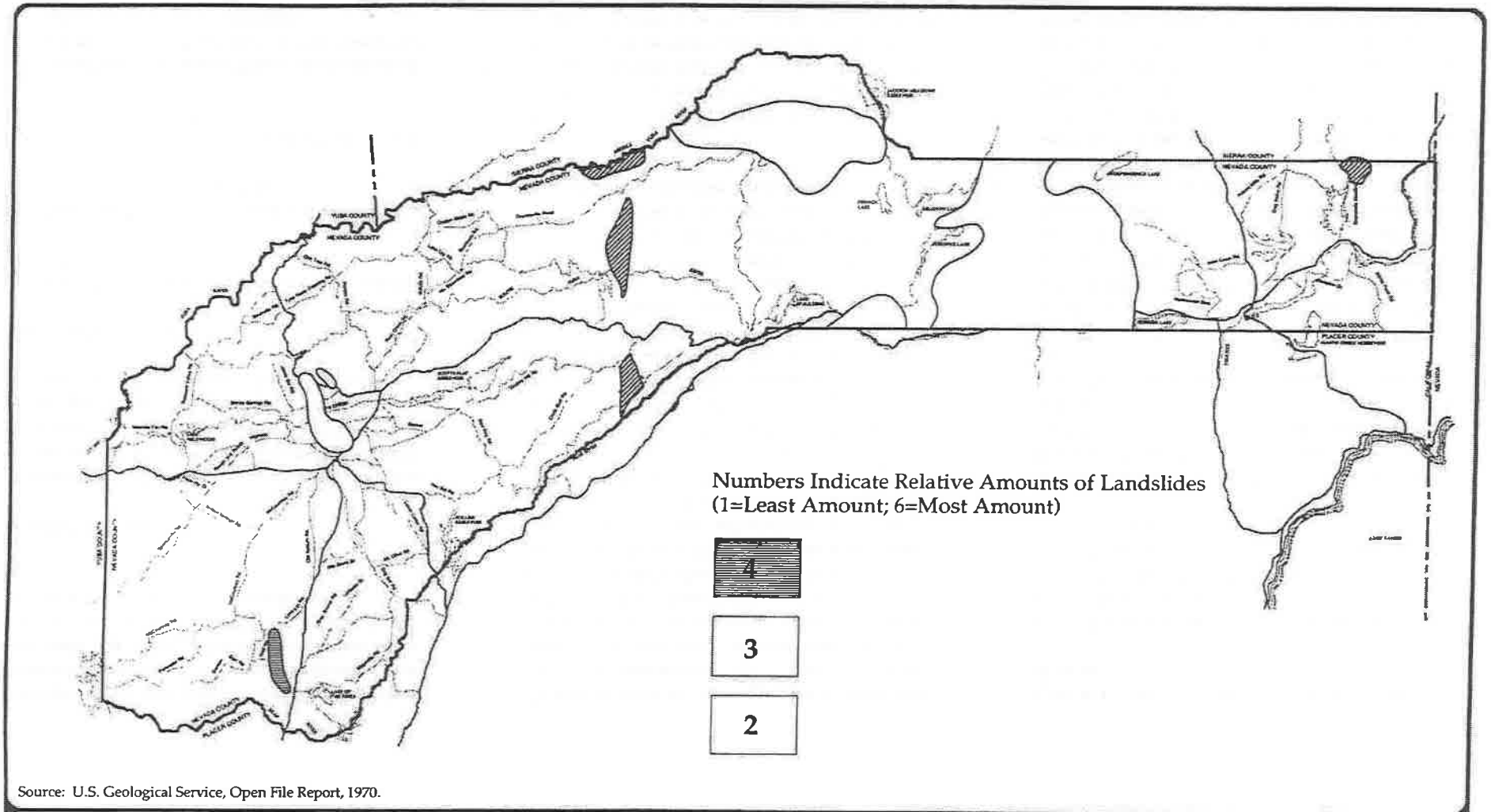
Some of the largest mining sites in Nevada County are listed below:

- Malakoff Diggings, North Bloomfield area;
- Montezuma Hill, Nevada City;
- Chalk Bluff, You Bet/Red Dog area;
- North San Juan; and
- French Corral.

In 1982, Nevada County experienced 100 inches of precipitation and in the following year, received 90 inches. According to the Soil Conservation Service, every landslide that occurred during those periods was adjacent to a hydraulic mine site. Mapping of these areas was unavailable.

Reactivation of Inactive Slides. After movement most landslides attain a degree of stability, but a landslide reacts with remarkable sensitivity to changes brought on by nature and man. Equilibrium can be upset by increasing the driving force (i.e. overloading the head of the slide) or by decreasing the resisting force (i.e. removing support from in front of the slide - the toe). This is apparent every winter by road maintenance crews who remove the toe of a fresh slide from the highway only to leave the slide in a poised and precarious state for the next triggering rain. The same is true where new roads are constructed across the toe of an old inactive slide; or where grading on a residential tract is completed with satisfactory precautions, only to have grading during utility, sidewalk, house or yard construction remove toe support from a creep or slide area (U.S.D.A Soil Conservation Service).

Triggering devices such as water, ground shaking, and grading activities are not the basic causes that create the unstable condition and determine the dimension of the



Source: U.S. Geological Service, Open File Report, 1970.

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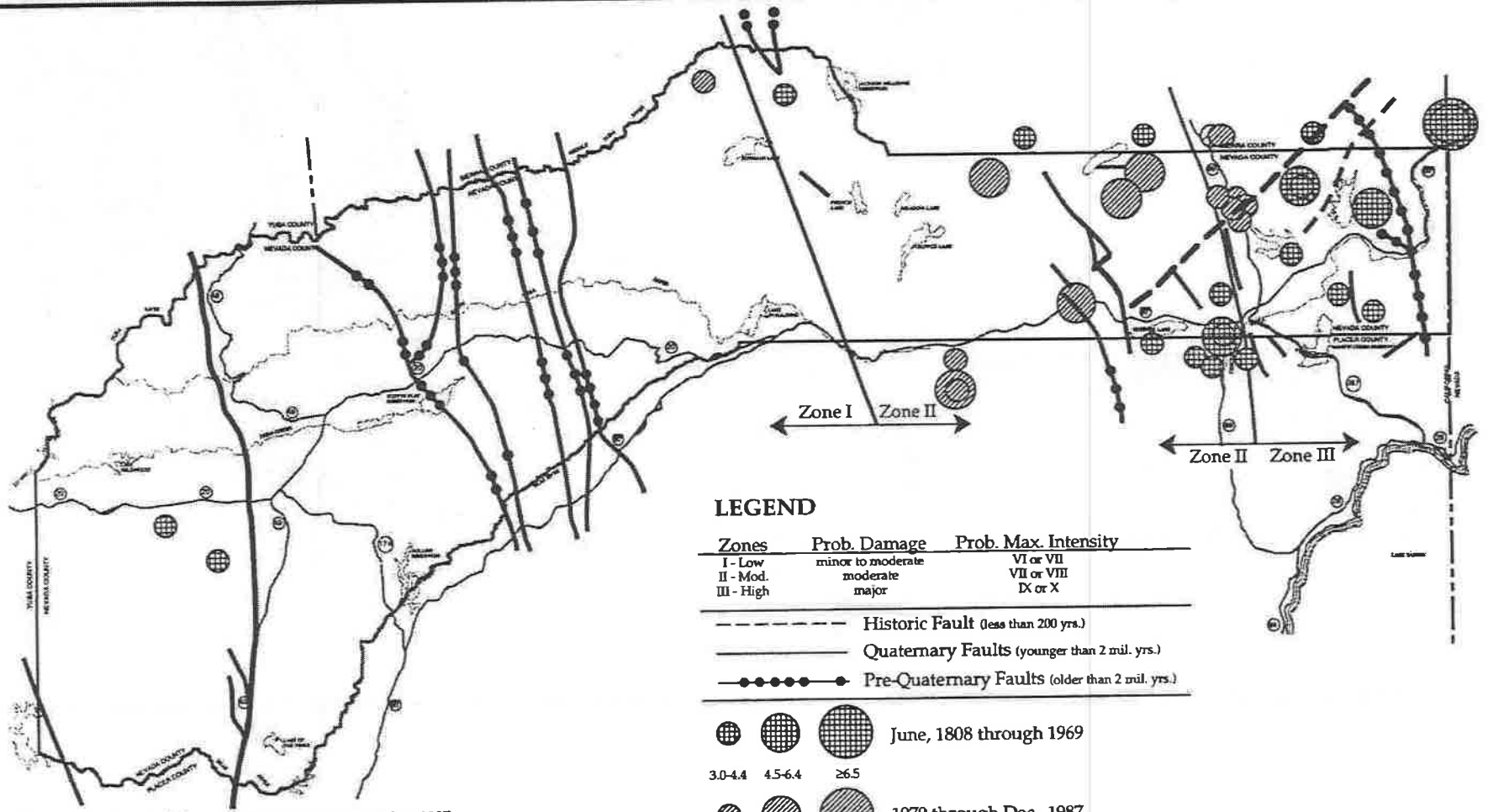
NEVADA COUNTY GENERAL PLAN
Landslide Activity

1" = 25,000'

FIGURE 8-3



Sources: National Earthquake Information Center, Epicenter Map, 1987.
Generalized Geology and Major Faults in the Northeastern Sierra Nevada, 1990.
O.E.S. Emergency Operations Plan, 1990.

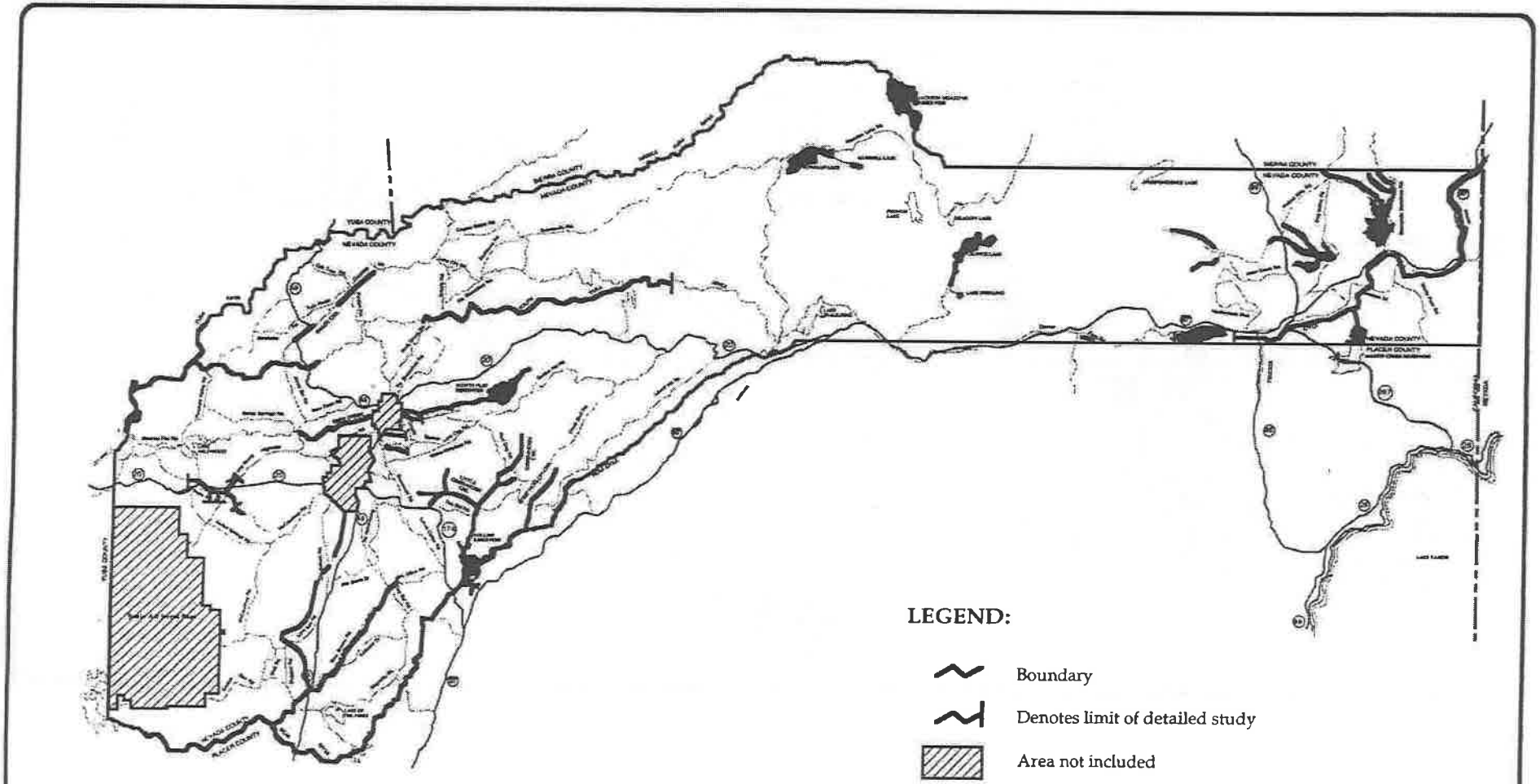
Harland Bartholomew & Associates, Inc
Sacramento, California

NEVADA COUNTY GENERAL PLAN

Epicenters and Faults Map

1" = 25,000'

FIGURE 8-4



Source: Federal Emergency Management Agency Flood Maps

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NEVADA COUNTY GENERAL PLAN
Flood Potential Areas (up to 500 year)

1" = 25,000'

FIGURE 8-5

Table 8-1
Seismic Activity Scales

Richter Magnitude Scale	Modified Mercalli Scale	Description
2	I-II	Usually detected only by instruments or very few people under favorable conditions.
3	III	Felt indoors.
4	IV-V	Felt by nearly everyone, minor damage.
5	VI-VII	Everybody runs outdoors, damage minor to moderate.
6	VIII	Everybody runs outdoors, damage moderate to major, depending upon quality of buildings.
7	IX-X	Damage major, many well-built buildings destroyed, ground cracked, landslides.
8	XI-XII	Virtually total damage, nearly all buildings destroyed, large fissures in ground.

slide. Rather, it is the effect of these triggering devices on the basic environmental conditions; the relationship of rock type and geologic structure to, most importantly, slope height and slope angle.

8.4 SEISMIC HAZARD

Earthquakes are naturally occurring events that involve the moving or shaking of the earth's crust, and are believed to be caused by the release of stresses accumulated as a result of rock rupture along opposing fault planes in the Earth's outer crust.

There are primary and secondary seismic related impacts. Primary impacts are those caused by the actual breaking and shaking of the ground. For example, a potential primary impact would be dam failure resulting from severe ground shaking, which in turn would result in flooding (see Subsection 8.5 for further discussion of flooding).

Secondary impacts include ground settlement, soil liquefaction, landslides, and seiches, as discussed in other sections of this chapter. According to the OES, most secondary impacts should be considered moderate at worst due to the characteristics of Nevada County's soils and bedrock.

Generally, potential damage resulting from earthquakes is relational to the magnitude of the quake and the local rock and soil characteristics, and the vulnerability of property to the resulting quake intensity. Therefore, the hazard of an earthquake is based on the interrelationships between faults, weak geologic materials, and human activity (Petak). Shown on page 8-8, Table 8-1 summarizes the relationship between earthquake magnitude and earthquake damage.

Faults within the State of California are divided into three categories; prequaternary (older than two million years), quaternary (younger than two million years), and historic (less than 200 years). Prequaternary faults can be found in the County's western half, running generally in a north-south direction. Quaternary and historic active faults can be found in the eastern portion of the County near the Community of Truckee (see Figure 8-4).

According to the U.S. Geological Service, Nevada County falls within all three "Maximum Expectable Earthquake Intensity" severity zones. The western half of the County is in the low intensity zone, the middle quarter is in the moderate zone and the eastern quarter is in the highest intensity zone (see Fig. 8-4).

Since 1887, the Nevada County area has experienced 26 earthquakes at a Modified Mercalli Intensity (MMI) of VI or VII and ten at a MMI of VIII (see Figure 8-4). No major earthquakes of MMI of X or greater have occurred in the Nevada County area (OES, 1988). The latest earthquake to affect Nevada County was the Boca or Truckee earthquake of 1966 which had a Richter magnitude of 5.4 and an MMI of VII (OES, 1988). Twenty-one after shocks at a magnitude of four or greater were felt in the area, with Russell Valley generally believed to be the location of the earthquake's epicenter. Although damage was extensive in the area, it was minor in scale, occurring almost entirely in unconsolidated natural fill. Relatively slight damage occurred to bridges along Highway 80 and both Prosser and Boca earthfill dams. The earthquake was also noticeably felt in western Nevada County.

In areas where seismic hazard is probable, sensitive land uses such as schools, hospitals, buildings over two stories, high-density population areas, emergency facilities, dams, reservoirs, levees, and canals should not be allowed (OES). An example of a potentially hazardous situation exists in Nevada County where the Truckee (Dog Valley) fault runs through Truckee and from Prosser Reservoir past Boca Reservoir to Stampede Reservoir in Sierra County (see Figure 8-4). Dam failure could result in the event of a large earthquake.

8.5 FLOOD HAZARD/DAM FAILURE

Flooding of lands adjacent to streams and rivers are caused by flows that exceed the capacity of the normal water course. This type of flooding involves the spill-over of above-normal stream flows onto lands immediately adjacent to the normal watercourse. Those areas subject to overflow are referred to as the stream or river's flood plain. Areas within Nevada County subject to 100-year and 500-year flooding are mapped on Figure 8-5. As shown on the figure, the flood hazard areas are generally confined to the areas adjacent to the County's local rivers and streams.

Dam failure is another form of flood hazard. Failure can occur as a result of manmade or natural causes. Such causes include improper siting, structural design flaws, erosion of the face of foundation, earthquakes, massive landslides, and rapidly rising flood waters.

There are 12 dams located within Nevada County, owned and/or operated by various agencies or organizations. These include:

- Scott's Flat Dam (NID - Nevada Irrigation District);
- Lower Scott's Flat Dam (NID);
- Rollins Dam (NID);
- Combie Dam (NID);

- Magnolia Dam (Lake of the Pines Home Owners Association);
- Bowman Dam (NID);
- Jackson Meadows Dam (NID);
- Martis Creek Dam (U.S. Army Corp of Engineers);
- Prosser Creek Reservoir Dam (U.S. Army Corp of Engineers); and
- Boca Reservoir Dam (Bureau of Reclamation).
- Spaulding Reservoir (Pacific Gas & Electric)
- Englebright Reservoir (U.S. Army Corps of Engineers)
- Lake Wildwood (Lake Wildwood Home Owners Association)
- Donner Lake (Sierra Pacific Power)
- Independence Lake (Sierra Pacific Power)

Populations occur within the inundation zone of several of these dams. According to the Office of Emergency Services for Nevada County, of particular concern is the failure of either the Upper or Lower Scott's Flat Dams. The failure of such a dam would most likely be the result of an earthquake magnitude of MMI X (see Table 8-1). The inundation zone of these dams include Nevada City as being affected as well as Bitney Springs Road and Deer Creek and a portion of Newtown Road and the Lake Wildwood Subdivision. However, the area of Nevada County in which these dams exist is not located within an historical seismic zone. In fact, the western half of the County resides within the lowest "Maximum Expectable Earthquake Intensity" zone in California (see Table 8-1)

As noted in the Seismicity Section, the far eastern portion of the County is classified in the highest earthquake intensity zone. Within this area are three major dams; Prosser Creek Reservoir Dam, Stampede Reservoir Dam (located within Sierra County), and Boca Reservoir Dam. A Seismotechtonic Study of the Truckee/Lake Tahoe Area identified two major faults believed to be "potential seismic sources of greatest significance" in the eastern portion of the County - The Mohawk and Dog Valley Faults. The Dog Valley Fault appears to be the more active of the two and of special significance due to its close proximity to the three dams listed above. However, the Truckee earthquake of 1966 had a magnitude of 5.4 and an intensity of VII, but only relatively slight damage occurred to both Prosser and Boca earthfill dams (OES).

Also noted in the Seismicity Section is the hazard of seiches. Seiches are seismically induced waves in bodies of water that can be considered a flood-related hazard. There is still much to learn about seiches, but it is known that they are particularly hazardous where lakes and reservoirs are bordered by campgrounds or other facilities on flat banks. Because of the large number of recreational lakes in Nevada County, seismically-induced seiches could prove very damaging. However, most recorded seiches have proved rather menial. The Alaskan earthquake of 1964 for example, produced seiches no larger than 1.2 feet. Considering the overall seismic risk in this County, seiche risk should be considered only a moderate hazard.

8.6 SEVERE WEATHER HAZARD

The weather plays an important role in many of the hazards mentioned. For instance, rainfall, humidity, and wind affect the severity of a wildland fire. Snow and wind are factors determining avalanche hazard zones. However, these are intermittently occurring hazards whereas severe weather hazard is of seasonal concern in Nevada County.

Winter months are of special concern in Nevada County due to the heavy snow fall received at the higher elevations. The area most affected by severe winter weather is the Donner Summit/Truckee area (OES). High winds and blowing snow often result in gridlock at the Truckee basin causing Interstate 80 to close (OES).

Below the 3,000 foot-level, the western half of the County is not prepared for heavy snow fall and therefore is severely affected if a substantial storm occurs. This was evident during the February storm of 1990 when over 32 inches of snow fell in the Nevada City/Grass Valley area in less than 36 hours. Surface streets and main roadways were difficult to clear and many of the areas were without electricity for several days.

Heavy rainfall also has the potential for impacting areas of the County. The February storms of 1986 were so severe that the County qualified for state reimbursement for costs incurred as a result of flooding (OES).

8.7 AIRPORT HAZARD

Nevada County has within its boundaries several small private airports and two public airports; the Nevada County Air Park and Truckee-Tahoe Airport. The Nevada County Air Park lies within the foothills near Grass Valley and Nevada City and the Truckee-Tahoe Airport is located east of the community of Truckee.

Safety issues arise as a result of compatible use and non-compatible land uses existing side by side with one another. The FAA (Federal Aviation Administration) defines the most critical areas as those that are immediately beyond the runway ends - the initial climbout and final approach sectors. It is within these approach/departure sectors that

the concentration of aircraft accidents occur. In addition, according to the Comprehensive Land Use Plan (CLUP) for the Nevada County Air Park, there are studies indicating that about half of all airport accidents occur on airport property and an additional 15 percent of accidents occur within one mile outside the airport property.

This information suggests that areas immediately off the ends of the runway and under the airport traffic pattern should be carefully evaluated for developed land use. Land uses that can create hazards include objects that:

- Exceed Federal Aviation Regulations Part 77 height standards;
- Attract large concentrations of birds within approach/departure sectors;
- Produce smoke;
- Flash or reflect light; or
- Generate electronic interference (CLUP/Nevada County).

The Airport Land Use Commission designates airport safety areas. Safety areas for Nevada County Air Park and Truckee-Tahoe Airport are shown on Figure 8-6 and 8-7 respectively. Safety Area 1 and 2 (Clear Zones) of Runway 25 at the Nevada County Air Park are bordered, but not encroached upon, on the north and south sides by residential developments. Safety Area 1 of Runway 7 is bordered to the south by industrial buildings. All other safety areas at this airport are surrounded by open space.

Safety areas at the Truckee-Tahoe Airport are quite clear. Some industrial buildings are located south of Runways 28L and 10R but do not encroach in any of the safety areas. Most of the airport is bordered by open space, with the exception of a residential development at the foot of Safety Area 2 of Runway 10R.

8.8 HAZARDOUS MATERIALS

The significance of hazardous materials to the environment, property, and human health depends on the type, location, and quantity of the material released. Certain areas of the County are at higher risk of encountering a hazardous material incident. Roadways, railways, waterways, and airways are frequently used for transporting hazardous materials. Areas with industrial facilities that use, store, or dispose of such materials all have an increased potential to exposure. Existing contaminated sites found within the County and transportation of hazardous material will be discussed.

Contaminated Sites

In 1988 it was estimated that approximately 97 percent of the hazardous waste stream within Nevada County is generated by "small quantity generators" (SQG's). These are defined as businesses that generate up to 2,200 pounds of waste per month (Nevada County Hazardous Waste Plan - NCHWP). The NCHWP states that the major contributor to the hazardous waste stream is "waste oil." Miscellaneous waste, which includes types of waste such as asbestos, metal dust, chemical toilet waste, and photoprocessing waste, is another major group. Other groups include non-halogenated solvents, dye and paint sludges, resins, and non-metallic inorganic liquids (NCHWP).

According to the NCHWP, 43 contaminated sites were identified in Nevada County; 21 of which are known to have contaminated ground water. Sites contaminated with hydrocarbons (gasoline, diesel, and other fuels) are the most commonly found. Table 8-2 on the following page lists the locations and types of sites in the County. Federally listed contaminated sites are not found in the County.

There are two sites within the County previously identified on the State Superfund List; the Denson property in Nevada City and Auto Recovery Service in Grass Valley (NCHWP). These two sites have been declared clean by the County. Information on disposal sites, closed toxic pits, or abandoned sites was not available at the time the NCHWP was prepared.

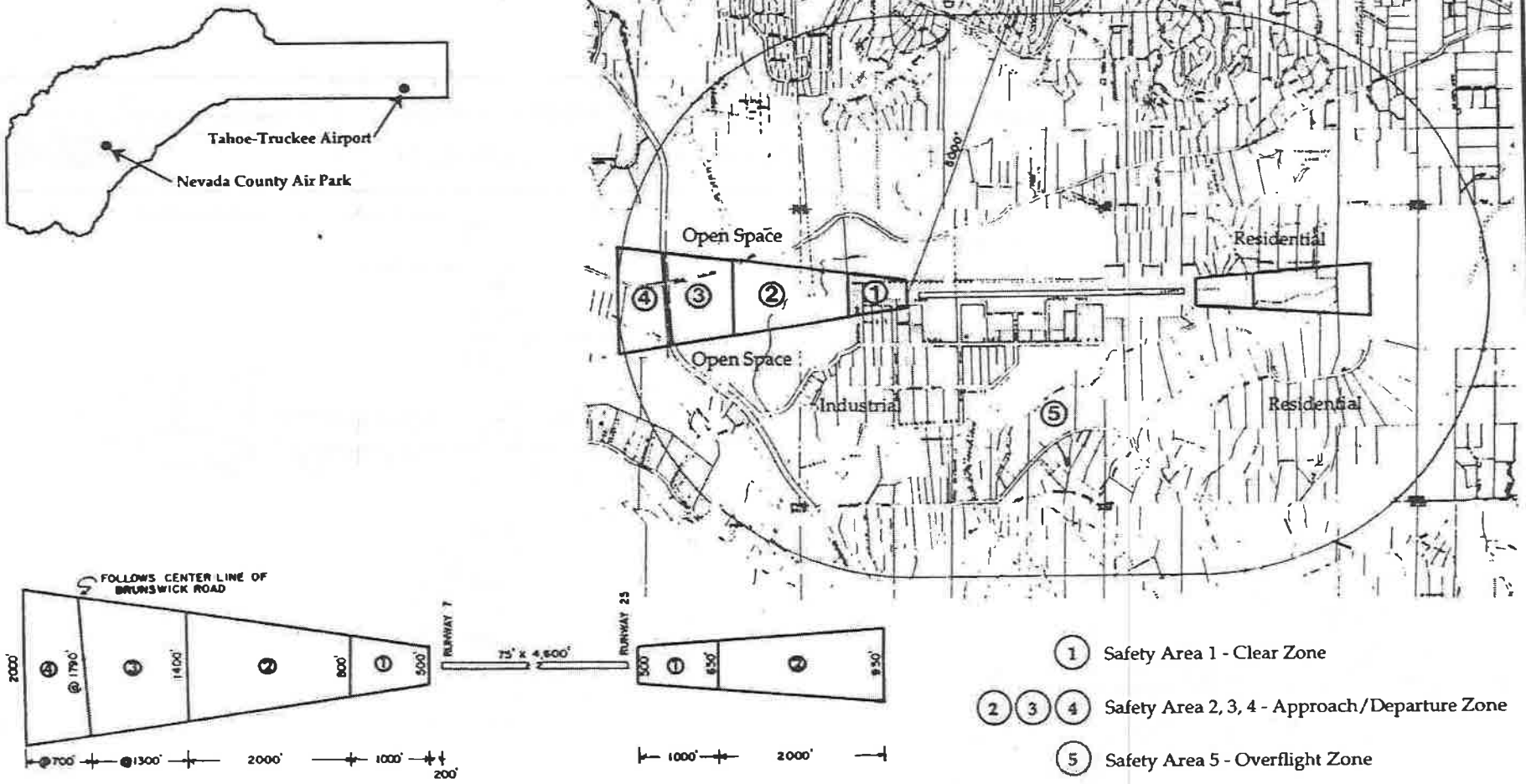
According to the Department of Health and Safety CHWMP Guidelines,

> "Land use issues to be addressed may be local zoning ordinances which restrict use of or establish buffer zones around contaminated sites; use of deed restrictions or moratoriums; and, coordination of site information with the issuance of planning and building permits (DHS, 1987)."

As stated in the NCHWP, no such ordinances, guidelines, or coordination of site information exist within the County.

Transportation of Hazardous Materials

Interstate 80, the Southern Pacific Railroad, and the Southern Pacific pipeline are the three major transportation routes by which tons of hazardous material are transported through the County. Interstate-80 weaves in and out of the County from the State Route 20 interchange to the Nevada State line. It is within this corridor that the incident of an accidental release of hazardous material is most likely to occur. Traffic volumes, the weaving character of the Interstate, and snow and ice make this corridor especially dangerous during the winter months (OES).



Source: Nevada County Air Park, Comprehensive Land Use Plan, 1987.

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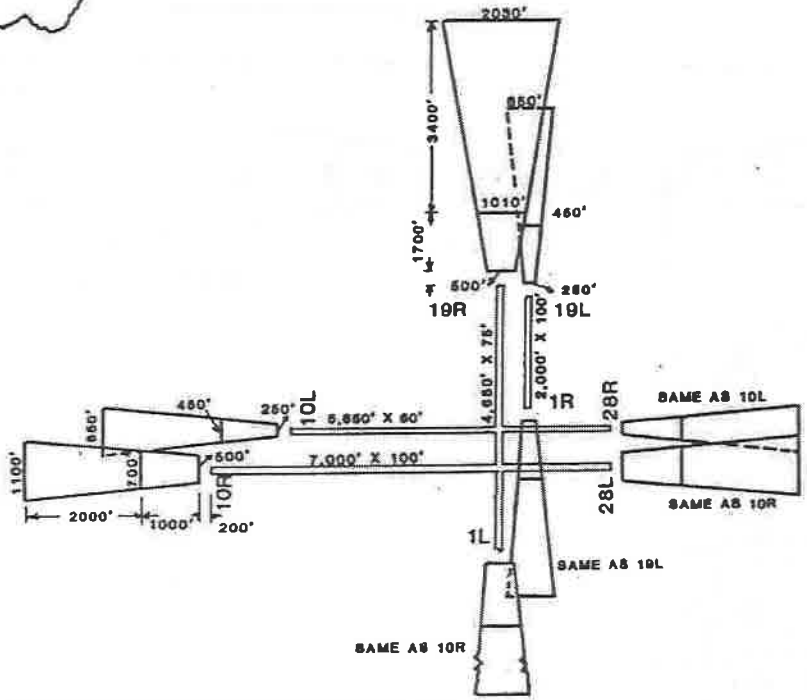
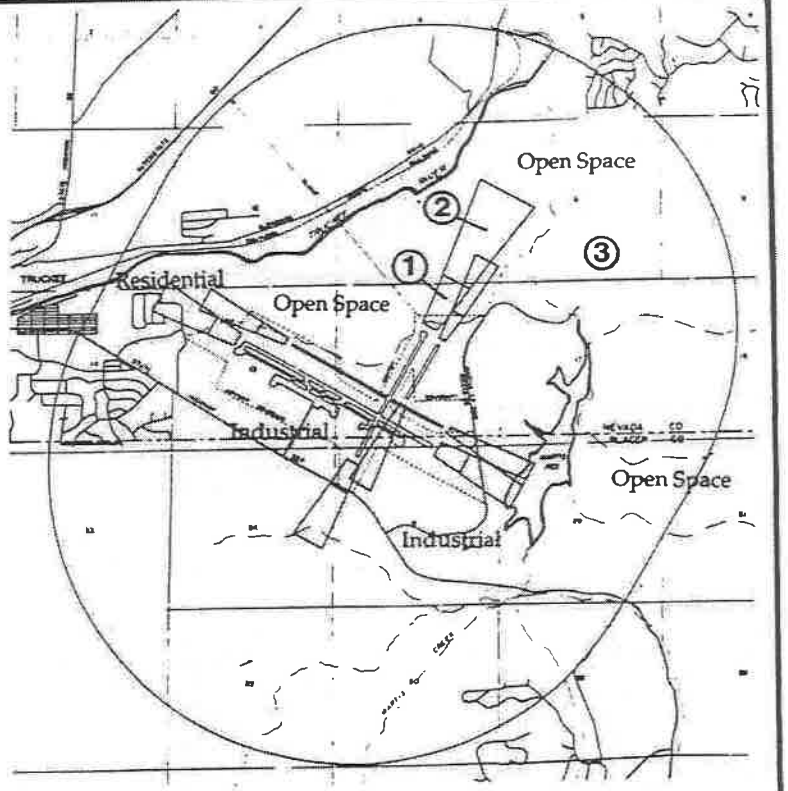
NEVADA COUNTY GENERAL PLAN
Airport Safety Areas - Nevada County Air Park

Not to Scale

FIGURE 8-6





1. Safety Area 1 - Clear Zone
2. Safety Area 2 - Approach/Departure Zone
3. Safety Area 3 - Overflight Zone

Source: Truckee-Tahoe Comprehensive Land Use Plan, 1986.

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Sacramento, California

NEVADA COUNTY GENERAL PLAN
Airport Safety Areas - Truckee-Tahoe Airport

Not to Scale

FIGURE 8-7

In addition to the character of the interstate, the remoteness of the County from outside help creates even a greater potential for a major incident. Assistance from areas outside the County would be unavailable for a period of one to four hours in the event of a hazardous materials spill (OES).

8.9 THE ROLE OF THE OFFICE OF EMERGENCY SERVICES (OES)

The major function of the Nevada County OES is the protection of life and property in the County. It is responsible for the coordination of police, fire, public works, and health facilities in the event of a disaster. This involves the following:

- Planning necessary emergency response actions;
- Mitigation of potential impacts on the area;
- Response to emergency;
- Recovery after the event; and
- Response to public inquiries and requests.

The OES develops an Emergency Operations Plan (EOP) which describes the various emergency situations and outlines the County's response to such situations. The responsibilities of each agency is detailed and emergency facilities and their capabilities are listed.

Currently, the OES is developing a computer aided system to more efficiently display the pertinent data necessary for the planning of emergency responses.

TABLE 8-2
Nevada County Identified Hazardous Waste and Substances Sites
November 1990

SITE NAME	LOCATION	SOURCE	PROBLEM
IMPACT CITY: UNINCORPORATED			
Magnolia School	Unknown	WRCB	Tank Leak
IMPACT CITY: CEDAR RIDGE			
Cedar Ridge Trading Post	Highway 174	WRCB	Tank Leak
Monty Carlton	P.O. Box 215	WRCB	Tank Leak
IMPACT CITY: GRASS VALLEY			
Toms Sierra Company	East Main & Bennett	WRCB	Tank Leak
Pacific Bell (TB-035)	315 Colfax Avenue	WRCB	Tank Leak
Pac. Bell (TB-R01)	23337 Highway 49	WRCB	Tank Leak
OK Tire Shop	421 Colfax Avenue	WRCB	Tank Leak
Caltrans	Unknown	WRCB	Tank Leak
Crystal Cream & Butter	Idaho-Maryland Road	WRCB	Tank Leak
Grass Valley City Tank	Stewart Street	WRCB	Tank Leak
Butte Equipment Company	Idaho-Maryland Road	WRCB	Tank Leak
Cranmer Engineering	1188 East Main Street	WRCB	Tank Leak
Fred Anderson Chevron	107 East McKnight Way	WRCB	Tank Leak
ARCO Station #2077	11913 Nevada City Highway	WRCB	Tank Leak
Health, Education & Welfare	10433 Willow Valley Road	WRCB	Tank Leak
IMPACT CITY: KINGVALE			
Donner Trails Elementary School	Highway 50	WRCB	Tank Leak
Kingvale Maintenance Station	Interstate 80	WRCB	Tank Leak
IMPACT CITY: NEVADA CITY			
Nevada City Maint. Station	Gold Flat Road	WRCB	Tank Leak
The Grass Valley Group, Inc.	13024 Bitney Springs Rd.	WRCB	Tank Leak
IMPACT CITY: NORDEN			
Soda Springs Ski Hill	Soda Springs Road	WRCB	Tank Leak
Norden Railyard (Tunnel 6)	Old Highway 40	WRCB	Tank Leak
IMPACT CITY: PENN VALLEY			
Penn Valley Union 76	Penn Valley Dr. & Ranch	WRCB	Tank Leak
IMPACT CITY: TRUCKEE			
Caltrans Truckee Maintenance	Unknown	WRCB	Tank Leak
Chevron Station #9-2139	12523 Deerfield Drive	WRCB	Tank Leak
J & L Food mart/Jack Shell	12105 Donner Pass Road	WRCB	Tank Leak
Truckee Don. Pudcorporate Yard	11570 Donner Pass Road	WRCB	Tank Leak
Chevron SS #9-0612	10231 Donner Pass Road	WRCB	Tank Leak
Unocal Service Station #0541	10041 Commercial Row	WRCB	Tank Leak
TSD–Alder Creek Pump Station	Alder Creek Road	WRCB	Tank Leak
Taylor's Tires	11464 Donner Pass Road	WRCB	Tank Leak
Truckee Fire Station #2	11473 Donner Pass Road	WRCB	Tank Leak
Donner Creek Shell	Unknown Highway 89	WRCB	Tank Leak
Truckee S.P. Railyard	West River Street	WRCB	Tank Leak
Guzman Industrial Center	10745 West River Street	WRCB	Tank Leak
Donner Lake Village Resort	Donner Pass Road	WRCB	Tank Leak

TRANSPORTATION 9

9.1 STREET SYSTEM

Roadways

Due to mountainous topography, Nevada County does not contain the traditional grid street network. The street system is composed of a combination of roadways which are categorized into one of the following functional classifications:

- **Freeways** - Limited access highways carrying regional and interstate traffic (e.g., Interstate 80);
- **Highways** - Roadways carrying some regional traffic and connecting the major population centers within the County (e.g., State Route 49 and State Route 20);
- **Arterials** - Roadways providing primary access from freeways and highways to major origins and destinations (e.g., Brunswick Road and Donner Pass Road);
- **Collectors** - Streets connecting highways and arterials to local roads (e.g., East Bennett Street and Alta Sierra Drive); and
- **Locals** - Streets providing primary access to individual properties (e.g., Jones Bar Road and Hobart Mills Road).

Figure 9-1 displays the current laneage and functional classification of the major streets in the County.

The following discussion summarizes the major freeways and highways within the County and their function.

Interstate 80 is a four-lane freeway running along the southern border of the County. It is the primary east-west interstate facility in this region connecting the large urban areas of Reno, Sacramento and the Bay Area. Consequently, it carries a significant amount of traffic destined outside of the County.

According to the Caltrans District 3 Draft Systems Management Plan, plans to widen Interstate 80 to six lanes through eastern Placer and Nevada Counties are proposed in order to maintain a desirable level of service for commerce.

State Route 49 is the only north-south highway connecting the western portion of the County to the Sacramento region. Consequently, it is heavily travelled by commuters. Other than a four-lane freeway section between Nevada City and Grass Valley, it is a two-lane highway with many local access points.

Caltrans acknowledges that the opportunity for capacity and operational improvements along Route 49 are minimal due to physical and socio-cultural constraints. Nevertheless, Caltrans recommends the existing two-lane conventional highway be upgraded to a four-lane expressway between the Placer/Nevada County line and Grass Valley.

State Route 20 is an east-west highway beginning at Interstate 80 near Lake Spaulding and extending west through Nevada City and Grass Valley, Penn Valley and into Yuba County.

Caltrans proposed to upgrade Route 20 to an expressway from its current two-lane arterial status. This would improve the functional utility of the route and accommodate increased traffic demand for the Lake Wildwood area and vicinity.

State Route 89 is a north-south highway passing through the eastern portion of the County. It is a two-lane facility connecting Truckee to Lake Tahoe at Tahoe City and serving both local and tourist traffic in the area. Although Route 89 experiences poor levels of service during peak periods, Caltrans has not recommended any improvements on this route within Nevada County.

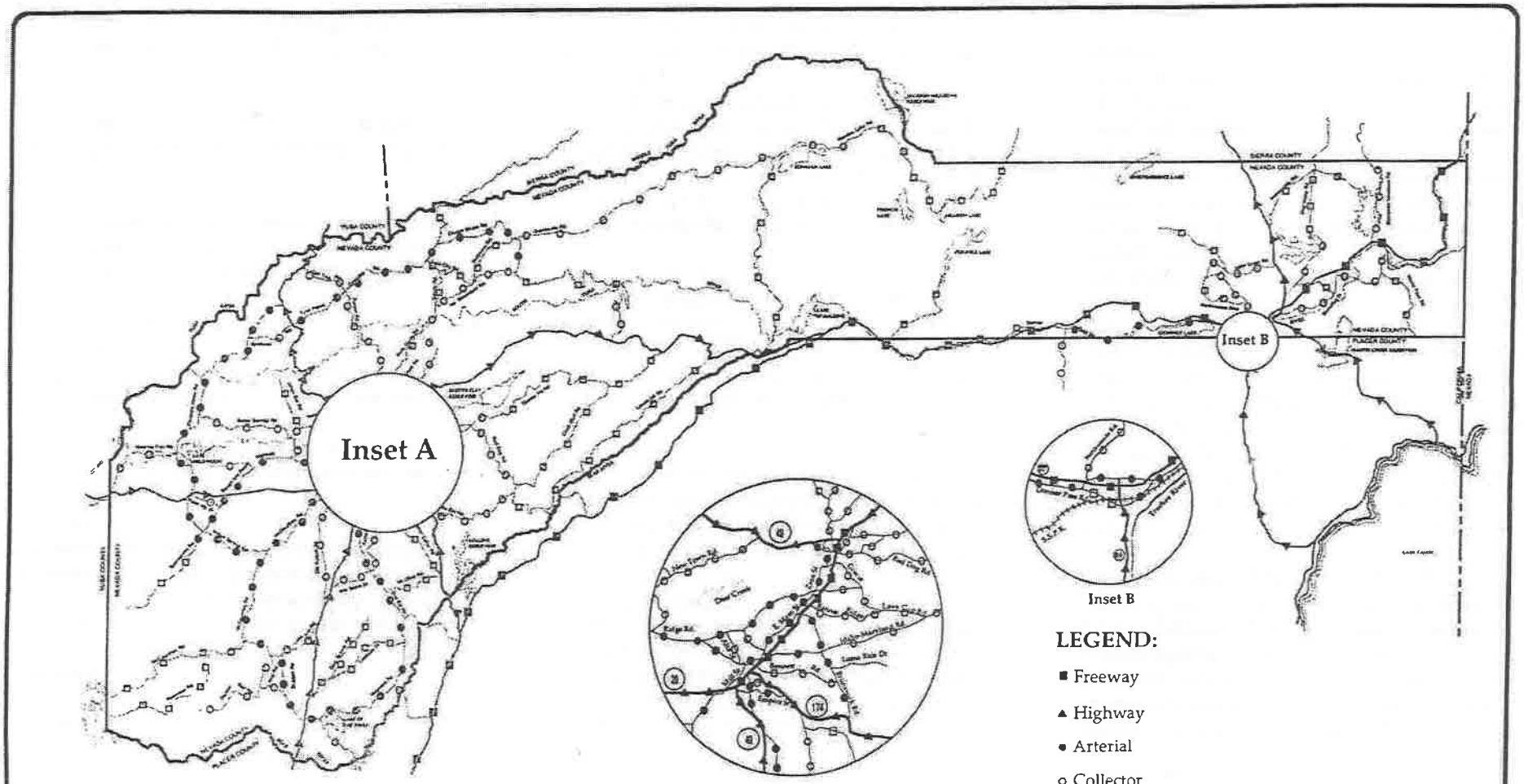
State Route 174 is a two-lane highway connecting Grass Valley to Colfax at Interstate 80. The primary function of this facility is to serve local needs within and between the two cities. Organized local opposition has resisted proposals by Caltrans to improve Route 174. Therefore, since Route 174 is of little statewide importance, according to Caltrans, the route may be phased out of the state highway system and be relinquished to Placer and Nevada Counties.

State Route 267 is a two-lane highway connecting Truckee to Kings Beach at Lake Tahoe through Martis Valley. Similar to Highway 89, both local and tourist traffic are served by this facility. Problem areas along Route 267 within eastern Nevada County are concentrated within the Truckee area. Since the opportunities for improving the existing route are limited, Caltrans, therefore, is currently studying a bypass around downtown Truckee in an effort to reduce peak hour and peak recreational traffic congestion.

Travel Characteristics

Travel characteristics within Nevada County vary widely according to the region in which it occurs.

The western portion of the County contains a large number trip-producing (residential) land uses in relation to



Source: Nevada County Maintained Mileage Map, 1990.
Planning the Major Road System in Nevada County, 1990.

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Sacramento, California

NEVADA COUNTY GENERAL PLAN

Functional Street Classification

1" = 25,000'

FIGURE 9-1

trip-attracting (office and commercial) land uses. Approximately 80 percent of the developed land contains residential uses. This causes many trips to originate in this area with a destination outside of the area.

Travel within the eastern portion of the County, however, is driven by a greater quantity of trip-attracting land uses than trip-producing uses. This area is characterized by many recreational and tourist attractions, which causes large amounts of traffic to originate outside the area with destinations either inside or outside the area.

Figure 9-2 displays the 1990 average daily traffic volumes on selected roadways in Nevada County.

Levels of Service

A level of service (LOS) is a measure of the operating efficiency of a transportation facility. Letter designations from A (best) to F (worst) are assigned to a road or intersection to describe how well it functions. Table 9-1 on the following page provides a general description of each level. The actual volume of traffic which can be accommodated at each level of service depends on several factors including:

- Number of lanes;
- Width of lanes;
- Width of shoulder;
- Topography;
- Design speed; and
- Vehicle mix (% auto, truck, etc.)

Table 9-2 on the following page displays level of service criteria for five general roadway types. This criteria was developed by adjusting theoretical roadway capacities to account for the various influencing factors listed above. In some cases, however, the rural environment of Nevada County creates unique constraints in roadway capacity that may not be reflected in the five general roadway types previously mentioned. Therefore, individual roadway LOS analyses will require the development of specific LOS criteria.

Using the LOS criteria in Table 9-2, the existing average daily LOS was determined for selected roadways in the County. Figure 9-3 displays the results.

High Accident Locations

Figure 9-4 displays high accident locations on County roads. As this data shows, the majority of the high accident locations occurred in the more urbanized areas of the County. It should also be noted that these accident rates are relatively low, considering the fact that two-thirds of the locations had fewer than 5 accidents per million vehicle miles.

Truck Routes

Most truck traffic enters and exits Nevada County on State Routes 20, 49, 174, and Interstate 80. Designation of these roadways as truck routes has not occurred due to the lack of other alternative routes for goods movement.

Urban areas such as Grass Valley and Nevada City, however, have delineated truck routes within their jurisdictions. These routes are designated to avoid obstructions, residential neighborhoods, or to prevent roadway damage associated with heavy vehicle travel.

9.2 TRANSIT FACILITIES

Public transit facilities in Nevada County are the responsibility of the County Department of Services for Transit, Aviation, and Recreation (STAR). STAR is responsible for operation of the public transit system and works under a member governing body, The Operational Policy Committee.

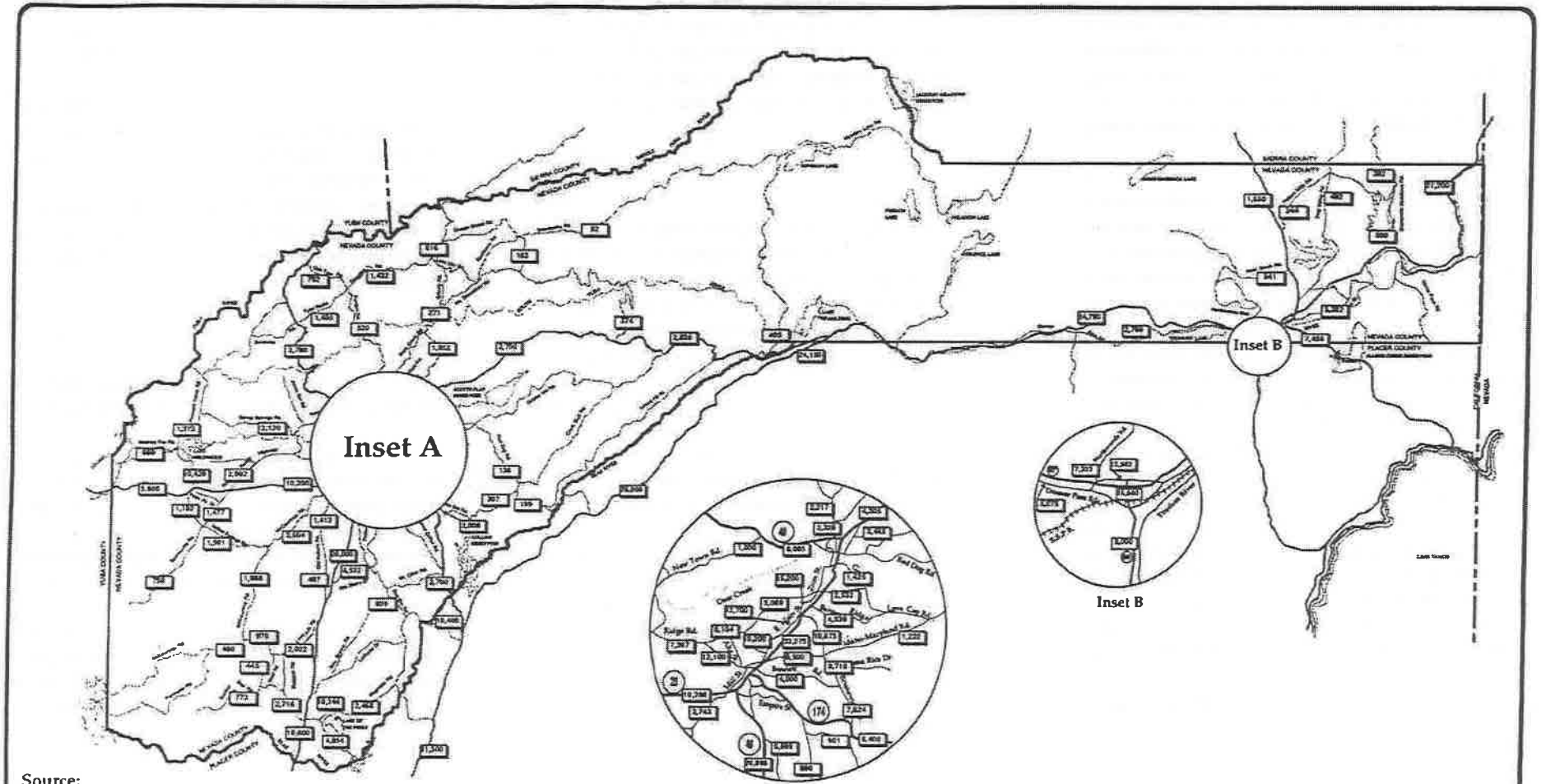
The following summarizes each public transit facility operating in the County.

Gold Country Stage is a fixed route system which operates primarily in and between Nevada City and Grass Valley. A new route has recently been added to serve the State Route 49 corridor between Grass Valley and Lake of the Pines, with connections for Placer County Transit service. A new route is planned to begin in the summer of 1991 to serve the Penn Valley area. STAR operates this system and has nine busses with 22-passenger capacity. Fares are $ 1.00 for single trip, $ 1.75 for a daily pass and $ 15.00 for a monthly pass.

Dial-A-Ride is a demand-based service operated through a non-profit contract with Durham Transportation, Inc. The California Alta Regional, Inc. subsidizes the elderly, handicapped and disabled passengers, but does not directly subsidize the overall operation of the service.

Gold Country Telecare is a private, non-profit organization serving elderly, handicapped and disabled patrons. Passengers are transported by full-sized vans, mini-vans, or station wagons to shopping and medical appointments. A total of 3 vehicles is operated by this service.

High Sierra Senior Services is also a demand-based service



Source:
- Nevada County Department of Transportation
- Caltrans

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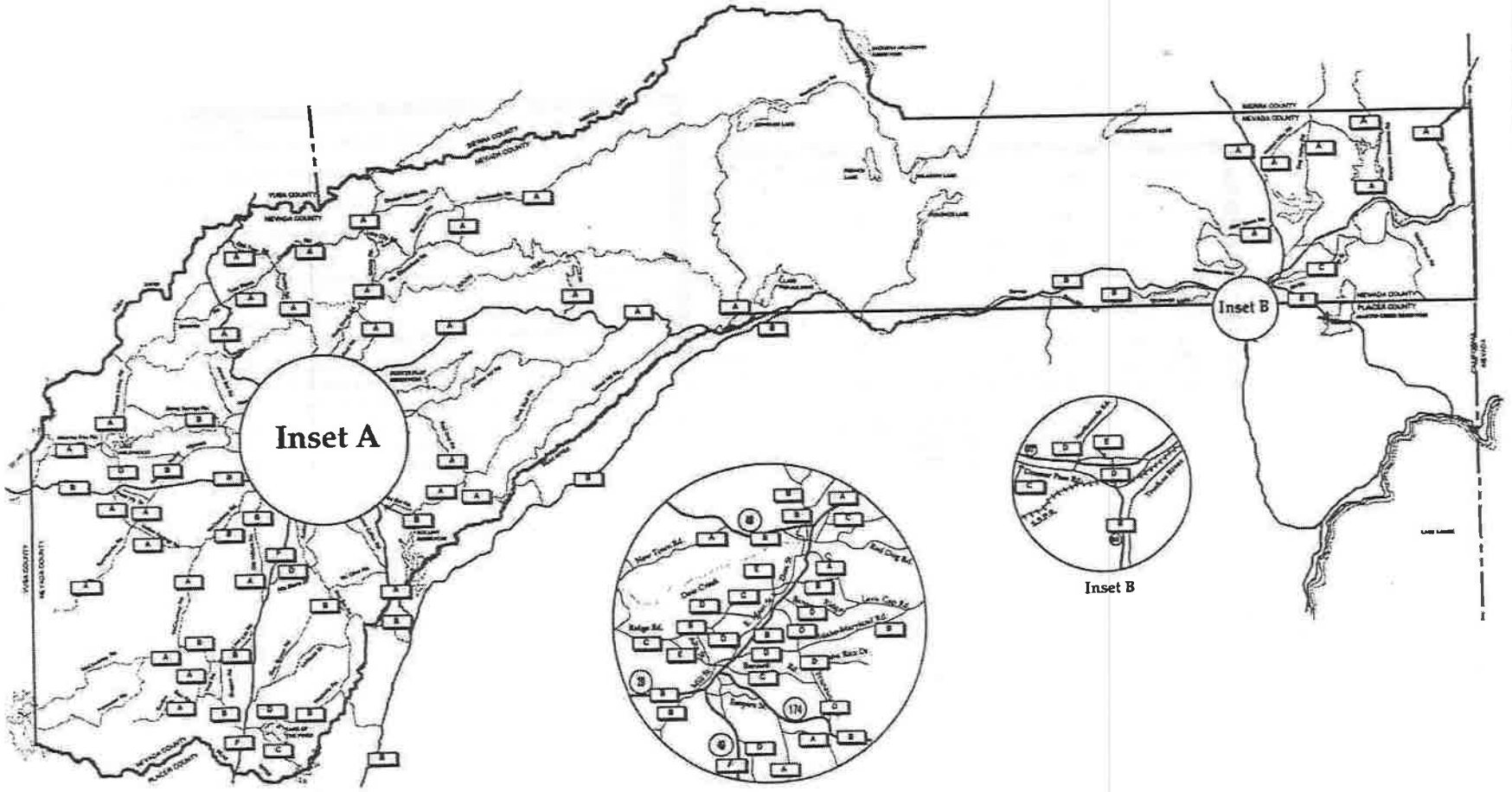
NEVADA COUNTY GENERAL PLAN

Existing Average Daily Traffic Volumes

1" = 25,000'

FIGURE 9-2



Source:
Harland Bartholomew & Associates, Inc.

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Sacramento, California

NEVADA COUNTY GENERAL PLAN
Existing Daily Level of Service

1" = 25,000'

FIGURE 9-3

Table 9-1
Level of Service Description

LOS	Description
A	Represents free flow. Individual users are virtually unaffected by the presence of others in the traffic stream.
B	Stable flow, but the presence of other users in the traffic stream begins to be noticeable.
C	Stable flow, but marks the beginning of the range of low in which operations of individual users becomes significantly affected by interaction with others in the traffic streams.
D	Represents high-density, but stable flow.
E	Represents operating conditions at or near the capacity level.
F	Forced or breakdown flow.

Source: *Highway Capacity Manual, Special Report 209* , Transportation Research Board, 1985.

Table 9-2
Level of Service Criteria
Average Daily Traffic (vehicles per day)

Facility Type	Lanes	LOS A	LOS B	LOS C	LOS D	LOS E
Freeway	4	22,700	35,000	49,900	60,300	64,800
	6	34,000	52,500	74,900	90,400	97,200
Rural Highway	2	5,600	12,000	16,400	17,700	18,700
	4	11,900	25,400	33,700	35,900	37,800
Arterial	2	2,000	4,300	7,200	10,700	17,700
Collector	2	1,500	3,000	5,900	9,200	10,400
Local	2	1,000	2,500	4,300	8,200	9,500

Source: Compiled from *Highway Capacity Manual, Special Report 209*, Transportation Research Board, 1985.

for elderly, handicapped and disabled passengers. The service area is confined to the Eastern portion of the County. It is operated by the Tahoe Forest Hospital in Truckee.

The Bus is a pilot bus service operating along Highway 89 between the Truckee Intermodal Transportation Center to Tahoe City. For this service, Nevada County entered into an agreement with Placer County, Alpine Meadows Resort, Squaw Valley Resort, and The Resort at Squaw Creek. This system operated from December 15, 1990 to April 15, 1991 between 6:30 a.m. and 6:30 p.m. to serve employees and patrons at the resorts. The fare is $ 1.00 per trip. This service may or may not be continued in 1991/1992.

Table 9-3 on the following page displays operating information for each service described above.

The fixed-route service areas of the Gold Country Stage and THE BUS are shown on Figure 9-5. Figure 9-5 also identifies the park-n-ride lots in the County.

9.3 AIR TRANSPORTATION FACILITIES

There are two general aviation airports in Nevada County as well as several small, private airports. The Nevada County Air Park, located east of Grass Valley, serves the Western County while the Truckee-Tahoe Airport serves the Eastern County. The location of each airport is displayed on Figure 9-6.

Nevada County Air Park

The Air Park is a small aircraft airport classified in the Airport Reference Code as B-1, meaning it generally accommodates aircraft ≤ 12,500 pounds and < 49 foot wingspan. The 1990 Nevada County Air Park Draft Master Plan recommends expansion of the Air Park which included physical improvements to meet future demand and to correct a line-of-sight distance requirement for aircraft.

The number of aircraft operations and based aircraft at the Air Park is projected to increase over the next 20 years as displayed in Table 9-4 on the following page.

Truckee-Tahoe Airport

The Truckee-Tahoe Airport is a Basic Utility-Stage II Airport which handles predominantly small aircraft but has the capability to handle larger aircraft due to runway size. This airport is owned and operated by a special airport district which includes portions of Eastern Nevada and Placer Counties.

The Truckee-Tahoe Airport Master Plan was updated in 1988. A three-phase development plan was proposed in the Master Plan, which outlined improvements for the airport to allow for a classification of General Utility with Basic Transport Capability. Airport improvements were based upon the anticipated growth in airline activities that would occur with future development within the Truckee-Tahoe area.

The number of aircraft operations and based aircraft at the Truckee-Tahoe Airport is projected to increase over the next 20 years as displayed in Table 9-5 on the following page.

9.4 RAIL TRANSPORTATION FACILITIES

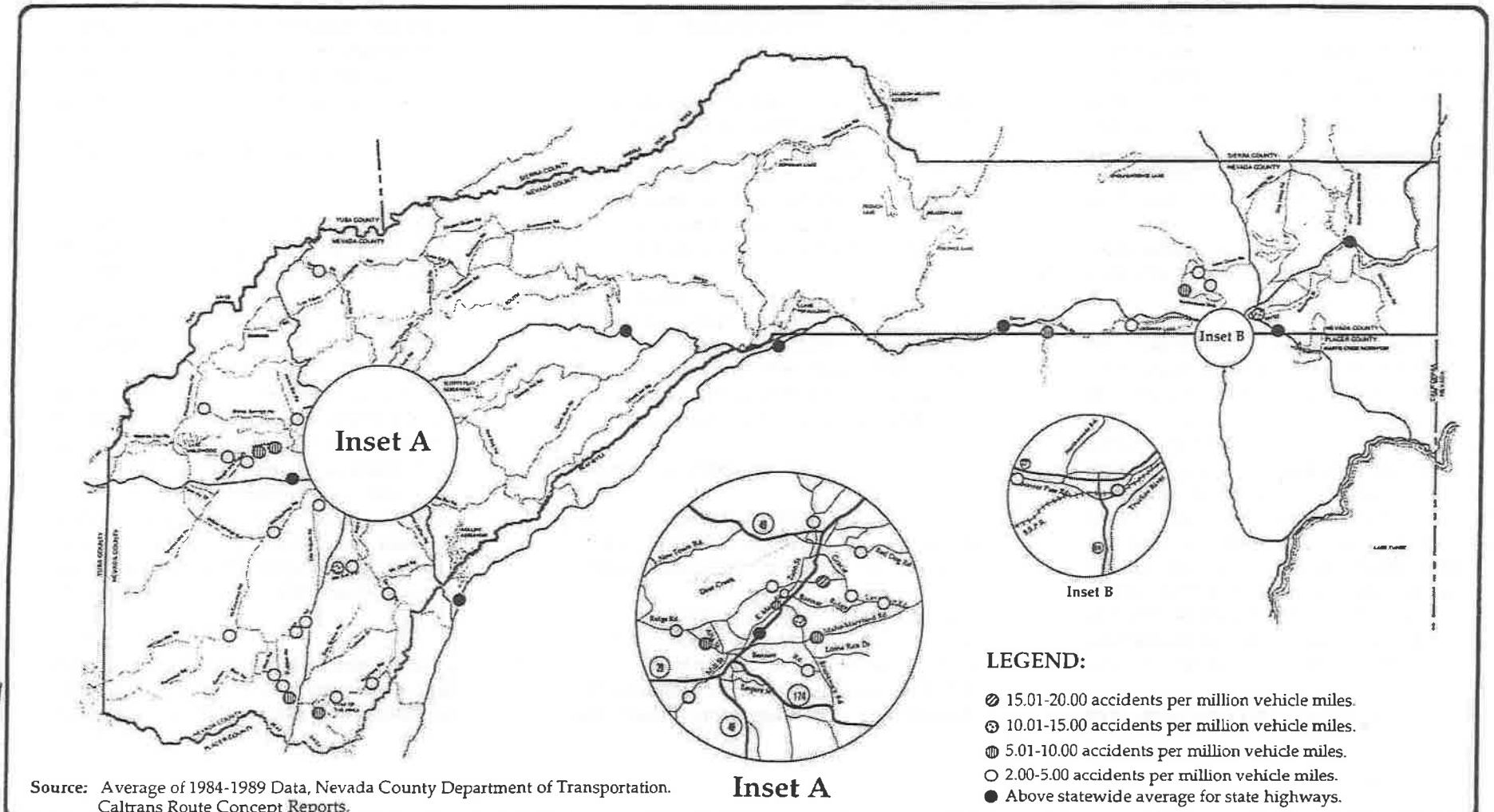
Southern Pacific (SP) railroad owns and operates one set of tracks that follows Interstate 80 along the southern border of Nevada County (Figure 9-6). The rail line is used for the shipment of goods and people. Currently, Amtrak's California Zephyr serves the San Francisco to Chicago corridor with a mid-day train in each direction through nearby stations at Sacramento, Roseville, Colfax, Truckee, and Reno. Also, the mid-day train supplies an alternative mode of travel to the automobile or airplane in the Reno to San Francisco corridor.

The Truckee Intermodal Transportation Center is an important facility located in the eastern County which serves transit, rail, automobiles, trucks, bikes, and pedestrians.

9.5 BIKEWAY /PEDESTRIAN /EQUESTRIAN CORRIDORS

The number of existing bicycle, pedestrian, and equestrian trails in Nevada County is limited. Figure 9-7 displays the non-auto trails within Nevada County which are either complete or partially complete. These trails are oriented toward recreational use and do not provide logical connection for non-auto transportation within the urbanized areas of Nevada County. A brief description of each trail is given below:

A. ***Scotts Flat Trail*** is a 50 mile trail that crosses both Forest Service and private property. It serves Upper Burlington Ridge, Deer Creek, Forebay, Indian Springs and Towle Mill.



Source: Average of 1984-1989 Data, Nevada County Department of Transportation. Caltrans Route Concept Reports.

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NEVADA COUNTY GENERAL PLAN

High Accident Locations

1" = 25,000'

FIGURE 9-4

Table 9-3
Public Transit Service Operations 1989/1990 Data

Transit Service	Ridership	Operating Costs	Revenue	Farebox Recovery
Gold Country Stage lines	107,980	$380,687	59,233	15.6%
Dial-a-Ride	31,524	$174,420	$116,865	67.0%
Gold Country Telecare	4,494	$47,744	$10,508	22%[1]
High Sierra Senior Service[2]	10,930	$51,640	N/A	N/A
The BUS	4,550	$60,500	$3,056	5.1%

1. Recovery depends upon level of in-kind service.
2. High Sierra Senior Center is the transportation of the Tahoe Forest Hospital.

N/A = Not Applicable.

Source: Nevada County Regional Transportation Plan, 1990.

Table 9-4
Nevada County Airpark Activity Data and Forecasts

Activity Type	1989/1990	1995	2000	2005	2010
Total Based Aircraft	160	176	193	201	209
Total Parking Capacity	180[1]	195	210	223	235
Total Aircraft Operations	75,000	90,500	101,000	109,000	116,000

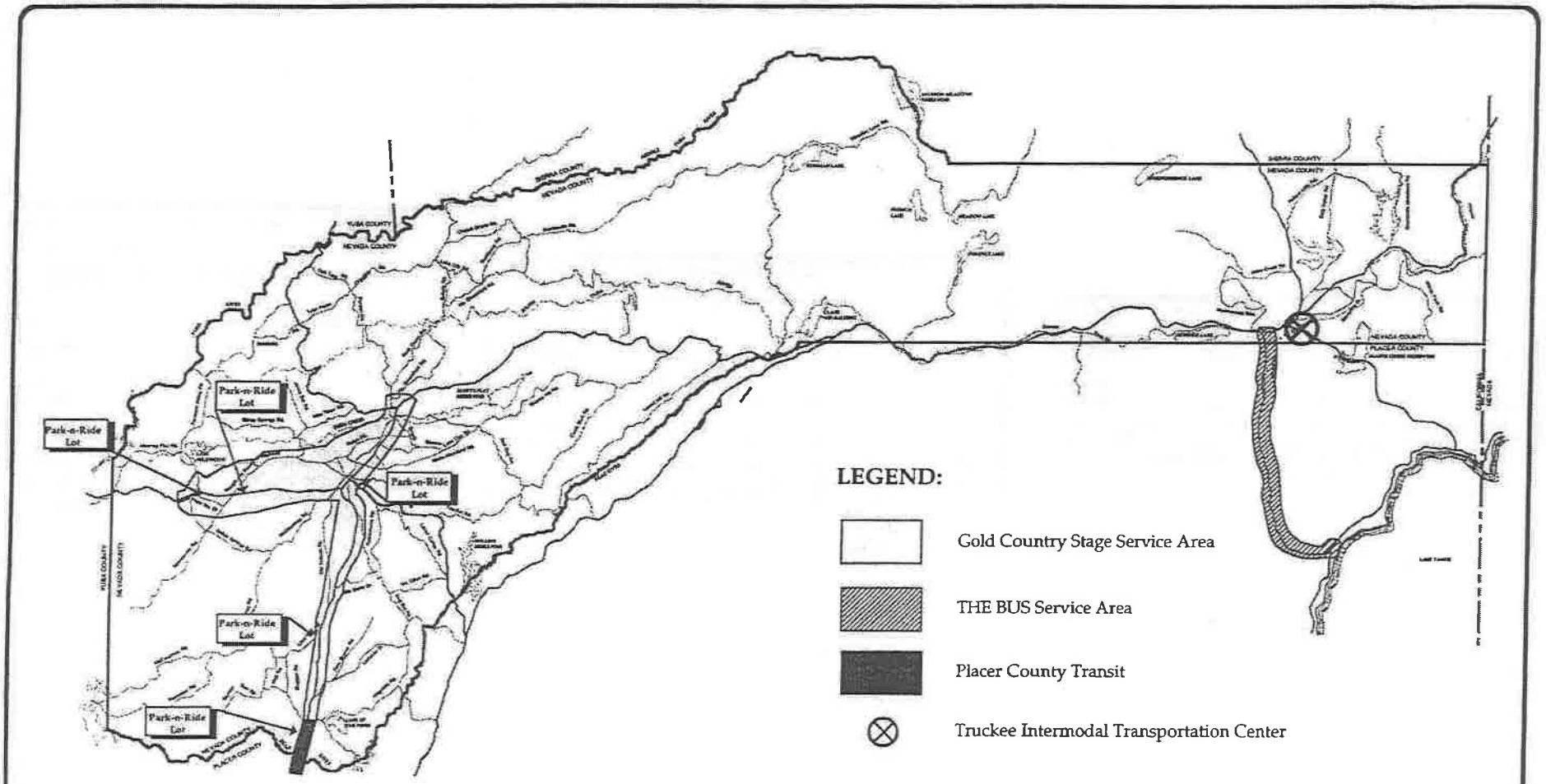
1. Existing parking demand at hangers is exceeded.

Source: Nevada County Air Park Draft Master Plan, 1990.

Table 9-5
Truckee-Tahoe Airport Activity Data and Forecasts

Activity Type	1995	2000	2005	2010
Total Based Aircraft	132	147	166	199
Total Aircraft Operations	33,000	43,000	52,900	83,800

Source: Nevada County Draft Regional Transportation Plan, 1990.



Source: Nevada County Department of Services for Transit, Aviation and Recreation

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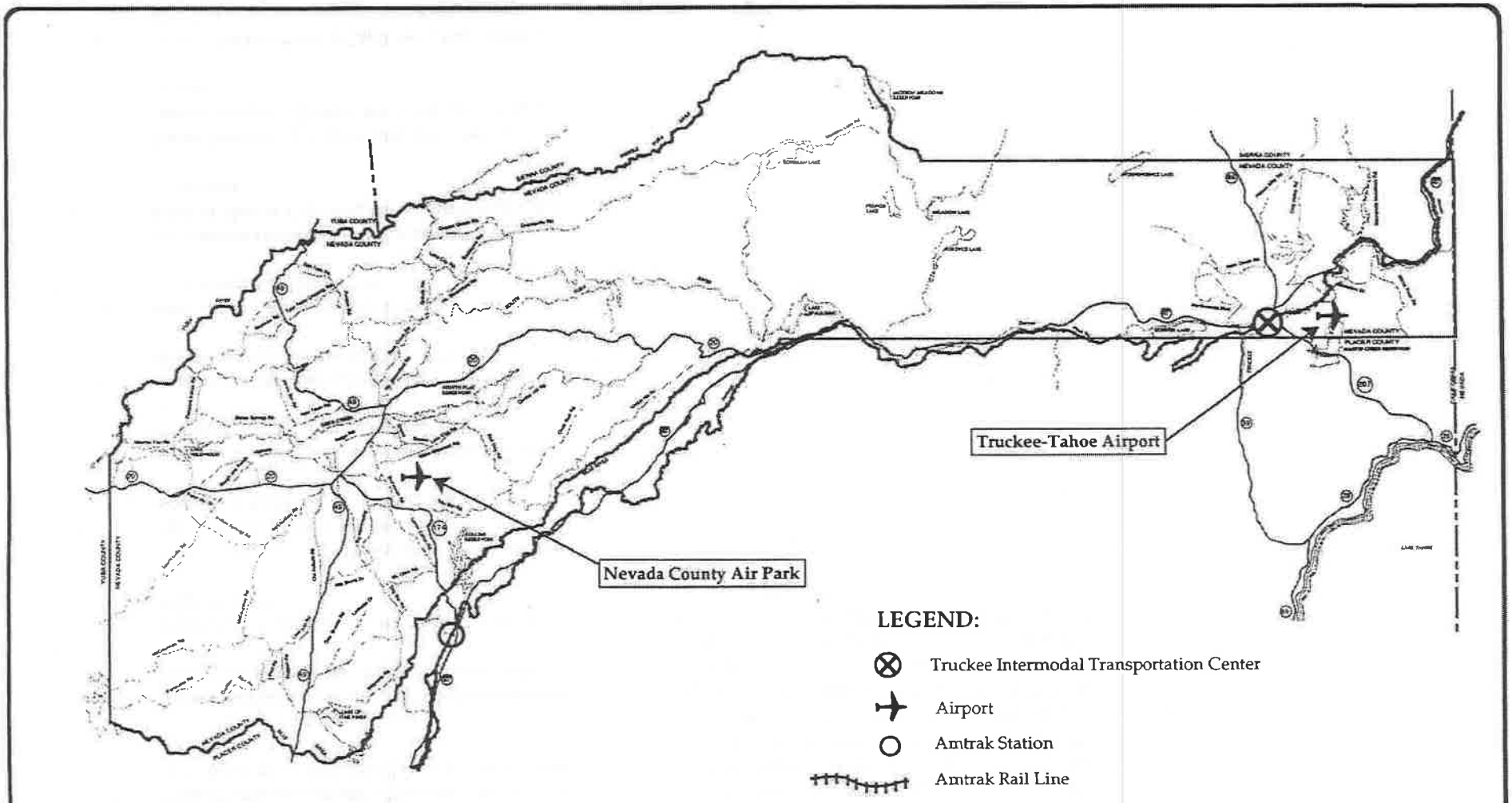
NEVADA COUNTY GENERAL PLAN

Fixed Route Transit Servi

1" = 25,000'

FIGURE 9-5



Source: Harland Bartholomew & Associates, Inc., 1991.

Harland Bartholomew & Associates, Inc
Sacramento, California

NEVADA COUNTY GENERAL PLAN
Air and Rail Transportation

1" = 25,000'

FIGURE 9-6

B. ***Nugget Trail*** is approximately 50 miles at the Sierra County Line. It also crosses both Forest Service and private property.

C. ***South Yuba Trail*** begins at the South Yuba Recreation Area and extends approximately 5 miles to campgrounds.

D. ***Missouri Bar Trail*** extends north of Highway 20 across the South Yuba River.

E. ***Pioneer Trail*** parallels Highway 20 east of Nevada City. Approximately 15 miles are complete, with plans for an extension to the Pacific Crest Trail by 1993.

F. ***Emigrant Trail*** is a historic trail of regional significance extending through the entire County.

G. ***Wildwood*** is a proposed equestrian center and trail system of approximately 25 miles near Lake Wildwood.

H. ***Empire Mine State Park*** is a trail of approximately 10 miles off Highway 49 in Grass Valley.

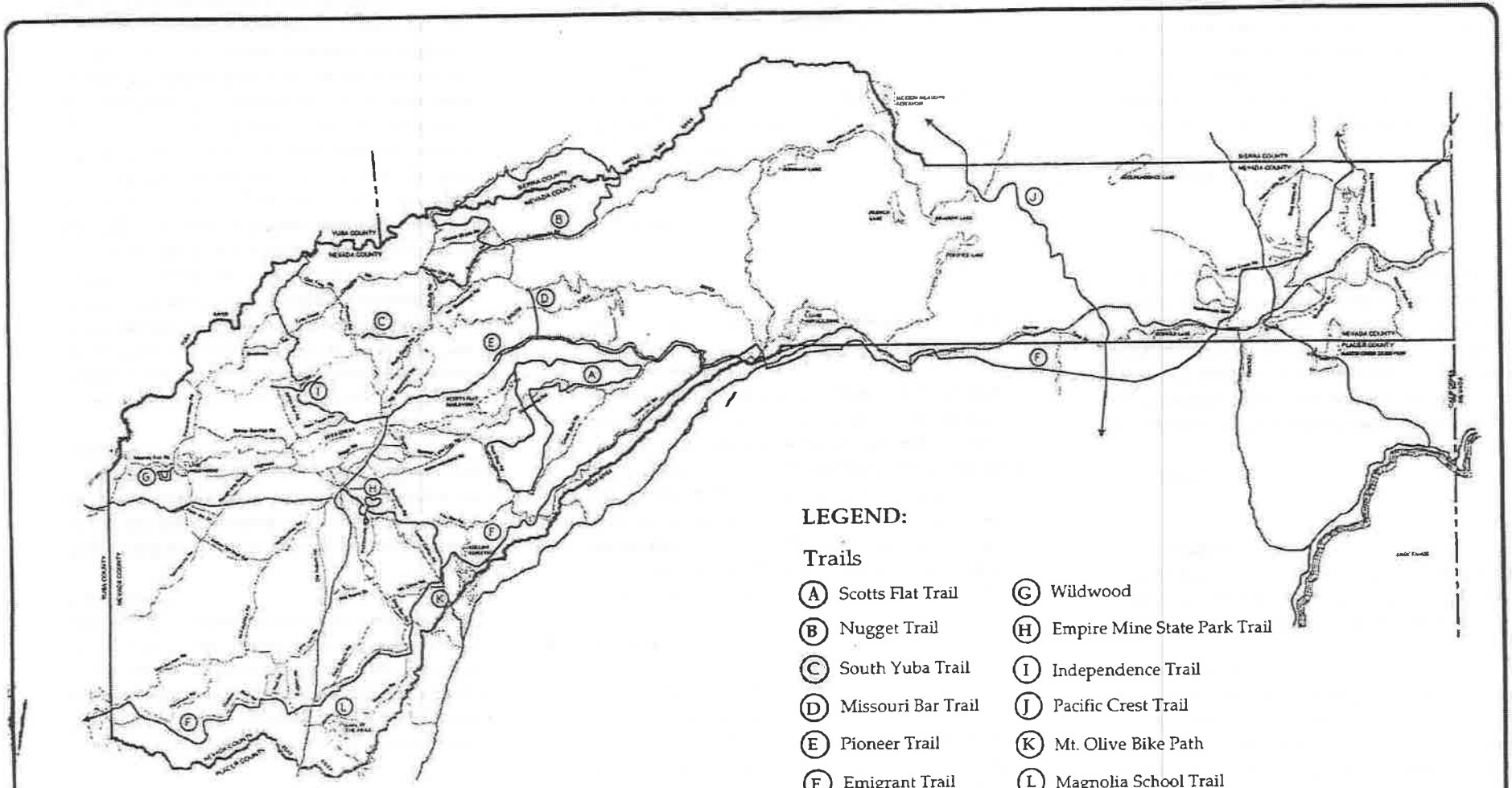
I. ***Independence Trail*** is a 2 mile trail adjacent to Highway 49 north of Nevada City designed for handicapped and wheelchairs.

J. ***Pacific Crest Trail*** is a north-south trail extending from Canada to Mexico through the eastern portion of the County.

K. ***Mount Olive Bike Path*** is a Class I path adjacent to Mount Olive Road adjacent to Lower Colfax Road.

L. ***Magnolia School Trail*** is a short path that serves Magnolia School students along Magnolia Road.

The 1989 Nevada County Master Bicycle Plan includes bikelanes within the urbanized areas of the County that improve non-auto access and mobility. Further, to improve pedestrian travel, the County has applied its non-auto TDA funds entirely to sidewalk construction in Nevada City, Grass Valley, Truckee, and urban unincorporated areas. Based on public scoping for the 2010 General Plan Update, however, the current non-auto facilities do not adequately meet the needs of Nevada County residents.



Source: Draft Regional Transportation Plan, Nevada County, 1990.

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NEVADA COUNTY GENERAL PLAN

Non-Motorized Trails

1" = 25,000'

FIGURE 9-7

NOISE 10

10.1 METHODOLOGY

The Office of Planning and Research (OPR) Noise Element Guidelines require that major noise sources be identified and quantified by preparing generalized noise contours for current and projected conditions. Significant noise sources include traffic on major roadways and highways, railroad operations, representative industrial activities and fixed noise sources.

Noise modeling techniques and noise measurements were used to develop generalized L_{dn} noise contours for the major roadways, railroads and fixed noise sources in the Nevada County General Plan study area for existing (1990) 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 in this report 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 not conducted as a part of this study. However, extensive file data collected by the Nevada County Planning Department and project-related data collected by BBA was used to describe existing noise levels in noise-sensitive areas within Nevada County so that noise level performance standards could be developed to maintain an acceptable noise environment.

10.2 ROADWAYS

Local roadway traffic is probably the most significant noise source in Nevada County. Traffic noise levels as defined by L_{dn} were calculated for existing (1990) traffic volumes. Noise contours were not developed for streets within urban areas. The close proximity of the street network system to commercial, industrial and residential buildings affect actual noise propagation, and the actual distances to the noise level contours can vary significantly, thus making it difficult to develop noise contours for these developed areas.

Table 10-1 on the following page displays the noise contour data.

10.3 RAILROADS

Railroad activity in Nevada County includes freight activity on the Southern Pacific Transportation Company (SPTCo) trackage which travels east/west through the eastern portion of the County and through the town of Truckee.

In the project study area, locomotive noise, warning horn noise, and roadway crossing bells were the major contributors to railroad noise levels as defined by SEL. The results of the noise measurements indicate an average SEL of 101.9 decibels (dB) at a distance of 75 feet.

Present operations on this line include an average of six freight trains per day traveling in each direction, all on an unscheduled basis. Freight trains are randomly distributed throughout the daytime and nighttime hours. One Amtrak operation occurs during the early afternoon hours in each direction.

The total L_{dn} of railroad operations at a distance of 75 feet from the tracks was determined to be 67.6 dB. The distance to the 60 dB L_{dn} noise contour is about 240 feet from the track centerline.

10.4 AIRPORTS

There are two public use airports located in Nevada County: the Nevada County Air Park located east of Grass Valley and the Truckee-Tahoe Airport located south of Truckee. CNEL contours are shown in Appendix C to describe existing operations at each of the airports. The contours shown in the Noise Element are based upon Master Plans which have recently been prepared for each of the facilities.

10.5 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.

Table 10-1
Noise Contour Data
(Distance in feet from center of freeway to Ldn contour)

SEGMENT	DESCRIPTION	1990 60 dB	1990 65 dB
SR 49:			
1	@ Placer County Line	329	153
2	South of Combie Road	343	159
3	South of Allison Ranch Road	284	132
4	North of McKnight Way	435	202
5	North of Newton Road	110	51
SR 20:			
6	@ Yuba County Line	122	57
7	West of Rough and Ready	158	74
8	West of SR 49 194	90	
9	North of Empire Street	339	157
10	South of Idaho-Maryland	398	185
11	South of Brunswick	382	177
12	North of Gold Flat	304	141
13	North of Broad Street	204	95
14	North of Nevada Street	99	46
SR 89:			
15	South of I-80	265	123
16	North of I-80	108	50
SR 267:			
17	South of Donner Pass Road	198	92
18	South of River Street	166	77
19	North of I-80 to River Street	144	67
NEVADA CITY HIGHWAY:			
20	South of Brunswick Road	201	93
21	North of Brunswick Road	227	105
22	South of Banner Lava Cap	134	62
23	South of Ridge Road	139	65
PLEASANT VALLEY ROAD:			
24	North of SR 20 Intersection	176	82
25	South of Mooney Flat Road Intersection	110	51
PENN VALLEY ROAD:			
26	South of SR 20	87	40
27	South of SR 20/Rough & Ready Hwy.	108	50
ROUGH & READY HIGHWAY:			
28	North of SR 20	77	36
29	East of Bitney Springs Road	129	60

SEGMENT	DESCRIPTION	1990 60 dB	1990 65 dB
BRUNSWICK ROAD:			
30	East of Nevada City Highway	246	114
31	East of Sutton Way	281	131
32	North of Idaho-Maryland	179	83
33	North of Bennett Road	168	78
34	South of Bennett Road	145	67
SUTTON WAY:			
35	North of Brunswick Road	169	79
36	South of Brunswick Road	182	84
IDAHO-MARYLAND ROAD:			
37	East of Main Street	166	77
38	East of Railroad Avenue	160	74
39	East of Dorsey 99	46	
40	South of SR 20	53	24
BENNETT STREET:			
41	East of Ophir Road Intersection	53	24
42	West of Brunswick	44	20
SR 174 COLFAX HIGHWAY:			
43	East of Empire	117	54
44	South of Brunswick Road Intersection	153	71
45	East of SR 20	140	65
LA BARR MEADOWS ROAD:			
46	South of McKnight Road Intersection	161	75
47	North of Dog Bar Road Intersection	137	63
COMBIE ROAD:			
48	East of SR 49	177	82
49	South of Magnolia	107	49
MAGNOLIA ROAD:			
50	North Combie Road	73	80
51	West of Dog Bar Road	31	14
RIDGE ROAD:			
52	East of Rough & Ready Highway	101	47
53	East of Hughes Road Intersection	153	71
54	West of Zion Street Intersection	102	47
I-80:			
55	Entire Length	558	259

The following descriptions of existing fixed noise sources in the Nevada County study area are intended to be representative of the relative noise impacts of such uses.

Light Industrial Areas

Numerous light industrial areas exist in Nevada County. Based upon noise level measurements conducted by the Nevada County Planning Department staff for the 1986 General Plan Noise Element, most of the light industrial areas have very little noise associated with their operations. High noise levels observed in the vicinity of these operations were noted as being due to roadway traffic. Located on the following page, Table 10-2 lists light industrial facilities and noise level data collected by the Nevada County Planning Department staff in the near vicinity of each operation.

Lumbermills

Lumbermills are distributed throughout Nevada County, and are considered to be potentially significant stationary noise sources. Noise generating equipment associated with lumbermills includes the operation of saws, planers, blowers, dry kilns and fork-lifts. BBA file data on lumbermill operations indicate that noise levels of approximately 65 dB L_{eq} and 71 dB L_{max} could be expected at a distance of 400 feet. Table 10-3 on the following page displays the noise level data collected by County staff.

Mining Operations

Mining operations are scattered throughout Nevada County. These operations include the mining of rock, sand/gravel, gold and barite. Many of these operations are inactive or operate intermittently. Some of these operations are located in extremely remote areas and are removed from residences which could be disturbed by mining operation noise. The 1986 Nevada County Noise Element lists all mining operations located within Nevada County, and their operating status. Based upon discussions with the Nevada County Planning Department staff, the 1986 list of mining operations was updated. The 1990 status of mining operations is shown on the next page in Table 10-4. Table 10-5, located on page 10-5, summarizes the noise level data for each mining operation located within Nevada County.

Landfill Operations

The Nevada County Landfill is located on McCourtney Road. Significant noise sources at landfill operations generally include bulldozers, backup warning devices, garbage trucks, bellyscrapers, compactors, and private and commercial traffic. Shown on page 10-5, Table 10-6 summarizes noise levels associated with the Nevada County landfill.

The Nevada County Sportsmen's Club is located on Banner Mountain Trail. This is a facility open to the public, providing target practice using pistols and large bore rifles. The facility also has a trap shooting facility. Noise level data indicate that a .357 magnum pistol registers a maximum noise level of 112 dB at a distance of 50 feet. A 7mm magnum rifle registers approximately 111 dB at a distance of 50 feet. A 12-gauge shotgun registers 97 dB at a distance of 50 feet.

Noise level measurements conducted by the Nevada County Department of Planning staff in the vicinity of the Nevada County Sportmen's Club indicated that maximum noise levels ranged between 86.0 - 95.8 dB on Rocker Way, 60.3 - 71.9 dB on Caledonia Way and 60.4 - 69.2 dB on Melanie Court. The wide range of measured maximum noise levels is due to the type, number and caliber of guns being fired at the facility.

Dog Kennels

Dog kennels and animal control shelters can be considered as an objectionable source of noise if located near noise sensitive land uses. The primary noise source associated with kennels is barking dogs. The existing Nevada County Animal Control Shelter is located on Freeman Lane in Grass Valley.

A consultant report was prepared for Nevada County at the Horton Street Kennel which is operated by Larry and Sandra Self. The report indicated that maximum noise levels from barking dogs was approximately 78.1 dB at a distance of 100 feet. The measured L_{eq} value for a 1-2 minute sample period was approximately 63.2 dB at 100 feet.

BBA file data for the Sacramento County Animal Control Shelter indicated that average noise levels ranged between 80.5 and 66.2 dB at distances of 30 to 100 feet.

Race Track

The Nevada County Fair Grounds is located off of McCourtney Road southwest of Grass Valley. During the summer months, the Fair Grounds hold stock car races on Saturday nights. Time trials for the stock car races begin at 6:30 p.m., and races typically occur between the hours of 8:00 p.m. and 10:00 p.m. BBA file data for the Nevada County Fair Grounds race track and a report prepared by Land Use Associates in June, 1982 indicate that maximum noise levels range between 88 and 100 dB at a distance of 100 feet.

Table 10-2
Light Industrial Noise Level Data

Site	L_{eq}	L_{max}	Time	Date	Location
Loma Rica Industrial Pk.	38.0 46.0	76.0 83.0	7pm-7am 7am-7pm	March 1985	Grass Valley Ave./Charles Drive
La Barr Meadows Industrial Area	39.0 38.0 32.0	69.0 72.0 64.0	8am-9am 9am-10am 10am-11am	April 1985	500' N. of Industrial
Grass Valley Group Springs	48.2	73.1	9:10am-9:30am	June 1985	Bitney Road
Kingston Ln. R&D Facility	43.3	61.6	9:10am-9:30am	June 1985	On Kingston Ln.between Magnolia School and R&D Facility
Streeter Rd. Industrial Area	52.8	69.7	10:20am	June 1985	On Streeter Road
West River St. Industrial Area (ABC Concrete Product)		65.4	84.6 5:10pm	4:55pm- June 1985	N/A

Source: Data collected by Nevada County staff

Table 10-3
Lumbermill Noise Level Data

Lumber Mill	L_{eq}	L_{max}	Time	Date	Location
Agate Sales	59.0 56.0 49.0	82.0 77.0 82.0	1pm-2pm 2pm-3pm 3pm-4pm	April 1985	On Bennett St. 300' from mill
Bohemia Mill	73.0 74.0 49.2	89.0 86.0 66.4	11am-12pm 12pm-1am 2pm-2:35pm	April 1985	Near Brunswick Road 300' from mill July 1985 1000' West of mill
	63.0	82.4	10pm-10:20pm	July 1985	Near Brunswick Road 300' from mill
Warnke Mill	63.0 63.0	82.0 81.0	2pm-3pm 3pm-4pm	April 1985	North of Idaho-Maryland Rd., 300' from mill saw & loader
Caffey-Rice Mill	50.0 50.0	78.0 73.0			Mill not in operation Mill not in operation
Truckee Mill	50.7	63.8			Mill not in operation

Source: Data collected by Nevada County staff

Table 10-4
Mining Operations in Nevada County (1990)

Name	Location	Type	Status
Cal Sierra	Allison Ranch Rd.	Rock	Inactive
Joe Chevreaux	Bear River	Sand/Gravel	Seasonal
Val Metal	Grizzley Hill Rd.	Gold/Gravel	Inactive/Intermittant
Bill Dearman	Hirschdale Road	Cinder/Gravel	Inactive
Kelmine Corp.	Meadow Lake	Gold	Inactive
Teichert & Sons	Martis Valley	Sand/Gravel	Active
Placer Services	San Juan Ridge	Gold	Inactive
Hansen Brothers	Greenhorn Creek	Sand/Gravel	Active
Hansen Brothers	Bear River	Sand	Inactive
Upper Spanish Mine	N. of Washington	Barite	Seasonal
Giant Exploration	U-Bet Diggins	Gold	Inactive
Northstar Rock	Idaho-Maryland Rd.	Rock	Active
Cal Bar	Lowell Hill Road	Barite	Inactive
International Res	Birchville	Gold	Inactive
Pantle	French Corral	Gold	Active
San Juan Gold	Tyler Foote Road	Gold	Active
Sha-Neva	Glenshire	Rock	Active
West River Cinder	Hirschdale Road	Cinder/Gravel	Active

Table 10-5
Mining Operations Noise Level Data

Name	L_{eq}	L_{max}	Time	Date	Location
Hansen Brothers/ Greenhorn Creek	62.0	75.0	7am-7pm	April 1985	Unknown
Joe Chevreaux/ Bear Creek	61.0	76.0	11:30am - 11:50am	June 1985	Unknown
Cal Sierra/ Allison Ranch Rd.	52.0	78.0	10:40am 11:00am	June 1985	Unknown
	59.4	65.6	5 minutes	Jan. 1986	100 yds @ E. Property Line
	51.9	62.4	5 minutes	Jan. 1986	200 yds @ S.E. Property Line
	49.8	64.3	5 minutes	Jan. 1986	400 yds @ W. Property Line
San Juan Gold/ Tyler Foote Rd.	67.7	70.2	Unknown	Nov. 1985	150' from Rock Drill
	56.9	61.5			
	60.4	61.3			
	58.9	64.0			
	82.5	87.3	11:45am-11:48am	Dec. 1988	32' W. of Rock Drill
	57.9	60.3	11:55am-11:48am	Dec. 1988	200' W. of Rock Drill
	74.0	80.4	11:30am-11:37am	Dec. 1988	50' S.E. of Rock Drill
	80.4	83.4	11:22am-11:27am	Dec. 1988	50' N of Rock
Sha-Neva/	52.4	70.1	3:20pm-3:33pm	June 1985	In Residential Area Near Rock Plant
West River Cinder/ Hirschdale Rd.	53.7	72.8	3:45pm-4:00pm	June 1985	Off Hirschdale Road

Source: Data collected by Nevada County staff

Table 10-6
McCourtney Road Landfill Noise Level Data

Name	L_{eq}	L_{max}	Time	Date	Location
McCourtney Rd.	62.4	73.0	5 minutes	April 1986	200' S.W. of Compactor Landfill
	67.7	90.1	10 minutes	April 1986	200' S.E. of Grader & Scraper
	69.7	83.6	10 minutes	April 1986	20-100' W. of Grader & Scraper

Table 10-7
Noise Monitoring Site Data

		Average Level, dB						
		7am-7pm		7pm-10pm		10pm-7am		
Location	Date	L_{eq}	L_{max}	L_{eq}	L_{max}	L_{eq}	L_{max}	L_{dn}
Quarry Site in Birchville	9/89	48.5	65.8	38.5	54.9	37.5	45.4	47.5
13032 La Barr Meadows Rd.	9/89	47.0	61.3	45.1	55.3..	40.1	54.6	48.3
N. of SR 20 near Pleasant Valley Road	11/89	52.6	70.0	51.6	70.5	49.0	63.1	56.1
Field off of Bitney Springs Road	10/88	46.0	60.9	42.7	57.8	36.6	46.8	46.0
12311 McCourtney Road	1/89	57.6	67.3	52.1	68.6	47.5	64.4	57.2
10597 Gold Flat Road	4/88	49.1	65.1	48.0	64.4	43.1	59.1	51.0
11246 Brunswick Drive	12/88	49.5	71.0	48.0	54.0	42.9	57.5	51.0
11184 Tahoe Street	8/89	57.1	73.8	54.4	64.5	49.5	61.6	58.0
Spring Street	12/90	58.9	71.0	58.2	69.0	56.9	70.4	63.6
15135 Wolf Road	12/90	42.0	70.0	36.0	61.0	35.0	62.0	43.1

10.6 COMMUNITY NOISE SURVEY

To document noise exposure in areas of the County containing noise sensitive land uses, existing noise level data collected by the Nevada County Planning Department staff, and noise level data provided to the County in recent consultant reports were used. Noise sensitive land uses were considered to include residences, parks, schools and hospitals. The noise monitoring sites are representative of typical conditions in the County.

Both short and long-term noise monitoring data were used to describe ambient noise levels within the County. Noise monitoring attempted to record day/evening/night statistical trends affecting the L_{eq} and other statistical descriptors. Long-term noise monitoring sites allowed estimates of L_{dn} values at each site.

Table 10-7 on the preceding page summarizes the results of the survey. The results indicate that Nevada County is relatively quiet.

PUBLIC SERVICES 11

11.1 OVERVIEW

This section presents an overview of the current status of public services within Nevada County. Included in this discussion are general county services, school districts, fire districts, water/sewer/public utilities, other districts, and federal and state agencies.

The data presented were obtained from a variety of sources, including personal interviews, telephone conversations, and existing documents and reports. The information was obtained directly from individual district personnel. Appendix D contains a list of sources and contacts used to assemble this information and also contains a series of data sheets summarizing each agency.

The following discussion summarizes each service, including its current level of operation, and if it is operating at an acceptable level or at a deficiency. The assessment of adequacy of operation is based on information provided by each agency or district. Commonly used standards for provision of adequate services were used when available.

11.2 COUNTY DEPARTMENTS

The Nevada County departments or offices which were surveyed include: Administrator's Office; Assessor's Office; Clerk/Recorder's Office; Public Health Department; Mental Health Department; Services for Transportation, Aviation and Recreation (STAR); Department of Transportation; Department of Social Services, Council; Probation Department; District Attorney; Sheriff's Department; Library Systems; Building Inspector; Department of Sanitation; Environmental Health Department; Agricultural Commission; Community Action Agency; Municipal Court; Treasurer/Tax Collection; Office of Education; and Commission on Aging. The Transportation Committee, while not a County Department, was also surveyed.

The County departments or offices which are considered to be generally adequately staffed, housed and equipped include: Administrators Office; Building Inspector; Probation Department; Alta-Oaks Sunset Fire District; Peardale-Chicago Fire District; Rough & Ready Fire District; Truckee Fire District; Chicago School District; Ready Springs School District; Special Education Consortium District; Union Hill School District; Cemetery District; Truckee Tahoe Airport District; and Truckee Donner Park and Recreation District. Additionally, the local Transportation Commission, while not a County agency or district, is also adequately staffed, housed, and equipped.

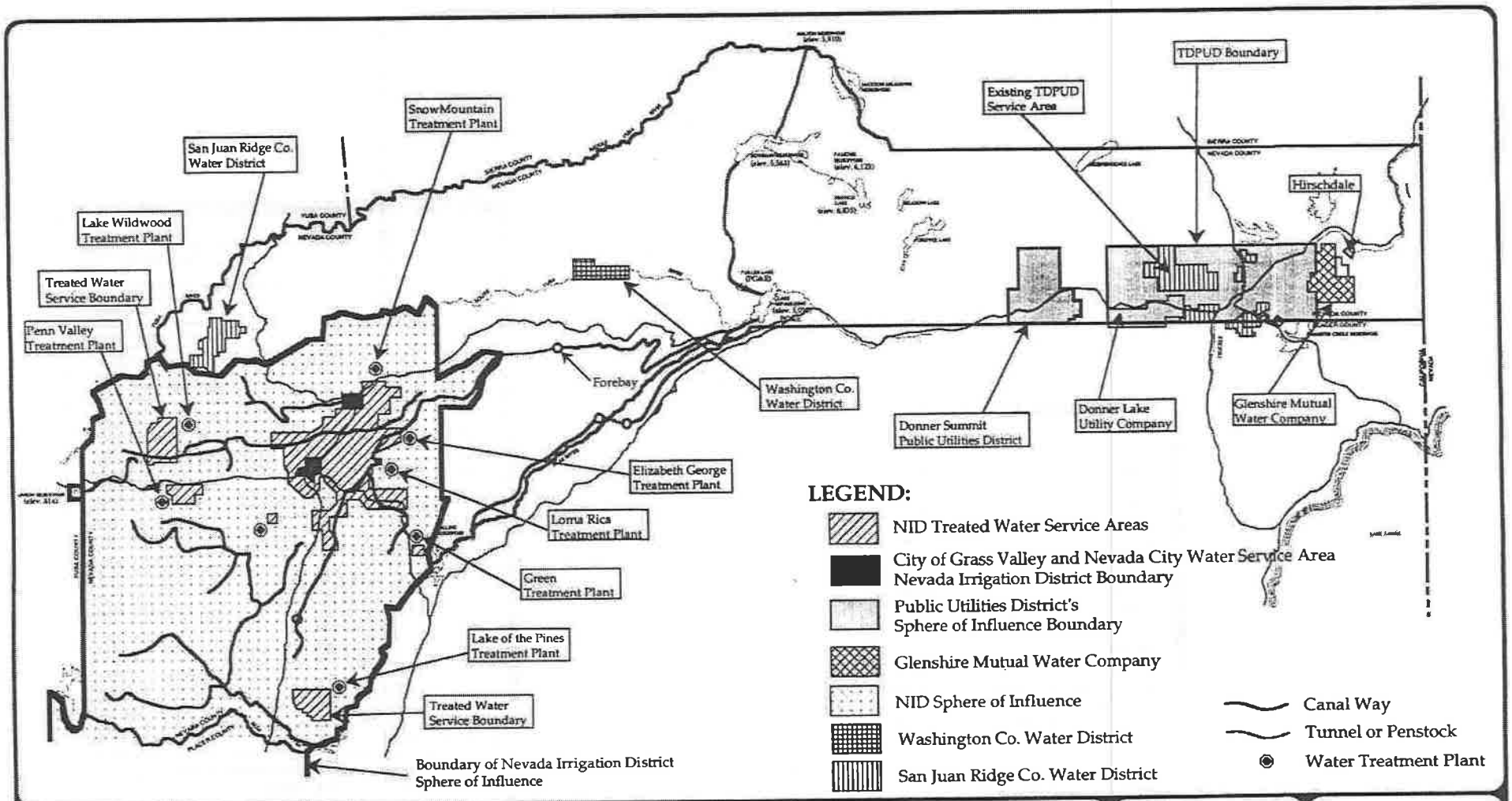
The County departments or offices which are considered to be inadequately staffed, housed and equipped include: Assessor's Office; Clerk/Recorder's Office; Public Health Department; Mental Health Department; Services for Transportation, Aviation and Recreation (STAR); Department of Social Services; Counsel; District Attorney; Sheriff's Department; Library System; Department of Sanitation; Department of Transportation; Environmental Health Department; Agricultural Commission; Community Action Agency; Municipal Court; Treasurer/Tax Collection; Office of Education; County Clerk; County Counsel; Bullion Fire District; Donner Summit Fire District; Forty-Niner Fire District; Gold Flat Fire District; Higgins Fire District; North San Juan Fire District; Ophir Hill Fire District; Watt Park Fire District; Clear Creek School District; Grass Valley School District; Nevada City School District; Nevada Joint Union High School District; Tahoe Truckee School District; Twin Ridges School District; and Commission on Aging.

The data in Appendix D provides an explanation of the deficiencies by Department or Office. Table 11-1 on the following page provides a summary overview of the deficiencies identified.

In general, the major deficiencies within County agencies, departments and districts are related primarily to staffing. Of the 43 County agencies surveyed, 58 percent identified deficiencies in staffing. Additionally, 42 percent identified deficiencies in equipment, and only 28 percent noted deficiencies in space.

It should be noted that 37 percent of County agencies or districts are experiencing deficiencies in at least two of three categories (space, staff, and equipment). The following is a brief summary of the deficiencies identified for those agencies.

- The County Clerk's Office needs more office space for both the Elections and Recorder's Divisions. Additionally, the Recorder's Division is also deficient in staff.
- The Environmental Health Department is understaffed and underequipped in the following divisions: water program, liquid waste, food program, alternate advanced and central sewage systems, underground tanks, and hazardous materials requirements.
- The County Library System is deficient in staff and equipment (primarily related to a significant book shortage).
- The Public Health Department programs are all deficient in staff, space and equipment.



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NEVADA COUNTY GENERAL PLAN
Water Districts

1" = 25,000'

FIGURE 11-1

Table 11-1
Summary of Deficiencies in County Departments

Agency/District	Space	Staff	Equipment
Agriculture	X		X
Assessor	X		X
County Clerk	X	X	
Community Action Agency		X	
County Counsel		X	
District Attorney	X		
Environmental Health		X	X
Library System		X	X
Municipal Courts		X	
Office of Education	X		
Public Health		X	X
Sanitation–Solid Waste		X	X
Sanitation–Wastewater		X	
Sheriff		X	
Social Services	X		
Department of Transportation	X	X	X
Fire Districts			
Bullion	X	X	X
Donner Summit		X	
Forty-Niner		X	X
Gold Flat	X	X	X
Higgins		X	
North San Juan			X
Ophir Hill	X	X	X
Watt Park		X	X
School Districts			
Clear Creek (nursing only)		X	X
Grass Valley		X	X
Nevada City		X	X
Nevada Joint HSD	X	X	
Nevada Joint HSD (Admin.)	X		
Tahoe Truckee Unified		X	X
Twin Ridges		X	X
Resource Conservation District		X	
Western Gateway Park & Rec. (softball space)	X		
TOTAL DEFICIENCIES	**12**	**25**	**18**
TOTAL AGENCIES SURVEYED	**43**	**43**	**43**
PERCENT OF TOTAL	**28%**	**58%**	**43%**

Table 11-2
NID Reservoirs Capacity

Reservoir	Capacity (acre-feet)
Jackson Meadows	69,205
Bowman	69,510
Rollins	65,988
Scotts Flat	48,547
French Lake	13,840
Combie	5,555
Faucherie	3,980
Sawmill	3,080
Jackson	1,330
Milton	295

- Maintenance facilities of the Department of Transportation are not adequately staffed or equipped. Department of Transportation Engineering is deficient in space and staff.

- Alta-Oaks, Gold Flat, and Ophir Hill Fire Districts are deficient in space, staff, and equipment. Additionally, Forty-Niner Fire District and Watt Park Fire District are deficient in staff and equipment.

- Clear Creek School District, Grass Valley School District, Nevada City School District, Tahoe Truckee School District, and Twin Ridge School District are all deficient in staff and equipment. Additionally, Nevada Joint High School District is deficient in space and staff.

WATER

Availability of an affordable water supply may become a limiting factor in growth. With recent droughts, the public and water agencies will need to define priorities and determine what percent of the time that they will allow limitations or rationing of a limited resource. Additionally, new drinking water standards being implemented by the State of California and the U. S. Environmental Protection Agency will significantly increase the level of treatment and its associated costs.

Both ends of Nevada County are blessed in most years with water good in both quantity and quality. In the eastern County, the primary purveyors are Truckee Donner Public Utility District, the Donner Summit Public Utility District, Donner Lake Utility Company and Glenshire Mutual Water Company. The western County is served primarily by the Nevada Irrigation District (NID) and the cities of Nevada City and Grass Valley. The water districts are shown on Figure 11-1.

In the western county, water development began during the gold rush era. Water was diverted into mining ditches from the rivers that flowed from high in the Sierra Nevada to the east. As farming replaced mining activities, the mining ditches were extended to the west in the lower elevations. By the 1890s an estimated 20,000 acres of orchards were irrigated. Today, approximately 16,000 acres are irrigated using about 95 percent of water brought from the high country.

In the western County, those early mining ditches formed the backbone of the Nevada Irrigation District which supplies surface water to its domestic, industrial and agricultural customer. Outside of the existing service areas, water users depend primarily on groundwater through individual or small systems.

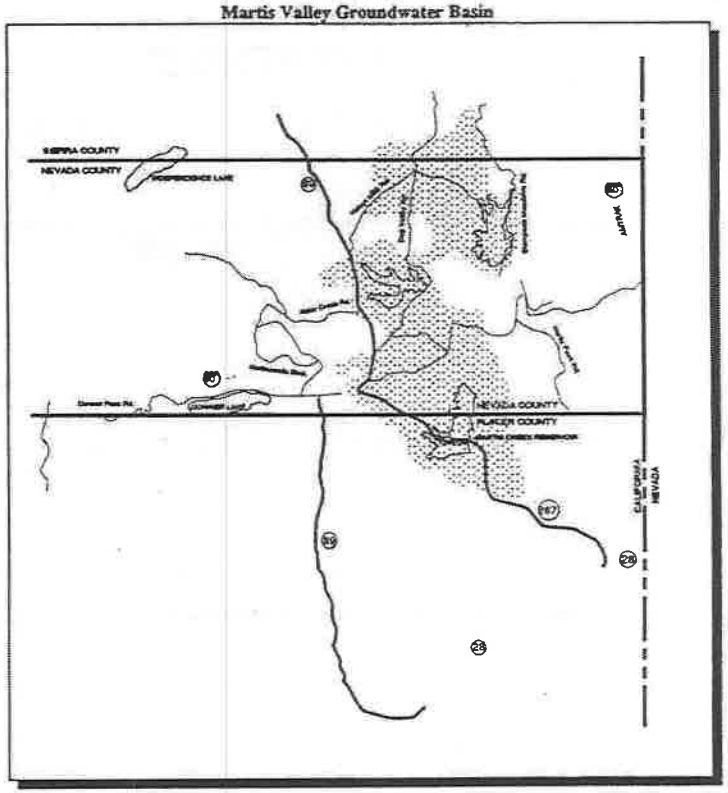
At the eastern portion of the County, the water purveyors depend primarily on groundwater from the Martis Valley Aquifer and springs to supply domestic, commercial and industrial users. The extent of the Martis Valley aquifer is shown Figure 11-2, Martis Valley Ground Water Basin. The aquifer will be the subject of a major study that the California Department of Water Resources is undertaking as a part of determining the operational criteria for implementation of the Truckee-Carson-Pyramid Lake Water Rights Settlement Act.

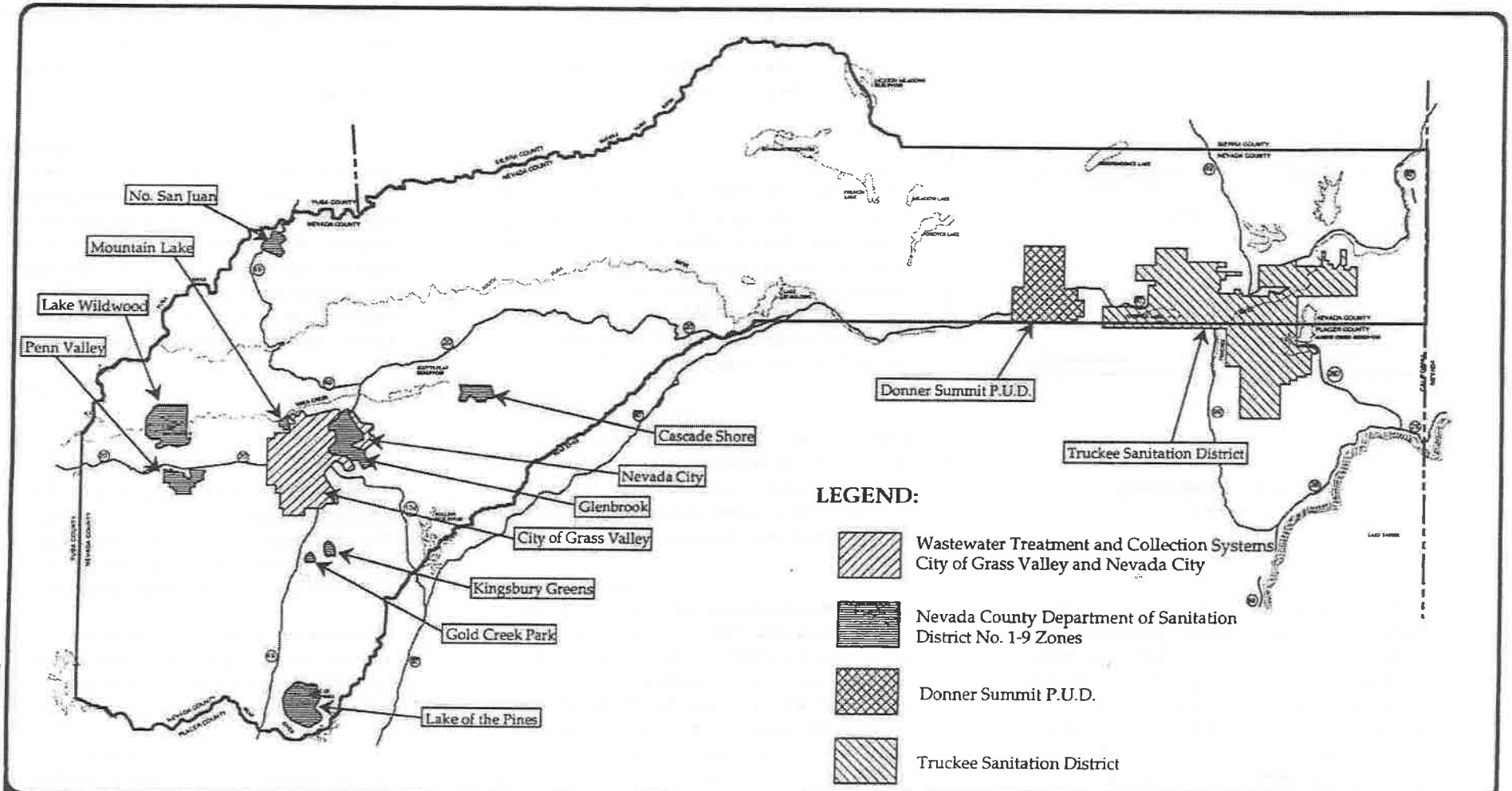
In a report by John Sharp of Hydro-Search, Inc., he indicated that estimated 1,000,000 acre-feet (AF) of groundwater is located in the Martis Valley aquifer. Recharge is estimated at 18,000 AF per year with a safe yield of 13,000 AF. The Truckee-Donner P.U.D. has not noticed any impact of the drought upon groundwater levels in Martis Valley wells. Their current feeling is that there is adequate water for growth projections.

Water Purveyors: Western County

In January 1921, the Nevada Irrigation District was established by a vote of the people to provide water to approximately 200,000 acres of the western portion of Nevada County. NID also serves the northwestern portion of Placer County. The major source of their water supply is from approximately 70 square miles of the upper reaches of the Middle and South Forks of the Yuba River and the Bear River. Water from Jackson Meadows Reser-

Figure 11-2
Martis Valley Groundwater Basin





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Sacramento, Calif.

NEVADA COUNTY GENERAL PLAN
Sanitation Districts

1" = 25,000'

FIGURE 11-3

Table 11-3
NID Treated Water Sales

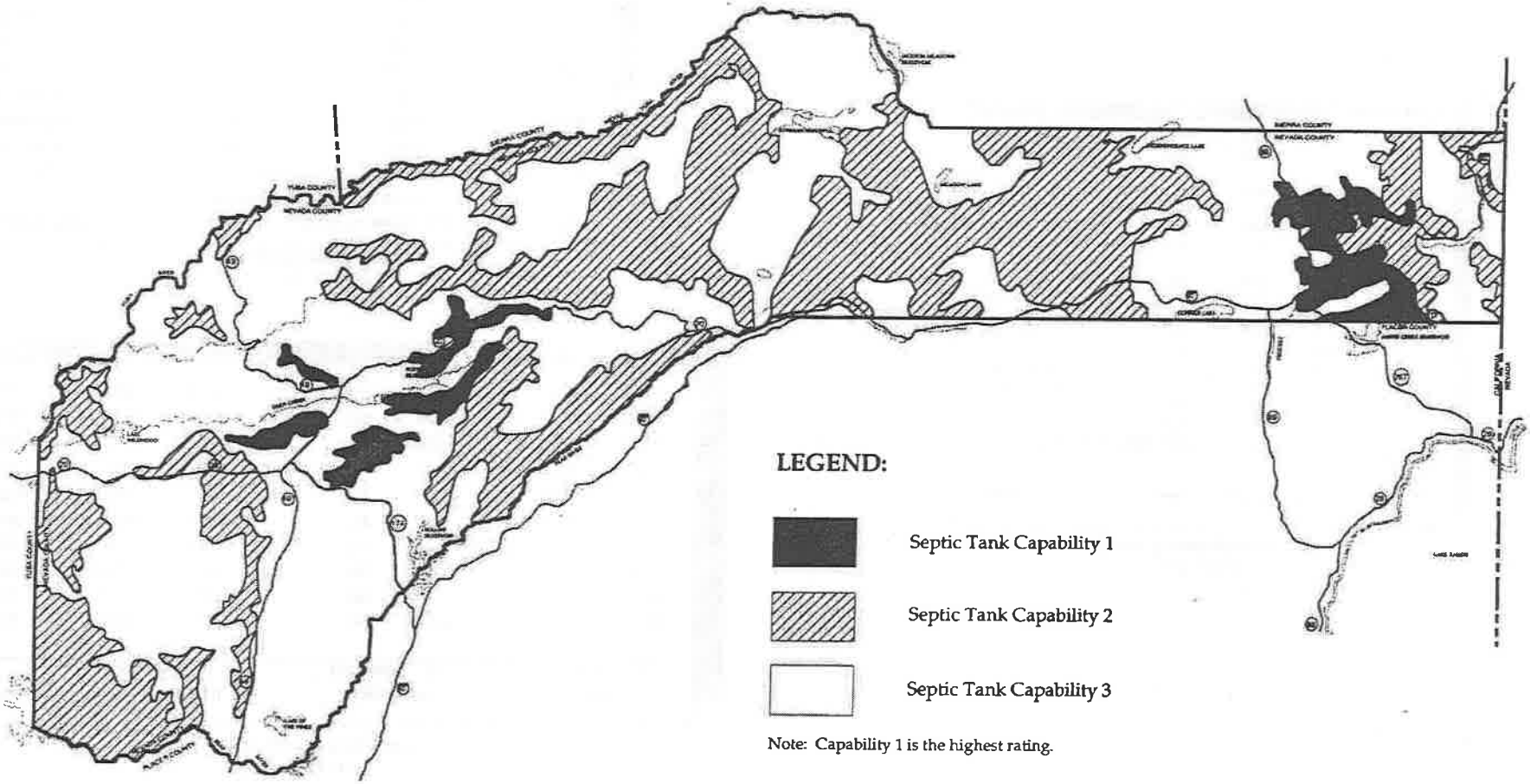
Year	Noncommercial		Commercial		Total	
	Customers	AF	Customers	AF	Customers	AF
1980	9,073	3,193	550	1,217	9,623	4,410
1985	10,691	4,155	650	1,418	11,341	5,573
1986	10,902	4,316	673	1,558	11,575	5,874
1987	11,503	4,966	725	1,791	12,228	6,757
1988	12,116	4,848	757	1,719	12,873	6,567
1989	12,595	4,735	791	1,692	13,386	6,427
1995	17,020	6,400	1,070	2,300	18,090	8,700
2000	21,280	8,000	1,360	2,900	22,640	10,900
2005	25,800	9,700	1,650	3,500	27,450	13,200
2010	30,860	11,600	1,970	4,200	32,830	15,800

Table 11-4
Treatment Plants Capacity

Treatment Plant	Capacity (MGD)	Water Production Per Year (MG)	Customers
Cascade Shores	.34	24.9	350
Elizabeth George	10.0	872.3	3300
Green Reservoir	0.1	17.0	58
Lake of the Pines	3.0	317.8	1850
Lake Wildwood	4.0	304.5	2420
Loma Rica	8.0	761.8	3730
Penn Valley	0.5	37.1	176
Sherwood Forest	0.17	N/A	50
Snow Mountain	1.2	66.7	300
Total	27.3	2402.1	12,234

Table 11-5
Sewer Capacity Summary

Agency	Customers	Population	Design Flow GPD	Exist. Flow Avg. GPD dry weather
Nevada County Department of Sanitation				
Lake Wildwood	3430	9100	1120000	450000
Lake of the Pines	1880	5080	720000	400000
Kingsbury Greens	45	120	12000	3500
North San Juan	80	210	24400	6200
Gold Creek Park	44	120	14500	6000
Penn Valley	265	700	90000	25000
Mountain Lake	47	120	11750	1500
Cascade Shores	—	—	—	—
Subtotal	5791	15370	1992650	892200
City of Grass Valley	4530	12000	1550000	1272000
City of Nevada City	1131	3000	690000	400000
Total	11452	30370	4232650	2564400
Unsewered	17440	46230		
West County Population		76600		



Source: Nevada County General Plan, Technical Data, 1980.

Harland Bartholomew & Associates, Inc
Sacramento, Califo

NEVADA COUNTY GENERAL PLAN
Septic Tank Capability

1" = 25,000'

FIGURE 11-4

voir on the Middle Fork of the Yuba River is diverted through a series of tunnels and canals as well as Bowman Reservoir to PG & E 's Lake Spaulding. From there the water is conveyed down to the water users in the western part of the County through a series of canals. Estimates of water losses from the canals system vary but may be in the order of 20 percent or more. Nevada Irrigation District reservoirs and their capacity are shown in Table 11-2 located on page 11-2. Figure 11-1 shows the NID sphere of influence and service area. The current agriculture ditch system could convey waters to areas of future development, however, NID will presumably connect to pressurized pipelines which will have more flexibility than the gravity flow in ditches.

Water production for the whole district in recent years has ranged from a high of 138,155 acre-feet in 1990 to a low of 57,408 acre-feet in drought year of 1977, a factor of 2.3. In the 1990 Update to the Urban Water Management Plan, NID estimates that currently approximately 95 percent of water sales is for raw water or agricultural use. By the year 2010, that will drop to 90 percent as urbanization spreads. From that same report, Table 11-3, located on the preceding page, summarizes their past and projected treated water sales.

Treated domestic water in Nevada County is supplied by NID through eleven individual domestic water treatment and distribution systems. The systems and their current treatment capacity are listed on the preceding page in Table 11-4. This includes construction contracts awarded through 1991.

The **City of Nevada City** provides water primarily within the City limits to 1,177 metered customers as of June 1990. There were 914 single family dwelling units and 239 unit other than single family dwellings. The water production for the 1989-90 year was 162.4 million gallons. The majority of Nevada City water originates from Little Deer Creek water rights. Less than 5 percent may come from NID sources during dry summer months.

The **City of Grass Valley** provides water primarily within the City limits to 2105 metered customers. There were 1757 dwelling units and 348 commercial or industrial customers. The water production for the 1990/91 year was 104 million gallons. In addition, NID serves piped, treated water to the City.

Grass Valley's source of water is raw water purchased from NID.

The **Washington County Water District** serves the small community of Washington located on the South Fork of the Yuba River. The small district, which covers approximately 1270 acres, serves approximately 125 connections. The District is in an isolated area and has only a maximum of 20 potential future connections. The District produces approximately 1.0 million gallons per year. The monthly rate for water service is $12 of which $3 is for fire protection.

The **San Juan Ridge County Water District**, formally known as the French Corral Water District, Serves 20 to 22 irrigation customers. Approximately 60 acre-feet of water are delivered per year. No domestic or treated water is provided. Water is supplied on a rotational basis between mid-May and mid-September. The waters are diverted from Shady Creek and stored in Pine Grove Reservoir which has a capacity of 93 acre-feet.

Groundwater

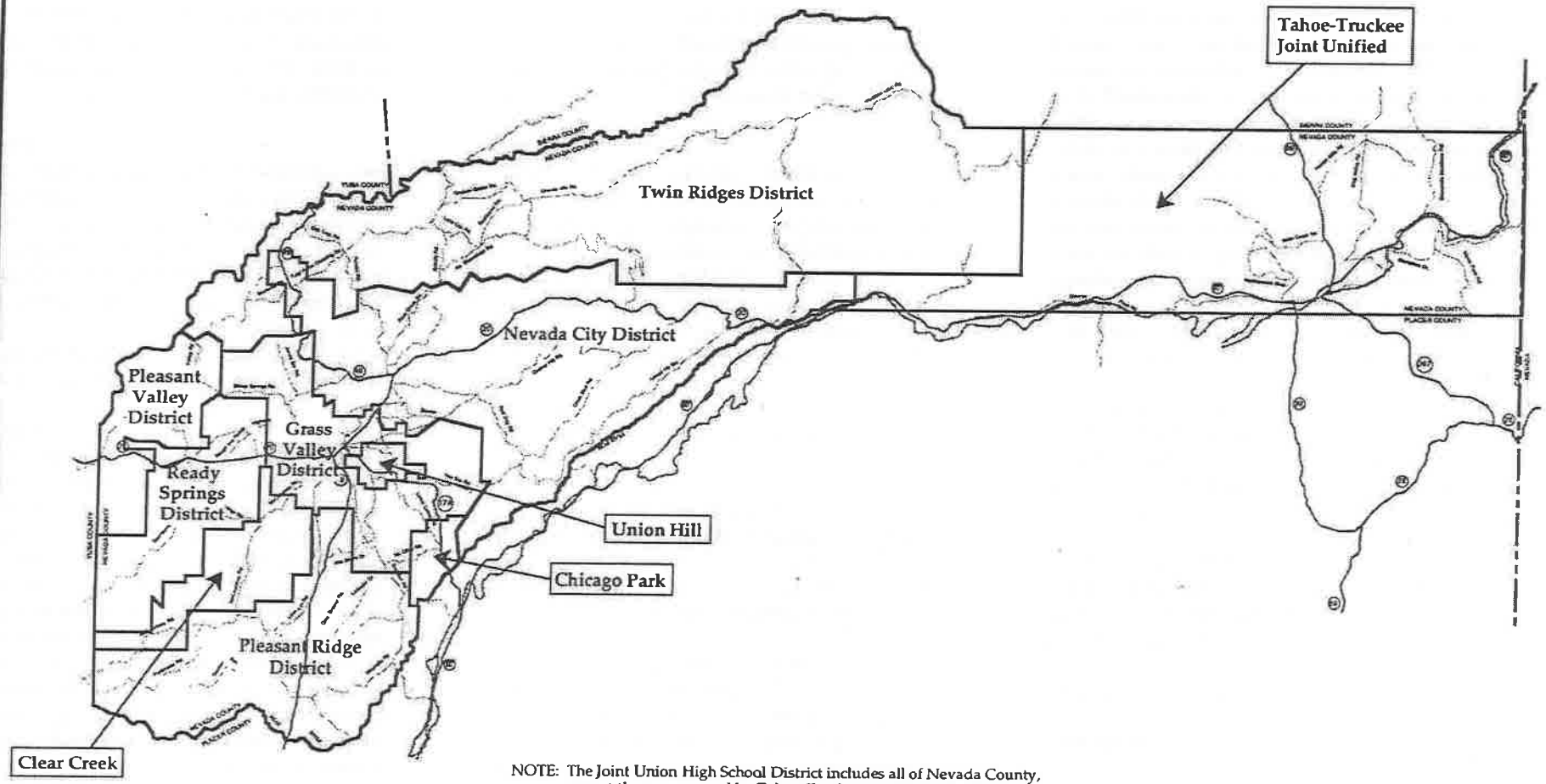
Wells: Western County

In areas not served by public or private water purveyors, private wells are used. Approximately 10,000 residences at this time rely on private wells, most of which are in western Nevada County.

Historical background reports indicate that groundwater in the western area is not characterized by well defined aquifers. The highly fractured characteristics of the subsurface geology as well as a variety of other factors combine to create inconsistent groundwater characteristics.

Little information is available on the quantity and quality of well water on private property in the western portion of the county. In the past several years, a significant number of wells have gone dry or have had to be lowered. There is a lack of historical data to help determine whether this has been caused by the prolonged drought or from overdrafting of the aquifer. Officials of the Nevada County Department of Environmental Health have been concerned with the long term water quality impacts of septic systems on the chemical and bacterial constituents in the groundwater. In addition, the accumulation of nitrates and their impact on groundwater supply is of particular concern. No sustained studies, however, have been undertaken to determine these water quantity and quality impacts.

For use of a private well or septic system, County Ordinance requires a minimum of 3 acres per parcel. For areas supplied by a water purveyor, 1-1/2 acres is required.



Source: Nevada County Planning Department, 1991.

NOTE: The Joint Union High School District includes all of Nevada County, except the area covered by Tahoe-Truckee Joint Unified. The Sierra College School District encompasses the entire County.

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NEVADA COUNTY GENERAL PLAN
School Districts

1" = 25,000'

FIGURE 11-5

Water Purveyors: Eastern County

There are four water purveyors in the eastern part of Nevada County. These include the Truckee-Donner Public Utility District, Donner Lake Utility Company, Donner Summit Public Utility District and the Glenshire Mutual Water Company. The major source of water in the Truckee area is the Martis Valley aquifer with springs and small lakes supplying the remainder.

The **Truckee Donner Public Utility District** (TDPUD) service area include downtown Truckee and surrounding area, Sierra Meadows, Prosser Lake area, Tahoe Donner and Hirschdale. The District provides domestic water and electricity to their customers. The water production in 1990 was 1,044.8 million gallons (MG) compared to 934.2 MG for 1989. Customers connected to the water system were 5,161, for a total of 5,685 equivalent dwelling units (EDU), at the end of 1990 compared to 4,850 in 1989.

The water production rates have increased significantly in the past several years because of the five years of drought and a significant leaking problem in the water mains in the Tahoe Donner portion of the system. The District estimates that the system loses at approximately 350 gallons per minute (GPM). A program is being implemented at a cost of approximately $7.5 million in 1991 that will replace 72,650 lineal feet of water pipelines in the Tahoe Donner portion of the system. It is expected to eliminate at least 80 percent of the system losses. Funding for the rehabilitation project will be raised through long-term, tax exempt debt.

Current water use for TDPUD is approximately 3,400 acre-feet per year used by 6,027 EDU's. TDPUD expects buildout in the year 2015 will be approximately 16,000 EDU's (12,862 for residential and 3,143 for commercial) with a demand of approximately 9,000 acre-feet per year. These water demands are based upon 500 gpd per EDU.

The **Donner Summit Public Utility District** provides domestic water to 234 customers in the Soda Springs area. The source of water is from Lake Angela and Lake Mary. Water production varies from approximately 60,000 to 100,000 GPD during the periods without snow making. When the ski areas are making snow, production can increase to over 600,000 GPD. Water for snow making is supplied Boreal Ridge, Soda Springs, and Sugar Bowl.

The current fee for connection to the Districts' system is $350 while the average single family residence pays approximately $240 per year for water.

The **Donner Lake Utility Company** (DLUC) is a privately-owned company which serves 1,200 customers around Donner Lake. The purveyors source of water is from springs at the north side of Donner Lake, wells and Donner Lake itself. The company has seven storage tanks with a total capacity of 457,000 gallons.

There is no fee for connection to the DLUC system, while the average single family residence pays approximately $246.02 per year for water.

The **Glenshire Mutual Water Company** (GMWC), formed to serve the Glenshire subdivision, currently serves 1,428 residential parcels within its service areas. Based upon current land use, total buildout within the area is approximately 2,200 units. As of April 1991, there were 968 connections to the system with approximately 100 units being added per year. It is estimated that 85 percent of the residences are occupied on a full-time basis.

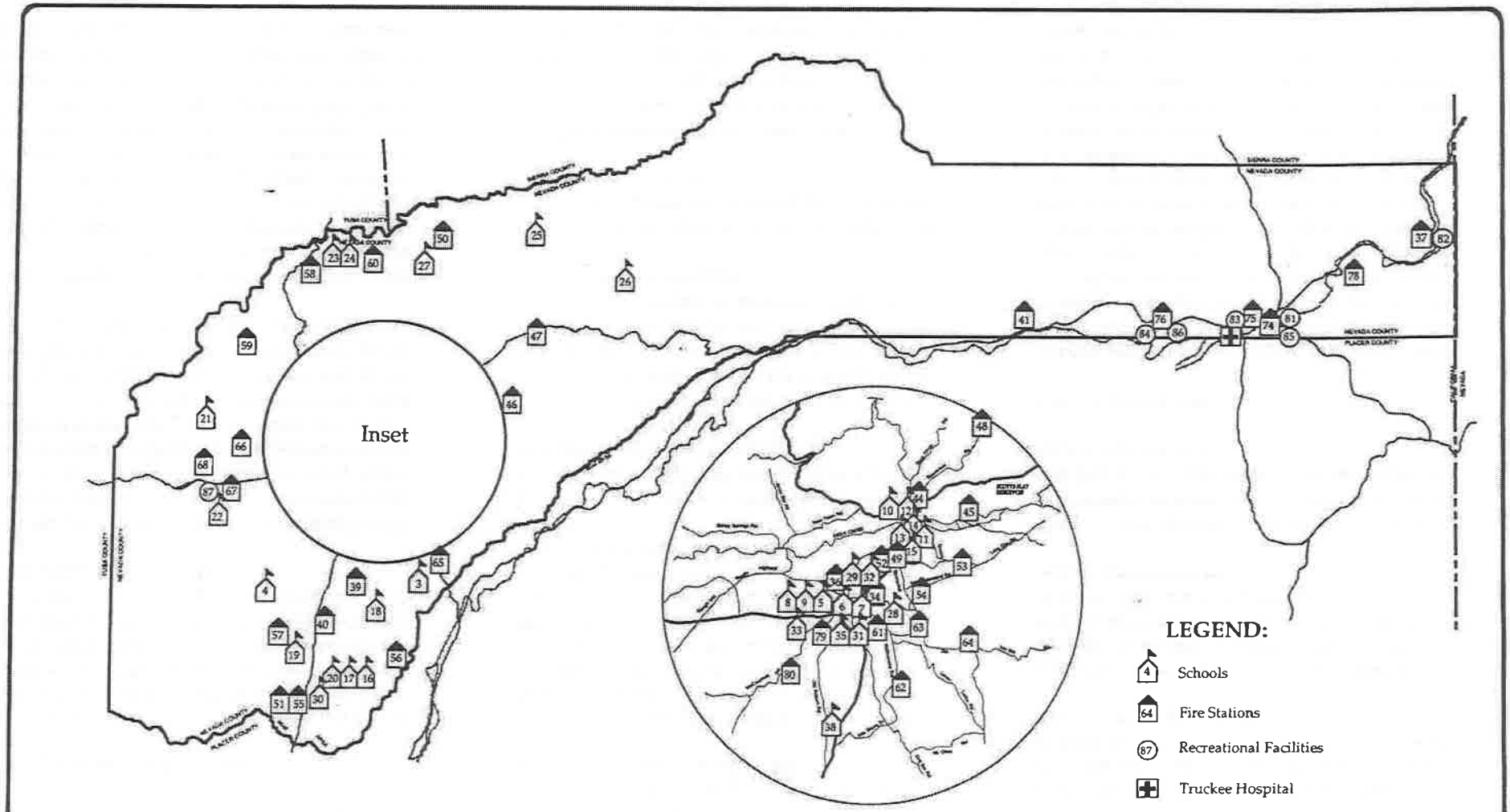
The water production for 1990 was 117.5 MG with a peak flow in July of 16.8 MG and a low flow in February of 6.0 MG. Production had increased approximately 14.2 percent over the 1989 total of 102.9 MG. The source of water supply is entirely groundwater wells.

Current water fees are $270 per developed parcel and $90 per undeveloped parcel within the service area. The 1991 budget is approximately $304,000 with $244,000 used for operations costs and the remaining $60,000 placed in a capital improvement fund.

The number of residences in the eastern portion of the County on private wells is relatively small. It is estimated that there are less than 100 residences and commercial entities on private wells.

Water Rights/Allocations

In 1990, Congress passed and the President signed into law Senate Bill No. 3084, The Truckee-Carson-Pyramid Lake Water Rights Settlement Act. The Act allows diversions of up to 32,000 AF of water in the area with a maximum of 10,000 AF diverted from the Truckee River. There is an additional 6,000 AF that is currently being diverted to Sierra County that could be purchased and directed back into the Basin which would be added to the 32,000 AF. Over the next five or six years, the states of California and Nevada will be developing an operational agreement. Currently, the California Department of Water Resources has begun a study of the Martis Valley groundwater aquifer to better understand its size and safe yield and environmental impacts.



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NEVADA COUNTY GENERAL PLAN

Public Facilities Locatio

1" = 25,000'

FIGURE 11-6

11.4 WASTEWATER

Figure 11-3 displays the wastewater facilities and districts within the County.

Western County Systems

The Grass Valley and the Nevada City sewage treatment plant were both constructed around 1950 and discharge into Deer Creek and Wolf Creek. Through the 1970s and 1980s, the Cities of Grass Valley and Nevada City continued to expand or upgrade their plans in incremental steps to provide capacity to growth within the existing boundaries and areas that were annexed into the districts. In areas outside the spheres of influence of the cities the County of Nevada, through the Nevada County Sanitation District No. 1, provided the needed mechanism to develop sewage collection and treatment facilities.

As the population increases and as surface water discharge requirements established by the Central Valley R.W.Q.C.B. are increased, solutions other than a discharge to the surface waters will need to be addressed. The costs to communities to implement new or expanded sewage collection and treatment systems will much greater than it has been in the past. With the elimination of the Federal and State Clean Water Grants, local communities will face the true and full cost of growth without the old subsidy.

Table 11-5 on page 11-4 summarizes the capacity of each system.

The **City of Nevada City** wastewater treatment plant is designed for a flow of 0.69 MGD. The average dry weather flow to the plant is 0.40 MGD with peak flows up to 1.52 MGD. The system serves 1,131 customers.

The plant which was built in 1950, is a secondary treatment plant with a trickling filter. The treated effluent is discharged to Deer Creek. Nevada City is in the process of upgrading their plant, with no appreciable increase in capacity, to meet the most recent discharge standards for effluent to Deer Creek.

The **City of Grass Valley** wastewater treatment plant is designed for a flow of 1.72 MGD. The average dry weather flow to the plant is 1.55 MGD with an equalized peak flows up to 6.37 MGD. The system serves 4,530 customers. The plant, built in 1950, is a secondary treatment plant with a trickling filter. The treated effluent is discharged to Wolf Creek.

At this time, the City of Grass Valley has approximately two years of capacity remaining. The City is looking at a proposal to increase capacity from 1.72 MGD to 3.5 MGD that will extend capacity for over ten years.

The **Nevada County Department of Sanitation** operates and maintains sewage collection and treatment facilities for areas outside of Grass Valley and Nevada City that require such systems. Currently there are seven systems or zones within the Nevada County Sanitation District No. 1. These zones are Lake Wildwood, Lake of the Pines, Kingsbury Greens, Gold Creek, Penn Valley, Mountain Lakes Estates and North San Juan. Cascade Shores Subdivision will soon be added to the Sanitation District. Other areas, such as Alta Sierra Subdivision and La Barr Meadows, may need a collection/treatment system as population densities increase and leach fields degrade or groundwater and surface waters are contaminated.

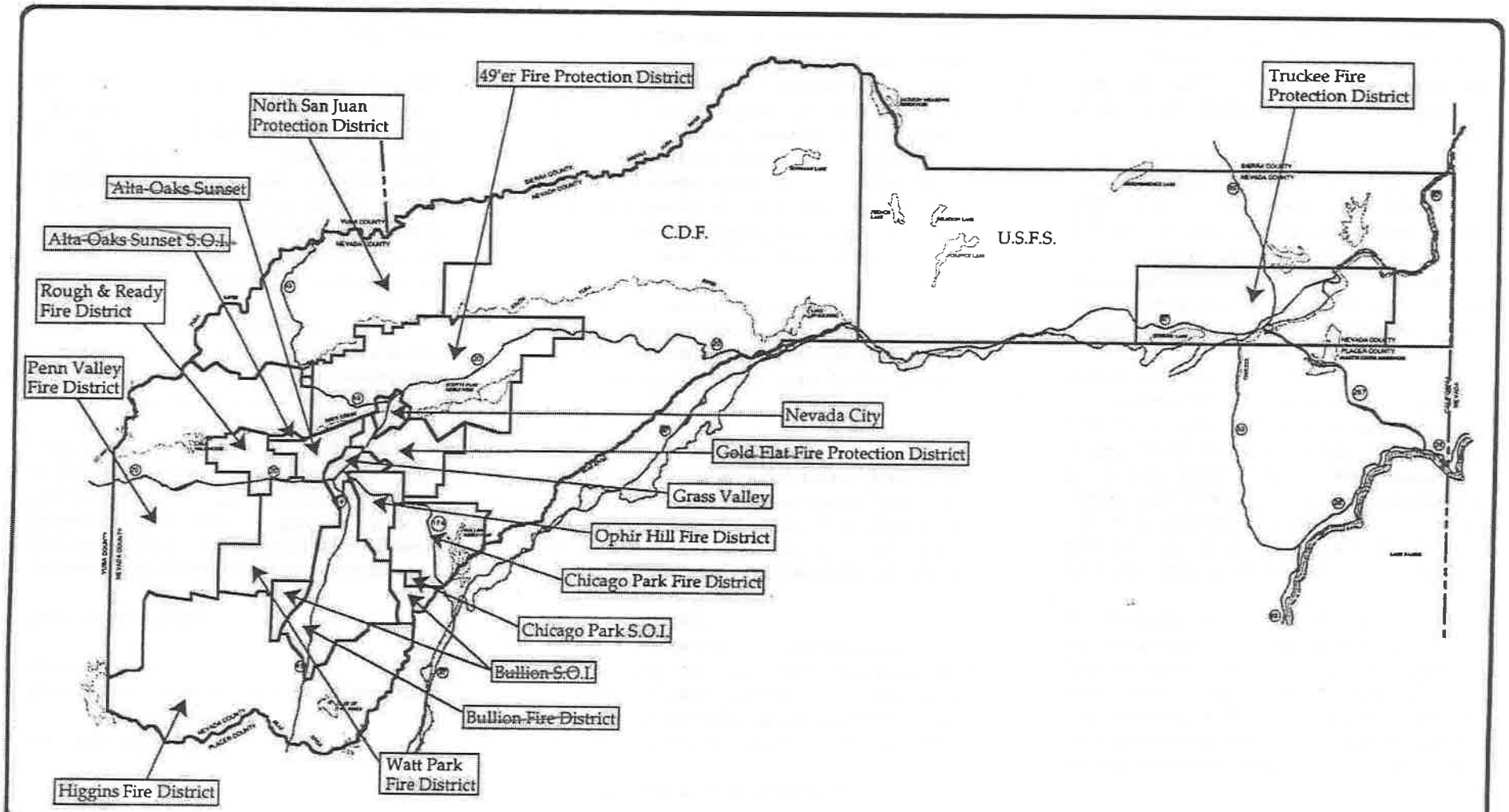
As the sphere of the existing wastewater collection systems is limited, a large number of residences in the western part of the county must use **private septic tanks** with leach fields. A current County ordinance requires a minimum of 3 acres if water is obtained from a well on the property and 1-1/2 acres if water comes from other sources. Nevertheless, past practices allowed subdivisions to have septic systems on many lots which were one acre or less.

The County Environmental Health officials have a expressed concern regarding the failure of septic systems, especially in older subdivisions where smaller lot sizes do not provide for adequate leach fields. The accumulation of nitrates in the groundwater is of special concern. No information is available on the long term cumulative impacts of leach fields. Many consider septic system and leach fields as only a temporary solutions for the medium to higher density areas.

The soils in the western part of the county are not conducive to the use of septic system except in low density. The Soil Conservation Service has found that all soils are rated as "severe" for installation of septic tanks and filter or leach fields. General areas of septic tank capability are shown on Figure 11-4. Soils are rated as "severe" because the soils are either less than 4 feet deep, have slopes greater than 9 percent or have poor percolation rates.

For the many of the same reasons that septic systems are not advisable, the installation of sewer collection lines will be more expensive. Steep slopes, shallow soil as well as boulders and rock outcroppings in the soil will cause higher excavation costs.

In the early 1970s, the Supervisors of Nevada County directed a consultant to make recommendations for a Regional Wastewater Collection/Treatment System. The



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NEVADA COUNTY GENERAL PLAN
Fire Districts & Spheres [illegible] Influence

1" = 25,000'

FIGURE 11-7

recommended project included approximately 18 miles of new sewer mains and a stabilization pond wastewater treatment facility southwest of Grass Valley in the French Ravine area. The recommendations were not followed, perhaps, principally due to the availability of 87.5 percent grant funding from the U. S. Environmental Protection Agency and the California State Water Resources Control Board which favored continuing to add to the existing facility units and capacity.

Through the 1970s and 1980s, the Cities of Grass Valley and Nevada City continued to expand or upgrade their plans in incremental steps to provide capacity for growth within the existing boundaries and areas that were annexed into the districts. In areas outside the spheres of influence of the cities, the County of Nevada provided the needed mechanism to develop sewage collection and treatment facilities.

The general feeling is that with upgrades to the existing wastewater treatment plants currently being contemplated in Nevada City, Grass Valley and County Sanitation District No. 1 , the systems are set for the next ten years or more.

Eastern County Systems

The Truckee Sanitary District (TSD) is the only district within Nevada County that discharges to the Tahoe-Truckee Sanitation Agency (TTSA) wastewater treatment plant. The TSD was established in 1906 and currently collects and transports sewage from 5,912 connections to the TTSA Plant. Average daily dry weather flows in the system are 1.007 MGD with wet weather flow reaching 5.000 MGD. The District has approximately 200 miles of sewer line with a service area that currently encompasses approximately 31 square miles.

It is estimated that approximately 50 percent of the residences within the District are full-time residences with the remaining being used as second homes or part-time rentals.

The Tahoe-Truckee Sanitation Agency was created in 1972 to provide wastewater treatment services for the Truckee area as well as portions of Placer County, including north and west shores of Lake Tahoe and Squaw Valley and Alpine Valley. The member districts are the Truckee Sanitary District, North Tahoe Public Utility District, Tahoe City Public Utility District, Alpine Springs Water District and Squaw Valley County Water District. In 1978, an advanced wastewater treatment plant was completed on the bank of the Truckee River approximately one mile east of downtown Truckee.

With an average increase of connections of 400 units per year, TTSA expects that expansion of the existing plant will not be needed until the year 2005. Most of the new connections will be in the Martis Valley with little growth being allowed in the Tahoe Basin. The number of connections could be increased if the Lahontan Regional Water Quality Control Board issues orders for existing residences with septic systems to connect to the TTSA system. There are approximately 1400 units within the TTSA District, of which approximately 1367 unit are within TSD boundary, that are on septic systems. It is anticipated that within five to ten years that most of these units will be required to connect to the sewer system.

The existing TTSA plant capacity is 7.4 MGD with the highest seven-day average flow of 5.41 MGD.

Currently TTSA discharges tertiary treated effluent to an underground disposal field. A spray irrigation will become operational in the summer of 1991 which will be capable of taking the full effluent flow from the plant. The irrigation system located on the TTSA property will only function during summer months and should greatly increase the lifetime of the underground disposal system aquifer.

The Donner Summit Public Utility District (DSPUD) services 545 customers, a majority of which are single family residences. There are 172 connections available in the Soda Springs area. The sewage treatment system currently treats an average of 520,000 GPD with an additional 300,000 GPD available.

The Lahontan Regional Water Quality Control Board has had a policy of requiring developed areas to connect to the regional wastewater collection and treatment system in the Truckee River Basin. There are several areas with small lots on the outskirts of Truckee that are still on septic systems. It is expected that with in the next five to ten years that these areas will be required to connect.

11.5 SCHOOL DISTRICTS

As shown on Figure 11-5 there are currently 13 separate school districts serving Nevada County, including Tahoe-Truckee Unified School District, Pleasant Ridge Unified School District, Ready Springs Unified School District, Chicago Park School District, Clear Creek School District, Grass Valley School District, Nevada City School District, Pleasant Valley School District, Twin Ridges School Dis-

Table 11-6
School, Fire, and Park and Recreation Districts for Nevada County

SCHOOLS			
1.	Tahoe Truckee Unified Sch. Dist.		
2.	Placer County Board of Education	350 Nevada Street	Auburn, CA.
3.	Chicago Park School District		
4.	Clear Creek School District	17700 McCourtney Road.	Grass Valley, CA.
5.	Grass Valley School District	10840 Gilmore Way	Grass Valley, CA.
6.	Bell Hill School	342 So. School Street	Grass Valley, CA.
7.	Hennessy School	225 So. Auburn Street	Grass Valley, CA.
8.	Margaret G. Scotten School	10821 Squirrel Creek Road	Grass Valley, CA.
9.	Lyman Gilmore School	10837 Rough & Ready Hwy.	Grass Valley, CA.
10.	Nevada City School District	215 Washington Street	Nevada City, CA.
11.	Gold Run School	470 Searls Avenue	Nevada City, CA.
12.	Nevada City Elementary	505 Main Street	Nevada City, CA.
13.	Deer Creek School	805 Lindley Avenue	Nevada City, CA.
14.	Seven Hills School	700 Hoover Lane	Nevada City, CA.
15.	Special Ed. Consortium	400 Hoover Lane	Nevada City, CA.
16.	Pleasant Ridge Union Sch. District	22580 Kingston Lane	Nevada City, CA.
17.	Cottage Hill School	22600 Kingston Lane	Nevada City, CA.
18.	Alta Sierra School	185 Annie Drive	Grass Valley, CA.
19.	Pleasant Ridge School	16229 Duggams Road	Grass Valley, CA.
20.	Magnolia School	22431 Kingston Lane	Grass Valley, CA.
21.	Pleasant Valley School	14685 Pleasant Valley Road	Penn Valley, CA.
22.	Ready Springs Union	10862 Spenceville Road	Penn Valley, CA.
23.	Twin Ridges School District	18847 Oak Tree Road	Nevada City, CA.
24.	Oak Tree School	18847 Oak Tree Road	Nevada City, CA.
25.	Malakoff School		
26.	Washington School		
27.	Grizzly Hill School	16661 Old Mill Road	
28.	Union Hill School	11638 Colfax Highway	Grass Valley, CA.
29.	Nevada Joint Union H.Sch.Dist.	11645 Ridge Road	Grass Valley, CA.
30.	Bear River High School	11130 Magnolia Road	Grass Valley, CA.
31.	Empire Continuation High School	140 Park Avenue	Grass Valley, CA.
32.	Nevada Union High School	11761 Ridge Road	Grass Valley, CA.
33.	Sierra Mountain High School	12338 McCourtney Road	Grass Valley, CA.
34.	Silver Springs High School	10657 E. Bennett Street	Grass Valley, CA.
35.	Adult Education	140 Park Avenue	Grass Valley, CA.
FIRE STATIONS			
36.	Alta Oaks Sunset Fire District	13103 Ridge Road	
37.	Bronco Vol Fire District/Floriston		
BULLION FIRE PROTECTION DISTRICT			
38.		14518 Highway 49 S.	Grass Valley, CA.
39.		136 Tammy Way	Grass Valley, CA.
40.		10095 E. Lime Kiln	Grass Valley, CA.
DONNER SUMMIT			
41.		#1 Sherritt Lane	Soda Springs, CA.
42.		Yuba & Short	Placer County, CA.
43.	Sugar Bowl Ski Area		Placer County, CA.
PORTY-NINER FIRE PROTECTION DIST.		Nevada City, CA.	
44.		10014 North Bloomfield	
45.		13376 Quaker Hill Cross	
46.		16528 Pasquale	
47.		18969 Scotts Flat Road	
48.		14700 North Bloomfield	

CALIF. DEPT OF FORESTRY			
49.	Nevada City	10242 Ridge Road	
50.	Columbia Hill	19076 Tyler Foot Road	
51.	Higgins Corner	10106 Combie Road	Auburn, CA.
GOLD FLAT FIRE PROTECTION DIST.			
52.		12444 Nevada City Highway	Grass Valley, CA.
53.		12337 Banner Lava Cap	Grass Valley, CA.
54.		Charles Avenue	Grass Valley, CA.
HIGGINS AREA FIRE PROTECTION DIST.			
55.		10106 Combie Road	Auburn, CA.
56.		23233 Morning Sun	Grass Valley, CA.
57.		20604 McCourtney	Grass Valley, CA.
NORTH SAN JUAN FIRE PROTECTION DIST.			
58.		10057 Reservoir Street	
59.		20399 Pleasant Valley Road	
60.		14618 Tyler Foot Crossing	Nevada City, CA.
OPHIR HILL FIRE PROTECTION DIST.			
61.		11545 Colfax Highway	Grass Valley, CA.
62.		Rattlesnake Road	Cedar Ridge, CA.
63.		Brunswick Drive	Cedar Ridge, CA.
PEARDALE-CHICAGO PARK FPD			
64.		15057 Colfax Highway	Grass Valley, CA.
65.		Mt. Olive Road/174	
ROUGH & READY FIRE PROTECTION DIST.			
66.		Rough & Ready Road	
PENN VALLEY			
67.		10513 Spenceville Road	
68.		18989 Lake Forest	
GRASS VALLEY FIRE DISTRICT			
69.		472 Brighton Street	
70.		139 East Main Street	
71.		110 Race Street	
72.		1442 East Main Street	
NEVADA CITY FIRE DISTRICT			
73.		317 Board Street	
TRUCKEE FIRE PROTECTION DISTRICT			
74.		10049 Donner Pass Road	
75.		11473 Donner Pass Road	
76.		15688 Donner Pass Road	
77.		12986 North Woods Blvd.	
78.		10900 Manchester Drive	
WATT PARK FIRE PROTECTION DISTRICT			
79.		11329 McCourtney	
80.		14811 McCourtney	
TRUCKEE DONNER PARK & REC DISTRICT			
81.	Community Center	10046 Church	
82.	Club House (School house)	102344 Floriston	
83.	Swimming Pool	11725 Donner Pass Road (w/locker rooms)	
84.	Small Concession & Bathrooms	West End Beach Park	
85.	Corporation Yard & Bathrooms	Regional Park	
86.	Bathroom	Donner Lake Boat Launch	
WESTERN GATEWAY PARK & RECREATION			
87.	Meeting room; Bathrooms/shop; Storage barn; Ballfield bathrooms		

Table 11-7
Nevada County School Districts
Current Enrollment and Capacity Data

SCHOOL DISTRICTS	CURRENT ENROLLMENT	FACILITY CAPACITY
Chicago Park School District	245	185
Clear Creek School District	145	200
Grass Valley School District	Total: 2,355	
1. Bell High School	399	350
2. Hennessy School	728	600
3. Scotten School	482	500
4. Lyman Gilmore	732	700
5. Special Education	42	
6. Home Study	36	
Nevada City School District	Total: 1,788	
1. Nevada City Elementary	285	334
2. Gold Run Elementary	269	304
3. Deer Creek Elementary	626	575
4. Seven Hills Middle School	645	600
Nevada Jt. Union High Sch. District	Total: 3,262	
1. Bear River High School	789	914
2. Nevada Union High School	1,950	1,982
3. Sierra Mountain High School	95	140
4. Empire High School	129	74
5. Young Parent Project		71
6. Community School Project		25
Pleasant Ridge School District	Total: 2,320	
1. Cottage Hill Elementary	291	281
2. Alta Sierra	552	370
3. Pleasant Ridge	680	488
4. Magnolia	797	558
Pleasant Valley School District	770	525-550
Ready Springs School District	473	750
Special Education Consortium	Total: 125	
1. Gold Run	6	15
2. Seven Hills	11	15
3. Nevada Union High School	5	10
4. Deer Creek	9	15
5. Champion Mine	15	20
6. Union Hill	20	20
Tahoe Truckee Unified School District*	Total: 3,726	
1. Donner Trail Elementary	17	62
2. Kings Beach Elementary	459	482
3. Tahoe Lake Elementary	400	400
4. Truckee Elementary	754	627
5. Ride-out Elementary	164	215
6. Sierra Mountain Middle School	523	447
7. North Tahoe Intermediate	358	540
8. North Tahoe High School	319	850
9. Tahoe Truckee High School	619	904
Twin Ridges School District	Total: 385	
1. Grizzly Hill	170	190
2. Malakoff	20	28-30
3. Oak Tree	120	120
4. Washington	33	33
Union Hill School District	476	650

* using portables

trict, Union Hill School District, Special Education Consortium District, Nevada Joint Union High School District and Sierra College Extension. The Placer County School Board serves as an administrative body to Tahoe-Truckee Unified School District. Figure 11-6 illustrates the location of all school facilities within the County.

According to school officials, the following school districts are sufficiently staffed and equipped to operate at an acceptable level of service:

- Clear Creek;
- Pleasant Ridge;
- Union Hill;
- Special Education Consortium;
- Ready Springs; and
- Chicago Park.

The following school districts, however, are operating at a deficiency:

- Nevada City;
- Nevada Joint Union High School;
- Tahoe-Truckee;
- Pleasant Valley;
- Grass Valley;
- Twin Ridges; and
- Nevada City.

Each of the school districts listed above require additional funding to increase staffing levels, facilities, equipment and programs. The Placer County School Board is also operating at deficiency.

As illustrated in Table 11-7 on the preceding page, five of the school districts are currently experiencing overcrowded conditions at certain schools. At some schools this situation is being corrected with the use of portable classrooms on the school grounds.

11.6 FIRE DISTRICTS

As shown on Figure 11-7, there are currently 12 separate fire districts to serve Nevada County, including 49er, Donner Summit, Higgins Area, North San Juan, Rough and Ready, Truckee, Watt Park, Bullion, Alta-Oaks Sunset, Peardale-Chicago Park, Gold Flat, and Ophir Hill. Figure 11-6 illustrates the location of fire houses and facilities in the County.

According to fire district officials, the following fire districts are sufficiently equipped and staffed to operate at an acceptable level of service:

- Rough and Ready;
- Truckee;
- Peardale-Chicago Park; and
- Alta-Oaks Sunset.

The following districts, however, are operating at a deficiency:

- Donner Summit;
- 49er;
- Higgins Area;
- North San Juan;
- Watt Park;
- Ophir Hill;
- Gold Flat; and
- Bullion.

The 49er Fire Protection District is deficient in staff, equipment, and office space. The Higgins Area and Donner Summit District are experiencing a deficiency in staff. Gold Flat Fire District is deficient in staff and equipment for fire protection (emergency medical is adequate) and in office space. The North San Juan District needs a fire marshal on staff. The Watt Park Service Area is deficient in fire service response time and in staff. The Ophir Hill District is inadequate in staff, equipment, and office space. Bullion Hill is deficient in response time and in equipment, both fire fighting vehicles and emergency rescue equipment.

11.7 OTHER DISTRICTS/AGENCIES

Park and Recreation Districts

There are two separate park and recreation districts in Nevada County: Western Gateway Park and Recreation District and the Truckee Donner Park and Recreation District. Figure 11-6 illustrates existing recreational facilities in the County.

Both districts are generally well staffed and equipped for the majority of the programs provided. Both districts, however, have significant deficiencies in softball facilities and Truckee Donner is in need of additional indoor space because of the seasonal variability of climate. Both districts have considerable undeveloped park acreage which has not yet been improved due to lack of available funding.

Truckee Tahoe Airport District

The Truckee Tahoe Airport District serves the Reno-Tahoe area, as well as Tahoe Village and the rest of Nevada County. The facility is currently adequately staffed and equipped for the services provided.

Cemetery District

The Nevada County Cemetery District, which provides landscaping, maintenance and other services to the cemeteries, is adequately staffed and equipped and facilities are sufficient.

11.8 STATE AND FEDERAL AGENCIES

In addition to contacting County agencies, several state and federal agencies which serve the County were also interviewed. These agencies were: California Department of Forestry, California Department of Forestry-Fire, Northern Sierra Air Pollution Control District, California Department of Fish and Game and the U.S. Forest Service-Tahoe National Forest. Although these agencies are independent from the County jurisdiction, they currently provide services to the County or County residents. The results of these interviews are summarized in Appendix C under "State and Federal Agencies."

CULTURAL AND HISTORIC RESOURCES

12

12.1 OVERVIEW

A variety of prehistoric and historic site types occur within Nevada County. Prehistoric sites which have been inventoried include permanent villages and associated cemeteries, temporary multi-task camps, single task-specific locales (such as bedrock mortar milling features), and special use sites (to include hunting blinds, petroglyphs, and quarries). Major historic themes within Nevada County are manifest archaeologically by site types related to early settlement, mining, water management, logging, transportation, emigrant travel, ranching and agriculture, grazing, the ice industry, and recreation.

A variety of California laws have been passed in the last few decades which are designed to protect these sites. Consequently, the unique and varied cultural resources of Nevada County are incorporated into community planning studies, just like any other natural resource. But unlike most natural resources, cultural resources are nonrenewable. They are fragile and must be considered with sensitivity. Their integrity is diminished daily by natural deterioration processes and the pressures of growth. Archaeologists have estimated that more than 80 percent of California's prehistoric record has already been destroyed before it could be studied. This makes the inventory and protection of significant remaining sites all the more urgent and requires that this resource be conserved to the best of our ability.

12.2 EXISTING RESOURCE SURVEYS

The varied environmental zones, the geological characteristics, and the geographical position of Nevada County account for a cultural resource base which is exceedingly rich and exceptionally complex. This explains the relatively large number of recorded prehistoric and historic sites and the wide array of site types. Nevada County contains 978 square miles or 625,920 acres. Approximately 52,500 acres, or about 8% of Nevada County has been subjected to archaeological survey with relatively "complete" coverage. (Complete coverage implies the implementation of a systematic survey at 30-meter transect intervals or less.) This includes about 29,300 acres surveyed on private lands, 22,800 acres on Forest Service lands and 480 acres on Bureau of Land Management lands. Within this total County area, approximately 1,490 prehistoric and historic archaeological sites have been recorded to date (see Appendix C). Considering the total number of sites recorded in the County and given the amount of acreage that has been surveyed, it can be estimated that the potential number of sites expected within Nevada County number about 17,900, leaving about 16,400 potential archaeological sites yet undiscovered. On the average, one site is expected per every 35 acres surveyed within Nevada County. This figure accounts for a relatively high site density, especially when considering that nearly half of the total prior archaeological coverage within the County falls on forested and mountainous public lands which are, overall, less likely to contain cultural resources.

12.3 HISTORIC SITES

The National Register of Historic Places is the official list of the nation's cultural resources especially worthy of preservation. It was established to help preserve the diversity of our cultural heritage by highlighting the outstanding remaining examples of all site types. Thirty-nine sites within Nevada County are either listed on, or have been determined eligible to the National Register (see Appendix C). An additional 22 historic properties have been nominated to the National Register, but their eligibility remains to be determined (see Appendix C). Nineteen Nevada County sites are listed as California Historic Landmarks (Appendix Table 6), 27 properties have been established as Points of Historical Interest (see Appendix C), and another three sites are on the general State Inventory of Historic Places (see Appendix C).

12.4 CULTURAL RESOURCE SENSITIVITY MODELS

Cultural resource sensitivity models offer valuable guidelines in advanced community planning by providing sensitivity ratings which estimate the probable likelihood of cultural sites occurring within a given area proposed for development. In this way, project sponsors can anticipate, at the outset, the extent to which cultural resources may become a constraining issue later on. Sensitivity models are not meant to replace a project specific records search by the North Central Information Center at California State University at Sacramento or a field survey by a professional archaeologist. While the formal records search is required, field surveys are not always necessary. Not every project area needs to be physically inspected (for example, selected areas in low sensitivity zones); but the option to require a field study rests with the archaeologist. In the event that field work is required, the sensitivity model provides a beginning point from which archaeological survey strategies are then tailored, so as to minimize the number of acres requiring examination, while still maintaining a survey intensity sufficient to identify all the cultural resources in a particular project area. Project

areas in high sensitivity zones are addressed at the earliest states of planning, where the likelihood of encountering cultural resources is high and project modifications and/or further mitigative research are usually anticipated. Accordingly, sufficient time and money can be appropriated. It is beneficial for all concerned to know what may be necessary before project planning progresses too far.

Cultural resource sensitivity predictions for Nevada County are derived from the collective results of many archaeological surveys in similar environments throughout the region. Cultural sites do not appear to be randomly located. Rather, it is apparent that the prehistoric and historic inhabitants of an area selected specific locales in which to occupy or work because of the presence of particular environmental conditions. The goal of sensitivity models, then, is to identify the kinds of environmental situations in which sites may be expected to occur. This requires an understanding of the relationship between independent environmental variables (such as elevation, slope, aspect, proximity to water, etc.) and dependent cultural variables (or sites types to include prehistoric villages, task-specific locales, historic mining, logging sites, etc.). Checklists of environmental variables influencing cultural resource sensitivity assessment and their order of relative importance are presented in Appendix C. In general, correlations with specific environmental variables are better for prehistoric site types than for historic sites.

PERSONS CONTACTED /BIBLIOGRAPHY 13

13.1 PERSONS CONTACTED

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