

# CHAPTER VI

## OPEN SPACE / CONSERVATION

**A. INTRODUCTION AND PURPOSE FOR OPEN SPACE/CONSERVATION  
CHAPTER****1. State Government Code Provisions**

State planning law requires the County to identify environmental resources and hazardous conditions existing within its boundaries. State law also requires the preparation and implementation of policies which relate to the utilization and management of these resources and assure public health and safety. The following sections of the State Government Code are addressed in this Chapter:

- a. Sections 65302 d. and e.: Require the preparation of Conservation and Open Space Elements to specify policies for the conservation, development and utilization of natural resources including water, soils, rivers, fisheries, wildlife and minerals. The Code also requires provisions for the preservation of natural resources, managed production of resources, outdoor recreation and public health and safety.
- b. Section 65560(b) and 65561: Defines open space lands as "Any parcel or area of land or water that is essentially unimproved and devoted to open-space use." Such lands are further described as those necessary not only for the maintenance of the state's economy, but for assurance of the continued availability of land for the production of food and fiber, scenic beauty, recreation and the use of natural resources. Part of this section states that discouraging premature conversion of open space land to urban uses, is a matter of formal, public state interest which must be addressed in the chapter.
- c. Section 65564: Requires that every local Open Space Plan contain an action program consisting of specific programs to be pursued in the implementation of its open space policies.
- d. Section 65566: Any action by the County by which open space land is acquired or disposed of or its use restricted or regulated, must be consistent with the local open space plan; and Section 65567, which states that no building permit may be issued, or subdivision map approved unless the proposals are consistent with the County's Open Space Policy and Action Program.

## 2. Purpose of this Open Space/Conservation Chapter

The Open Space Chapter is a plan for the comprehensive and long-range management, preservation and conservation of "open-space lands." State provisions have clear statutory intent and, next to the land use provisions, are broadest in scope; therefore open space issues overlap those of other mandated elements. As one of the seven Chapters constituting the General Plan, it is most closely associated with satisfying the above referenced state requirements. However, this Chapter alone will not contain all discussions and policies related to these Government Code Sections; several issue areas are addressed further in other Chapters as will be noted.

This Chapter must contain provisions relating to the management and conservation of Merced County's natural resources and the protection of life, health and property from natural hazards. The natural resources addressed in this Chapter include land, water, plant, animal, cultural, archaeological, scenic resources and air quality. Public protection related open space topics are primarily covered in Chapter V. titled Safety, including geologic, flood and fire hazards.

The policies in Section C of this Chapter are designed to ensure that the development of the County will not significantly interfere with or destroy valuable natural resources and that it will occur with recognition of sensitive resources and hazardous conditions. The intent of the Plan is not to prohibit all types of development and uses of land in sensitive or hazardous areas, rather it is to recognize the role that wise management has in maintaining and enhancing the character of the County and its diverse resource production opportunities. The purpose of the Plan is to maintain the natural topography, vegetation, wildlife and scenic beauty of the County to the greatest extent possible while recognizing the County has balancing needs for affordable housing and economic opportunities.

The "Open Space Action Plan," which is found in Section D., describes how this and other Chapters of the General Plan, are coordinated in a broader policy framework to deal with issues related to natural resource preservation, production, public health and safety and outdoor recreation. Figure VI-1 briefly outlines several Federal and State related provisions which the County's Action Plan will need to recognize during project review the development of regulations to ensure consultation and coordination.

## 3. General Overview of Open Space Resources of Merced County

- a. Agricultural and Recreational Resources - Merced County's open space resources, as defined by Government Code Section 65561, include both agricultural and recreational values. The County's prime agricultural soil contributes significantly to the local economic base, with agricultural production comprising a major component, having a sales value of over \$973,000,000 in 1988.

## FIGURE VI-1

STATE AND FEDERAL WETLAND AND WILDLIFE REGULATIONSFederal Clean Water Act

The Corps of Engineers regulates wetland fill primarily under Section 404 of the Clean Water Act. 404 permits are required for any wetland fill of over 1 acre. The Corps coordinates its approval of permits with the Regional Water Quality Control Board (RWQCB; which also must issue a 401 certification before the 404 permit is issued), the U.S. Fish and Wildlife Service, and the U.S. EPA.

The Corps can issue regional permits for specific classes or areas of fill. For example, if a local jurisdiction foresees a substantial amount of wetland fill due to planning and local development needs, that jurisdiction (or a group of landowners) can work with the Corps and the State and Federal wildlife agencies to prepare the basis for a regional permit.

The Corps also regulates activities in navigable waters under Section 10 of the 1899 Rivers and Harbors Act. The Merced River (below Highway 99) and the San Joaquin River are considered navigable waters under Section 10.

Federal Endangered Species Act (FESA)

The FESA prohibited the "taking" of a listed endangered or threatened species unless a non-jeopardy opinion has been issued for the proposed project under Section 7 of FESA or a Habitat Conservation Plan (HCP) for the species has been approved. The FESA is administered by the U.S. Fish and Wildlife Service.

HCPs are completed to resolve a regional issue regarding endangered species, similar to the regional permit described above for the Corps. These plans involve the development of an overall conservation plan for a particular species (or more than one species) for an area expected to have a number of projects affecting that species. An HCP is typically proposed by a local government in consultation with affected landowners. Once the HCP is approved by the Service, the various projects can all go forward without individual Section 7 consultations.

The U.S. Army Corps of Engineers and the Environmental Protection Agency signed a Memorandum of Agreement ("MOA") on January 19, 1989, that portends an expansion of their wetlands regulatory jurisdiction. Under the MOA, the Corps and EPA have agreed to delineate wetlands using a yet-to-be-released Federal Manual for Identifying and Delineating Jurisdictional Wetlands. This technical manual will embody a major policy decision to expand the definition of wetlands to encompass more and drier lands than before. Preliminary versions of that manual, reveal that the Corps and the EPA may soon reach out and touch lands previously not considered wetlands. The manual treats facultative-upland species, including Bermuda grass, sweetclover, common dandelion,

poison oak, Ponderosa pine, and western white pine, as wetland indicators. At the same time, evidently they will rely less on hydrology and more on vegetation in delineating wetlands. The result is the wetland label may be applied to drier lands. In a second Memorandum of Agreement, ("MOA") signed on January 19, 1989, the Corps and the EPA established new policies and procedures for handling violations of section 404 of the Clean Water Act. The result is a more active role by the EPA in enforcement of section 404 permits.

#### California Endangered Species Act (CESA)

The CESA also prohibits the taking or harassment of listed endangered or threatened species. The California Department of Fish and Game is the lead agency within the State for implementation of the CESA and makes written findings on proposed project effects to listed species.

The California Endangered Species Act (CESA) process for approving/authorizing the incidental take of listed species varies somewhat from the Federal process and also varies depending on the type of (CEQA) lead agency involved. For non-state CEQA lead agencies (i.e. counties, cities, special districts, etc.), the process involves the department issuing an Endangered Species Permit for Management Purposes, pursuant to Section 2081 of the Fish and Game Code. To obtain this permit, the code requires that a project (including mitigation/compensation measures) must result in benefits to the species.

#### Streambed Alteration Agreements

Section 1600 of the State Fish and Game code requires that any private or public entity seeking to alter a streambed must first reach an agreement with the State Department of Fish and Game as to the nature of the alteration and any needed mitigation. Streambeds are broadly defined by the Department and almost always include any wetlands.

In addition, thousands of acres of Federal, State, local and private recreational lands provide both passive and active opportunities for the County's residents and tourists.

- b. Plant and Animal Resources - Merced County is endowed with a significant variety of natural areas including foothills, stream corridors and wetland areas. These distinct environments provide a rich habitat for a diversity of plant and animal life. The County supports numerous wildlife and plant species included on either the Federal or State list of endangered and/or rare plant species.

Important wetland areas, particularly along the Merced River and the San Joaquin Flood Plain, have already been lost to agricultural and development activities. These natural areas contribute greatly to the County's quality of life as well as having regional significance for economic and recreational values. They support such activities as fishing, hunting and hiking.

- c. Mineral Resources - Much of Merced County's mineral wealth is due its proximity to the east and west foothill areas. Sand and gravel extraction constitute the major portion of the County's activity, both in terms of quantity of material produced and the value of extracted resource. In 1986 the County's sand and gravel production was 1.2 million tons with a value of over 5 million dollars--excluding transportation and manufactured products.
- d. Water Resources - Merced County water resources include numerous reservoirs, streams, creeks and ponds, whose waters serve the domestic and agricultural needs of the County as well as provide fish, wildlife and recreational opportunities.

The abundance and availability of water resources are vital to the County. They are essential for the County's agricultural operations and to ensure that adequate development opportunities are fulfilled. Water is also one of the key attractions for thousands of summer time visitors and critical for wildlife habitats to flourish.

- e. Cultural, Historical and Archaeological Resources - Merced County is fortunate to have a number of cultural and archaeological sites which have been preserved for the enjoyment of present and future generations. Several sites of historic significance are located in the County including two sites on the National Register of Historic Places and eleven sites designated as State of California landmarks.
- f. Public Protection, Man Made and Natural Hazards - Various areas of the County have natural and man made hazards which can expose the public to health and safety risk. Hazards for which minimizing risk is important include: Fire, flood, noise, hazardous and solid waste sites, airport approach patterns, geologic and ground water problem areas.

## B. OPEN SPACE AND CONSERVATION ISSUES

### 1. Wildlife/Vegetation/and Wetland Resources

Merced County is centrally located in the San Joaquin Valley bordered by the foothills of the Sierras to the east, the coast ranges to the west and generally the Chowchilla River to the south. From open grass and marsh lands to foothill scrub oak woodlands, the County enjoys a wide variety of vegetation and wildlife. Merced County is the heart of the central San Joaquin Valley River basin. Present plant composition is not the same as it was before the advent of modern settlers. Agricultural activities have significantly changed extensive areas. Freshwater marshes were once much more widespread throughout the Central Valley, covering as much as 4 million acres. Today, marshes cover only about 300,000 acres in the Valley and are restricted locally primarily to the fringes of waterways and historic oxbows (isolated parts of old channels) of the San Joaquin River, especially the east and west Grasslands areas.

#### a. Wetland Resources

"Inland wetland" areas can be defined as any area that is more or less regularly wet or flooded, where the water table stands at or above the land surface for at least part of the year. Merced County contains four basic types of wetlands: The riparian woodlands are typically found along the Merced River; freshwater marshes are found along the Merced and San Joaquin River corridor; vernal pools, which are found mostly in the grazed lands on the eastern and western foothill areas of the County; and alkali sinks and pools, are primarily located on the southern and western fringes of the County.

Close to 90 percent of the riparian vegetation once in existence in the Valley has been lost. The Merced River is the only area left in the County with significant riparian woodland vegetation and it is probably among the most valuable remaining in the San Joaquin Valley. Significant amounts of wetland and riparian vegetation exist along the San Joaquin River, Salt Slough and portions of Bear Creek, Los Banos, San Luis and Garces Creeks.

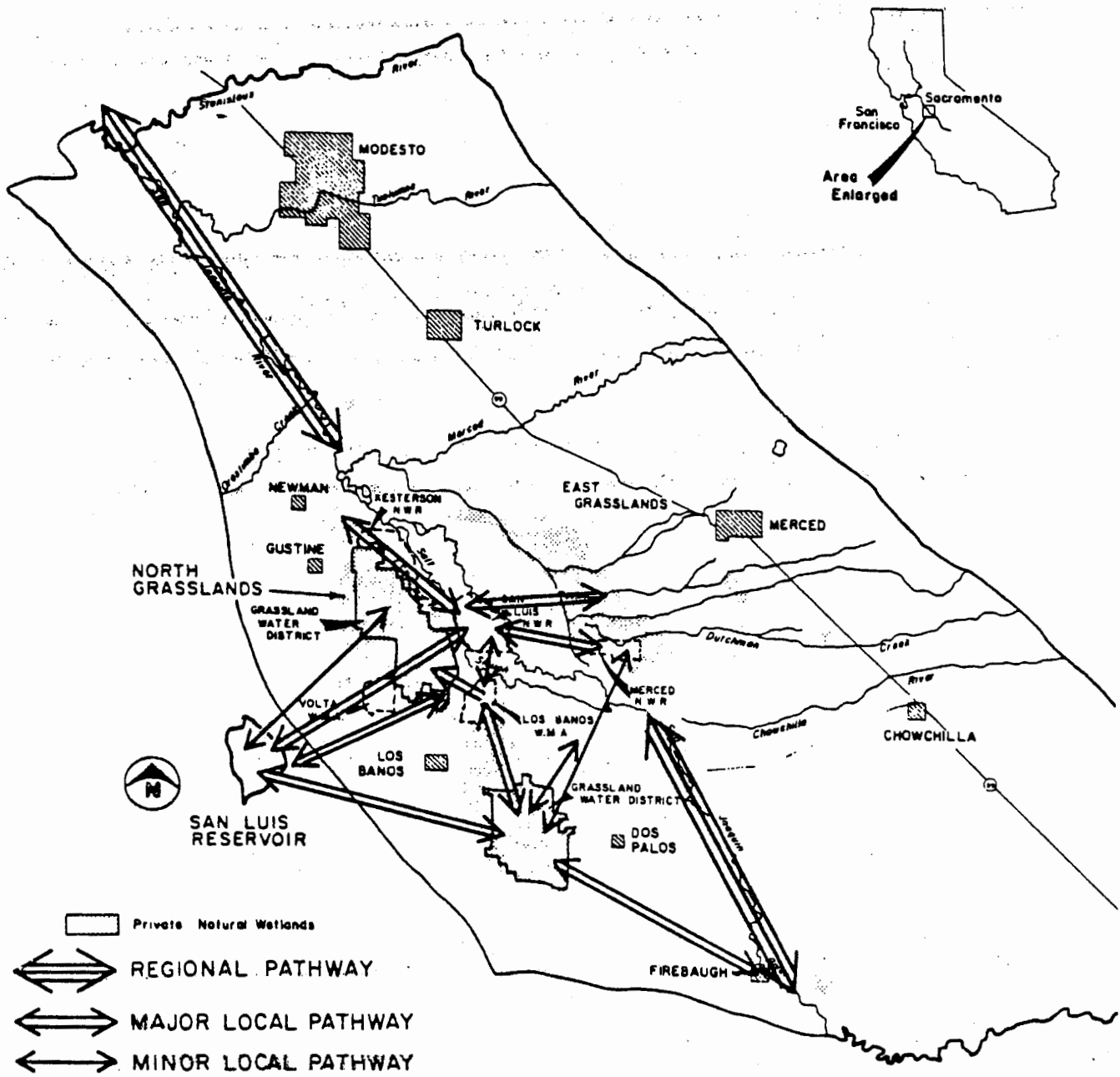
Most of the wetland types contained in the County have been subject to extensive degradation or losses throughout their range in California. Though the County has not been extensively urbanized compared to other counties, agricultural development has accounted for much wetlands loss.

The area known as the "Grasslands" in western Merced County is especially valuable for wetland habitat as it combines marsh, open water and grasslands; a mix of characteristics especially important for migratory waterfowl. This area, which covers about 87,500 acres, represents approximately 27 percent of the inland freshwater marsh area in the State.

In the west "Grasslands," approximately 21,500 acres are State and Federally managed and 66,000 acres are privately managed. The east "Grasslands" includes approximately 32,500 acres, of which 2,500 are State and Federally managed and 30,000 acres are privately managed. (See Figure VI-2 for an illustration of the grassland and waterfowl areas in the County.)

Much of the value of wetlands is derived from the shallow flow or ponding of water across a vegetated or semi-vegetated plain. The combination of shallow water and vegetation can remove pollutants from the water, increase nutrient production, flood storage and groundwater recharge, reduce storm erosion, create waterfowl and shorebird habitat, and provide passive and active recreation. Figure VI-3 lists the functional values of wetland areas in the County based on use of the "Adamus methodology", which is a qualitative method for evaluating wetland values used in the Federal Clean Water Act. The Figure summarizes functional use which is discussed more fully in the Technical Appendices, Section C. Figure VI-4 provides a general definition of the Adamus method. The County's wetlands are highly valuable wildlife and vegetation habitats within the Valley and State. Much of the County's resources are on private land although Wildlife Refuges protect substantial acreage. Approximately 11,000 acres of marshes (primarily in the grasslands area) are owned by the Federal and State governments with another 26,000 acres in the same area covered by protective easements. Future plans for the East Grasslands call for the purchase in fee of an additional 6,290 acres and easements over 34,050 acres. More recently the Army Corps of Engineers has likewise begun to purchase development rights over wetlands to ensure their flood retention capacities are retained in perpetuity. The purchase includes 2,800 acres of riparian and freshwater marsh wetlands along the San Joaquin River corridor as part of Corps policy to mitigate wetland losses. Map 18 illustrates wetlands generally classified into two groups. For additional discussion of Merced County's four wetland types see the Technical Appendices Section C, subsection III.





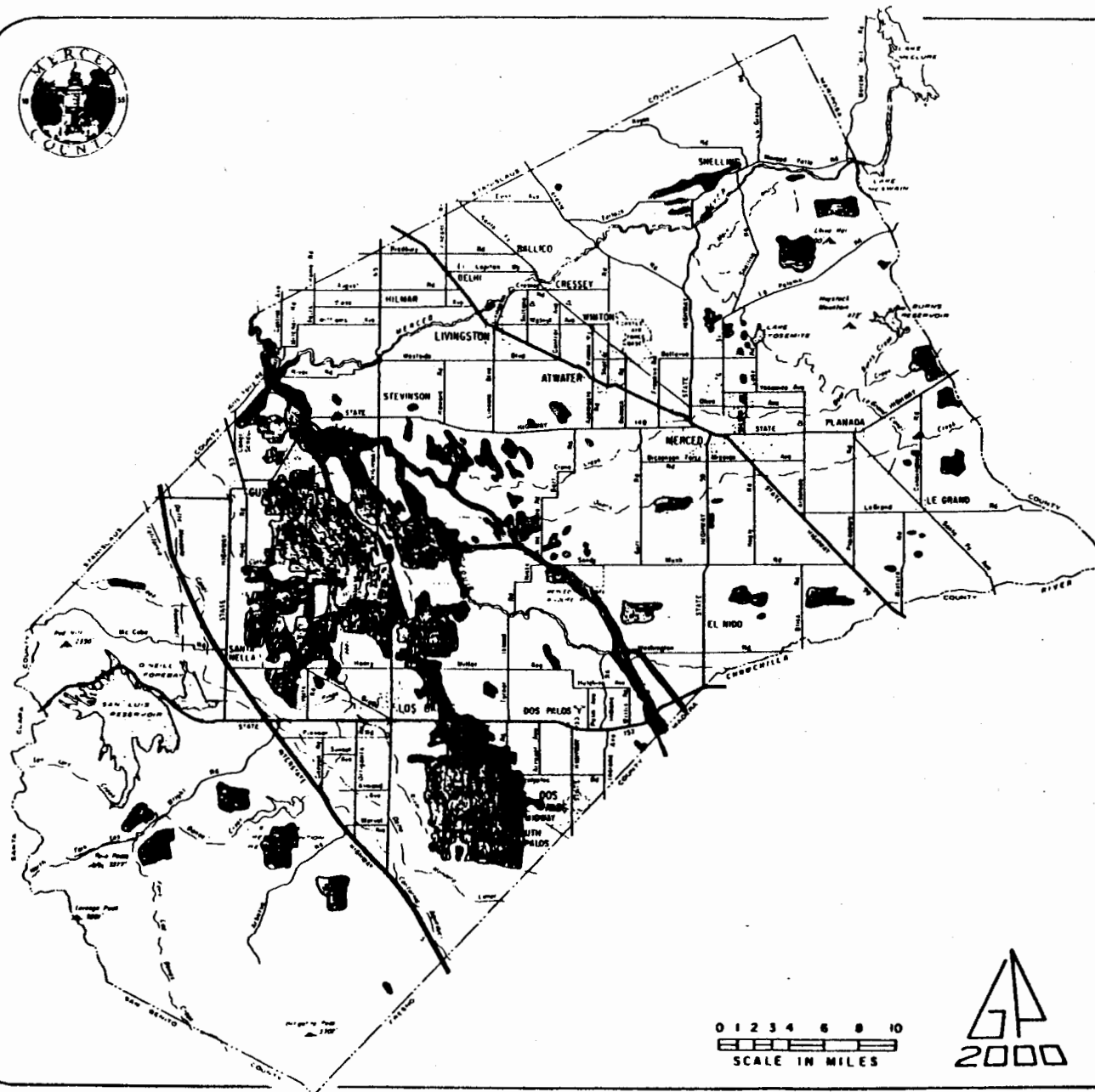
# SAN JOAQUIN BASIN

## Wetlands and Waterfowl Movement Pathways





## Wetlands



SOURCE: U.S. FISH AND WILDLIFE SERVICE  
NATIONAL WETLANDS INVENTORY,  
ZENTNER AND ZENTNER FIELD SURVEY  
1989

MERCED COUNTY  
YEAR 2000 GENERAL PLAN MAP 1B

FIGURE VI-3

### GENERAL FUNCTIONAL VALUES FOR WETLANDS AND OTHER SENSITIVE HABITAT FINDINGS

The following is drawn from a study by Zentner and Zentner Associates found in the Appendices Volume to the General Plan. The ratings provided in the first section are based on use of the "Adamus" methodology described in Figure VI-4. The findings listed in Section II summarize other habitat values identified by Zentner and Zentner.

#### I. Functional Wetland\* Values for:

##### A. Groundwater Recharge

1. The Adamus method rates riparian wetlands in the County as of high value for groundwater recharge due to the ponding of water in the various oxbows and overflow swales and the relative permeability of the soils underlying these wetlands.
2. The palustrine wetlands are rated as of moderate value; the underlying soils are generally impermeable but cracks in the soil do allow the ponded water to percolate into underlying aquifers.

##### B. Flood Storage, Shoreline Anchoring and Desynchronization

1. The County's riparian and palustrine wetland areas were rated as of high value for flood protection.
2. Wetlands in some areas may reduce flood peaks by as much as 60 to 70 percent.
3. The Adamus method rates the County's riparian wetlands as of high value for flood protection due to the density of the plant cover.
4. Palustrine wetlands generally have only moderate values for shoreline anchoring due to the lack of substantial vegetation.

##### C. Sediment Trapping

1. Riparian wetlands, especially those in oxbows which are inundated during floods, have high values for sediment trapping. The oxbow wetlands near the Los Banos-Gustine corridor of the San Joaquin River may trap substantial amounts of sediment. Surveys during the Zentner study found several deposits of new silt in these wetlands.
2. Palustrine wetlands generally have low values for this function, as evidenced by the absence of sedimentation in these basins.

## D. Nutrient Retention and Food Chains Support

1. The County wetlands would be rated high for this function. The riparian and palustrine wetlands suspend flows and reduce nitrogen outputs through trapping and plant use (riparian wetlands) or through conversion to gas (palustrine wetlands). In essence, due to the ponding which occurs and the growth of algae or other plants, these wetlands act as primary treatment lagoons.
2. Wetland areas are rated as having high value for food chain support. The riparian wetlands provide nutrients in the form of leaf litter, decomposing plant detritus and invertebrates which are fed upon by migratory and resident fish. The palustrine wetlands provide algae and invertebrates which are fed upon by migratory shorebirds and waterfowl.

## E. Fisheries and Wildlife Habitat

1. The Adamus method would rate the County riparian wetlands as of high value for this function. The Merced River wetlands, for example, can support a run of 24,000 king salmon. This represents 30% of the total run expected throughout the San Joaquin drainage and 2.5 percent of the total potential run in the State.
2. Palustrine wetlands have low value for fish habitat due to their ephemeral (seasonal) ponding and often alkaline waters. However, palustrine wetlands can be of value to amphibians and some reptiles.
3. High value for waterfowl especially as a major portion of the Pacific Flyway.

## F. Active, Passive Recreation and Heritage Values

1. County wetlands are used extensively for active recreation such as hunting, fishing and boating.
2. County wetlands have potentially high value for aesthetic enjoyment, picnicking, education and research.

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\* For the purpose of wetland analysis using the Adamus methodology in the Zentner Study wetlands were divided into two general types as follows:

1. "Riparian" wetlands, which are generally adjacent to rivers and stream, heavily vegetated and typically wet or saturated for the majority of an average year.
2. "Palustrine" wetlands which are generally isolated from surface water flows except during major floods, sparsely vegetated and typically dry for the majority of the year. These wetlands are often known as alkali sinks or mudflow vernal pools and are found on the periphery of the County, especially on the western, southern and eastern borders in grazed lands.

FIGURE VI-4

THE ADAMUS METHOD

Wetland values identification can be determined by one of several methods. The most widely used method is that of the Army Corps of Engineers, the Adamus method. The Adamus method is an evaluation technique developed by the Federal Highway Administration as a qualitative method for evaluating wetland values. The system is based on the functions described for wetlands in the Federal Clean Water Act. The methodology relies on use of a large number of factors to determine wetland value for each wetland or wetland type. The number of factors of "predicators" examined increases the accuracy of the results which can be used to compare the opportunity and effectiveness of different wetlands for specific values. The results are qualitative in that they are expressed as ratings of high, moderate, or low for each value of function of a particular wetland or wetland system. Moreover, this method looks at not only values such as location, vegetation and climate, but other factors that include storm buffers, erosion control, recreation and overall human interaction.

Figure VI-3 summarizes the higher values for the two general types of wetlands outlined in the text for the wetland areas identified on Map 18. A more complete description on the wetland values can be found in the Technical Appendix, Section C.

b. Wildlife and Vegetation Resources

The County's low elevation and extensive grazing activities in the foothills limits forest or commercial timber values. Foothill areas have a few scattered Digger Pines and the more common Blue Oak, which is widely spaced. Young oaks have difficulty surviving to replace old oaks due to cattle grazing. Other trees found in the western part of the County are the California Buckeye, Juniper Sycamore, Live Oak, White Oak, Fremont Cottonwood, Interior Live Oak, and Willow. The tree most often found in the eastern part of Merced County is the California White Oak, common along the Merced River bottom land and channels of the lesser streams. Other trees along the streams are Oregon Ash, Boxelder, and several types of willows.

There is no commercial logging activity in the County or any Timberland Production Zoning as provided for in Government Code Section 51112 and 51113. While no commercial timber production values are associated with the limited forest resource areas in the County, the various species of trees provide a variety of benefits including: wildlife habitat, watershed protection (primarily in the coastal range) and general aesthetic value. Because much of the woodland areas of the County have been lost to farming and grazing activities, the remaining stands of oak and other trees have a more important value.

FIGURE VI-5

ENDANGERED/SENSITIVE SPECIES  
CONSERVATION/OPEN SPACE ELEMENT

Sensitive species were defined as those organisms formally listed by either the Federal or State governments as endangered or threatened species. Effects to listed species are regulated by the respective government agencies. The plants and animals listed below may graphically be located on maps 19 and 20. (Please see the technical appendices for an expanded list of animals and plants, which includes candidate species).

A. WILDLIFE

1. **Aleutian Canada Goose** (Branta candensis leucopareta) is Federally listed as endangered but is not listed by the State. This goose is rarely known from the marshes on the San Joaquin River corridor and is sighted occasionally in the Wildlife Refuges or in adjacent gun club lands. It is primarily found in the Modesto area. Its likely distribution in the County would be limited to the wildlife refuges and adjacent marshlands and grainfields.
2. **Swainsons Hawk** (Buteo Swainsoni) is a candidate for Federal listing (category 2) and is listed by the State as threatened. This hawk typically nests in riparian forests adjacent to open lands. The species formerly nested throughout the open plains of California and is now restricted to the Central Valley.
3. **San Joaquin Kit Fox** (Vulpes Macrotis Mutica) is Federally listed as endangered and is listed by the State as threatened. San Joaquin Kit Fox occur both along the west side of the County and along the San Joaquin River (primarily in the vicinity of the San Luis National Wildlife Refuge). The movement corridor (genetic interchange area) exists along the Highway 33 and I-5 corridor.

Within Merced County, the alkali sinks and dry grasslands of the west County are the most likely habitat. Kit fox den locations are known from a zone which begins (in the County) just north of Quinto Ranch and then continues southeast of the Los Banos Grandes Reservoir. The fox's likely distribution in the County includes all open lands between InterState 5 and the foothills.

4. **San Joaquin Antelope Squirrel** (Ammospermophilus nelsoni) is a candidate for Federal listing and is listed by the State as threatened. This species was once found throughout the Central Valley and is now restricted to dry grasslands and alkali sinks in spotty locations.

5. **Giant Kangaroo Rat** (*Dipodomys ingens*) is Federally listed as endangered and is listed by the State as endangered. This rat is found on the eastern side of the San Joaquin Valley from Merced County to southern Kern County. Its preferred habitat appears to be grassy hillsides near alkali sinks or draws; these habitats are found in eastern Merced County around the Los Banos Grandes Reservoir and to the south.
6. **Fresno Kangaroo Rat** (*Dipodomys nitratooides exilis*) is Federally listed as endangered and is listed by the State as endangered. This rat is known from the San Joaquin Valley floor from Merced County south to the northern border of Tulare County. It appears to prefer open grasslands; grazing may assist in habitat value by reducing vegetation density. Its habitat in Merced County is the grazed lands in the south central portion of the County.
7. **Blunt Nosed Leopard Lizard** (*Gambelia silus*) is Federally listed as endangered and is listed by the State as endangered. This lizard is known from the valley floors of the San Joaquin and Cuyama Valleys and Carrizo Plain. They appear to prefer open plains with alkali sinks and sandy washes. Little is known about the populations but the open grazed plains in the south central portion of Merced County (new Los Banos) are thought to be prime habitat.
8. **Valley Elderberry Longhorn Beetle** (*Desmocerus californicus dimorphus*) is Federally listed as threatened but is not listed by the State. This beetle once resided throughout the Central Valley on elderberry plants but is now reduced to a few locations.
9. **Giant Garter Snake** (*Thamnopsis couchi gigas*) is a candidate (category 2) for Federal listing and is listed by the State as threatened. The snake is known from the Central Valley from rivers, creeks, irrigation ditches, and rice fields. It appears to prefer smaller tributaries (about 15 feet wide) which do not contain substantial open water but do contain cattails and tules.

## B. PLANTS

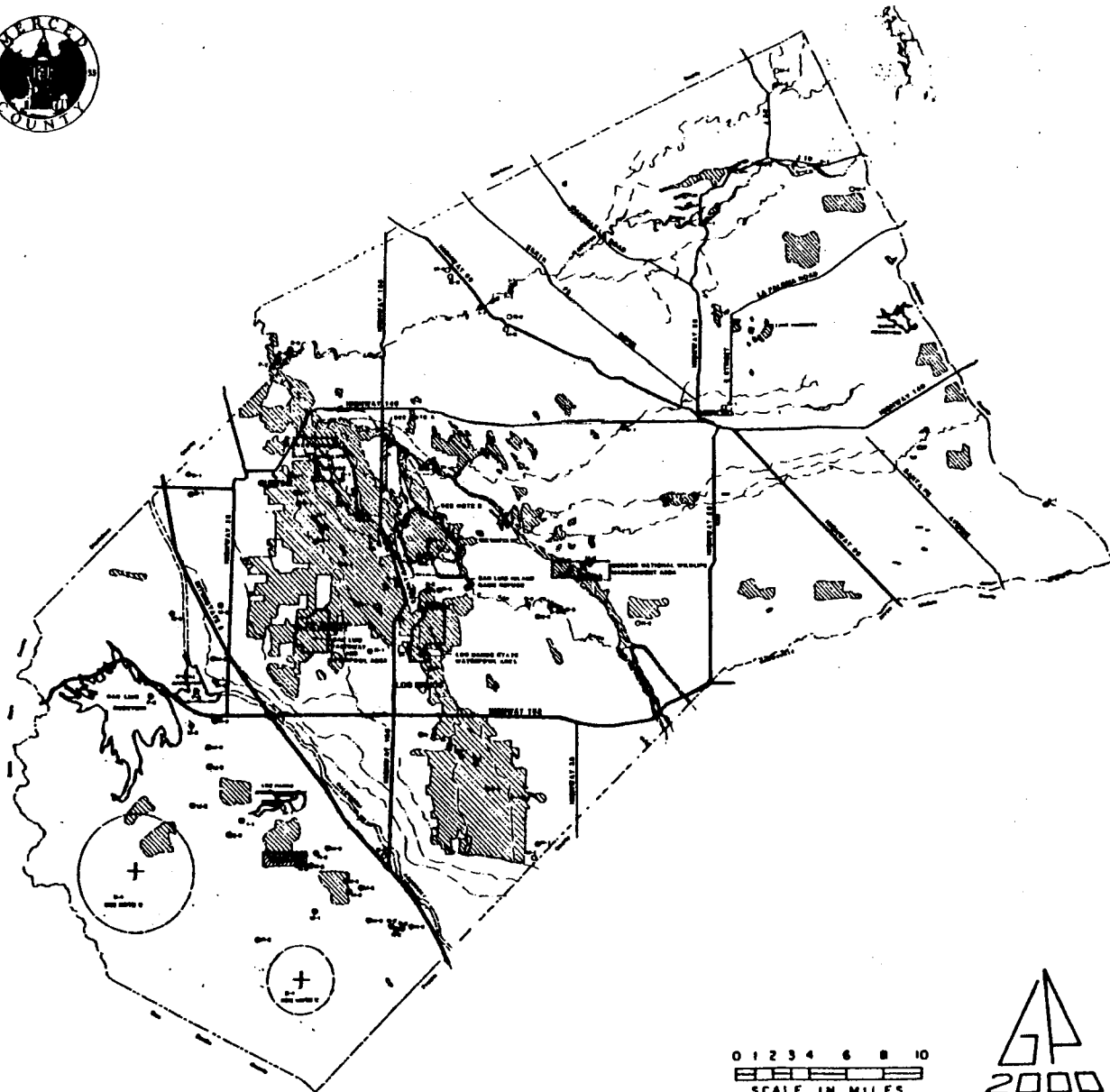
1. **Colusa Grass** (*Neostapfia colusana*) is a candidate (category 2) for Federal listing and listed as endangered by the State. This plant is known from vernal pools on the west side of the Central Valley.
2. **San Joaquin Valley Orcutt Grass** (*Orcuttia inaequalis*) is a candidate (category 1) for Federal listing and listed as endangered by the State. This grass is known from vernal pools on the eastern slopes of the San Joaquin River corridor and the volcanic soils in the eastern portion of the County.

3. **Hairy Orcutt Grass** (*Orcuttia pilosa*) is a candidate (category 1) for Federal listing and is listed by the State as endangered. This grass was also historically found in Merced County vernal pools but no recent reviews have cited the County as habitat. Two older sightings near Merced and south of Snelling may have confused this species with *Orcuttia inaequalis*.
4. **Greenes Tuctoria** (*Tuctoria Greenei*) is a candidate (category 1) for Federal listing and is listed as rare by the State. This grass was once known to occur from Tehama to Tulare Counties but now appears restricted to Tehama and Stanislaus County vernal pools. Sightings in Merced County are restricted to southeastern portion of County in vernal pools just north and south of Le Grand.
5. **Delta Button Celery** (*Eryngium racemosum*) is a candidate for Federal listing (category 1) and is listed by the State as endangered. This species occurs on frequently flooded, recent alluvia in association with willows, *Lippia* spp., and other riparian/march seedlings. The Data Base shows numerous sightings along the East Side Bypass (which may be the southern extent of the population) and the San Joaquin River and Salt Slough junction.
6. **Succulent Owls Clover** (*Orthocarpus campestris*--variety *succulentus*) is a candidate for Federal listing (category 2) and is listed by the State as endangered. This species occurs in and is adjacent to vernal pools.

At least 27 species of listed endangered or threatened plant and wildlife species have been found in the County, including the San Joaquin Kit Fox and the Aleutian Canadian Goose. Listed species are provided in Figure VI-5. Other candidate species for either the State or Federal list may also be in danger or extremely sensitive due to habitat requirements or other factors. Too little is known about the extent of such species in the County, and while Federal and state laws protect these unlisted species, no regulations protect the unlisted species or the species currently listed as candidates for listing. (Candidate listing is found in the Technical Appendices, Section C, subsection IV.) As the habitats of some of these species are limited, unwitting actions could easily wipe out an entire population in the County. Many of these species are also found in wetlands, especially the vernal pools and alkali sinks on the County periphery. Map 19 and 20 illustrate the general sitings for those plants and animals found on either the Federal or State List.

The central San Joaquin Basin is also part of the Pacific Flyway and an important concentration area for ducks early in the fall. A general reflection of the flyway is presented in Figure VI-6 and more localized waterfowl movement patterns are illustrated on Figure VI-2. The flyway extends from western Canada through the western United States to Mexico. A major portion of the winter and summer migration is through the Central Valley. Available waterfowl inventory data indicate that the number of ducks peak from mid-November to mid-December, with pintails accounting for most of the ducks. The Central Basin supports about one-





## Sensitive Wildlife

### LEGEND:

#### Site Record

- old or questionable record
- current record

#### Species Identification codes

I-1 Valley alderberry longhorn beetle

F-1 Kern brook lamprey

F-2 Sacramento splittail

F-3 Sacramento perch

A-1 California tiger salamander

R-1 Giant garter snake

R-2 Blunt nosed leopard lizard

B-1 Tricolored blackbird

B-2 Aleutian Canada goose

B-3 Swainson's hawk

B-4 Prairie falcon

M-1 San Joaquin antelope ground squirrel

M-2 Giant kangaroo rat

M-3 Fresno kangaroo rat

M-4 Merced kangaroo rat

M-5 San Joaquin pocket mouse

M-6 San Joaquin kit fox

NOTE A- Numerous site records of the San Joaquin kit fox from USFWS Studies.

NOTE B- Numerous site records and probable distribution of California tiger salamander in this area of the county (Jennings, Pers. Commission.)

NOTE C- Prairie falcon sites are protected information.

#### LAKES



#### DENSE WETLAND AND UPLAND



#### RIPIARIAN



#### WILDLIFE REFUGE

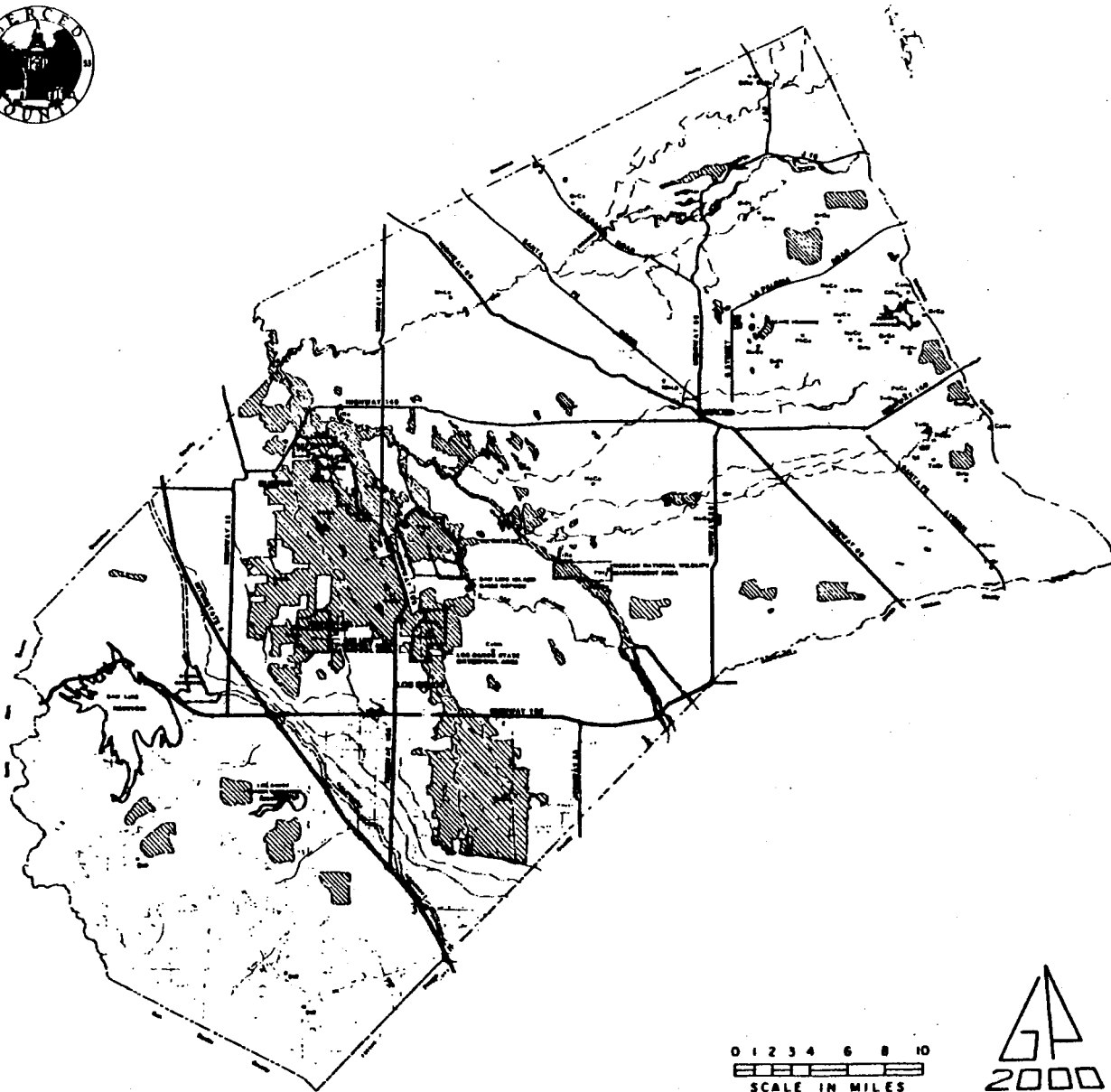


SOURCE: U.S. FISH AND WILDLIFE SERVICE  
NATIONAL WETLANDS INVENTORY AND  
CENTER AND CENTER FIELD SURVEY

0 1 2 3 4 6 8 10  
SCALE IN MILES



MAP 19  
MERCED COUNTY  
YEAR 2000 GENERAL PLAN



0 1 2 3 4 6 8 10  
SCALE IN MILES



## Sensitive Plants

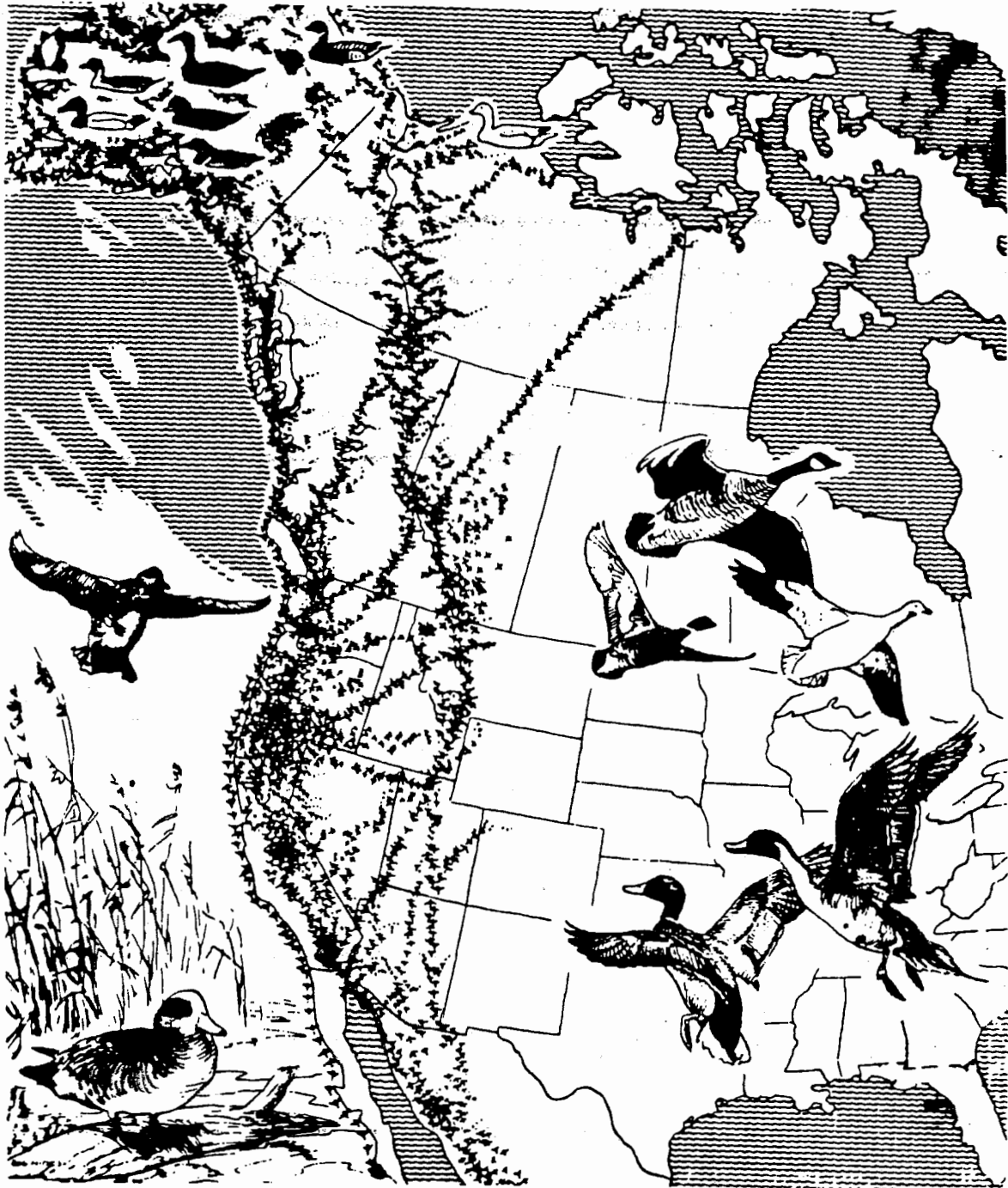
### LEGEND:

- CaHo *Calycadenia hooveri*
- CRo *Clarkia rostrata*
- CoMh *Cordylanthus mollis* ssp. *hispidus*
- DoHu *Downingia humilis*
- ErRs *Eryngium racemosum*
- MoLa *Monardella leucocephala*
- NeCo *Neostepha colusana*
- OrIn *Orcuttia inaequalis*
- OrPl *Orcuttia pflusa*
- OrCs *Orthocarpus campestris* var. *succulentus*
- PhCo *Phacelia ciliata* var. *opaca*
- PlHy *Plagiobothrys hystericulus*
- PlHy *Plagiobothrys hesperis* ssp. *lyoni*
- TuAr *Tutoria grandis*

- LAKES
- DENSE WETLAND AND UPLAND
- RIPARIAN
- WILDLIFE REFUGE

U.S. FISH AND WILDLIFE SERVICE  
NATIONAL WETLAND INVENTORY AND  
RIPARIAN AND WILDLIFE HABITAT SURVEY

MERCED COUNTY  
YEAR 2000 GENERAL PLAN  
**MAP 20**



# Pacific Flyway

fourth of the Central Valley's Pintails and one-fifth of the Mallards. The number of geese tends to peak from mid-December to mid-January; the Grasslands and Los Banos Wildlife Management Area (WMA) support the largest flocks. The Central Basin also supports one-third of the Great Basin, Lesser, and Cackling Canadian Geese and 20 percent of the White-Fronted Geese in the Central Valley during mid-winter.

Major County waterfowl habitat areas consist of natural wetlands and native pasture. Natural and managed wetlands include the East, North and South Grasslands, the Los Banos Wildlife Management Area (WMA), San Luis National Wildlife Refuge (NWR), San Luis Reservoir as well as numerous smaller areas.

Water quality has a substantial effect on wetland and wildlife values in the County. The problems with high levels of selenium at the Kesterson Refuge have received a great deal of media and scientific attention. Much of that particular issue is outside the County's jurisdiction since the Refuge is Federal property and the selenium-laden drainage waters come from Fresno County. However, other toxic pollutants have surfaced in groundwater and require monitoring to ensure no harmful effects are felt in wetlands or among sensitive species. The U.S. Fish and Wildlife Service has begun water quality monitoring within the Grasslands area. (Also see Section G.6 for additional ground water discussion.)

The primary problem in maintaining wildlife today is the continued alteration or loss of habitat caused by man's activities. Some animal species are quite dependent on the existence of certain plant communities. Wetlands, for instance, have been noted to serve as a vital link in the Pacific Flyway. They also provide food, cover, water and living space to a large variety of resident wildlife.

According to the California Department of Fish and Game, both urban as well as rural homesites can have many impacts on wildlife, including: harassment by dogs and cats of ground nesting birds; disruption by children and other outdoor activists; elimination of habitat due to construction; trail disturbance from fencing; destruction of water resources by excess livestock grazing; reduction and elimination of water in springs when tapped for residential use, and the elimination of oak trees (a major food source for many wildlife species) for firewood cutting and land clearing activities.

## 2. Fish Resources

Merced County has both natural and developable fishery resources. "Fishery Resources" includes all non-game fish, amphibians, aquatic habitat and wetland associated reptiles. The County riparian wetlands are highly valuable for fisheries and other wildlife. The Merced River wetlands, for example, can support a run of 24,000 King Salmon (the 1985 run was 24,500 fish). This represents 30 percent of the total run expected throughout the San Joaquin River drainage basin and 2.5 percent of the total potential run in the State. Currently, King Salmon runs in the Merced River are one-tenth their potential due to inadequate seasonal water flows. Recent runs, have averaged only 2,500 fish due to low water conditions in the spring and fall. Prior to 1985, the Merced River also supported a strong rainbow trout fishery. Since then the trout fishery has declined markedly for unknown reasons. It can be presumed that the reduction in river and stream flows (which is due to dams and stream diversions) is affecting all fish and habitat migration. Low water conditions affect salmon, as they must have enough water in the streams in the spring to allow runs to pass the Delta pumps in the lower San Joaquin River. This creates a major draw on water supplies and flows. Fall flows are also often inadequate to attract migrating adults up the waterway.

Adverse impacts to the salmon resource can also arise from improperly designed sand and gravel extraction projects. (Loss of existing spawning riffles, loss of rock/gravel recruitment for maintenance of spawning areas, entrapment of adult and young salmon in gravel pits during high river flows, etc.) In addition, recreational and residential developments which reduce riparian vegetation and/or increase urban runoff (fertilizers, pesticides, oils, etc.) into the Merced and San Joaquin Rivers and road/bridge construction may also be affecting local populations.

Aside from the biologic impacts, adult fish loss results in significant opportunity losses to state and local businesses due to the absence of anglers and other recreational users. However, many other concerns also must be met by the same water supply, including agricultural production. The primary issue, therefore, is the attempt to balance the competing uses. Also, see Section B.1 of the Chapter which discusses related wetland concerns and Section B.6 for issues concerning watersheds and water quality.

However, special care should be taken in the permitting of facilities. Commercial aquaculture facilities can pose some specific problems. Potential problems include the accidental introduction of unwanted fish species into adjacent rivers during high flow events or by accident and the attraction of fish-eating birds (herons, egrets, king fishers, etc.) Birds can have serious impacts on fish farms resulting in the temptation for operators to illegally kill birds. Illegal control can have the effect of seriously reducing/eliminating nesting colonies of certain birds.

During the mid-1980's a trend towards establishment of commercial and recreational fish farms has been evident in the County, with operations active along

the Merced River, in the Snelling area, and in the Central San Joaquin Valley flood plain. These operations should be encouraged due to their potential support of the County's sport fisheries economy and food production, as well as recreation and tourism. However, special care should be taken in the permitting of facilities. Commercial aquaculture facilities can pose some specific problems. Potential problems include the accidental introduction of unwanted fish species into adjacent rivers during high flow events or by accident and the attraction of fish-eating birds (herons, egrets, king fishers, etc.) Birds can have serious impacts on fish farms resulting in the temptation for operators to illegally kill birds. Illegal control can have the effect of seriously reducing/eliminating nesting colonies of certain birds.

### 3. Soil Resources

Soil resource protection and management issues include loss of soil through erosion, depletion, contamination and conversion. Map 29 in the Agricultural Chapter (VII) identifies State designated important farm land soils. The following issue discussion is a supplement by discussion and provisions in the Agricultural Chapter (VII), Section B.2.

#### a. Soil Erosion

There is no reliable estimate of the annual amount of soil loss locally due to soil erosion. However, soil erosion is a natural process which can become accelerated by human activities such as construction and agricultural practices. The process often results in the loss of topsoil; the creation of deep ruts, gullies and sediment filled streams. Key factors affecting erosion and sedimentation are the extent of vegetation, vegetative cover, slope, amount of rainfall and soil porosity.

For example, development induced erosion resulting from construction activities, is the greatest source of localized sedimentation problems; primarily caused by vegetation removal, compaction of porous soils and large drainage areas. Improperly managed agricultural practices can also be a source of accelerated soil erosion, either from over grazing on sloped areas, land clearing or winter farming. Through cooperation with the Soil Conservation Service and local resource conservation districts, Merced County (and its farmers) maintain a high level of erosion control awareness and practice.

#### b. Soil Depletion and Contamination

If agriculturally mismanaged, soil can lose many natural properties necessary for plant growth, particularly organic matter content. In general, the organic content of County soils increases with good management.

Natural and man made chemical contamination is an issue facing some areas of the County, especially in the areas of urban development. Ongoing farming operations have chemical storage tanks and vehicles which historically have caused localized

contamination problems. Local agricultural experts are certain that pesticide contamination is presently not a problem in the County. They state that chemicals used have a short active life and are quickly broken down by natural processes. Most soil contamination problems that have arisen recently are associated with increased salts and selenium due to agricultural drainage and irrigation activities.

c. Land Use Implications; Soil Conversions

Agricultural and other open space land uses are capable of renewing and protecting the soil's productive potential and preserving its availability. Other uses, predominantly those requiring structural development, eliminate the soil's productive use. As a planning orientation, conversion of valuable soil resources from protective to consumptive uses should be avoided. Extensive discussion on this topic is presented in the Agricultural Chapter (VII), Section B.3.

4. Mineral Resources

a. "Surface Mining and Reclamation Act."

The Surface Mining and Reclamation Act (SMARA) of 1975 requires the State Board of Mining and Geology and the State Geologist to prepare mineral resource reports that designate mineral deposits of statewide and regional significance for all counties. Under SMARA, the County will be required to recognize this information in either this chapter or in a separate mineral resource management element of the General Plan within 12 months of receiving this information. The State has yet to survey Merced County. Therefore the following discussion is not based on a comprehensive inventory of these resources in the County.

b. Merced County Resources

The majority of the County is situated in the center of a great agricultural belt, produced primarily from unconsolidated sedimentary rocks and alluvial sediments deposited by several of the great river tributaries draining into the San Joaquin River. The mineralogical occurrences of the County are, therefore, less numerous than other areas of the State.

Active mining is occurring in concentrated locations on both the eastside and westside of the County with a sand deposit located in the Atwater area. Mining activities are located in the alluvial flood plain deposits of the Los Banos Creek and the off-channel flood plain of the Merced River. Geologically speaking, sand and gravel deposits are relatively young. Merced River deposits are estimated to be 10 thousand years old. Los Banos Creek deposits are estimated to be 10 million years old.

Mineral extraction has occurred on the Merced River and Los Banos Creek since the late 1800's. In the past, gold dredging operations have been practiced in the

eastern foothills along the Merced River. Although this practice ended in the early 1950's, several proposals to extract leftover trace-silver, gold and other metals in the dredger tailings, have been approved in recent years. However, mineral extraction is currently limited mainly to sand and gravel operations. Approximately one million tons are mined annually, primarily from streambeds and flood plain deposits. Other local mineral resources include gypsum, found west of the San Joaquin River, and diatomite. Some test oil and natural gas drilling has been attempted numerous times at various locations throughout the County, but with no apparent success. Indications are that gas drilling may be productive, however, no commercial operations are active. Figure VI-7 identifies other minerals found in the County.

Sand and gravel operations will continue to have the greatest potential for commercial utilization in unincorporated areas. It is the most valuable mineral resource in the County. It is created from years of mountain erosion and from seasonal storms that result in rapid stream movement often referred to as "gulley washers" which come down from the mountain side. Figure VI-8 lists current mining operations in the County and Map 21 illustrates the general distribution of potential sand and gravel resources. As noted on the map, only potential areas of resources are identified. Actual viability for commercial extraction is unknown.

Increasing population will also increase demand for mineral resources, particularly sand and gravel; therefore, alternative sources other than existing active channel sources may be needed. The upstream damming of water courses in Merced County has significantly reduced replenishment; therefore, once extracted, mineral resources should be considered non-renewable. Hardrock source alternatives have not been surveyed.

Benefits to the County economy from mining operations may be offset by their potential for disruption of the environment. Extractive operations tend to generate a great deal of controversy due to their operational characteristics which include dust, noise and traffic. Gravel extraction may also affect some aquifers by decreasing the amount of groundwater for agricultural or domestic use during the irrigation season. Groundwater can be affected by instream extraction in two ways: affecting valuable recharge areas by lowering the water table and, if significant water is used in processing, potential effects on aquatic and terrestrial life may also directly or indirectly result. Habitation destruction is usually due to removal of riparian vegetation and streambed siltation. Quarry operations can result in



## FIGURE VI-7

## MINERAL RESOURCES OF MERCED COUNTY

Resources other than sand and gravel from Merced County are: aragonite, calcite, chalcopyrite, copper, glauconite, gold, gypsum, hydromagnesite, jarosite, lawsonite, pumpellyite, soda niter, sphalerite, stibnite and stilpnomelane.

**Aragonite** occurs in veins and replacement patches in the Franciscan rocks in the vicinity of Pacheco Pass. It is sometimes associated with lawsonite, pumpellyite and stilpnomelane. (B.McKee (2) p.382)

**Calcite** in the form of Strontiancalcite is reported from Delhi, CDMG (16326)

**Chalcopyrite**--small amounts of chalcopyrite occur in the Jose Copper Mine (sec. 4, T14S-R9E MDMB) and Victor Bonanza Mine (T13S-R9E), Aubury (1) p. 146.

**Copper** occurs with quartz and chalcopyrite in the Victor Bonanza Mines, 16 miles from Dos Palos (T13S-R94 MDMB), Lowell (1) p. 605.

**Glauconite** occurs with jarosite in sandstone (sec. 35, T11S-R10E MDMB), 10 miles south of Los Banos, Briggs (1) p. 902.

**Gold**--deposits of placer gold have been found historically along the Merced River, Burns Creek, Bear Creek and Mariposa Creek on the eastern side of the Valley.

**Gypsum** occurrences of no particular commercial or mineralogical interest have been reported for Merced County by Watts (1) p. 331.

**Hydromagnesite**--a specimen of hydromagnesite in the Stanford University Collections came from the Bald Eagle Mine, near Gustine.

**Jarosite** (1) Yellow-Brown colloform crusts of jarosite have been found in a few antimony veins of the Stayton Mining District in Merced and San Benito Counties, E.H. Bailey and Myers (4) p. 418, (2) Jarosite in microscopic grains occurs abundantly in glauconite-Jarosite sandstone (sec. 35, T11S-R10E MDMBJ), Briggs (1) p. 902.

**Lawsonite** is associated with aragonite, pumpellyite and stilpnomelane in Franciscan rocks of the Pacheco Pass area, Bates McKee (2) p. 384.

**Pumpellyite** is sometimes associated with brown stilpnomelane, lawsonite and aragonite in Franciscan rocks of the Pacheco Pass region, McKee (2) p. 384.

**Soda Niter-Chile Saltpeter** occurs in crusts with other sodium salts, from Merced Falls, Hilgard (1) p. 25 and Laizure (3) p. 182.

**Sphalerite**--Triboluminescent sphalerite, with barite has been found near Merced Falls, Laizure (3) p. 175.

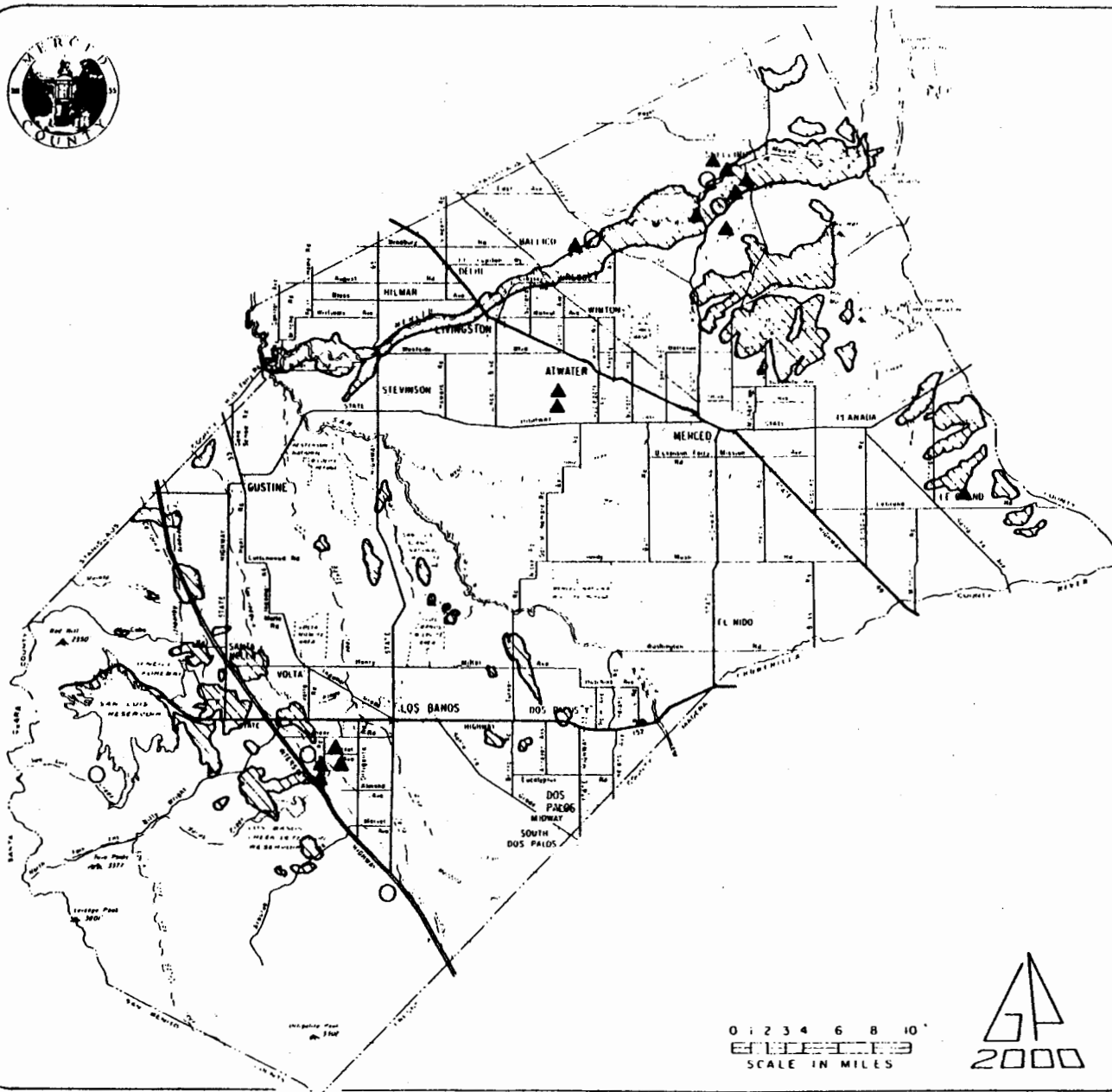
**Stibnite** (1) Fine specimens of prismatic stibnite have come from the Stayton (McLeod) Mining District (sec. 32, T11S-R7E MDMB) Laizure (3) p. 175 and (2) from the Red Metal Mine (sec. 32, T11S-R7E MDMB), Ireland (3) p. 350.

**Stilpnomelane** is commonly associated with lawsonite and aragonite as brown flakes in Franciscan rocks of the Pacheco Pass area, McKee (2) p. 384.

FIGURE VI-8

## LIST OF SURFACE MINING AND RECLAMATION OPERATIONS IN MERCED COUNTY

NAME	APPLICATION	LOCATION & ASSESSOR'S PARCEL NUMBER	ACRES
Los Banos Gravel	Land Excavation 217	Westside of Canyon Road on Los Banos Creek 88-070-72, 73	110
Western Stone Robinson South	Land Excavation 307	Southeast Corner of Merced River & Hwy 59 42-230-26	100
Western Stone Silva	Land Excavation 586	Northwest Corner of Merced River & Hwy 59 42-230-31	76
Gordon Clark	Land Excavation 683	North/South Sunset Drive 2000' East Central Avenue 56-270-35	29
San Luis Water District	Conditional Use Permit 1911	Los Banos Creek E/I-5 88-070-65,70	89
Los Banos Gravel	Conditional Use Permit 2004	Los Banos Creek E/I-5 83-180-17; 83-210-17, 23, 27	145
County-Craven	Conditional Use Permit 2080	South White Rock Road N/Le Grand Road 68-020-07	18
County-Wennig	Conditional Use Permit 2627	Los Banos Creek S/Pioneer Road 83-190-11	32
Blasingame	Conditional Use Permit 2870	Ingalsbe Slough E/State Hwy 59 43-040-33, 34	154
Western Stone Carson	Conditional Use Permit 3031	North/South Merced River 2 miles E/Cox Ferry Road 43-070-05	100
La Grange Gold Dredging	Conditional Use Permit 3075	Ingalsbe Slough W/Cox Ferry Road 42-160-32, 33	379
Turlock Rock	Conditional Use Permit 3266	North/South Merced River East End of Bradbury Road 140- 030-09	218
County-Sunset Site		1000' N/Sunset Drive 20	40



## Distribution of Sand and Gravel Resources

### LEGEND

- ▲ ACTIVE MINING SITES
- INACTIVE MINING SITES
- ▣ POTENTIAL LOCATIONS FOR SAND AND GRAVEL RESOURCE SITES

NOTE: PURPOSE OF MAP IS NOT TO LOCATE HARVESTABLE MATERIAL, BUT TO IDENTIFY POTENTIAL SAND AND GRAVEL RESOURCE AREAS.

SOURCE: #1 Eastern Merced County: Soils Survey  
U.S. Dept. of Agriculture 1962

#2 Western Merced County: U.S. Dept. of  
Agriculture Soil Conservation Service  
1984

0 2 4 6 8 10  
SCALE IN MILES



MERCED COUNTY **MAP 21**  
YEAR 2000 GENERAL PLAN

similar impacts as instream operation except the potential problem can also include affecting slopes and soils. To productively deal with these concerns the County can establish performance criteria and require monitoring in all operation approvals. Development of overriding policy or standards which would preclude utilization of certain mineral resources due to conflicts with other open space, wetland and wildlife preservation goals, can ensure a balance is achieved between competing resource values.

Reclamation of operations deserve attention, including attempting to ensure it occurs throughout the life of a project whenever possible. All mining operations are required by state law to provide reclamation plans. However, the degree to which reclamation is required following mining operations is often controversial due to practicality and cost. Existing mining operations which do not have approved reclamation plans have been required by the State and the County to submit plans for approval prior to June of 1990.

Extractive lands are not automatically considered permanent open space; however, through land use control in the reclamation of these operations, a future open space area for passive or active recreational facilities can occur. It is important that "post-use" planning of sand and gravel operations be initiated early in the development stages of the resource.

## 5. Historical/Archaeological Resources

Beginning with the earliest Indian inhabitants, Merced County has been the repository of a rich legacy of historical and archaeological resources. The Yokut Indian tribe inhabited the San Joaquin Valley for a long period before falling prey to European diseases in the 1830's. The resources the Yokuts and earlier tribes left behind include fossils, cemetery and camp sites, artifacts and relics.

During the 1830's, new settlements came into existence on the large Spanish land grants that had been established on the west side of the County. Later, during the gold rush, the west side became a major feeding stop for sheep and cattle being herded over the Pacheco Pass to San Francisco. The County was formed in 1855, and in 1857, the first courthouse in the County was erected in the town of Snelling. The east side of the County began its principal development after the building in 1870 of the Central Pacific Railroad, followed in 1896 by the completion of the Santa Fe Railroad. The County seat was moved from Snelling and was established in the town of Merced in 1872; by the turn of the century, communities grew around an agriculturally based economy. Today, historical structures and landmarks span all parts of the County. They are recognized for the architecture, design and artifacts contained within, as well as their role in the history of the County. Places of historical significance include only two sites in unincorporated areas listed on the National Register of Historic Places and eleven sites designated as State of California landmarks.

Only an estimated 6 percent of Merced County has been surveyed for evidence of archaeological or historical cultural resources. There are 292 recorded cultural resources in Merced County, 278 of which are prehistoric archaeological sites and 14 of which exhibit historical features. These sites for the most part have been recorded from localized, limited surveys. Records of known archaeological and historical cultural resources (as of March 1, 1989) are filed with the Office of Historic Preservation, Central California Information Center, California State University, Stanislaus, Turlock, California, (no list is provided within this chapter or the Technical Appendix in order to protect the sites from vandalism). Figure VI-9 lists those County, Federal and State listed significant sites and landmarks.

Areas that are considered "sensitive" and likely to contain archaeological or historical cultural resources are often located near natural watercourses, springs or ponds, and on elevated ground such as ridges and knolls. The channels of natural watercourses change over the years and springs dry up or emerge at different locations, therefore, archaeological sites are often found in areas that are distant from present-day sources of water. Many archaeological sites in the region have been covered by alluvial deposits and therefore, will not necessarily be evident solely by inspection of the ground surface. Disturbance or destruction of cultural resources may result from any type of activity that involves disturbing the earth or removing existing structures.

Types of archaeological sites that could occur in Merced County include (but are not limited to) occupation sites, indicated by structural features such as housepits, ceremonial ("dance house") locations, remains of sweathouses and storage structures, which are often found in areas that have been organically enriched by accumulation of domestic debris. Other types of archaeological sites include cemeteries, isolated burials, quarry sites, petroglyph (rock carvings) and pictograph (rock paintings) sites.

Many archaeologists consider that all types of archaeological sites are significant because all sites may have the potential to produce information of value. Hence, all archaeological sites merit recordation, mapping and investigation at a level of detail sufficient to obtain essential information, especially if a site will be impacted directly or indirectly as a result of a proposed action or undertaking.

What is the significance of Merced County's archaeological resources?  
"Significance" is one of the least understood concepts in archaeological and historic preservation. Broadly speaking, when assessing significance, an effort should be made to ensure that properties important to all sorts of people, and properties representing all sorts of cultural phenomena, are intelligently and efficiently treated. Preservation of historical and archaeological resources are a physical link with the past and reinforces self-identity for present day residents.

FIGURE VI-9

## MERCED COUNTY FEDERAL &amp; STATE HISTORICAL SITES

SITE	LOCATION	HISTORICAL SIGNIFICANCE
<u>FEDERAL</u>		
Shaffer Bridge	Northeast of Gustine	Carries River Road over Merced River
Truss Bridge	North of Winton	Carries Oakdale Road over Merced River
<u>STATE</u>		
Los Banos Creek	Southwest of Los Banos	Early visiting place for Padres from San Juan Bautista Mission
Pacheco Pass	West of S.L. Reservoir	Early and present principle route for settlers and travelers between coastal areas and Central Valley
Temporary Detention Camps For Japanese Americans	Southwest of Merced	World War II incarceration camp for Japanese Americans
Snelling Courthouse	Snelling	First courthouse in Merced County (1857)
Snelling Community Recreation Hall	Snelling	One of the oldest public buildings in Snelling
Merced County Courthouse	Merced	Site of first established County Government
G.B. Neighbors Home	Snelling	Historic homestead
U.S. Union Post Office Building	Northeast of Le Grand	One of County's oldest public buildings
Lake Yosemite Water Tower	North of Merced	Built in early 1900's
Buhach Grammar School	Northwest of Merced	County's oldest schoolhouse
San Luis Gonzaga Archaeological District	West of San Luis Reservoir	Site of historical and archaeological resources
*San Luis Camp Adobe	County Center	Oldest house in County (1848)

\*Not recognized by State or Federal historical designations

Significant cultural resources may be one of a kind, or they may be representative of their type; they may be the oldest known examples of their kind or they may be associated with the lives of important individuals. Assessment of the quality of significance should be made on a case-by-case basis and not upon an arbitrary point score system, or upon some other type of "cookbook" approach for determination of significance.

6. Watersheds, Water Quality and Quantity Resources
  - a. Water Supply and Watersheds

A drainage basin, or watershed, is commonly defined as "the area of land that drains water, sediment and dissolved materials to a common outlet at some point along a stream channel." This drainage can be from a small ephemeral (seasonal) stream to that on a regional scale, like the multi-county San Joaquin River system. Watershed boundaries are usually ridgelines, which can be easily identified on topographic maps.

The San Joaquin Valley is separated into two hydrologic basins by an indistinct divide which interrupts the lengthwise slope of the Valley. The San Joaquin Subbasin to the north (including Merced County), which drains to the Pacific Ocean; and the Tulare Subbasin to the south, which has an outlet only when rare flood flows carry its water across the divide and into the San Joaquin Subbasin. Merced County can be divided into the two major subbasins' drainage basins: Merced River and San Joaquin River. However, these basins are quite large. Both basins also can be divided further into smaller watersheds which are illustrated in Map 22. Also see Figure VI-10, which briefly lists major river and stream courses, canals and reservoirs within the County.

Water supply is one of the major factors used to determine the intensity of land use and the type of use which can occur in an area. Planning, using a regional or local watershed to establish, study and plan boundaries, is valuable for several reasons. It is on this level that natural and human-related actions most directly affect one another and land use conflicts can be identified. Hill slopes, rivers, groundwater bodies, urban storm drains, and irrigated fields are all connected as parts of a watershed drainage basin. If upstream users deplete the flow or damage its water quality, then downstream users will suffer. Adequate water quantity and quality are essential to all land uses within the County.

Groundwater is a very significant source of water in the County; especially for urban land uses. It is supplied by runoff from foothills and mountains which percolates through the soil to the San Joaquin basin underground aquifer. Water from one of the three general levels of aquifer is pumped to the surface through wells. Due to the variety of depths that occur regionally, the groundwater basin experiences fluctuation in the depth of its water table

FIGURE VI-10

## MERCED COUNTY MAJOR RIVERS, CREEKS, CANALS &amp; RESERVOIRS

<u>RIVERS</u>	<u>LOCATION</u>	<u>USES/DESCRIPTION</u>
Merced	N.E. portion of County	Drainage area of 1040 sq. miles, flow average of 969,400 acre feet annually, diverted by MID, provides source water for other water systems
San Joaquin	County Center	Irrig. water, average annual flow below Friant Dam (Madera County) of 1,721,000 acre ft., supplies water to Tulare HSA
Chowchilla	S.E. Merced/Madera	Drains area of 240 sq. miles, regulated by Buchanan Dam (Madera County) annual flow of 71,900 acre fee, diverts water to LaBranza Water District
<u>CANALS</u>		
Delta-Mendota	Westside, parallels I-5	Conveys water from Tracy Pumping Plant to Mendota Pool (Fresno County)
San Luis	Westside, parallels I-5	Conveys water from San Luis Reservoir to Kettleman City. Long-term annual water entitlements = to 1,300,000 acre feet
State Water Project (California Aqueduct)	Westside, parallels I-5	Conveys water from Delta to San Joaquin Valley
Eastside	East of San Joaquin River	Irrigation, collector for Owens and Bear Creek
<u>CREEKS</u>		
Quinto	North of San Luis Reservoir West of I-5	Intermittent flow, poor water quality
Romero	North of San Luis Reservoir West of I-5	East to West trending, intermittent flow
Bear	Parallels Hwy 140	Drainage system for Black Rascal, Fahrens, Cottonwood & Canal Creeks, South Slough, Trindade Drain & part of El Capitan Canal
Los Banos	South of Hwy 152	Drains into Los Banos Reservoir, and eventually reaches San Joaquin River
Owens	N.E. of Planada, S.W. to Eastside Canal	Drainage Disposal system for area south of Bear Creek
Mariposa	South of Merced from Hwy 59 to Mariposa County	Drainage disposal system for northern portion of Le Grand
Deadman	South of Le Grand	Drainage disposal system for southern portion of Le Grand
<u>RESERVOIRS</u>		
San Luis	10 miles West of Los Banos	13,800 acres, recreation area, storage area for California Aqueduct and Delta-Mendota Canal
O'Neil Forebay	East of San Luis Reservoir	2,000 acres, recreation area, storage area for California Aqueduct and Delta-Mendota Canal
Los Banos Creek	S.W. of Los Banos, West of I-5	410 acres, recreation area, drains westside creeks
Burns	Burns Creek, Merced/ Mariposa County line	4,360 acres, recreation area, drains Burns Creek



resulting from local irrigation practices. Discharge of groundwater can result from seepage into streams, evaporation, crop transpiration and pumping.

Both irrigation and urban water districts provide Merced County's municipal, domestic and irrigation needs. They range in size from the Merced Irrigation District with 241 square miles to the newly formed Volta Community Services District which will serve less than 100 acres. Except for northeast and western foothills, and small areas in the San Joaquin flood plain, nearly all of the County is within the boundaries of a water purveyor district.

Currently, groundwater withdrawals in the Valley subbasin exceed recharge. The overdraft is primarily noticeable in areas around El Nido and Le Grand. Most water districts in Merced County rely on groundwater for only a limited portion of their supplies. Groundwater recharge efforts near El Nido consist of diverting winter runoff water into sand fields and pastures. Recharge in most other areas of the County takes place through percolation of surface water in streambeds and unlined canals. Fortunately the State Water Project and the Central Valley Water Projects have both reduced overdraft and increased recharge. Diversions for irrigation, municipal and industrial water supplies have reduced end-stream flows resulting in less than historic recharge percolations in streambed areas. Land subsidence and a high level of water hardness and salinity contribute to poor water quality on the west side.

Urban development and its accompanying increase in impervious surfaces (such as parking lots and buildings), has also reduced the groundwater recharge area. Precipitation and irrigation tends to run off these impervious surfaces into gutters, stormdrains and streams rather than percolate through the ground into the aquifer. Flooding also increases as a direct result of this increased runoff. Principle recharge areas are currently not protected. It is unknown how much local irrigation water is lost due to unlined, old or weakened canals and ditches. Improvements in irrigation systems have the potential to significantly increase the availability of agricultural water.

Small reservoirs could help increase the reliability of local water supplies. During periods of surplus waters, the storage of water in off-stream reservoirs could serve to capture winter runoff for storage and ultimate use during periods of low summer flow when streams are generally in short supply. While cheaper and less damaging than large dams, small dams are still expensive to build and maintain. They might not be practical on some streams that carry a heavy sediment load.

Discussions with the three largest irrigation districts in the County--the Merced, Turlock and Central California Irrigation Districts (MID, TID and CCID)--note that groundwater extraction has increased in recent years due to drought conditions. Current groundwater extraction for agricultural use is in excess of 250,000 acre feet

per year from these three districts. Surface water use from upstream and out of County sources by the same irrigation districts is in excess of 1,100,000 acre feet per year.

In response to the increasing demand for water in the San Joaquin Valley, the Federal government's Central Valley Project (CVP) began delivering water in the 1940's, and the State Water Project (SWP) followed with additional imports in the late 1960's. Map 34 in the Agricultural Chapter (VII) illustrates the major water canals and other water courses in the County. Today the County is served by 25 water and irrigating districts, (and several small private systems), irrigating more than 456,000 acres. Water sources of the districts include the CVP and the SWP, the Merced River, groundwater pumping, recirculation of drainage water, and for some of the smaller districts, water purchases from MID and the other larger districts.

The present canal system can be divided into three major geographic areas: 1) West side: the area west of the San Joaquin River has the California Aqueduct, Delta-Mendota Canal and the San Luis Canal, forming the basis of the west side canal system. These major canals have several smaller laterals diverting water to the large west side farms. 2) Merced River area: the MID diverts water from the Merced River as it flows through the northern area of the County. Some water is also supplied by the Turlock Irrigation District from the Tuolumne river which serves the Delhi, Ballico, and Hilmar areas. 3) The southeastern area: the Planada, Le Grand and El Nido areas of the County are supplied by connections to the MID and through groundwater pumping. There are several streams flowing through the area which drain into the San Joaquin River. This area is experiencing a shortage of water in the summer irrigation period because of the limit in canal and pipe capacity from the MID.

While the primary function of the County water agencies is to provide domestic water and farmland irrigation, other related water uses include: hydroelectric power generation, active and passive recreational use, waterfowl habitat, native pasture and groundwater drainage areas. Other sections of this Chapter discuss these uses. Map 22 identifies principle watershed and recharge areas in the County.

b. Water Quality

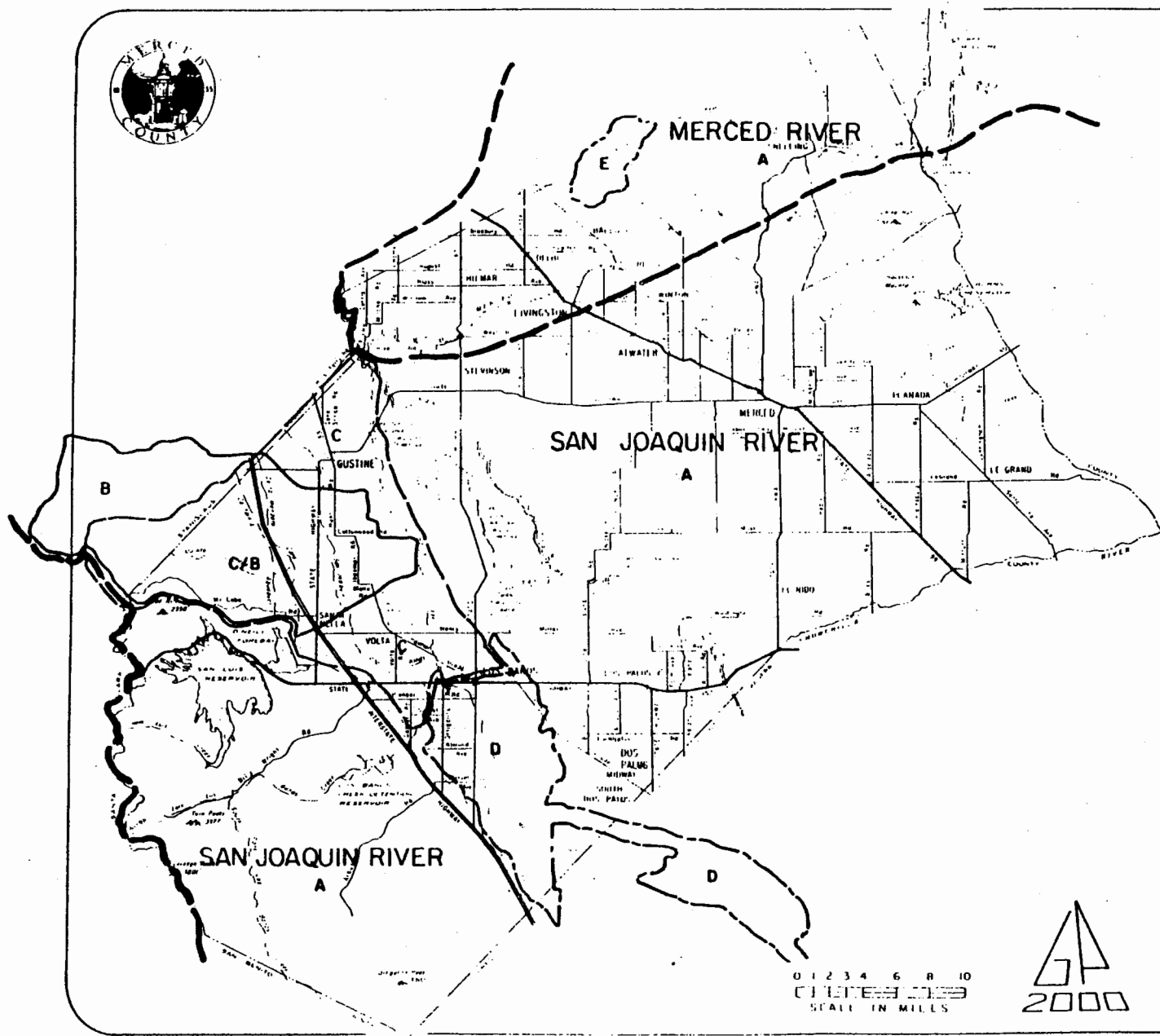
A Water Quality Control Plan has been adopted by the State Water Resources Control Board and the Regional Water Quality Control Board. The purpose is to provide a program of actions designed to preserve and enhance water quality and to protect the water supply for beneficial uses. The State Regional Water Quality Control Board has primary responsibility for establishing water quality standards in the County. In addition, the California Department of Fish and Game and the County Environmental Health Department have codes and ordinances, which also provide for water quality protection.

Water quality in the County differs from east to west and from north to south, due to varying degrees of turbidity, color, odor and chemical characteristics. The differences in surface water quality are caused by the climate and the differences in the physical character of the geology in the smaller watersheds. The Sierra Nevada Mountains dispense low amounts of dissolved solids into east side streams and rivers, while the west side streams have a much higher salinity rate due to the sediments that comprise the Diablo Range of the Coastal Mountains. Similarly, the stream flow into the Merced River in the northern part of the County is of very good quality, but gradually decreases south through the Valley due to the inflow of excess irrigation waters.

The quality of groundwater is determined primarily by salt concentrations, and to a lesser degree by levels of nutrients, pesticides and other contaminants. Low quality groundwater is found throughout much of the San Joaquin Valley Basin with high levels of soil boron and total dissolved solids occurring west of the San Joaquin River. Additionally, concentrations of nitrates and pesticides are generally found in shallow wells northwest of Atwater. Overall groundwater quality is generally similar to surface water quality, it is good to excellent in the higher foothill areas and decreases in quality toward the Valley center low areas.

Groundwater quality can also affect use of the water for irrigation purposes. An example of this are critical issues regarding the availability of agricultural water due to the problems with drainage and with selenium in the west side of the County. Subsurface drainage creates problems in many areas of the County of Merced due to high water tables; irrigated lands contribute to these area problems with their surface runoff. Most of these problem areas are located in the lower alluvial fans west of the San Joaquin River on irrigated lands of the Delta-Mendota service area and in Grasslands. The grassland area is flood-irrigated for pasture and waterfowl. While other minor problem areas are scattered throughout the east side of the Valley which may require corrective drainage, most areas achieve drainage control through groundwater pumping. Areas experiencing drainage problems are indicated on Map 24.

In areas with high water tables, salt-laden water accumulates in the soil and steadily rises as irrigation and leaching continue. In the west side of the County near Gustine, drainage is currently recirculated for irrigation or discharged into the San Joaquin River. In the west side areas to the south, drainage is also recirculated for irrigation, or it is discharged through drainage ditches to marsh lands of the Grasslands Water District. After the duck hunting season, the waters are drained into the Salt and Mud Sloughs which are tributaries of the San Joaquin River. An additional 5-8,000 acres of farmland from the Westlands Water District in Fresno County has until recently drained into the partially completed San Luis Drain. The drain emptied into the Kesterson Reservoir where major wildlife contamination occurred due to concentrations of selenium. Farm drainage from Fresno County Westlands Water District into Merced County no longer occurs.



## Principal Watershed Areas and Groundwater Recharge Areas

### LEGEND:

- A SAN JOAQUIN RIVER / MERCED RIVER
- B GARZAS-QUINTO-ROMERO
- C GUSTINE
- D CAMP 13
- E MUSTANG CREEK

SOURCE: U.S. Department of Agriculture  
Soil Conservation Service 1977

MERCED COUNTY  
YEAR 2000 GENERAL PLAN

MAP 22

Figure VI-11 lists groundwater problem areas in the County identified during recent studies by the Merced County Division of Environmental Health. This list is primarily the result of organic analysis of public water systems with less than 200 service connections having groundwater as their primary source. Map 23 graphically identifies some of the problem areas based on 1982 data, although on a more localized basis, other problem areas exist in the County.

Nitrogen problems appear to be the dominant land use related pollution problem. Sources of groundwater nitrogen pollution include fertilizers, animal manures, treated sewage from percolation ponds or land disposal, septic systems, natural geologic sources and plant residues from cropland and native vegetation. Sources of surface water nitrogen include fertilizers and animal manures in irrigation runoff, treated sewage discharged into streams, groundwater which enters streams through bank flow or tile drains and natural geologic sources.

The improper location and/or operation of septic tanks and other individual wastewater systems can also affect the quality of groundwater and seriously impair the use of water for water supply, recreation and fish and wildlife habitat.

Most individual systems are septic tanks, which provide primary treatment only. Septic tanks do provide basic bacteriological break-down of solids to a liquid state allowing discharge into a leachfield. Effluent then percolates or evaporates. Since such systems still contain chemically combined gas such as nitrogen (nitrates) which can percolate through the soil can find its way into the groundwater. Established health standards usually prevent septic systems from creating groundwater problems. The exception occurs when systems are concentrated in a given area and a combination of water table/soil characteristics result in degradation of the underlying aquifer.

A worse case scenario is when the water table is 5 feet or less to the surface. The opportunity for sewage contaminants being carried laterally by groundwater flowing away from the drainfield upon an adjacent well may occur if the sewage travels considerable distances and the domestic well is improperly sealed. Such wells offer a conduit interconnecting contaminated shallow aquifer with the deeper, uncontaminated aquifers.

A similar situation may also occur when the septic system is installed in a flood plain adjacent to rivers or creeks. During prolonged flooding or high water levels, the soil becomes saturated, severely restricting percolation of the effluent from the drainfield. This also may happen when disposal fields are installed in low areas subject to periodic flooding from storm run-off water from higher ground.

FIGURE VI-11

## IDENTIFICATION OF MERCED COUNTY GROUNDWATER PROBLEM AREAS

A. The following are the general groundwater problems for communities in the County:

**ATWATER-WINTON**

Nitrates, Dibromo-chloropropane (DBCP), Ethylene Dibromide (EDB), Trichloroethylene (TCE), 1, 1 Dichloroethylene, 1, 2 Dichloroethane

**DELHI**

Nitrates, DBCP

**DOS PALOS**

Total Dissolved Solids, Chloride, Sodium, Manganese

**GUSTINE**

Nitrates, DBCP, Hard Water, Chlorides, Sodium, Total Dissolved Solids, Lead Sulfate

**LIVINGSTON**

Nitrates, DBCP, EDB

**HILMAR**

Arsenic, Nitrates, Sodium, Total Dissolved Solids, Manganese, Chlorides, Hard Water, Uranium

**LOS BANOS**

Nitrates, Chlorides, Total Dissolved Solids, Sodium, Manganese

**MERCED**

Hard Water (exceeds 150 mg/l), DBCP

**DOS PALOS Y**

Nitrates, Total Dissolved Solids, Manganese, Hard Water, Sodium, Chlorides, Sulfates

**EL NIDO**

Sodium, Total Dissolved Solids, Arsenic

**LE GRAND**

Hard Water

**PLANADA**

Hard Water, DBCP

**STEVINSON**

Sodium, Manganese, Sulfates, Total Dissolved Solids, Chlorides, Hard Water, Arsenic

B. The following areas of the County also have serious point specific groundwater problems:

**KENDALL PLANT AREA (HWY 140 & KIBBY ROAD, MERCED)**

Extremely high levels of: (1) Trichloroethylene (TCE); (2) 1, 2 Dichloroethylene; (3) Methylene Chloride; (4) 1, 2 Dichloropropane; (5) Tetrachloroethylene (PCE); (6) Chloroform. TCE levels have been as high as 6300 ppb (action level for TCE is 5.0 ppb).

**BALLICO-LIVINGSTON-ATWATER-DELHI**

This area has existing source groundwater problems with nitrates, EDB and DBCP. Over 1200 water samples have been taken for DBCP in this area since 1979 with 20% of those over the State 1.0 ppb "action level".

**CASTLE AIR FORCE BASE**

Because of past disposal practices on the base, TCE, 1, 2 Dichloroethane, Tetrachloroethylene (PCE), Carbon Tetrachloride, Styrene, Ethyl Benzene, Methylene Chloride, Dibromochloromethane, and Chloroform have been found in the groundwater. Two wells off base have exceeded safe drinking water levels for TCE and one well has exceeded the safe drinking level for 1,2 Dichloroethane.

**KESTERSON RESERVOIR AREA**

Degradation of upper aquifer of boron and specific conductance beneath the reservoir. Potential for further degradation by selenium, zinc, silver, nickel, mercury, chromium, cadmium and arsenic.

In addition, Merced County has approximately 50 sites with unknown underground storage tanks which have contaminated soil and/or groundwater.

**FIGURE VI-11 (CONT.)**

C. Other small public water systems with less than 200 connections which are have problems:

<u>Name</u>	<u>Problem/Deficiency</u>	<u>Name</u>	<u>Problem/Deficiency</u>
Anderegg Rental	NO3* (72 ppm)	Miller Apartments	Bacteria
Donny Brothers #1	DBCP (14.0 ppb)	Livingston CDC	Bacteria
	NO3 (77 ppm)	Al's Apartments	NO3 (72 ppm)
Donny Brothers #3	DBCP (1.2 ppb)	El Rey Apartments	NO3 (122 ppm)
	NO3 (63 ppm)	Castle Mobile Home Park	TCE
Grace Nursing Home	NO3 (63 ppm)	Ysidro Reys Labor Camp	NO3
Santa Nella Water District	Pressure Problems	Larry & Mary's	Bacteria
El Nido Elementary School	Bacteria	Turlock Golf & Country Club	Bacteria
Cressey Fire Station	Bacteria	Shaffer Road Trailer Park	DBCP (8.4 ppb)
Buhach School	NO3 (71 ppm)	Donny Brothers, Winton	DBCP (6.7 ppb)
Nagame	NO3 (75 ppm)	Ballico School	DBCP (1.4 ppb)
Newhall Land & Farming	Taste - Odor	Weaver Pre-School	Bacteria
Westmorelands	NO3 (57 ppm)	Southerlands Guest Ranch	NO3 (52 ppm)
Souza Rentals	NO3 (89 ppm)	Longview Mennonite School	NO3 (51 ppm)
Donny Brothers #2	DBCP (5.4 ppb)	La Fuente Market	Bacteria
	NO3 (66 ppm)	Atwater Auction Yard	Bacteria
Hagaman Park	NO3 (72 ppm)	Atwater Christian School	NO3 (58 ppm)
Buhach Pentecost Hall	NO3 (52 ppb)	Diesel Country Truck Stop	Bacteria
Delhi Head Start	Bacteria		

D. Health Department sampling has revealed that 14 wells serving the following water systems contained organic contaminants:

Atwater

DBCP - .01 ppb: Aloha Apartments  
 DBCP - .21 ppb: Atwater Christian School  
 DBCP - .06 ppb: Zameblli Rentals  
 DBCP - Loo Rentals  
 Atrazine - Casa Verde Apartments

Livingston

DBCP - .24 ppb: Akal Used Cars & Apartments  
 Simazine - .56 ppb: Schelby School

Cressey

DBCP - .80 ppb: Cressey Way Apts.  
 & Simazine

Merced

DBCP - .01 ppb: Seventh Day Adventist School  
 DBCP - Loo Rentals  
 DBCP\* - Ranch Grande Mobile Home Park

Winton

DBCP - .03 ppb: Crookham School  
 DBCP - .26 ppb: Shaffer Road Trailer Park  
 DBCP - .43 ppb: Grace Mennonite School

\* two wells

Since 1979, 17 small water system wells not listed contained DBCP and have been abandoned. The use of 3 other wells has been discontinued due to TCE contamination.

Other sections of this Chapter, including Mining (Section 4) and Wetland/Wildlife (Section 1), also recognize and discuss water quality related issues. Also see the Agricultural Chapter (VII), Section B.6, for similar and additional discussion.

7. Open Space for Public Health and Safety, Natural and Man Made Hazards

The environment within the County is composed of various interrelated systems. It is the interaction and exchange between these various systems that generate and influence the quality and well-being of life within the County. In the broadest sense the major systems that comprise the environment include geophysical forces, biological processes and social organizations. Identifying and understanding the inter-relationship between these various systems and their individual issues is a very critical component in the planning process.

From the development of the first human settlements to the advent of supersonic transport and complex synthetic chemicals and materials, man has continually created hazards for himself and the community at large. Although capable of creating hazards, man also maintains the ability and the intelligence to reduce hazard potential. The man made hazards in the County include: noise, hazardous materials, aircraft overflights and general hazards of local significance due to the County's geography and level of development.

Three major types of natural hazards, geological, fire and flooding, have influenced the historic development pattern of Merced County and continue to expose residents to various levels of risk. The protection of the public from significant risks resulting from these hazards is a major function of County government. Open space related policies in the General Plan are directed to facilitate this public protection function by defining the extent and location of hazard areas; by directing urban development away from areas that pose an unreasonable risk; by promoting regulations that minimize the hazard and risk; and by developing ordinances and procedures for emergency response.

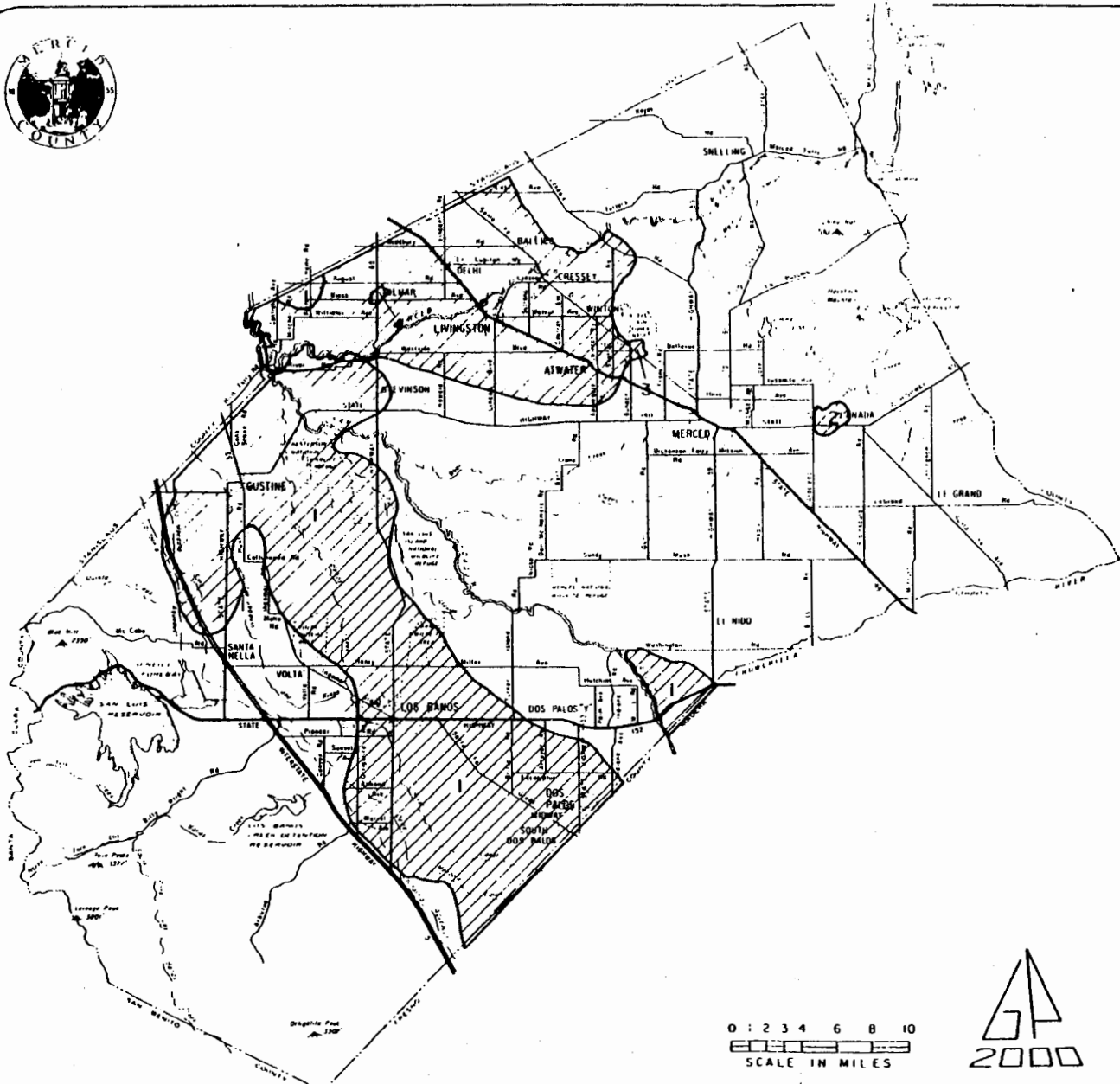
a. Geological

The development pattern in the County has generally avoided hazardous areas. The areas that are identified in the County as having seismic and unstable soils are identified on Maps 10, 13 and 14, and are discussed in the Safety Chapter (V), Section 5.B.1., 3. and 4.

b. Wildland Fire Hazard

The presence of flammable vegetation combined with rolling hills, poor access and the absence of extensive water supply lines or water pressure, creates hazardous fire conditions in many of the unincorporated areas of the County. Although these hazards are not as extreme as they are in other areas of the state, there are problem areas in areas that could easily be isolated during fire emergencies. Map 16 identifies high wildland fire hazard areas and Section B.6. of the Safety Chapter discusses policy issues.





## Groundwater Quality

### LEGEND

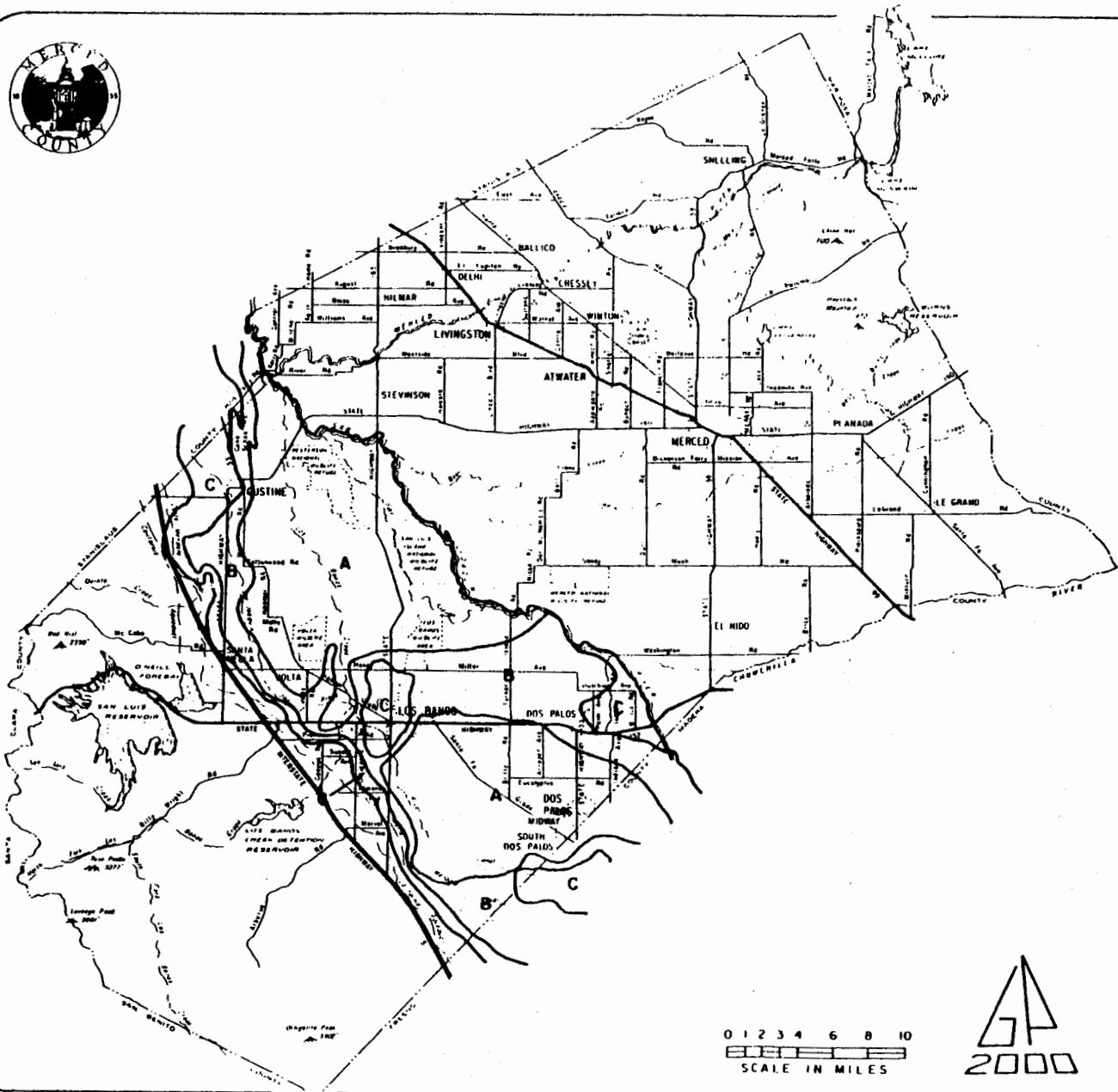
- 1 TDS 1000 PPM (TOTAL DISSOLVED SOLIDS)
- 2 DBCP AND NITRATES
- 3 TRICHLOROETHYLENE
- 4 ARSENIC

SOURCE: U.S. Soil Conservation Service 1982

0 2 3 4 6 8 10  
SCALE IN MILES



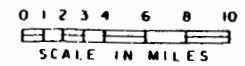
MERCED COUNTY **MAP 23**  
YEAR 2000 GENERAL PLAN



# Drainage Problem Areas

## LEGEND:

- A 0' - 5' DEPTH TO FREE WATER
- B 5' - 10' DEPTH TO FREE WATER
- C 10' - 20' DEPTH TO FREE WATER
- STUDY AREA BOUNDARIES



SOURCE: California Dept. of Water Resources 1982

## MAP 24

MERCED COUNTY  
YEAR 2000 GENERAL PLAN

c. Flood Areas and Dam Inundation

Two major categories of flooding hazard affect Merced County. The greatest risk is from storm runoff, particularly in the urban areas located within the Merced flood plain. The second hazard is the remote risk of failure of one of the local or adjacent counties dams. Impacts from dam failure could affect virtually every urban area within the County. Map 15 illustrates the 100 year flood plain and Map 12 displays areas that would be impacted from dam failure. See the Land Use Chapter (I), Section B.5.e., and the Safety Chapter, Sections B.2. and 5., for discussion of these hazards.

d. Noise

In the past several decades, noise levels in Merced County have increased due to urbanization and increased technological development. Merced County is the home of Castle Air Force Base, the major noise source in the County. Other primary sources of noise are rail, automobile traffic and agricultural industrial activities in the rural areas. The Noise Chapter (IV) discusses these policy issues.

e. Airport Safety

Aircraft accidents are most prevalent in areas immediately adjacent to airports and primarily occur during takeoff and landings. The area of highest risk potential is at the end of runways where forced landings generally occur. As Merced County is the host for Castle Air Force Base and various smaller airports adjacent to urban areas, it is essential that the County develop and maintain techniques which protect people and property from aircraft accidents. Maps in the Appendices Section of the Noise Chapter, identify the airport noise contours in the County. The Land Use Chapter (I), Section B.5.d., discusses related policy issues. The Merced County Airport Land Use Commission (ALUC) has adopted a Countywide Airport Land Use Commission Policy Plan and a Comprehensive Land Use Plan for the protection of the Castle Air Force Base. The County General Plan is required to be consistent with the ALUC Plans unless the Plans are overridden following the adoption of certain findings.

f. Solid Waste, Hazardous Waste and Reclamation

Californians produce over 55 million tons of solid waste a year from municipal, agricultural, civilian and other sources. Of this, close to 49 million tons are non-hazardous. Approximately 6 million tons are hazardous--from chemical and industrial firms. It is estimated that the typical household in Merced County produces approximately 1200 pounds of solid waste per year.

Contemporary society has come to depend on chemical products to enhance the quality of life. One consequence of increased chemical production and use is extensive and increasing human exposure to hazardous materials. Hazardous materials are found almost everywhere in potentially dangerous quantities. With the evolution of high technology industries in the State and the general proliferation of toxins in the environment, local governments are becoming more involved in the management of hazardous materials and are confronted with both the need to reclaim old waste sites and the problem of chemical contamination in areas which need cleanup.

A key issue relevant to open space for public protection is cleanup of identified abandoned waste sites and spill areas. Concepts and techniques analyzed within the County's separate Solid Waste and Hazardous Waste Management Plans include: required public disclosure by industries; transportation and underground storage monitoring requirements; waste stream reduction of hazardous waste; siting processes and provisions for alternate disposal methods and small waste generators. With the advent of recent legislation called the Tanner Bill and the adoption of the Hazardous Waste Management Plan by the County, there have been proposed program changes for improving the overall effectiveness of treatment and disposal of designated hazardous wastes. The County Hazardous Waste Management Program has been developed to monitor waste generation, and to provide a planning framework for siting facilities and a program for hazardous material regulation. Chapter I, Section B.5.c., also discusses related policy issues. Figure VI-12 lists spill and other chemical contamination sites which are required to be cleaned up. These areas should not be further developed until cleanup, both due to state requirements and for public health and safety.

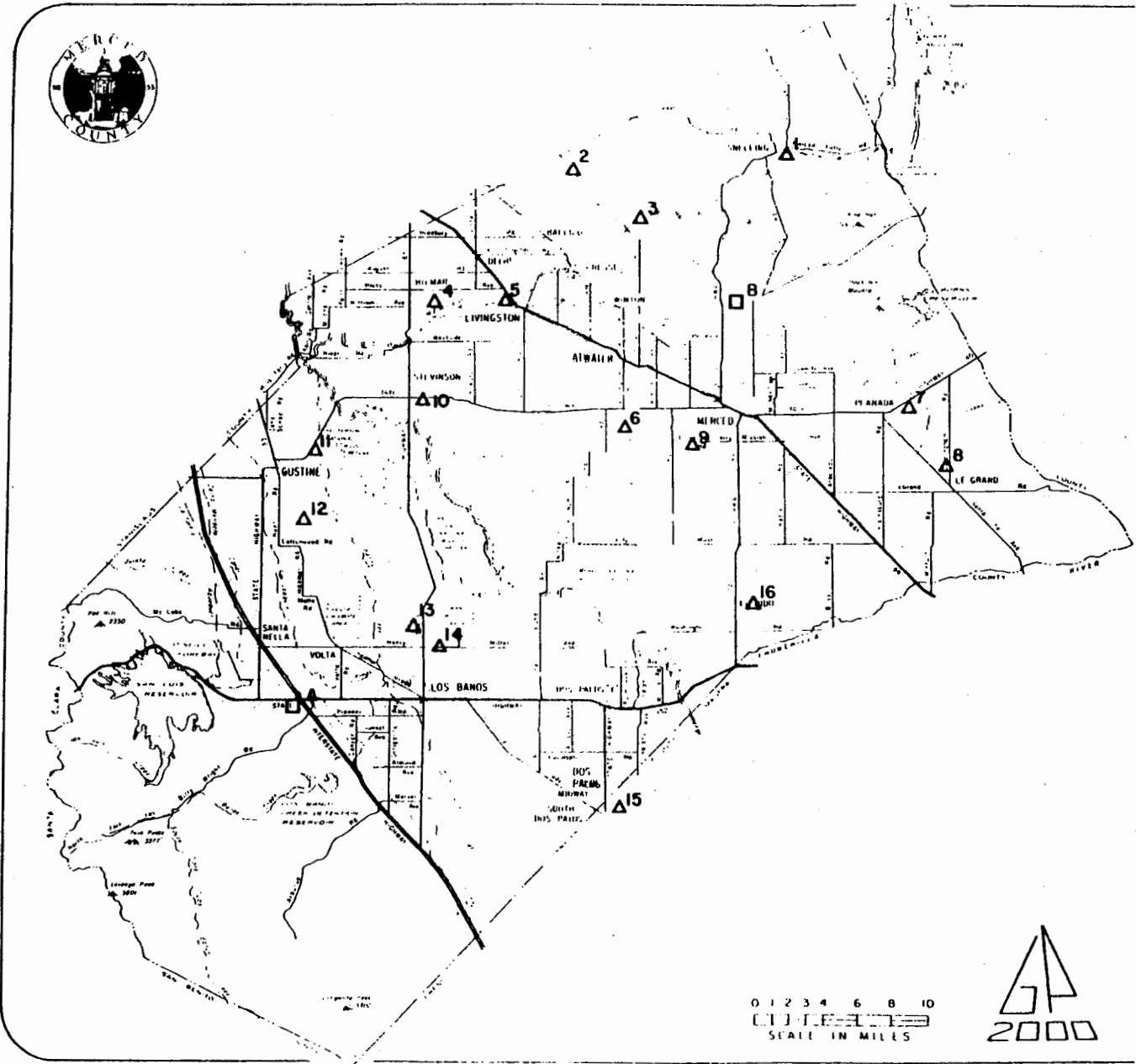
There are two active solid waste landfill facilities located within unincorporated areas of the County, the North Highway 59 site and the Billy Wright site on the west side. The North Highway 59 site is projected to have a remaining use life, with expansion, of 25 years. The west side Billy Wright landfill site has, with limited expansion, a 14 year life. In addition, there is one private disposal facility located at Highway 59 and the Merced River, known as the Flintkote County Disposal Site. This site is restricted to concrete and earth material disposal. Map 25 identifies the location of all solid waste disposal sites in Merced County, both active and abandoned and Figure VI-13 provides a description of each of the 16 abandoned sites.

FIGURE VI-12

## MERCED COUNTY HAZARDOUS WASTE/CONTAMINATED SITES

<u>SITES</u>	<u>LOCATION</u>	<u>PROBLEM/STATUS</u>
1. Classic Casters	Industrial Way, Atwater Area	Chemicals
2. Rancho Grande HHP	Atwater Area	2 contaminated wells
3. Shaffer Road Trailer Park	Atwater Area	1 contaminated well
4. Atwater Christian School	Atwater Area	1 contaminated well
5. Merced County Housing Authority	Santa Fe Drive, Ballico Area	Fuel/Monitoring
6. Rossini Farms	Newport Road, Ballico Area	Fuel/Site assessment
7. Turlock Municipal Airport	Newport Road, Ballico Area	Organics
8. Arroyo's Auto Repair	Vincent Road, Delhi Area	Waste oil
9. Foster Farms Feed Mill	Collier Road/99, Delhi Area	Diesel fuel/ Evacuation proposed
10. Delhi County Water District	Delhi Area	1 contaminated well
11. Battaglia-Frey	Willis Road, Dos Palos	Area Fuel/Contam. stabilized
12. Lower San Joaquin Levee	Indiana Road, Dos Palos Area	Fuel/Site stabilized
13. Spain Air	Dos Palos Area	Chemicals
14. Dos Palos Concrete	Almond Drive, Dos Palos Area	Fuel/Site assessment
15. Nicoletti Oil	Blossom St., Dos Palos Area	Fuel/Site assessment
16. Porter Property	Harmon Rd., El Nido Area	Fuel/Surface contamination
17. Westside Concrete	Baumbauer Rd., Gustine Area	Fuel
18. Chevron USA, Inc.	Sullivan Rd., Gustine Area	Fuel/Site assessment
19. Spark's Exxon	N. Lander Ave., Hilmar Area	Tank leak
20. City Maintenance Yard	Santa Fe Rd., Le Grand Area	Tank leak
21. Akal Used Cars & Apartments	Livingston Area	1 contaminated well
22. Schelby School	Livingston Area	2 contaminated wells
23. 7th Day Adventist Church	Los Banos Area	1 contaminated well
24. Department of Fish & Game	Henry M. Road, Los Banos Area	Fuel/Site assessment soil samples obtained
25. Holt Brothers	Pacheco Blvd., Los Banos Area	Fuel/Evacuation proposed
26. Kendall Plant Organics	Kibby Road, Merced Area	Fuel/Clean-up in progress
27. R & D Mini-Mart	Beachwood Drive, Merced Area	Fuel, waste oil/ Site assessment

<u>SITES</u>	<u>LOCATION</u>	<u>PROBLEM/STATUS</u>
28. Merced Irrigation District	Franklin Yard, Merced Area	Fuel/Site assessment
29. Tri-Valley Growers	Kibby Road, Merced Area	Fuel/Site assessment
30. Leavett's Truck Repair	Arboleda Drive, Merced Area	Fuel
31. RBJ Trucking	Ashby Road, Merced Area	Fuel/Site assessment
32. Hamilton Dairy	Vassar Ave., Merced Area	Fuel/Site assessment
33. BAC-Pritchard	Beachwood Dr., Merced Area	Organics/UST closure
34. Richwood Meat Company	Santa Fe Dr., Merced Area	Fuel/Site assessment
35. Mobil Station	Franklin Rd., Merced Area	Fuel/Site assessment
36. Western Farm Service	Arboleda Dr., Merced Area	Fuel/Excavation completed, closure anticipated
37. Ragu Foods, Inc.	Ashby Road, Merced Area	Diesel fuel/Site assessment
38. United Merced Concrete Pipe	Ashby Road, Merced Area	Fuel
39. Yosemite Wholesale Co.	Vassar Ave., Merced Area	Diesel fuel/Excavation
40. Red Rock Ranch	Arboleda Dr., Merced Area	Diesel Fuel/Surface Contamination, clean-up
41. Salinas Exxon	Hwy 140, Planada Area	Fuel/Clean up in progress
42. Wallace Transport	Hwy 140, Planada Area	Waste Oil
43. Oasis Foods	E. Childs, Planada Area	Tank leak
44. Exxon Service Station	Hwy 140, Planada Area	Tank leak
45. Loo Rentals	Planada Area	1 contaminated well
46. Beacon Oil Station	Hwy 33, Santa Nella Area	Tank leak
47. Exxon Service Station	Hwy 33, Santa Nella Area	Tank leak
48. Chevron Service Station	Hwy 33, Santa Nella Area	Tank leak
49. San Luis Reservoir	Hwy 152, Santa Nella Area	Tank leak
50. Crookham Elem. School	Walnut Avenue, Winton Area	Fuel/Excavation site stabilized
51. Winton School	Almond Avenue, Winton Area	1 contaminated well
52. Winton Water Company	Winton Way, Winton Area	3 contaminated wells
53. Kesterson Reservoir	Gustine Area	Selenium
54. Diesel County Truck Stop	S. Highway 99, Chowchilla Area	Fuel/Site assessment



# Solid Waste Disposal Sites

### LEGEND:

#### CLOSED DISPOSAL SITES $\Delta$

- 1 SNELLING
- 2 EAST AVENUE (Closed)
- 3 ARUNDEL SHAFFER RANCH
- 4 HILMAR
- 5 LIVINGSTON CITY
- 6 ATWATER CITY
- 7 PLANADA (Closed)
- 8 LEGRAND
- 9 MERCED CITY
- 10 EL NIDO
- 11 GUSTINE CITY
- 12 INGOMAR
- 13 LOS BANOS
- 14 LOS BANOS CITY
- 15 DOS PALOS CITY
- 16 EL NIDO

#### EXISTING AND PROPOSED LANDFILLS $\square$

- A BILLY WRIGHT ROAD
- B HIGHWAY 59

0 1 2 3 4 6 8 10  
SCALE IN MILES



MAP 25

MERCED COUNTY  
YEAR 2000 GENERAL PLAN

## FIGURE VI-13

## ABANDONED SOLID WASTE DISPOSAL SITES

There are 17 abandoned solid waste disposal sites in Merced County. All but one; the Castle Air Force Base site, were formerly used by the incorporated cities and unincorporated areas of the County. Today, the Billy Wright landfill and Highway 59 landfill are the only two active waste disposal sites in the County.

A. City Sites in the County Area.

1. The disposal site for the City of Atwater is situated 5 miles south of Atwater, just off of Bert Crane Road, and is 108 acres in area.
2. The disposal site for Dos Palos is located one mile south of Dos Palos at the intersection of Folsom and Shain Roads and just within the border of Fresno County. The site has an area of 10 acres.
3. The disposal site for the City of Gustine is situated 2 miles east of Gustine at the end of Carnation Road and has an area of 10 acres.
4. The disposal site for the City of Livingston is located 2 miles west of Livingston on the south bank of the Merced River and has an area of 20 acres.
5. The disposal site for the City of Los Banos is situated one mile north of Los Banos on Mercey Springs Road and has an area of 50 acres.
6. The disposal site for the City of Merced is a 10 acre parcel situated 4 miles southwest of Merced near the corner of Rice Road and Dove Road.

B. County Sites

1. The East Avenue disposal site is located east of the Turlock Municipal Airport at the intersection of East Avenue and Oakdale Road and occupies 13.7 acres.
2. The El Nido disposal site is situated 2 miles east of El Nido on the south side of El Nido Road and has an area of 4.5 acres.
3. The Hilmar disposal site is located 2.5 miles southeast of Hilmar at the end of Williams Avenue, and has an area of 5 acres.
4. The Ingomar disposal site is situated 2.5 miles north of Ingomar on Moffat Road and has an area of 20 acres.
5. The Le Grand disposal site is located one half mile north of Le Grand on the east side of Santa Fe Avenue and has an area of 2.5 acres.
6. The Los Banos County disposal site is situated 2 miles north of Los Banos at the northwest corner of the intersection of Henry Miller Avenue and Mercey Springs Road. The area of the site is 37 acres.
7. The Planada disposal site is located 2 miles northeast of Planada on the south side of Highway 140 and has an area of 5 acres.



8. The Shaffer Road disposal site is situated 4.5 miles north of Winton at the northwest corner of the intersection of Shaffer Road and Oakdale Road and has an area of 18 acres.
9. The Snelling disposal site is situated 1.5 miles east of Snelling and just south of Merced Falls Road with an area of 70 acres.
10. The Stevinson disposal site is located 1.5 miles north of Stevinson on the east side of Lander Avenue between Highway 140 and Sixth Avenue with an area of 10 acres.

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g. Summary

This discussion, and discussions contained in other Sections of this Chapter, the Land Use Chapter (I) and the Safety Chapter (V), have identified areas which need to be considered for open space policy for public protection purposes. Critical land use facilities should be identified which deserve special consideration in the policy adoption process. Critical land uses include: major dams; explosives or hazardous materials manufacturing, handling or storage; hospitals or other communications systems; Emergency Operations Centers (EOCs); electric power inter-tie systems; power plants; small dams; utility substations; sewage treatment plants; waterworks; local gas and electric distribution lines; aqueducts; major pipelines; major highways, bridges and tunnels; ambulance services; public assembly with capacity of 300 or more and schools.

8. Aesthetics and Open Space lands for Recreation Resources

The natural scenic beauty of the County has attracted residents and visitors to the area for decades. Naturally endowed with mountains, valleys, reservoirs and rivers, the County is a major recreation/tourist area in northern California. Discussion in this section recognizes the visual amenities and needs for public and private recreation open space areas in the County.

a. Visual (or Aesthetic) Resources

Natural areas and scenic areas have much in common. Most natural areas of significance have attractive scenery. Many highly scenic areas have natural areas included. Natural areas are valued for their aesthetic and scientific, wild and undisturbed character. The natural aesthetic amenities of the County include a wide valley floor with panoramic views of both the Coastal ranges and the Sierras. Seasonal contrasts of swollen rivers and lush hillsides are complimented by snow capped distant mountains. The County has not experienced intensive development outside of its historical urban designated areas. The mix of orchard lands with open field crop areas also create an aesthetic amenity.

These visual assets of the County are a quality to be enjoyed and preserved. The aesthetic character established by the natural landscape provides a subtle quality

which can be adversely disturbed if lack of attention is given to siting techniques and infrastructure construction. Often the value of an area is not consciously recognized until it is altered. Roadways provide one of the primary means by which physical settings and visual attributes of the County are experienced. Both State Highway 152 west of I-5, and I-5 from the Stanislaus County line south to Highway 152, have been designated State Scenic Highways because of their as scenic vistas. Map 27 identifies the State designated Scenic Highways.

The enjoyment of many areas with aesthetic amenities depends largely upon the continued maintenance and further improvement of access to them. The County is fortunate to have an established highway system which traverses areas of scenic and recreational interest. Highways with scenic view corridors provide for an enjoyable travel experience, link urban areas with open space areas, and provide access to recreational areas.

The State has established standards for protecting state designated scenic corridors. These standards include regulation of land use and the intensity of development through detailed site planning, control of outdoor advertising, attention to landscaping and the design and appearance of structures and equipment.

Scenic qualities can be preserved through retaining the character of natural slopes and formations and through preservation and enhancement of water courses, wildlife habitats and vegetation. Development patterns and land use activities which block vistas or views of local landmarks reduce scenic qualities. The exterior appearance of structures (bulk, height, color) can detract from the natural surroundings.

Special attention can be focused on ensuring that urban development does not significantly reduce visual vistas or glimpses from roadways and developed areas. The major scenic vistas which need to be recognized in County policy are views of both the Coastal and Sierra mountain ranges and the Merced, San Joaquin and Bear Creek River corridors. Unsightliness of certain land uses and activities; such as utility lines, signs and landfills, degrade the quality and livability of an area, community or neighborhood. Also, production activities that result in vegetation clearcutting can disrupt the visual quality of the landscape, particularly in the foothill areas. Preservation of rivers, lakes and reservoirs are features that add to the quality of a scenic corridor as well as the quality of life in the County.

Protecting the County's character requires more than simply focusing on design standards and policies which discourage extensive dispersed development. Poor air quality is perhaps the biggest threat to the visual amenities of the County. Air pollution significantly devalues these amenities through lost visibility as well as due to the damage to vegetation and wildlife that results. Section B.10 discusses policy issues related to air resources.

b. Public Lands and Public Recreation Areas

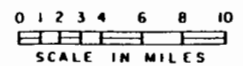
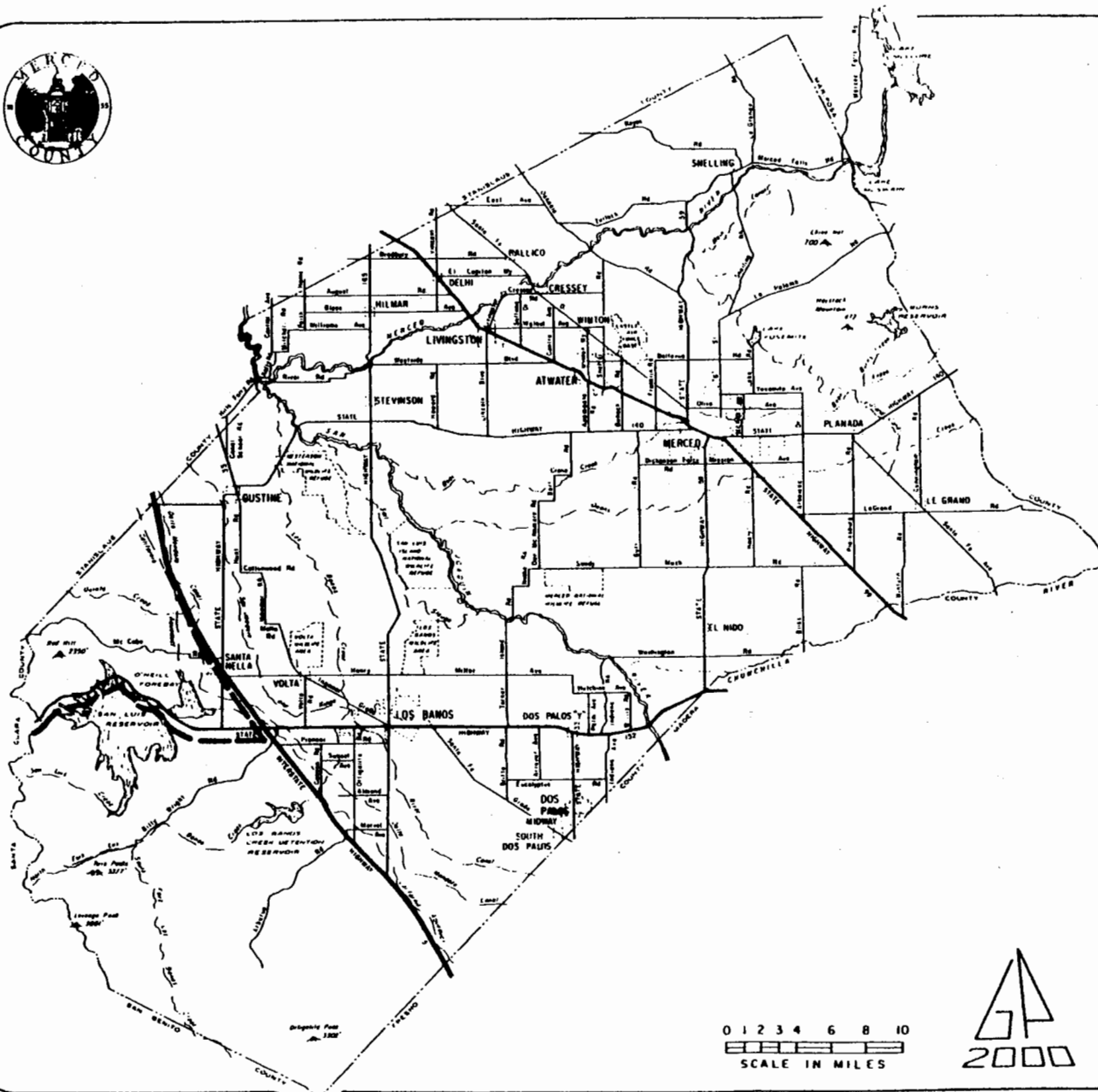
The word "recreation" is generally interpreted as the refreshment of the body, the spirit and the mind. With an increasingly urban population developing in the County, greater demands are being placed upon available recreational and open space facilities. As the County grows, the demand placed on existing facilities, and the need for new facilities will also increase.

The shortage of recreational facilities today is not so much in the quantity of land available, but in the access to available and suitable recreation lands. Open space preservation can demonstrate much about the values held by the County at large. Attracting the very industry and growth the County needs may well hinge on how it handles the issue of resource management. In many communities throughout the State there are urban areas with large stands of trees, preserved creeks and huge parkspaces. Those places and vistas exist because the community made the choice to protect and integrate natural elements into the development process instead of destroying them. As designated urban areas expand in the County, there will be the opportunity to make these choices. Planning is necessary if various types of open space are to be retained. There is a need for recreational open space in the countryside outside the urban areas such as regional parks. Recreation areas are also needed within urban areas such as community and neighborhood parks. All levels of government must respond to this need if adequate parks and other recreational opportunities are to be available for future generations.

Both parks and other open spaces have a measurable, decided impact on the quality of life by providing variety and breathing spaces within the County environment; and by providing for the recharge of water and air. Natural, scenic and historic areas, when considered as recreation attractions in themselves, have potential for increased use, which can also serve as tourist or vacationer attractions. They are an opportunity for development by both the public and private sector.

Merced County offers thousands of acres of Federal, State and recreation facilities to accommodate many types of outdoor leisure activities ranging from sightseeing to boating, picnicking and camping. These facilities provide both economic and open space benefits to County residents. These lands represent a unique assortment of facilities that provide both residents and visitors with an escape from the pressures caused by urban living.

Of the County's large area, approximately 5% is public lands. Federal lands involve 1.5% of the County land area. The County and the six cities own .5% which includes public buildings, schools, parks and roads. State owned lands total 3% which are used for a variety of purposes: parks, recreation, scientific research and wildlife management. The significant Federal and State active and passive recreational facilities in the County provide a greater availability of open space for recreation purposes than most other areas in the State. However, much of the Federal and State



# State Scenic Routes

lands also serve the purpose of providing wildlife habitat. Most of the State water fowl and wildlife refuge areas are available primarily for passive recreational use; for example, bird watching. Development adjacent to wildlife management areas, whether for public or private recreation require special policy consideration. Figure VI-14 lists Federal, State and County parks and recreation areas. Map 26 locates many of these lands. Map 18 locates Federal and State wildlife refuge and management areas.

Though the County has large areas owned and maintained by the State for recreational use, most of these areas are not in close proximity to the majority of residents within the County. Within the designated urban areas there are two special park location opportunities which should be considered: the dual use of school grounds and drainage basins as park sites. Drainage basins, schools and park facilities are all requirements in urban area planning which have common elements. To maximize the use of valuable land and reduce the amount of designated residential land taken by these required features, some of these features can be combined. During the design or upgrading of a drainage basin to meet additional development needs consideration can be given to its desirability as a recreation area. Basins can be designed as either a deep pit to collect drainage water or they can become a distinctive feature of the neighborhood. A somewhat larger shallow, broad depression with turf, trees and perhaps some recreation equipment would allow maximization of use.

One of the most successful and effective park design concepts has been to build school-parks. Elementary and high school facilities currently supply a necessary supplement to our park system through their open space, athletic and meeting facilities during after-school hours. Because of the fact that the schools do provide the same active facilities as a park, it becomes advantageous to develop park land adjacent to the school to maximize the combined area. A ten-acre school open space site combined with a ten-acre park site essentially becomes a 20-acre park. The school and park combine to become a community recreation center, thereby maximizing the use of both facilities.

In both urban and rural areas, trails can also be used for recreation. Trails can be used where a lower cost and more primitive types of travel can enhance both access and public enjoyment of the environment. Trails can provide safe and adequate passage for foot travelers, equestrians and cyclists. Through a system of trails, other open space resources can be experienced and appreciated, further increasing their value and benefit to the public. The basic objective in planning and developing a trail system is to coordinate it with other recreational facilities, besides the trail itself. Important factors which should be considered in developing a system include: Points of interest, aesthetic value, terrain, road crossings and final distinctions.

FIGURE VI-14

## MERCED COUNTY FEDERAL AND STATE PARKS AND RECREATION AREAS

<u>FEDERAL</u>	<u>SIZE</u>	<u>LOCATION</u>	<u>USES</u>
Burns Reservoir	4360 Acres	Burns Creek, Merced-Mariposa County Line	Fishing, Boating, Picnicking
Castle Reservoir	2400 Acres	1/4 mile northeast of Castle AFB	Fishing, Boating, Picnicking
Delta-Mendota Canal Angling Access Site #3	3.7 miles of canal	Northwest of Santa Nella	Fishing
Delta-Mendota Canal Angling Access Site #4	6.5 miles of canal	8 miles south of Los Banos	Fishing
Kesterson National Wildlife Refuge	5900 Acres	Northeast of Gustine	Waterfowl Resting & Nesting
Merced National Wildlife Refuge	2561 Acres	8 miles north of Dos Palos Y	Waterfowl Resting & Nesting; Waterfowl & Rabbit Hunting under strict control regulations
San Luis National Wildlife Refuge	7340 Acres	Between Salt Slough & San Joaquin River	Tule Elk Herd Reservation, Fishing, Camping, Bird Study, Waterfowl Resting & Nesting, Regulated Hunting
San Luis Reservoir Recreation Area	23,551 Acres	10 miles west of Los Banos	Boating, Camping, Hiking, Fishing, Swimming & Picnicking
<u>STATE</u>			
Cottonwood Creek	6000 Acres	Adjacent to San Luis Reservoir	Photograph, Nature Study, Hiking, Seasonal Wildlife Area, Hunting for Deer, Pigs, Rabbits, Dove & Quail
Fremont Ford State Park	114 Acres	Highway 140/San Joaquin River	Undeveloped
George Hatfield State Pk.	46 Acres	Merced-Stanislaus County Line, Merced River	Camping, Fishing, Boating
McConnell State Park	75 Acres	2 miles north of Livingston	Camping, Picnicking
Los Banos Creek Reservoir	2475 Acres	Southwest of Los Banos	Fishing, Boating
Los Banos Wildlife Area	5586 Acres	3 miles northeast of Los Banos	Nature Study, Fishing, Water Nesting & Resting, Waterfowl, Pheasant, Rabbit Hunting under strict controls
O'Neill Forebay Wildlife Area	750 Acres	2 miles southwest of Santa Nella	Nature Study, Hiking, Restricted Hunting for Pheasant, Rabbit, Dove, Quail
San Luis Reservoir Wildlife Area	900 Acres	West of San Luis Reservoir	Restricted hunting for Deer
Volta Wildlife Area	2887 Acres	1/2 mile north of Volta	Waterfowl Resting & Nesting, Waterfowl & Rabbit Hunting under strict control regulations

FIGURE VI-14 (CONTINUED)

MERCED COUNTY PARKS & RECREATION AREAS			
<u>NAME</u>	<u>SIZE</u>	<u>LOCATION</u>	<u>USES</u>
Courthouse Park	6.5 Acres	Central Merced	Courthouse Tours, Picnicking
Emory O'Banion County Park	10 Acres	North of Dos Palos	Picnicking
Hagaman Park	16 Acres	South of Hilmar/Merced River	Picnicking, Fishing
Harris-Schmidt Park	33 Acres	Gustine	Tennis, Picnicking, Ballfields, Concessions
Henderson Park	74 Acres	1 mile east of Snelling	Fishing, Boating, Picnicking
Lake Yosemite Park	600 Acres	4 miles north of Merced	Boating, Picnicking, Canoeing, Waterskiing, Wind Sailing, Swimming
Los Banos Park	6 Acres	Los Banos	Swimming Pool, Museum, Play & Picnic Areas, Library
McSwain Park	40 Acres	Buhach Rd., North of Hwy 140	Undeveloped
Planada Park	5 Acres	Planada	Picnicking, Senior Citizens Hall, Recreation Building
South Dos Palos Park	15 Acres	South Dos Palos	Picnicking, Ballfield, County Library
Winton Park	22 Acres	Winton	Picnicking, Ballfield, Concessions

The State Department of Parks and Recreation's "California Recreational Trails and Hostel Plan" promotes a Yosemite to Monterey Hiking/Biking/Equestrian Corridor, which would weave between the two points passing through the northern and western areas of the County. Funding constraints have precluded State implementation of the program.

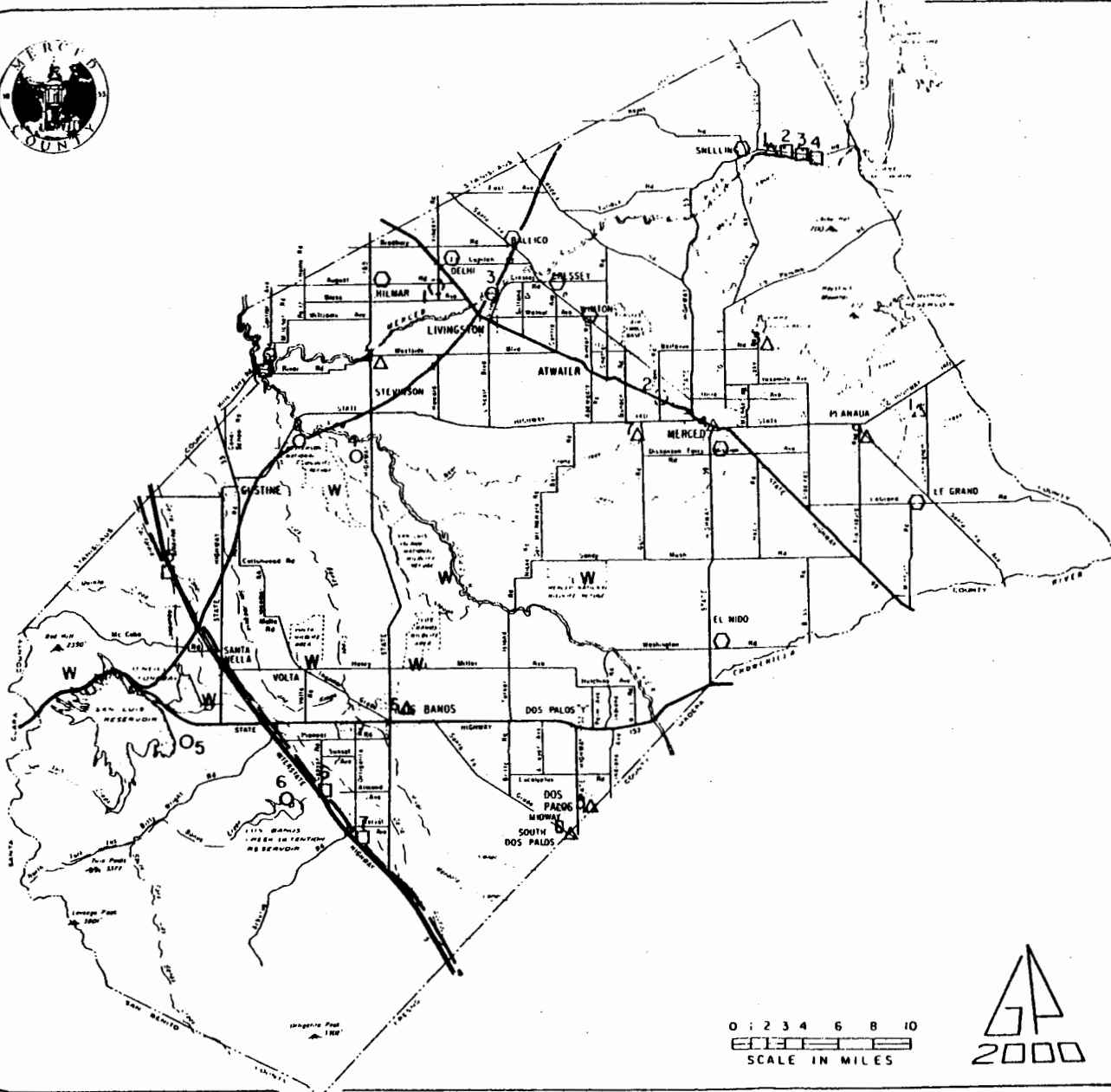
Currently, the County does have bicycle trails which link many of the local parks to Federal and State facilities (See Map 5). This system can be expanded by use of joint agreements with public and private agencies which control utility easements in order to incorporate such lands into permanent trail linkage for both bicycle and hiking through at the County. Trail easements can also be acquired through subdivision and development approval.

Also, see the Land Use Chapter (I), Section B.5.b., for additional discussion related to the Land Use Designation.

c. Private Recreational Lands and Facilities

Private lands can also provide open space recreation use areas for the public. Figure VI-15 lists private recreation facilities which provide both active and passive recreation services to tourists and local residents. Active recreational facilities located in the County include: four golf courses, hundreds of duck hunting clubs, a pheasant preserve, three recreational vehicle camp grounds and several equestrian camps. Private duck clubs can be found extensively throughout the major wetlands and water resource areas in the County. These private duck clubs are not only a valuable recreational amenity but also provide an economic benefit to the County (with an estimated \$11.5 million spent by hunters annually in the Grasslands District alone). The encouragement and the development of private facilities can offer a alternative to the costly public acquisition, development and maintenance of similar public facilities. The most effective approach is to encourage or require multi-family developments and larger commercial operations to provide on-site facilities. Though private recreation facilities can provide additional open space availability, such facilities as golf courses outside of urban designation areas can also promote conversion of open space land for residential and commercial uses. Special care should be given to the siting and operational characteristics of both public and private commercial recreational operations to ensure that these facilities do not occur at the expense of sensitive, rare or endangered plant and wildlife habitats or productive agricultural areas discussed in Section B.1.





## Public Park and Recreation Facilities

### LEGEND:

- CENTRAL VALLEY TRAIL CORRIDOR
- MONTEREY TO YOSEMITE TRAIL CORRIDOR

W FEDERAL AND STATE WILDLIFE AREAS

- O STATE PARKS
- 1 GEORGE J. HATFIELD
- 2 FREMONT FORD (FISHING ACCESS)
- 3 MC CONNELL
- 4 GRASSLANDS
- 5 SAN LUIS RECREATION AREA
- 6 LOS BANOS CREEK
- △ COUNTY REGIONAL PARKS
- 1 HAGAMAN PARK
- 2 HENDERSON PARK
- 3 LAKE YOSEMITE PARK
- 4 COURT HOUSE PARK
- 5 EMORY O'BANION PARK
- 6 LOS BANOS PARK
- 7 MCSWAIN PARK
- 8 SOUTH DOS PALOS PARK
- 9 HOULIHAN PARK (PLANADA)
- 10 HARRY P. SCHMIDT PARK
- △ PROPOSED COUNTY REGIONAL PARK
- 1 PLANADA/LE GRAND
- COMMUNITY PARKS
- PROPOSED COMMUNITY PARKS
- 1 DELHI
- 2 FRANKLIN / BEACHWOOD
- PUBLIC FISHING ACCESS
- 1 HILLS FERRY ROAD
- 2 HENDERSON PARK
- 3 CUNEO
- 4 CROCKER HUFFMAN PARK
- 5 COTTONWOOD ROAD
- 6 CANYON ROAD
- 7 MERVEL ROAD

SOURCE: California Recreational Trails and Hostel Plan  
(Preliminary) State of Calif. Dept. of Parks and  
Recreation 1977

MERCED COUNTY  
YEAR 2000 GENERAL PLAN MAP 26

0 2 4 6 8 10  
SCALE IN MILES



## FIGURE VI-15 MERCED COUNTY PRIVATE RECREATION FACILITIES

FACILITY - GOLF COURSE

<u>NAME</u>	<u>LOCATION</u>
Forebay Golf Course	Santa Nella
Golden Valley Golf Course	Hilmar
Merced Golf Club	Merced
Rancho Del Rey Golf Club	Atwater
Turlock Golf & Country Club	Turlock

FACILITY - DUCK CLUB

<u>NAME</u>	<u>LOCATION</u>
Gilroy Land & Cattle	Los Banos
101 Duck Club, Inc.	Los Banos
Mesquite Sportmans' Club	Los Banos
Gustine Gun Club	Gustine
Industrial City Duck Club	Los Banos
Old Los Banos Duck Club	Los Banos

FACILITY - CAMP/RIDING ACADEMY

<u>NAME</u>	<u>LOCATION</u>
Rascal Slough Ranch	Hilmar
Delta Stables Incorporated	Los Banos

Poco Loco Gun Club	Los Banos
Santa Cruz Gun Club	Los Banos
The Duck Club	Los Banos
Turlock Cattle Co.	Gustine

FACILITY - DUCK CLUB

<u>NAME</u>	<u>LOCATION</u>
Abantha & Nola Gun Club	Los Banos
Bee Ess Land & Cattle Co.	Los Banos
Accornero & Sons Investmtns	Gustine
Big Water Gun Club	Los Banos
Bert Crane Duck Club	Merced
Britto Land Company	Los Banos
Castle Duck Club	Merced
Charlie Bosso	Dos Palos
Edward Cardoza	Los Banos
Duckville Sports Club	Los Banos
Hollister Land & Cattle	Gustine
Ideal Gun Club	Los Banos
Fields Duck Club	Gustine
Lone Tree Gun Club	Gustine
Gable Land & Cattle	Dos Palos

West Gustine Gun Club	Gustine
Tracy Duck Club Unincorporated	Gustine
Little Water Duck Club	Los Banos
Sierra Duck Club Metz, Ebert & Scholl	Gustine
H & H Hunting Club	Los Banos
Bardin Duck Club	Los Banos
Ramogni Land Company	Gustine
Lucky Leven Duck Club	Los Banos

FACILITY - PHEASANT PRESERVE

<u>NAME</u>	<u>LOCATION</u>
Newhall Land & Cattle	El Nido

FACILITY - CAMPGROUND

<u>NAME</u>	<u>LOCATION</u>
Merced River Park	S. of Delhi

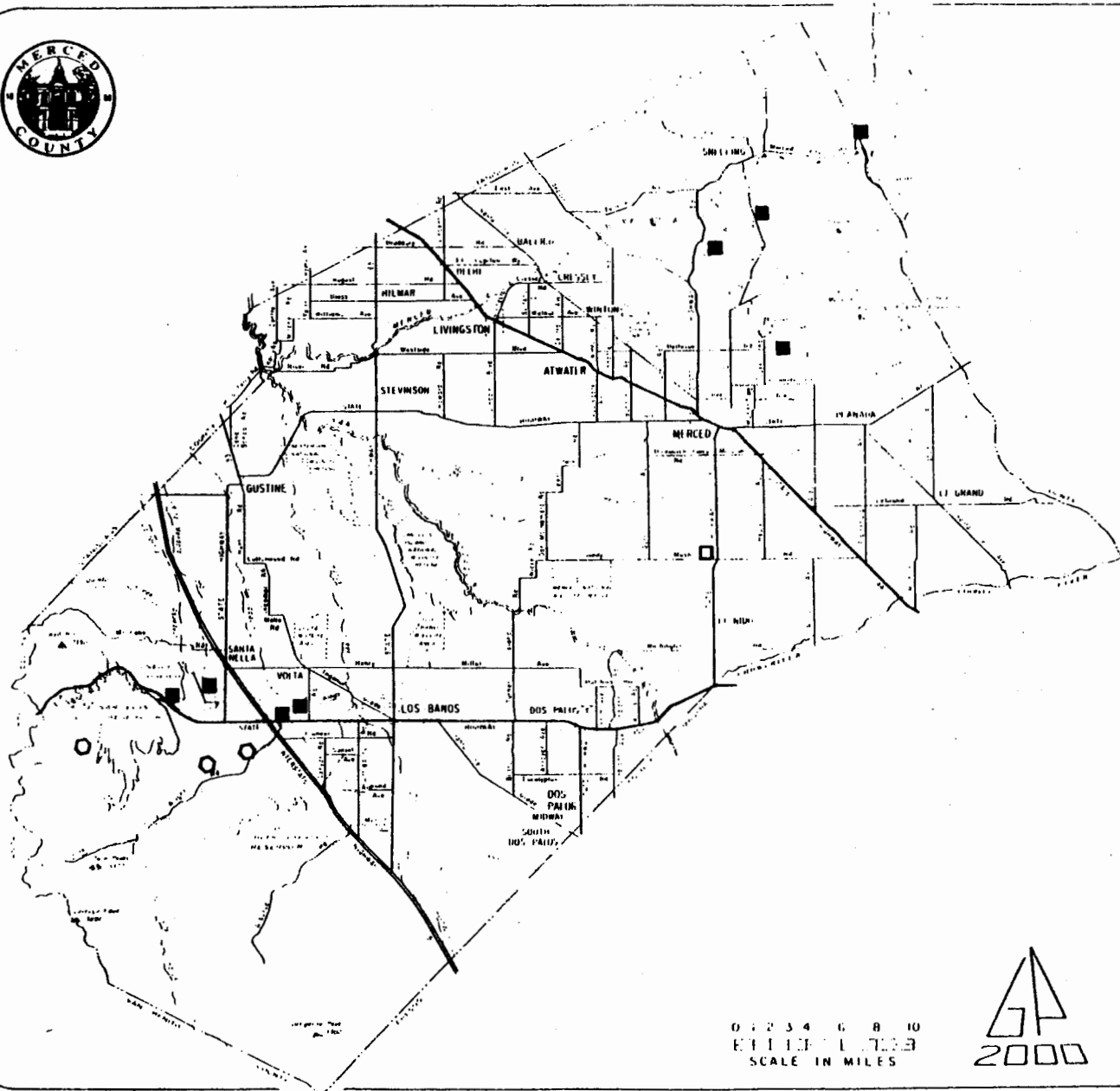
## 9. Energy Resources

The energy needs of Merced County are ever increasing while the availability of low cost energy resources continues to fluctuate. Due to global relationships and energy developments over the past two decades, public awareness of its dependence has increased. Today, most of the energy needs of the County are imported. Electricity and natural gas are received via electrical transmission and pipelines, while gasoline and diesel fuel are imported from outside the County by various oil companies by truck and pipeline (See Maps 6 and 7 in the Circulation Chapter). As traditional sources of energy become depleted, the importance of developing alternate options and methods of power generation becomes more important.

There are three practical alternative sources of energy available in the County: hydroelectric, wind and solar. Each of those resources are in abundance and are considered renewable. Hydroelectric power is the most prevalent of the alternative sources used in the County. Currently, eight hydropower plant facilities are in operation in the County, all located near reservoirs or canals, with a combined generation capacity of 259 megawatts. The County is not aware of proposals for additional facilities, though the State proposed Los Grandies Reservoir, adjacent to the existing San Luis Reservoir may include power generation. Opportunities may also exist for additional generation using irrigation district canals. Map 28 identifies the location of various energy generating facilities in the County.

Wind is also a proven energy source -- renewable, clean, and abundant in certain areas. Electricity generated by a wind-driven energy conversion system does not pollute the air or water, and often existing distribution systems can be used to transmit the power from wind energy generating stations to customers. The increasing monetary and environmental costs of electrical generation dependent on fossil fuels make the production of electricity from wind energy one of the most attractive and cost-effective alternative generation technologies currently available. Wind energy conversion systems need to be located in areas with strong and persistent winds for cost-effective electrical production because the total amount of power in the wind increases as a function of the wind speed. For example, as wind speed doubles, the total amount of wind power increases eight-fold. The Pacheco Pass area with over 112 operational turbine generators is the dominant wind source area in the County. In addition, the County has approved the location of an additional one thousand wind turbines. Due to the loss of tax credits, the County does not expect these permits to be activated unless significant increases in energy costs occur.

Solar energy is also used in limited amounts in the County primarily for domestic hot water heating. The opportunities for expansion or increased use are significant due to the number of cloud free days in the Valley. However, it is often foggy in the winter months when these systems are most needed.



0 2 3 4 6 8 10  
MILES  
SCALE IN MILES



## Energy Plants

LEGEND:

- HYDROELECTRIC PLANT
- BIOMASS PLANT
- WIND POWER PLANT

SOURCE: California Energy Commission June 1986

MAP 28

MERCED COUNTY  
YEAR 2000 GENERAL PLAN

## 10. Air Quality and Resources

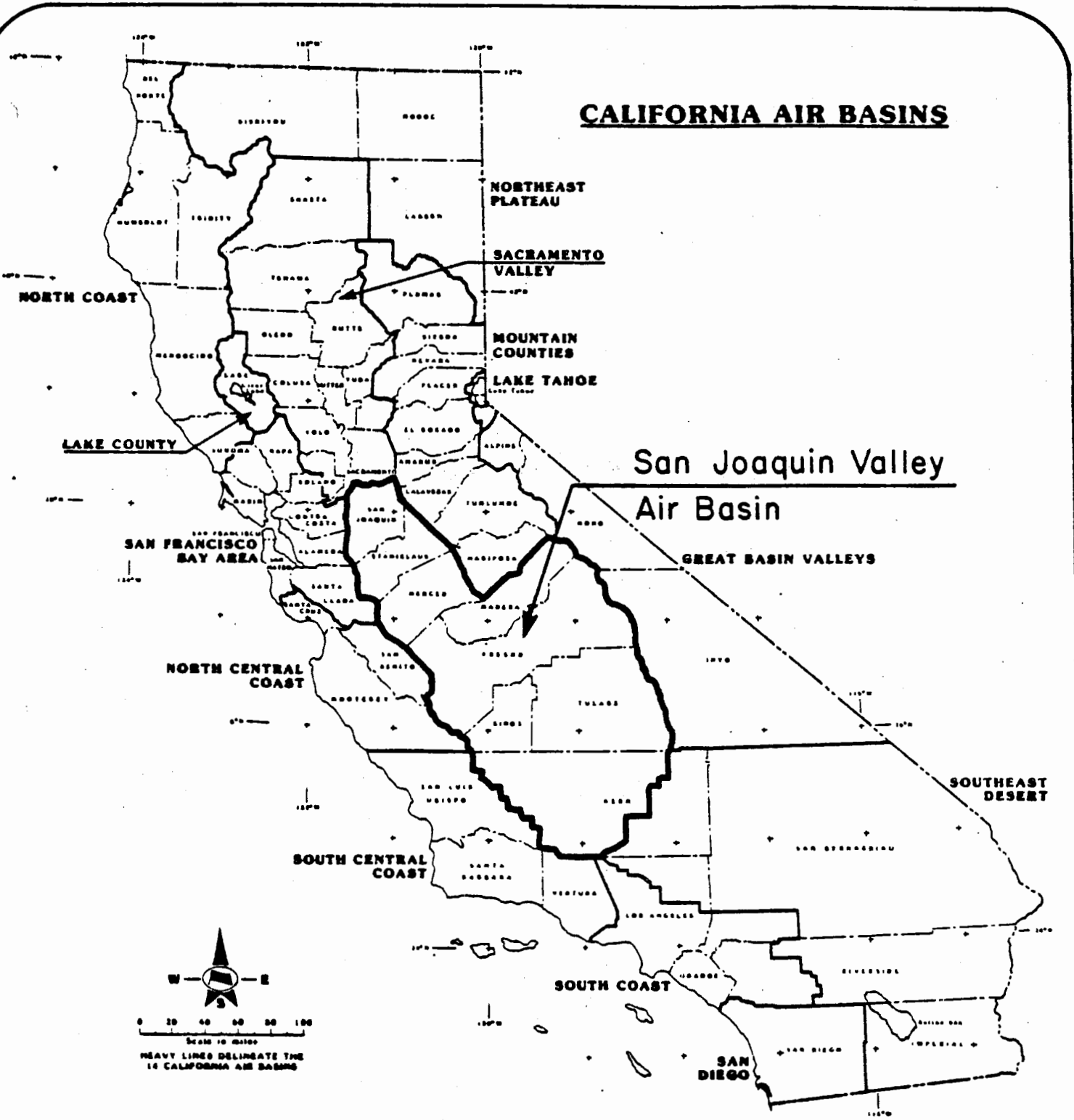
Air quality is determined by the ability of the environment to disperse and remove pollutants, the quality of emissions, the physical location, and the amount of background pollutants present. Merced County has a moderate to high concentration of air pollutants due to growth, its topography and the warm climate. Local population growth, commuting and agricultural activities add to emission problems. These geographical characteristics create the air basin. Many pollutants are blown into the County from the Bay area and northern San Joaquin Valley counties. Subsequent warm air inversions form, trapping air pollution close to the ground. Added to this condition are low wind speeds and winters where storms are rare and fog is common. Figure VI-16 identifies the San Joaquin Air Basin.

Merced County is considered a non-attainment area for ozone. The major sources of ozone precursors are vehicles, industry, combustion of fuels and evaporation of paints and solvents. Ozone is created downwind from the original source of the ozone precursors. Ozone in Merced County is largely due to the emissions released from the Bay area, upwind and other urban centers north and west of Merced County. However, Merced County is an attainment area for particulates, though other counties involved in the air basin have a non-attainment classification. Particulates are fine solid and liquid matter suspended in the air. Major sources of particulates in the San Joaquin Valley appear to be agricultural tilling, burning, dust raised by autos, trucks and trains and industrial sources. According to the California Air Resources Board, Merced County on an annual average, exceeds the State Ambient Air Quality Standards for particulate matter emitted in the atmosphere by 26%.

The Valley and Merced County has experienced rapid growth since the early 1970's. Population growth affects the amount of pollution growth in three ways; first, emissions increase from both manufacturing, industries and secondary service industries that support them; secondly, emissions from household and consumer products-such as hair care products-also increase; thirdly, emissions increase due to the greater use of automobiles. As long as the County's and the Valley's population continues to grow, efforts to control and reduce air pollution will be partially offset by increased emissions from more sources.

In the State, while total amounts of smog agents emitted from automobiles and motor vehicles have decreased from 1979 to date, State experts expect the amount to rise again after the year 2000. This is primarily because the number of miles traveled by motor vehicles is expected to increase by 5 percent Statewide, annually. Increased congestion on roadways leads to much higher emissions from individual vehicles because cars do not burn fuel as completely at decreased operating speeds.

# CALIFORNIA AIR BASINS



## San Joaquin Valley Air Basin

## San Joaquin Valley Air Basin



The role of local air districts in land use planning is very limited. Air districts have no formal role in reviewing city and county general plans, the major vehicle for land use planning decisions. In fact, there is not a requirement for county general plans to address air quality. However, during local decisions concerning siting of facilities review does occur.

Placing an emphasis on commercial and industrial development as a priority can result in local growth patterns where insufficient housing for the needed work force is available near commercial and industrial growth centers. As a consequence, individuals may live far away from their work, increasing the length of commuter trips. This in turn, increases vehicle miles traveled and traffic congestion, both of which worsen air quality. Currently, the State directs air districts to consider controlling indirect sources of pollution; but it has not clarified how differing goals of local planning agencies should be balanced when there are conflicts. Regardless of the State's activities, Merced County should consider incorporating air quality in all of its local planning efforts. Air quality considerations should always be included in the environmental review process and in the designation of zoning districts and General Plan designations.

The local Air Pollution Control District in conjunction with eight other air pollution districts in the San Joaquin air basin are conducting studies which will assist in the adoption of local or regional non-attainment plans. County land use policy will be reviewed for compliance with applicable regional air quality plans.

To monitor air quality, management responsibilities exist at local, State and Federal levels of government. The Clean Air Act of 1970 authorized the EPA to establish ambient air quality standards, emissions standards for stationary and mobile sources, and to require all states to develop and adopt implementation plans to achieve these standards. At the Federal level, the Environmental Protection Agency is responsible for air pollution control activities. At the State level, emission control devices are required by the California Air Resources Board on vehicles sold in California. Locally, the Merced County Air Pollution Control District (APCD) has primary responsibility for the control of stationary sources of pollution. Permits can be denied if emissions either exceed limitations or result in violations of ambient air quality standards. The Merced County APCD operates partial monitoring sites in Merced and Los Banos that measure particulate air pollution. Though this section addresses County air quality issues, the primary authority for establishing policy related to air quality is the Merced County Air Pollution Control District (APCD).

C. OPEN SPACE/CONSERVATION CHAPTER GOALS, OBJECTIVES AND POLICIES

GOAL 1:

Habitats which support rare, endangered or threatened species are not substantially degraded.

Objective 1. A.:

Rare and endangered species are protected from urban development and are recognized in rural areas.

Policies:

1. Recognize as significant wetland habitats those areas which meet the definition of having a high wetland habitat value based on the Adamus methodology and based on the Army Corps of Engineers delineation method.
2. Continue to regulate the location, density and design of development to minimize adverse impacts and encourage enhancement of rare and endangered species habitats.
3. The redesignation of land from a rural to an urban designation should occur in careful consideration of the potential impact on significant habitats and conformance with the Open Space Action Plan.
4. Urban designated areas should not include identified threatened species habitat areas unless specific provisions are made for their protection.
5. Urban uses which could result in significant loss of sensitive habitat should be directed to less sensitive wetland, wildlife and vegetation habitat areas if possible.
6. Buildings and structures approved for temporary residential use, such as duck club cabins, in significant wetland, non urban designated areas should not be converted to permanent residential use.
7. In wetland areas, all public utilities and facilities, such as roads, sewage disposal ponds and gas, electrical and water systems, should be located and constructed to minimize or avoid significant loss of wetland resources.



8. Development approval adjacent to rare and endangered species habitats or within identified significant wetland should include mechanisms to ensure adequate on going protection and monitoring occurs.
9. Significant aquatic and waterfowl habitats should be protected against excessive water withdrawals which would endanger or interrupt normal migratory patterns.

Objective 1. B.:

Local, State and Federally managed lands are recognized.

Policies:

10. Special agricultural commercial uses that are directly related to and a part of an agricultural enterprise or operation, and characteristically specific commercial or industrial uses in rural areas should not be located adjacent to Federal or State wildlife refuges.
11. The division of parcels which is determined to result in nonagricultural uses should be avoided, adjacent to Federal and State designated wildlife refuge areas.
12. Hazardous Waste Residual repositories (as defined by the Merced County Hazardous Waste Management Plan) shall not be located in significant wetland and threatened species habitats or adjacent to State and Federal wildlife refuges or management areas.
13. Minimize the fiscal impact to the County from State and Federal programs which result in the purchase of property in fee title through the use of mutual aid agreements, required subvention payments and any other available means determined to be acceptable by the Board of Supervisors.

GOAL 2:

Soil, water, mineral, energy, historical and air resources are properly managed.

Objective 2. A.:

Soil resources are protected from erosion, contamination and other effects that substantially reduce their value.

Policies:

1. The removal of vegetative resources which stabilize slopes, reduce surface water runoff, erosion and sedimentation should be minimized.
2. Watersheds which are necessary for the replenishment of reservoirs and aquifers should be protected and preserved.
3. Structures, utilities, or public facilities located within watershed recharge areas that are determined to be important should be designed and constructed in a manner to minimize or eliminate risk of erosion and impact on water quantity or quality.
4. Flood control alterations to existing waterways which contain important riparian vegetation should avoid significant vegetation impacts and avoid soil loss through sensitive project design and implementation.

Objective 2. B.:

Surface and ground water resources are protected from contamination, evaporation and inefficient use.

Policies:

5. Ensure that land uses and development on or near water resources will not impair the quality or productive capacity of these resources.
6. Methods to prevent the depletion of groundwater resources and promote the conservation and reuse of water should be encouraged.
7. The rehabilitation of irrigation systems and other waterworks to reduce the lost water, and improve the efficient use and availability of water should be promoted.
8. Waste water disposal facilities that are determined to have the potential to contaminate the groundwater or surface water, on either a site-specific or cumulative basis shall not be approved by the County.
9. In areas identified as having high groundwater and drainage problems, the development of intensive agricultural processing

activities which have heavy waste water discharge characteristics should be avoided.

10. Agricultural processing activities with high water use characteristics should not be located in rural areas where groundwater overdraft problems exist, unless said facility utilizes water recycling and conservation techniques that minimize affects of water use to the ground water table.
11. Promote the development of community drainage systems to manage, control and reduce degradation of wetland and other riparian areas from urban runoff.
12. New development should not be permitted within the service area of a water purveyor unless determined that an adequate quantity and quality of water will be available.
13. Encourage water conservation in urban areas by using drought tolerant landscaping and by avoiding overwatering.

Objective 2. C.:

Significant mineral resources are recognized and responsibly managed.

14. Promote the orderly development of mineral resources while preserving local values for recreation, watershed, wildlife habitat, and agricultural uses.
15. Strict control should be maintained on sand and gravel extractions in streambed channels and within areas designated as having sensitive open space resources.
16. Reclamation of mining sites should occur along with extraction activities rather than after extraction has been completed.
17. Reclamation should be achieved in a manner that will protect public safety and enable lands to be put to subsequent beneficial use.

Objective 2. D.:

Clean, efficient and renewable energy resources are appropriately developed. Nonrenewable energy resources are efficiently used.

Policies:

18. Encourage, when appropriate, the use of solar and other renewable energy resources for residential, commercial, industrial and public building applications.
19. New subdivision lots should be oriented to allow for both passive and active solar design and technology and to minimize energy losses.
20. Rural land uses which involve a high volume of vehicle traffic should be located adjacent to major roadways to reduce access distance.

Objective 2. E.:

Significant archaeological and cultural resources are recognized and managed.

Policies:

21. Projects which affect archaeological sites and artifacts should be carefully managed to avoid damage.
22. The original architectural character of significant historic structures should be maintained whenever possible.
23. To discourage looting and vandalism, significant historical and archaeological resources should be subject to limited or controlled public access.

Objective 2. F.:

Air quality which meets or exceeds local and regional air quality management goals.

Policies:

24. Evaluate potential air quality impacts through the environmental review of all development projects which may significantly increase air emissions.
25. The County will assist in voluntary efforts to improve air quality through regional cooperation and will resist efforts to create additional State air pollution mandates which are contrary to the overall goals of the General Plan.

26. All development projects will be reviewed for compliance with applicable regional air quality plans.

GOAL 3:

Open space for recreation, aesthetics and protection from hazards.

Objective 3. A.:

Recreational lands are available for local and regional needs.

Policies:

1. Encourage the continuation and expansion of existing public recreation land uses, including but not limited to, public beaches, parks, recreation areas, wild areas and trails.
2. Ensure that adequate local and regional park facilities are available to serve the growing County population.
3. Establish and continue to develop a system of local and regional parks, and other recreation areas throughout the County which balance the relative importance of direct site access with management of sensitive wildlife resources.
4. Nonrecreational land uses should be buffered from sensitive public recreation lands through site design and other techniques.
5. Promote the use of energy, communication, transmission and distribution easements as equestrian, bicycle and pedestrian or hiking trails.
6. Areas identified as proposed for the California Recreational Trails System should be reviewed during project proposals of consideration of easements and integration into County recreational facilities.

Objective 3. B.:

Lands with high aesthetic value are properly managed.

Policies:

7. Stream corridors should be maintained in a natural condition and retain the general character of natural slopes and formations.

8. Regional parks should be used to preserve areas of natural scenic beauty.
9. The location and construction of highways should occur in consideration of the surrounding landscape and topography.
10. Power transmission and distribution facilities should be underground whenever possible.
11. Structures and activities located adjacent to state designated scenic highways should receive special review to ensure that scenic vistas and local scenic values are not significantly degraded.

Objective 3. C.:

Open space lands are used for public protection purpose.

Policies:

12. Open space recreational uses should be considered appropriate for areas identified as noise impacted.
13. Agriculture shall be considered a compatible land use in public and private recreation areas which must be protected and buffered.
14. Open space buffers and larger minimum parcel sizes should be required around existing and abandoned (un-reclaimed) solid waste dump sites.
15. Landfills should be located to avoid health and safety risks and to ensure that future adjacent land uses do not restrict landfill operations.
16. Sites identified by the State Department of Health Services and the local Health Department as spill sites or hazardous waste sites shall not be considered for development approvals, unless clean-up occurs prior to or is part of said development.

D. IMPLEMENTATION, THE OPEN SPACE ACTION PLAN (OSAP)

1. Overview

Merced County has experienced a significant increase in urban development and population growth since 1970 (over 59%). Projections by the State Department of Finance project a 43% increase through the year 2000. The County's population is expected to then be over 238,000. This growth will result in pressures to eliminate more and more open areas that have recreational, aesthetic, and wildlife habitat and

resource production value. However, if the County's open space resources are properly managed and maintained they can provide important physical, social, aesthetic, wildlife habitat and economic benefits to its residents and visitors. These resources whether natural or man enhanced (such as recreation) will have increasing value in the future.

The sensitive management of other types of open space lands is also important. These include lands which have historical and prehistorical site values as well as lands used for mineral extraction. There are also lands which should be left in a more open space character and be carefully managed since they present potential risk or hazard when used for urban purposes. Such lands may include floodways, geologically unstable areas, former waste dump sites, high fire hazard areas and noise impacted areas.

The conservation of resources has recently become one of the major issues in this country. Although the term conservation usually brings to mind the protection and management of national forests and wildlife areas, it applies as well to other resources such as minerals, soils, water, vegetation, aesthetic, cultural resources and the air we breathe. Conservation is basically the process of managing all natural resources over a long period of time; it serves to regulate land uses that could lead to degradation of the environment by pollution or loss of productive capacity.

The aim and design of the County's Open Space Action Plan is to carefully manage open space resources in order to support the County's anticipated population growth while preserving nonrenewable assets for future generations. That aim can be expressed in the following objectives:

Resource Production. To moderate impacts of future development on long term availability of essential resources including wildlife and vegetation, and to identify the limits or "carrying capacities" of those resources.

Resource Conservation. To encourage conservation of productive agricultural, mineral and other resource lands, by anticipating the effects of development on identified area-wide resources.

Public Health and Safety. To support efforts to provide unincorporated communities with adequate potable water and adequate facilities for sewage disposal as well as direct urban development away from identified natural hazard areas.

Outdoor Recreation. To provide for, protect and maintain areas of scenic and recreational value to serve both existing and future citizens needs of Merced County.

### Guiding Principle

"Open Space" shall mean land or water areas that are essentially either unimproved or primarily nonintensive and which are planned to remain primarily open in character. Some public recreation lands are an exception to this general description. These areas should be devoted to uses resulting in one or more of the following:

Preservation of Natural Resources. Typical uses include wildlife habitat areas, natural or unique vegetation and scenic land and unique natural resources (Wildlife, Wetland and Vegetation section and the Visual Resources Section of this Chapter).

Managed Production of Resources. Typical uses include mineral extraction and agricultural production (Mineral Resources section of this Chapter and the Agricultural Chapter).

Hazardous Areas. Typical are lands subject to flooding and lands susceptible to geologic or soils problems, high fire potential or possibly abandoned waste dump sites (see natural and man made hazards section Safety and Seismic Safety Chapter).

Parks and Recreation. Typical uses include public and private parks and other land or water suitable for recreation activities (see Visual and Recreation section of this Chapter).

Merced County's Land Use Map designations of Agricultural, Foothill Pasture and Recreation areas are delineated not just because of their open space resource value or for public protection purposes. The County's "Urban Centered" concept is based on a land use pattern which promotes the most efficient use of local, regional and national resources. The character of this Action Plan is to not rely on the Countywide Land Use Map or even individual community Specific Urban Development Plans or Rural Residential Center boundaries as a means to define or delineate open space lands. This Action Plan relies primarily on the use of written policies and inventory maps in addition to the above sources. This approach recognizes a procedure to determine the true development potential of a piece of land at a given time, based on a determination of the open space sensitivity value, rather than only relying on a General Plan or zoning designation. This will provide a better approach for balanced consideration of sensitive resource areas with the need for housing and local economic health.

This County's Action Plan recognizes the comprehensive nature of the General Plan. It includes policies and implementation programs identified in other Chapters of the General Plan.



## 2. Open Space Action Plan (OSAP)

As part of the General Plan update program, inventories were conducted of open space resources. These resources have been mapped both in a general form as illustrated and discussed in this and other Chapters and identified on more detailed file maps in the County Planning Department. Areas which have been delineated on the Open Space and Conservation Chapter figures and maps as sensitive or significant resource or hazard areas are to be protected, managed, or preserved in a manner that is compatible with the resources or hazards that exist on the site or in the area. Specific development proposals within these areas must be consistent with the goals, policies, objectives and criteria specified for each resource or hazard. Where applicable, new measures for attaining the goals and objectives of the open space and conservation section will be implemented for both clarification and processing efficiencies. The County's Action Plan includes the following three Implementation Programs:

### **PROGRAM I: An On-going Inventory of Open Space Resources**

The County shall maintain an open space and conservation inventory which will delineate those areas that have significant open space or conservation value. Those areas include agricultural lands, parks and recreation areas, historic resources, scenic highways, wetland, wildlife and vegetation resources, mineral and energy resource areas, fire hazard areas, geologic and flood hazard areas, noise impacted areas and other resource and hazard areas. The figure and maps listed in Figure IV-17 represent the County's open space conservation inventory.

Provided in this and other chapters are general maps, figures and other data source information as part of the inventory. More detailed maps and technical studies are available in the technical appendices section of the plans or on file in the Planning Department. These sources shall be updated as additional information becomes available in consultation with other federal, state and local agencies which have either permitting or trustee responsibility or authority. The County's program is not intended to replace or supersede other agencies' authority, but simply to provide a local coordinated data base.

### **PROGRAM II: An Open Space Development Review System (OSDRS)**

The Open Space Development Review System (OSDRS) is one of the primary implementing tools of the County's Open Space Action Plan. Through such a review system, daily planning and permit approval decisions should reflect and implement the adopted policies and development standards provided within this and other Chapters of the County General Plan.

FIGURE VI-17

**LIST OF MAPS, TABLES AND FIGURES FOR OPEN SPACE INVENTORY**

<u>MAP</u>	<u>TITLE</u>
1	Public Facilities in Unincorporated Areas
5	Countywide Bicycle Route Plan
8	Major Noise Sources
9	Community Noise Survey Monitoring Sites
10	Faults in and Adjacent to Merced County
11	Maximum Expectable Earthquake Intensity
12	Potential Dam Failure Inundation Areas
13	Landslide Hazard Areas
14	Subsidence Area
15	Flood Prone Areas
16	Fire Hazard Severity Zones
18	Sensitive Lands Analysis-Wetlands
19	Sensitive Lands Analysis-Sensitive Wildlife
20	Sensitive Lands Analysis-Sensitive Plants
21	Distribution of Sand and Gravel Resources
22	Principal Watersheds and Groundwater Recharge Areas
23	Groundwater Quality
24	Drainage Problem Areas
25	Solid Waste Disposal Sites
26	Public Park and Recreation Facilities
27	State Scenic Routes

**LIST OF MAPS**

<u>MAP</u>	<u>TITLE</u>
28	Energy Plants
29	General Soil Quality
30	Existing Parcel Sizes in the A-1 Zone
32	Potential Locations for Ag. Services Centers
33	Potential Planned Ag. Industrial Development Zones
34	Major Irrigation Canals and Natural Waterways
35	Saline/Sodic Soils
36	Water Conservation
37	High Water Tables
38	Soil Erosion

**LIST OF TABLES**

<u>TABLE</u>	<u>TABLE NAME</u>
III-10	Distribution of Farmworker Housing Need - 1990
III-18	Unincorporated Community Vacant Residentially Zoned Land
IV-1	Traffic and Noise Level Data, State Highway and Major Local Streets, Merced County, California
IV-4	Land Use Compatibility Standards Residential Land Uses - Merced County
VII-1	Farms of Size
VII-2	Farms of Value of Sales
VII-3	Farms by Tenure and Organization
VII-4	Average Value of Land Per Acre

- VII-5 Vacant SUDP Land
- VII-6 Conversion of Agricultural Land Between 1967-1979 by Major SUDP
- VII-7 Farm Income Analysis

**LIST OF FIGURES**

**FIGURE   FIGURE NAME**

- VI-2 Wetlands and Waterfowl movement Pathways
- VI-3 General Functional Values for Wetland and Other Sensitive Habitat Findings
- VI-5 Endangered/Sensitive Species
- VI-6 Pacific Flyway
- VI-7 Mineral Resources of Merced County
- VI-8 List of Surface Mining and Reclamation Operations in Merced County
- VI-9 Federal and State Historical Sites
- VI-10 Major Rivers, Creeks, Canals and Reservoirs
- VI-11 Identification of Merced County Groundwater Problem Areas
- VI-12 Hazardous Waste/Contaminated Sites
- VI-13 Abandoned Solid Waste Disposal Sites
- VI-14 Federal, State and Local Park and Recreation Areas
- VI-15 Private Recreation Facilities
- VI-16 San Joaquin Valley Air Basin
- VI-17 Lists of Maps, Tables and Figures for General Plan
- VI-18 The Open Space Development Review System for Project Review
- VI-19 Open Space Action Plan--Wildlife and Vegetation Evaluation Process Example

The Open Space Chapter has identified resources found within Merced County described in ten (10) topic areas. Other federal, state and local agencies also have responsibility for the protection, maintenance and development of Open Space resources. The referral of projects, consultation and coordination with appropriate responsible and trustee agencies is part of the program.

The system is intended for utilization both by developers in the design and building of projects, and by planners and decision makers in review of projects for conformance with County policy. The system is basically a process for assessing the appropriateness of proposed developments, including their compatibility with surrounding environmental constraints and resources. The general review system will be organized in a (4) step process. Whether or not a development is determined consistent with the Open Space Action Plan (OSAP), it will be determined by the OSDRS process. This system of review will be required of all projects for which a building permit or other entitlement occurs such as a land division or use permit, as well as during policy and ordinance amendment. This process or system will be more specifically administratively developed in a procedural manual. The four Step review process is described in Figure VI-18 and Figure VI-19.

### **PROGRAM III: Open Space Acquisition Consideration as Part of the County Annual Capital Improvement Program**

The County annually prepares a Capital Improvement Program (CIP) as part of the budgetary process. Under the Government Code, the Planning Commission is required to determine if the CIP is consistent with the County General Plan, including the Open Space related policies. As a component of this process, acquisition of open space lands and resources will be considered. The final approval of the CIP is by the Board of Supervisors.

### 3. Other Implementation

Traditionally, general plans have consisted of a land use map which depicts future land uses, and written text and maps of other regional general plan elements such as noise and safety. The land use map is usually the primary focus of a general plan and is often looked upon as the composite of all the general plan issues and policies. The plan and map can be one and the same in the eyes of planners, citizens and elected officials, while the other elements are little used in assessing the consistency or desirability of specific development proposals. However, it is difficult to assure that a land use map does in fact reflect all significant issues which need to be considered in the planning process. As a prediction of final future land uses and densities, a map can be somewhat static. The map may accurately reflect conditions, attitudes and priorities at the same time it was adopted, but subsequent changes may not be reflected.

The use of written policies rather than simply a map to define development standards provides a way to recognize true development potential, and better provides for special local or regional institutions and facilities needs at a given time, rather than recognizing a general plan forecast designation. Land use maps and SUDP maps work well for communities, but policies provide a better planning tool for Merced County in recognizing open space resources.

These three programs outlined in the previous section, do not solely comprise the OSAP. In other Chapters, implementation measures which are part of this Plan and which would be considered during the OSDRS, are identified. An example is the basic policy direction for both the County General Plan and the Open Space Action Plan (OSAP), the "Urban Centered Concept." The Land Use Chapter (I), Section A.2.a., discusses this concept. Basic to the implementation of the "Urban Centered Concept" is the conversion criteria listed for the implementation of GOAL 1., Objective 1.A., Policy 2. This policy relies on a set of criteria to be used as a basis for determining when rural and open space lands would be converted to urban use. The criteria is supported by policies in the Land Use, Open Space/Conservation, Agricultural and Safety Chapters.

## FIGURE VI-18

## THE OPEN SPACE DEVELOPMENT REVIEW SYSTEM FOR PROJECT REVIEW

Step One: Basic Land Use Category, Service Determination and Zoning Code Consistency Determination

The first review step is an evaluation of the suitability of locating the proposed land use on the site, based on a review of the existing development surrounding the project and a review against the General Plan Land Use Map, applicable General Plan policies and the applicable County regulations (zoning, subdivision ordinances, etc.).

The site or project characteristic which determines whether a policy or standard applies may often be obtained from the general mapping system, which as been designed for use in conjunction with the Zoning Code. Information which cannot be obtained from the General Plan maps are to be supplied by the development project applicant. The Countywide Policies and ordinance standards constitute the initial basis for a project compliance determination.

Community Services Availability Determination

Projects will be required to supply plot plans, data letters from other agencies and other information requested to demonstrate waste water disposal, water and access are available and adequate for the project.

Step Two: Open Space Inventory Map and Data Base Review

An extensive land use information and mapping system has been developed to both update and help implement the Comprehensive General Plan. The maps convey the best available information of existing conditions and the system is designed to be updated on an ongoing basis as conditions change and new information becomes available.

The wildlife and wetland inventory maps will be used in project reviews to assess which policies and standards apply to a particular site or project. The maps Nos. 18, 19 and 20 provided in the General Plan are oversized general maps. On file in the Planning Department are more detailed United States Geological Survey quadrangle maps and other data files which will be used for actual project reviews. Other resource maps and data which will also be considered include: important farm lands mapping, U. S. Soil and Conservation Service information, archaeological and groundwater, etc.

Step Three: Environmental Determination

Step three of the OSDRS is an environmental review determination. The California Environmental Quality Act (CEQA) requires a review for all projects for potential environmental effects. Based on this review, a CEQA determination is made. A part of this review step is a review of the project site relative to critical wildlife wetland resource habitats. The map and data base review in Step Two will be used as the basis for a determination for the need for consultation with other appropriate federal, state and local agencies and interest groups. Based on this consultation (if necessary) certain requirements may be applied or additional study may be required. Figure VI-2 briefly describes federal and state regulation jurisdictions in some areas which will require formal consultations. Figure VI-19 outlines an example of the wildlife and vegetation evaluation review process.





5. Resource Protection Guidelines

Is the project in conflict with the guidelines of the Open Space/Conservation Chapter Appendix 1.b?

- c. Compatibility Findings: On the basis of the above review factors, one of three compatibility findings must be made:
1. The proposed land use is compatible with the adjacent existing and approved land uses and will not significantly impact a critically sensitive resource.
  2. The proposed land use is compatible with the adjacent existing and approved land uses and sensitive resources if all significant impacts and concerns are mitigated. Examples of mitigation measures which may be needed include project design alterations, the provision of setbacks and buffers.
  3. The proposed land use would not be compatible with the adjacent existing and approved land uses and significant sensitive resources.

These compatibility findings will be made by the appropriate reviewing authority as set forth in the County regulations and procedures. These reviewing authorities include the Board of Supervisors, Planning Commission and the Planning Director.

- d. Mitigation Responsibility: It shall be the responsibility of the applicant to accomplish any mitigation measures determined necessary through the Open Space Development Review System. Monitoring required of a project shall be the financial responsibility of the applicant.

FIGURE VI-19

OPEN SPACE ACTION PLAN WILDLIFE AND  
VEGETATION EVALUATION PROCESS EXAMPLE

A. Use of Maps and Inventory

Merced County has prepared wildlife and vegetation maps and compiled available data as to wildlife and vegetation and their habitats generally on private land within the County--in order to help the County make more effective decisions regarding projects which may affect rare and endangered wildlife and vegetation. This data base will make it possible to determine appropriate levels of protection for various types of wildlife areas. It will permit the County to provide more informed review and protection for the most valuable wildlife areas and will assist the County in channeling appropriate General Plan, zoning and development proposals to less valuable or less sensitive areas. In addition, the USGS Quadrangle maps will allow land owners, developers and planners to predict or determine general constraints to development which might be imposed by the existence of wildlife resources in specific areas. Finally, the data base in conjunction with the OSDRS (see Figure VI-18) will make it possible for a consistent wildlife mitigation policy to be practiced and to assist the County in clarifying protections required under the California Environmental Quality Act.

It should be noted, however, that no wildlife mapping can be complete. In fact, available data on many wildlife species is minimal or nonexistent. In the County's effort to create this data base, a consultant was used in scanning State's natural diversity data base files and other sources and field review in order to provide these graphics. However, there are undoubtedly other sources and additional studies which will be available that may be added to this base and/or through additional intensive bibliographic searches and field studies. Also, through the ongoing updating process accomplished by both Federal and State agencies independent studies and assessments for State and Federal projects, as well as local development projects, this data base will be constantly updated. In addition, the status and whereabouts of wildlife are constantly changing and thus maps will be needed to be updated periodically. Therefore, the wildlife maps in this evaluation process must be considered a starting point in the search for information on the County's wildlife, not as a final authority.

B. Compliance with CEQA

Through the use of the Open Space Development Review System, CEQA may be determined necessary. Under CEQA, the County is required to determine whether any project under its jurisdiction would have a significant effect on the environment. If such significant effects are considered likely, CEQA requires the County--among other things--to explore ways of mitigating or avoiding such

impacts. A significant effect is defined as a substantial or potentially substantial adverse change in any physical conditions in the area effected by the project; specifically, effects on flora and fauna (CEQA guideline section 15382). Appendix G of the CEQA guidelines states that a project will normally have a significant effect on the environment if it will "substantially effect a rare and endangered species of animal or plant, or their habitat", or "interferes substantially with the movement of any resident or migratory fish or wildlife species", or "substantially diminishes habitat for fish, wildlife or plants." Section 15065 of CEQA guidelines requires the finding of the significance of a projects potential to reduce the number of, or restrict the range of, rare or endangered plants or animals. By rare and endangered, CEQA means any plant or animal that is actually rare and endangered throughout all or a significant part of its range, even if it is not officially listed as rare, threatened or endangered (Section 15380).

The Wildlife Inventory prepared for the General Plan update, will put the county in a better position to comply with CEQA. Under CEQA, an EIR is required unless substantial evidence indicates that a project will not have a significant environmental impact. With this data base, the County is in a better position to make this judgement.

It is recognized that there could be significant impacts on wildlife habitats or use areas that are not mapped in this General Plan update process. Most notably, where common species habitats, rather than endangered species habitats, are being affected. Thus, the County must judge the significance of wildlife impacts based on available evidence, not just the wildlife maps and other information that was provided in this study for the update.

#### C. Definition of Mitigation

The CEQA guidelines Section 15370 state that mitigation includes:

- a. Avoiding the impact altogether by not taking a certain action or parts of an action.
- b. Minimizing impacts by limiting the degree or magnitude of the action and its implementation.
- c. Rectifying the impact by repairing, rehabilitating or restoring the impacted environment.
- d. Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.
- e. Compensating for impact by replacing or providing substitute resources for environments.

Under this broad definition, individual projects can be modified to avoid or minimize an impact; in addition, temporary impacts can be corrected or reduced over time. For unavoidable impacts, other mitigation measures can be required as compensation, either on-site or off-site. Finally, as a last resort, projects can be denied if impacts cannot be adequately mitigated.

#### D. Sensitive Resource Mitigation Principles

The following principles define the goals for sensitive wetland, wildlife and vegetation resource mitigation measures and how to select appropriate measures for individual projects and to provide guidelines for successful implementation of those measures.

##### 1. Goals of wildlife mitigation.

- a. A central goal of wildlife mitigation in the County will be to pursue a consistent, fair and cost effective approach to wildlife mitigation that provides the greatest protection for the most sensitive resources.
- b. Goals for significant wildlife areas will be to: 1) provide possible protection for designated significant habitat areas and to maintain or enhance their present value for wildlife; 2) in rare and endangered habitat areas, to avoid impacts to the extent possible, minimize or compensate for avoidable significant impacts and encourage voluntary efforts to enhance such areas for wildlife; 3) to the extent feasible, to channel future development to less sensitive habitat areas if consistent with other policies of the County--mitigation measures will be implemented on or adjacent to the project site; 4) improvement of the same habitats as those lost, but at an appropriate site elsewhere (in kind, off-site), and 5) improvement of alternative habitat types on or adjacent to the projects site (in kind, on-site).
- c. In preserving or restoring a sensitive habitat to benefit a particular species, it must be recognized that some departures from historic conditions may be necessary--but such departures should be minimized.
- d. In selecting a mitigation option, priority should usually be given to improving or replicating natural ecosystems rather than artificial ones. For example, it is usually preferable to improve the environments where natural reproduction of fish and wildlife occurs, rather than relying on hatcheries or captive breeding to augment natural populations.

- e. The range of available mitigation options will depend on the parcel size involved. On larger parcels, there are more possibilities for on-site mitigation such as clustering of units, buffer zones, carefully siting to avoid sensitive areas, and habitat improvements in undeveloped portions of the site.
- f. Mitigation options will also be limited by the intensity of development on a parcel. For high intensity developments, there may be little or no opportunity for on-site mitigation.
- g. To protect fish and other aquatic animals, the County should cooperate with the Department of Fish and Game to obtain adequate habitat protection through instream flow and stream bed agreements with developers. Other protections will include erosion control measures and riparian setbacks.

## 2. Implementing Mitigation Measures

- a. Implementation is the responsibility of the project proponent.
- b. To ensure that mitigation measures for a project are actually implemented, they should be incorporated into development agreements, use permits, permanent easements and other enforceable documents.
- c. Post-project monitoring by the County is essential for ensuring successful implementation of mitigation measures. However, the applicant should bear the financial responsibility for monitoring.

## E. Monitoring General Approaches to Mitigation

Some mitigation measures may be considered experimental and may require monitoring to determine if they actually benefit wildlife to the extent desired. Other measures may be controversial because they are considered too difficult to implement or too constraining to development. Although it is unlikely that the County will have funds available to conduct actual studies of the success or failure of various mitigation measures, it can maintain a mitigation update file on this subject. Sources of information would include: studies described in various publications; agreements and research studies with educational institutions, utilizing student workstudy degree programs or faculty expertise; discussions with biologists from the Department of Fish and Game Bureau of Land Management; comments submitted County staff, local biologists, developers and other concerned citizens.

F. Updating the Wildlife Data Base

The following steps would help ensure that County planning staff has adequate up-to-date information on which to base its determinations/recommendations regarding wildlife.

1. Maintain and expand a collection of sensitive species and habitat reference files emphasizing references with information for designated wildlife and vegetation, as well as more general files on management and planning.
2. Maintain a collection of target distribution files including a file of distributional data on each designated plant or animal species documented reported locations on private lands within the County or nearby, within one-half mile. Such distributional data should be solicited from available sources including local biologists and other experts. The data should be recorded on a standardized report form, or if any records are contained in a single report, the relevant pages should be filed. The forms should be arranged by township, range and section within each file to facilitate finding data on a particular project area.
3. Maintain a target distribution update file to include all new distributional data related to special target areas or habitats.
4. Maintain a map corrections file for use in revising the maps.
5. Update the sensitive habitat maps at least once a year, based on the information in the target distributional update and the map correction files. If budget permits, more comprehensive updating of the mapping of the designated areas should be accomplished approximately every five years, based on new aerial photos.

E. OPEN SPACE/CONSERVATION CHAPTER APPENDIX

1. Open Space/Conservation Chapter – Appendix A

a. The Following are a List of Terms With Accompanying Definitions

1. Definition of Vegetative Resources: Define vegetative resources as all beneficial plants. but excluding agricultural crops.
2. Definition of Water Resources: Define water resources as all surface water bodies, groundwater bodies and recharge areas, including perennial and intermittent streams.
3. Definition of Significant Habitats: Define a sensitive habitat as any area where the vegetative, water, fish and wildlife resources provide especially valuable and rare plant and animal habitats that can be easily disturbed or degraded. These areas include but are not limited to: 1) habitats containing or supporting rare or unique species; 2) riparian corridors; 3) wetlands; 4) wildlife refuges, reserves and scientific study areas; and 5) important nesting or spawning areas.
4. Definition of Rare or Endangered Species: Define rare or unique species as any plant or animal that is determined to be rare, endangered, threatened or protected by Federal or State law and State and County EIR guidelines. In contrast threatened species recognizes candidate species for either the State or Federal lists.
5. Definition of Riparian Corridors: Define riparian corridors as the vegetative and wildlife areas adjacent to perennial and intermittent streams and other freshwater bodies, such as lakes, ponds and reservoirs. Delineates these riparian corridors by the "limit of riparian vegetation," i.e., a line determined by the existence of plant species normally found near streams, lakes and other freshwater bodies.
6. Definition of Wetlands: Define wetland as an area where the water table is at, near, or above the land surface long enough to bring about the formation of hydric soils or to support the growth of plants which normally grow in water or wet ground. Wetlands values are primarily determined by use of the Adamus Methodology. Map 18 in Chapter VI generally identifies wetland areas in the County. More detailed maps are available in the Planning Department. Actual delineation of wetlands in relation to any project requires consultation with the U.S. Fish and Wildlife Service and the California Department of Fish and Game.

7. Definition of Wildlife Refuges, Reserves and Scientific Study Areas: Define wildlife refuges, reserves and scientific study areas as any area designated by public and/or private agencies for the purposes of protecting, maintaining and studying important vegetative, water, fish and wildlife resources.
8. Definition of Buffer Zones: Define Buffer Zones as those areas adjacent to sensitive habitats which are necessary to allow for periodic, seasonal or ecological changes which could affect the boundaries of sensitive habitats.
9. Definition of Productive Users of Vegetative, Water, Fish and Wildlife Resources: Define productive use as any activity involving the use, removal or alteration of vegetative, water, fish and wildlife resources from their natural environment for human use or economic purposes. Productive uses include, but are not limited to, fishing, aquaculture, grazing and water consumption.
10. Definition of Economically Valuable Vegetative, Water, Fish and Wildlife Resources: Define economically valuable vegetative, water, fish and wildlife resources as those resources which are important to the economy because they:
  - a) Provide income, employment or tax benefits;
  - b) Support experimental or research and development activities which hold future commercial potential;
  - c) Are essential to the continuance of other economic activity, such as water resources;
  - d) Are significant components of the scenic quality and uniqueness of the County which add to the value of property or attract visitors.
11. Definition of Incompatible Vegetation, Fish and Wildlife: Define incompatible vegetation, fish and wildlife as any plant, fish, or animal, or concentration of plants or animals which are found to be harmful to the surrounding environment or pose a threat to public health, safety and welfare.
12. Definition of Development: Define development as the construction, reconstruction, conversion, relocation or enlargement of any structure; the division of a parcel of land into two or more parcels; any mining, excavation, landfill or land disturbance; and changes in land uses.



13. Definition of Area of Regional Significance: An area which has been designated by the Mining and Geology Board pursuant to Section 2790 which is known to contain a deposit of minerals that are of prime importance in meeting future area mineral needs and which, if developed in a non-compatible use, would result in the permanent loss of regionally significant minerals.
14. Definition of Area of Statewide Significance: An area which has been designated by the State Mining and Geology Board pursuant to Section 2790, which is known to contain a deposit of minerals that are of prime importance to meeting the future needs of the state and which, if developed with noncompatible uses, could result in the loss of minerals that are of statewide significance.
15. Definition of Minerals: Define minerals as any naturally occurring chemical element or compound, or groups of elements and compounds, formed from inorganic processes and organic substances, including, but not limited to, coal, peat, and bituminous rock, but excluding geothermal resources, natural gas, and petroleum. (Title, 14, California Administrative Code Section 3502.)
16. Definition of Mineral Deposits: Define mineral deposits as naturally occurring rock or mineral materials in or on the earth's crust that are known to be economically mineable and such rock or mineral materials that are not presently mineable but which may come into such demand as to become economically mineable in the foreseeable future. (Guidelines for Classification and Designation of Mineral Lands, adopted by the State Mining and Geology Board.)
17. Definition of Mineral Resources: Define mineral resources as a collective term for all mineral deposits of a particular kind, or for mineral deposits in general. (Guidelines for Classification and Designation of Mineral Land, adopted by the State Mining and Geology Board.)
18. Definition of Reclamation: Define reclamation as the combined process of land treatment that minimizes water degradation, air pollution, damage to aquatic or wildlife habitat, flooding, erosion, and other adverse effects from surface mining operations, including adverse surface effects incidental to underground mines, so that mined lands are reclaimed to a usable condition which is readily adaptable for alternate land uses and create no danger to public health or safety. The process may extend to affected lands surrounding mined lands, and may require backfilling, grading, resoiling, revegetation, soil compaction, stabilization, or other measures. (Public Resources Code Section 2733.)

19. Definition of Surface Mining Operations: Define surface mining operations as all, or any part of, the process involved in the mining of minerals on mined lands by removing the overburden and mining directly from the mineral deposits, open-pit mining of minerals naturally exposed, mining by the auger method, dredging and quarrying, or surface work incident to an underground mine. Surface mining operations shall include, but are not limited to:
- a) In place distillation or retorting or leaching;
  - b) The production and disposal of mining waste, and,
  - c) Prospecting and exploring activities.

(Public Resources Code Section 2735)

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b. The Following are General Resource Protection Guidelines:

1. Protect Vegetative Resources

Ensure that development will: 1) minimize the removal of vegetative resources; 2) protect vegetation which enhances microclimates, stabilizes slopes and reduces surface water runoff, erosion and sedimentation; and 3) protect historic and scenic trees.

2. Protect Water Resources

Ensure that development will: 1) minimize the alteration of natural water bodies; 2) maintain adequate stream flows and water quality for fish and wildlife habitats; 3) maintain and improve, if possible, the quality of groundwater basins and recharge areas; and 4) prevent the depletion of groundwater resources.

3. Protect Fish and Wildlife Resources

Ensure that development will minimize the disruption of fish and wildlife and their habitats.

4. Protect and Manage Production Resources

Ensure that prime agricultural soils and significant sand, gravel and other mineral resource areas are properly managed and avoid loss due to urban development.

5. Protect Air Resources

Ensure that development will not significantly degrade local or regional air quality.

c. General County OSAP Program Responsibilities

1. Develop a Sensitive Habitat Information Base

Develop and maintain clear, detailed, and comprehensive maps and other information identifying sensitive habitats in the unincorporated area of the County.

2. Develop Standard Mitigation Measures

Develop a standard set of mitigation measures which could be the basis for measures recommended to protect sensitive habitats, valuable vegetative, water, fish and wildlife resources and their productive uses from development activities in the County.

3. Improvement of Damaged Resources

Encourage programs which repair and/or enhance damaged vegetative, water, fish and wildlife resources and sensitive habitats.

4. Develop Performance Criteria and Development Standards for Sensitive Habitats in Urban Areas

a. Develop a set of performance criteria and development standards to protect sensitive habitats in urban areas.

b. Consider using the regulations as an overlay zoning district.

5. Develop Guidelines for Vegetation and Debris Control in Riparian Corridors

Develop guidelines for vegetation and debris control in riparian corridors. Such guidelines should set forth clear direction of procedures to: 1) facilitate the abatement of avoidable flood hazards and 2) minimize adverse impacts on riparian communities.

6. Encourage the Management of Riparian Corridors

Encourage and, to the maximum extent feasible, reward the efforts of those responsible for managing riparian corridors in a manner that is consistent with County and State guidelines.

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